Stralsund Mining Authority

Consultation and plan approval authority
Frankendamm 17 • D-18439 Stralsund

Reg. No. 300/18
File Ref.: 663/NordStream2/04
Author Mü, Pr, Gr
Date 31.01.2018

Subject: **Plan approval process under energy law for the construction and operation of the gas supply pipeline 'Nord Stream 2' through the Baltic Sea from Narva Bay (RUS) to Lubmin (GER) in the section of the German territorial waters**

Re: Application by Nord Stream AG
Grafenauweg 2
CH-6304 Zug

dated 22.03.2013

and after change of project developer

Application by Nord Stream 2 AG
Baarerstrasse 52
CH-6300 Zug

dated 16.12.2016

(referred to hereinafter as the Project Developer (PD))

for plan approval under Section 43 Clause 1 No. 2 of "Gesetz über die Elektrizitäts- und Gasversorgung (Energy Industry Act – EnWG) dated 07.07.2005 (BGBl. I p. 3621; last amended by virtue of Para. 2 Section 6 of the Act dated 20.07.2017 (BGBl. I p. 2808).

Plan approval decision

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A Tenor of the Decision

A.1 Plan Approval

Acting in accordance with sec. 43 sentence 1 no. 2 of the "Gesetz über die Elektrizitäts- und Gasversorgung"[1] (Energiewirtschaftsgesetz, hereinafter: "EnWG") of 7 July 2005 (BGBl. I p. 1970, 3621)[2], most recently amended by Art. 2 para. 6 of the Act of 20 July 2017 (BGBl. I p. 2808), in conjunction with Annex 1, no. 19.2.1 of the "Gesetz über die Umweltverträglichkeitsprüfung"[3] (hereinafter: "UVPG") in the version of the publication on 24 February 2010 (BGBl. I p. 94) and of the amendment by Art. 2 of the Act of 30 November 2016 (BGBl. I p. 2749) in conjunction with sec. 74 para. 2 UVPG in the version applicable on 29 July 2017 on the basis of the amendment by Art. 2 of the Act of 20 July 2017 (BGBl. I p. 2808), and in accordance with sec. 74 of the "Verwaltungsverfahrens-, Zustellungs- und Vollstreckungsgesetzes des Landes Mecklenburg-Vorpommern"[4] (Landesverwaltungsverfahrensgesetz, hereinafter: "VwVfG M-V") in the version of the publication on 1 September 2014 (GVOBl. M-V p. 476)[5], most recently amended by Art. 2 of the Act of 25 April 2017 (GVOBl. M-V p. 198), at the request of Nord Stream 2 AG, Baarerstrasse 52, 6300 Zug, Switzerland, the Mining Authority of Stralsund issues the following

Plan Approval Decision.

The plan for the construction and operation of the Nord Stream 2 gas pipeline in the section of the German territorial waters (KP 31,065 to KP 84,500 on the centre line of two pipeline routes; cf. application document, Part C.02), including the landfall to the west of the industrial harbour of Lubmin, is approved with the changes, additions, ancillary provisions and reservations included in this plan approval decision. The assurances given by the project developer (hereinafter: "PD") in the public hearing are binding on the PD and constitute part of the plan approval. The project is to be carried out in accordance with the planning documents - including any insertions / deletions marked in red - listed under A.2, unless otherwise provided in the ancillary provisions of, and in the reasons given for, this Decision.

A.1.1 Incorporated decisions

In accordance with sec. 75 para. 1 VwVfG M-V, the plan approval incorporates all other decisions under public law necessary for the project, with the exception of the permit under water resources legislation pursuant to secs. 8 and 9 of the "Gesetz zur Ordnung des Wasserhaushalts"[6] (Wasserhaushaltsgesetz, hereinafter: "WHG") in the version of the publication on 31 July 2009 (BGBl. I p. 2585), most recently amended by Art. 1 of the Act of 18 July 2017 (BGBl. I p. 2771) in conjunction with secs. 5 and 32 of the "Wassergesetz des Landes Mecklenburg-Vorpommern"[7] (hereinafter: "LWaG") of 30 November 1992 (GVOBl. M-V p. 669), most recently

1 Federal Electricity and Gas Supply Act.
2 BGBl. = Federal Law Gazette.
3 Federal Environmental Impact Assessment Act.
4 Act on Administrative Procedure, Service of Documents in Administrative Procedures, and Administrative Enforcement of the State of Mecklenburg-Vorpommern.
5 GVOBl. M-V = Law Gazette of the State of Mecklenburg-Vorpommern.
6 Federal Water Resources Act
7 Water Resources Act of the State of Mecklenburg-Vorpommern.

amended by Art. 7 of the Act of 27 May 2016 (GVOBl. M-V p. 431).

In the present case, the following decisions are incorporated:

A.1.1.1 Construction permit

The permit in accordance with sec. 59 para. 1 of the "Landesbauordnung Mecklenburg-Vorpommern"[8] (hereinafter: "LBauO M-V") in the version of the publication on 15 October 2015 (GVOBl. M-V p. 344; 2016 p. 28), most recently amended by Art. 4 of the Act of 7 June 2017 (GVOBl. M-V p. 106), for the new office and operations building as well as a workshop building in accordance with the specifications contained in the application document, Part I1.04 and the ancillary provisions of this Plan Approval Decision.

A.1.1.2 Permits under river and shipping police legislation

The permit under river and shipping police legislation in accordance with sec. 31 para. 1 no. 1 of the "Bundeswasserstraßengesetz"[9] (hereinafter: "WaStrG") in the version of the publication on 23 May 2007 (BGBl. I p. 962, 1980), most recently amended by Art. 2 para. 8 of the Act of 20 July 2017 (BGBl. I p. 2808), for the discharge or emission of substances into coastal waters, in accordance with the specifications contained in the application document, Part C.01, Chapter 3.3.3.3 (marine interim storage), and with the ancillary provisions of this Plan Approval Decision.

The permit under river and shipping police law in accordance with sec. 31 para. 2 WaStrG for the construction, modification and operation of facilities in, above or below a federal waterway or on its banks for the construction and operation of the Nord Stream 2 gas pipeline in accordance with the specifications contained in the application document (in particular the position coordinates and the depth) and with the ancillary provisions of this Plan Approval Decision.

The permit under shipping police law in accordance with sec. 57 para. 1 no. 1 of the "Seeschifffahrtsstraßen-Ordnung"[10] (hereinafter: "SeeSchStrO") in the version of the publication on 22 October 1998 (BGBl. I p. 3209, 1999 I p. 193), most recently amended by Art. 2 sec. 3 of the Regulation of 29 November 2016 (BGBl. I p. 2668), for the traffic of exceptionally large vessels in accordance with the specifications contained in the application document, Part C.01, and with the ancillary provisions of this Plan Approval Decision.

A.1.1.3 Permits, exemptions and other decisions under nature conservation legislation

The consolidated nature conservation permit (sec. 40 para. 1 of the "Gesetz des Landes Mecklenburg-Vorpommern zur Ausführung des

[8] Building Regulations of the State of Mecklenburg-Vorpommern.
[9] Federal Waterways Act.
[10] Maritime Shipping Routes Regulations.

Bundesnaturschutzgesetzes"[11] (Naturschutzausführungsgesetz, hereinafter: "NatSchAG M-V") of 23 February 2010 (GVOBl. M-V p. 66), most recently amended by Art. 15 of the Act of 27 May 2016 (GVOBl. M-V p. 431), as follows:

The permit for interventions in nature and landscape in accordance with sec. 14 para. 1 of the "Gesetz über Naturschutz und Landschaftspflege"[12] (Bundesnaturschutzgesetz, hereinafter: "BNatSchG") of 29 July 2009 (BGBl. I p. 2542), most recently amended by Art. 1 of the Act of 15 September 2017 (BGBl. I p. 3434), the recognition of eco-account measures in accordance with sec. 9 para. 2 of the "Verordnung zur Bevorratung von Kompensationsmaßnahmen, zur Einrichtung von Verzeichnissen und zur Anerkennung von Flächenagenturen im Land Mecklenburg-Vorpommern"[13] (Ökokontoverordnung, hereinafter: "ÖkoKtoVO M-V") of 22 May 2014 (GVOBl. M-V p. 290) as well as the assumption of the compensation obligation in accordance with sec. 14 para. 4 ÖkoktoVO M-V, and in accordance with the ancillary provisions of this Plan Approval Decision. The precautionary permission for a derogation from the protective provisions in relation to the GGB "Bay of Greifswald, Teile des Strelasundes und Nordspitze Usedom" (DE1747-301) in accordance with sec. 34 para. 3, 5 BNatSchG (precautionary deviating decision).

The precautionary exemption in accordance with sec. 30 para. 3 BNatSchG, sec. 20 para. 3 NatSchAG M-V or, as the case may be, the exemption in accordance with sec. 67 para. 1 BNatSchG from the prohibitions under sec. 30 paras. 1 and 2 BNatSchG, sec. 20 para. 1 sentences 1 and 2 NatSchAG M-V of any destruction of, damage to or change of the characteristic condition or other significant or sustained impairment of protected biotopes named in the application document, Part F.01, Chapter 6.2.

A.1.1.4 Permits under monument protection legislation

The permit necessary in accordance with sec. 7 para. 1 of the "Denkmalschutzgesetz"[14] (hereinafter: "DSchG M-V") in the version of the publication of 6 January 1998 (GVOBl. M-V p. 12, 247), most recently amended by Art. 10 of the Act of 12 July 2010 (GVOBl. M-V p. 383, 392), to remove and change protected monuments, to relocate them to a different place or to change their current use or, as the case may be, to carry out measures in the surroundings of protected monuments which significantly impair the appearance or substance of the monuments.

The project is allowed in agreement with the "Landesamt für Kultur und Denkmalpflege M-V"[15] in accordance with sec. 7 para. 6 DSchG M-V, the agreement having been declared by letter dated 2 January 2018.

[11] Act of the State of Mecklenburg-Vorpommern on the Implementation of the Federal Nature conservation Act.
[12] Federal Nature conservation and Landscaping Act.
[13] Regulation of the State of Mecklenburg-Vorpommern on the Stocking of Compensatory Measures, the Establishment of Registers, and the Recognition of Land Agencies in the State of Mecklenburg-Vorpommern.
[14] Monument Protection Act.
[15] Culture and Monument Protection Office of the State of Mecklenburg-Vorpommern

A.1.1.5 Decisions under water resources legislation

The decision on the notification of soil profile pits in accordance with sec. 49 para. 1 sentences 1, 2 WHG, sec. 33 LWaG (microtunnel).

The admission of an exception to the prohibitions and restrictions of use on the beach (landfall) in accordance with sec. 87 para. 4 LWaG and with the ancillary provisions of this Plan Approval Decision.

The decision on the notification of the construction of buildings near coastal waters (landfall) in accordance with sec. 89 para. 1 LWaG and with the ancillary provisions of this Plan Approval Decision.

The decision on the handling of water-hazardous substances in accordance with sec. 20 para. 1 LWaG in conjunction with the "Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen"[16] (hereinafter: "AwSV") of 18 April 2017 (BGBl. I p. 905) and with the ancillary provisions of this Plan Approval Decision.

A.1.1.6 Notification in accordance with sec. 5 GasHDrLtgV

The non-objection to the installation of the Nord Stream 2 high-pressure gas pipeline in the section of the German 12-nautical miles zone in accordance with sec. 5 para. 4 sentence 1 of the "Verordnung über Gashochdruckleitungen"[17] (Gashochdruckleitungsverordnung, hereinafter: "GasHDrLtgV") of 18 May 2011 (BGBl. I p. 928), most recently amended by Art. 100 of the Act of 29 March 2017 (BGBl. I p. 626), and with the ancillary provisions of this Plan Approval Decision.

A.1.2 Permits under water resources laws

The plan approval authority decides, in accordance with sec. 19 paras. 1 and 3 WHG in agreement with the authority responsible for water, on the granting of the permits necessary in accordance with sec. 8 para. 1 WHG for any use in accordance with sec. 9 WHG.

The following water resources permits are granted:

The permit in accordance with sec. 8 para. 1 WHG in conjunction with sec. 9 para. 1 no. 4 WHG for the discharge into the groundwater of rain water collected in run-off drains (roof surfaces) and troughs (traffic areas) on the premises of the Pig Receiving Station as set out in the application document, Part I.04 in terms of quantity, purpose, time and location, and in accordance with the ancillary provisions of this Plan Approval Decision.

The permit in accordance with sec. 8 para. 1 WHG in conjunction with sec. 9 para. 1 no. 4 WHG for the introduction and discharge of substances into coastal waters (laying of the pipeline, dumping of dredged material and interim storage, backfilling of the pipe trench) as set out in the application document, Part C.01, Chapter 3.1.2,

[16] Regulation on Facilities for the Handling of Water-Hazardous Substances
[17] Regulation on High-Pressure Gas Pipelines

3.3.3 in terms of quantity, purpose, time and location, and in accordance with the ancillary provisions of this Plan Approval Decision.

The permit in accordance with sec. 8 para. 1 WHG in conjunction with sec. 9 para. 1 no. 5 WHG for the withdrawal, lowering, extracting, conducting and channelling of groundwater (water accumulating due to construction) set out in the application document, Part I1.05, Annex A in terms of quantity, purpose, time and location, and in accordance with the ancillary provisions of this Plan Approval Decision.

The permit in accordance with sec. 8 para. 1 WHG in conjunction with sec. 9 para. 1 no. 5 WHG for draining water (pressure testing water) as set out in the application document, Part I1.05, Annex B in terms of quantity, purpose, time and location, and in accordance with the ancillary provisions of this Plan Approval Decision.

The "Staatliches Amt für Landwirtschaft und Umwelt Vorpommern"[18] granted its consent by letter of 7 December 2017.

A.1.3 Reservations regarding decisions

- Should the project result in a deleterious impact on the environment or on third parties, the extent and impact of which are not yet foreseeable at the time of this Decision, the right is reserved to subsequently order facilities to be put into place or measures to be taken to prevent or compensate for damage.
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- Where an agreement concluded or to be concluded outside this procedure between the PD and a third party as a precondition for the permit in connection with this procedure is cancelled or not concluded, the right of the plan approval authority to take further decisions is reserved.

- Inasmuch as the requirements to coordinate with the respective competent authorities or with third parties do not result in an agreement, the plan approval authority will make a final decision.

- Inasmuch as further conditions or additions to conditions subsequently become necessary to avert dangers to the safety and efficiency of shipping traffic which are not yet foreseeable, the right is reserved to impose these.

- The permits under water resources laws are subject to the condition that substantive provisions and ancillary provisions can be issued subsequently in accordance with sec. 13 para. 1 WHG (within the meaning of sec. 13 para. 2 WHG, among other provisions).

A.1.4 Decisions on objections

The objections and applications made in the course of the proceedings are rejected

[18] State Office of Agriculture and the Environment in Vorpommern.

insofar as they have not been met by means of conditions and other ancillary provisions in this Decision, through plan amendments and / or commitments made by the PD, or have otherwise become redundant in the course of the proceedings.

Regarding the reasons in detail, reference is made to the explanations in the reasons given for this Decision (cf. Section B.4.10).

A.1.5 Cost decision

The costs (fees and expenses) of the plan approval proceedings shall be borne by the applicant. The amount of the costs will be determined separately.

A.2 List of the planning documents

The plan approved hereby comprises the documents named in the following Tables 1 to 4. These also contain the additions to and amendments of the plan by way of insertions / deletions marked in red made by the plan approval authority.

Table 1: List of planning documents

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		3	Description of the Nord Stream 2 project		
		4	Bases for the planning, installation and operation of the Nord Stream 2 pipeline		
		5	Permits and permit proceedings		
		6	Summary of the examined technical alternatives and alternative routes		
		7	Summary of the results of the environmental studies; *with deletions on p. 148*		
		8	Lists		
Part B		B.01 Examination of alternatives			
		1	Task of examining alternatives and legal bases		
		2	Definition of the project		
		3	Description of the project		

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	4	Methodical steps for the examination of alternative locations		
	5	Planning principles and comparative criteria		
	6	Selection of a target area		
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	8	Consideration of small-scale alternatives (Vierow/ Lubmin)		
	9	Summary		
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Part C		C.01 Technical explanatory report		
	1	Introduction and purpose		
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	C.02	Overview map of German jurisdiction Pipeline A and Pipeline B; 1 : 100,000		- / 1
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	C.05	Intersections and parallel routes with shipping lanes in territorial waters along the Lubmin route; 1 : 2,500		- / 6
	C.06	Pig Receiving Station - Site plan of receiving station; 1 : 3,333		- / 1
	C.07	Pig Receiving Station - Overview drawing with building site construction areas; 1 : 1,000		- / 1
	C.08	Pig Receiving Station - Pig Receiving Station plan; 1 : 1,000		- / 1
	C.09	Coastal crossing Lubmin - Schematic presentation; 1 : 500		- / 1
	C.10	Above Water Tie-in - Schematic presentation		- / 1

Document	Chapter / Annex	Contents		Text pages / Plans
	C.11	Crossing with 50Hertz subsea cables - Methodical overview; 1 : 2,000		- / 1
	C.12	Ground classification pipe trench		- / 1
Part D1	Environmental impact study			
	D1.01	Environmental impact study; *with deletions on p. 763 to 767*		803 / -
	D1.02	Generally comprehensible non-technical summary of EIS; *with deletions on p. 68 to 72*		79 / -
	D1.03	Determination of the possible and actual presence of species specially protected in Germany in the area under review acc. to BArtSchV[19] (Annex 1, column 2) and Annex II to the Habitats Directive[20] (hereinafter FFH)		25 / -
	D1.04	EIS map 1: Receiving station Lubmin 2 and allocation of project parts between GASCADE and Nord Stream 2; 1 : 2,500; *with deletions*		- / 1
	D1.05	EIS map 2: impact zones along the Nord Stream 2 route and the marine interim storage site; 1 : 5.000		- / 5
Part D2	Environmental impact study - Map annex part 2			
	D2.01	EIS map 3: Marine usage and infrastructure; 1 : 50,000		- / 4
	D2.02	EIS map 4: Natura 2000 areas; 1 : 130,000		- / 1
	D2.03	EIS map 5: National protection areas; 1 : 130,000		- / 1
	D2.04	EIS map 6: Surface sediments in the area of Bay of Pomerania; 1 : 130,000		- / 1
	D2.05	EIS map 7: Surface sediments on the basis of sampling with Van-Veen-bottom grabs; 1 : 50,000		- / 10
	D2.06	EIS map 8: Marine biotope types; 1 : 50,000		- / 4
Part D3	Environmental impact study - Map annex part 3			
	D3.01	EIS map 9: Biotopes in the landfall area of Lubmin 2; 1 : 2,500		- / 1
	D3.02	EIS map 10: Evidence of macrophytes (spermatophytes and macro-algae) by means of underwater video recordings; 1 : 50,000		- / 2
	D3.03	EUS map 11: Visualisation of overlapping between shipping traffic and staging birds per month; 1 : 400,000		- / 12

[19] Federal Species Protection Regulations
[20] Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora

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	D3.04	Shipping traffic recorded during pipe-laying work for the Nord Stream pipeline in the sea area (AIS data of C6 fleet, Locate 24 data of the dredging vessels and the C10 fleet, AIS data from the time of the presence of the C6 fleet in Germany from 24 September 2010 to 18 October 2010) ; 1 : 400,000		- / 1
	D3.05	EIS map 13: Survey of the number of bats - hunting grounds and overflights; 1 : 4,000		- / 3
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	E.03	GGB DE1747-301 "Bay of Greifswald, parts of the Stralsund and northern tip of Usedom"		137 / -
	E.04	FFH map 2: GGB "Bay of Greifswald, parts of the Stralsund and northern tip of Usedom" ; 1 : 26,000		- / 1
	E.05	Map 1 geotechnical studies; 1 : 5,000		- / 1
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	E.08	GGB DE1749-302 Greifswald Boddenrand-schwelle and parts of the Bay of Pomerania		83 / -
	E.09	FFH map 3: GGB "Greifswald Boddenrand-schwelle and parts of the Bay of Pomerania "; 1 : 20,000		- / 1
	E.10	EU bird protection area DE1747-402 "Bay of Greifswald and southern Strelasund"		79 / -
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[21] Forest Act of the State of Mecklenburg-Vorpommern.

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[22] Technical Guidelines Air

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	7	Method for the preparation of the documentation regarding the environmental impact assessment in accordance with the Espoo Convention	128 - 149

Document	Chapter / Annex	Contents	Text page / Plans
	Annex 3	Detailed modelling results and methodology, including sediment dispersion and sedimentation, underwater sound and modelling results in relation to air quality	75 / -
	Annex 4	Pollution load of the sediments along the route	4 / -
J02 Espoo Atlas			
	Project description		
	PR	Project description	- / 5
	AL	Description of the alternatives	- / 4
	Physical-chemical environment		
	BA	Bathymetry and hydrography	- / 1
	GE	Geology and sea floor	- / 3
	WA	Water quality	- / 7
	CL	Climate	- / 5
	Biological environment		
	PE	Pelagic environment	- / 3
	BE	Benthic environment	- / 2
	FI	Fish	- / 1
	MA	Marine mammals	- / 2
	BI	Birds	- / 2
	PA	Protected areas	- / 5
	Socio-economic environment		
	CU	Cultural heritage	- / 4
	SH	Maritime traffic and navigation	- / 7
	FC	Commercial fishery	- / 21
	RM	Raw material extraction areas	- / 1
	MI	Military training areas	- / 1
	IN	Existing and planned infrastructure	- / 2
	MS	International / national monitoring stations	- / 1
	MU	Conventional munitions and chemical weapons	- / 2
	Cumulative effects		

Document	Chapter / Annex	Contents	Text page / Plans
	PP	Planned and existing projects	- / 1
	Numerical modelling		
	MO	Sediment and pollutant distribution	- / 7
	UN	Underwater sound	- / 5
	NA	Airborne noise	- / 1

The following additions or amendments submitted by the PD hereby become part of the plan approval and change the baseline document. They are designated as follows:

Table 3: Plan additions, plan amendments

Document	Chapter / Annex	Contents	Text pages / Plans
1. Plan amendment supplementary volume: More concrete specifications			
	1	Compensation concept; *with deletions on p. 47 et seq., 62 to 64*	75 / 1
	2	Compensation measure for the island of Schadefähre; *entirely deleted*	48 / -
	Annex 1	HzE 1999 maps ; *for information purposes*	- / 4
	Annex 2	HzE marine maps; *for information purposes*	- / 4
	3	Measures for the improvement of the ecological condition of the Kleiner Jasmunder Bodden (Rügen); *with deletions on p. 10 to 15, 26, 28 et seq., 55*	84 / -
	Annex 3	Maps (HzE 1999) ; *for information purposes*	- / 4
	Annex 4	Maps (HzE marine) ; *for information purposes*	- / 4
	Annex	Feasibility study sewage treatment plant Bergen	58 /
		Annex 1: Existing technical sewage treatment facilities; *for information purposes*	5 / -
		Annex 2: Dimensions; *for information purposes*	3 / -
		Annex 3: Necessary dimensions; *for information purposes*	1 / -
		Annex 4: Basic flow chart; *for information purposes*	1 / -
		Annex 5: Site plan; *for information purposes*	- / 1

	4	Measures for the improvement of the water resources regime in the lowland of the Lobber See and reduction of nutrient discharge into the Bay of Greifswald; *with deletions on p. 9 to 11, 21 to 25, 28 to 30*	68 / -
	Annex 1	Explanations of the methods used for recording the changes of N- and P-discharges into the Lobber See lowland; *for information purposes*	7 / -
	Annex 2	Maps; *for information purposes*	- / 4
	Annex	Feasibility study of Göhren sewage treatment plant	52 / -
		Annex 1: Existing technical sewage treatment facilities; *for information purposes*	6 / -
		Annex 2: Dimensions; *for information purposes*	3 / -
		Annex 3: Necessary dimensions; *for information purposes*	1 / -
		Annex 4: Basic flow chart; *for information purposes*	1 / -
		Anlage 5: Site plan; *for information purposes*	- / 1
	5	Measures to reduce the discharge of nutrients from the sewage treatments plants at Greifswald-Ladebow and Stralsund	79 / -
	Annex	Feasibility study of the sewage treatment plant at Greifswald-Ladebow	39 / 1
	Annex	Feasibility study of the sewage treatment plant at Stralsund	44 / 2
	6	Compilation of the action sheets; *with deletions on p. 12 to 15, 18 to 27, 31 to 34*	34 / -
	7	List of properties for the measures; *completely replaces G.04; entirely deleted*	30 / - (anonymised) 35 / -
2. Plan amendment: Eco-account Fischlandwiesen			
	1	Addition to the application for plan approval - eco-account Fischlandwiesen	1 / -
	Annex	Notes on the acknowledgement decision of the "Landkreis Vorpommern-Rügen"[23] of 1 November 2017, Annex 2 and 3 to the decision	3 / -

Table 4: Compilation of changed plans

Document	Change	Reason

[23] District of Vorpommern-Rügen.

C.06	Pig Receiving Station - Receiving station site plant; 1 : 3,333; as per 14 December 2017	Coordination between PD and the "Landesforstanstalt M-V"[24], 7 November 2017
C.07	Pig receiving station - Overview drawing with construction site equipment areas; 1 : 1,000; as per 14 December 2017	Coordination between PD and the "Landesforstanstalt M-V", 7 November 2017

A.3 Ancillary Provisions

The plan approval is issued subject to the following ancillary provisions:

A.3.1 Shipping

A.3.1.1 The Project Developer ("PD") must name a responsible person for the installation of the pipelines and must ensure his or her permanent contactability (24 h). If several persons are named, the respective functional and/or scheduling responsibilities must be assigned to them in a differentiated manner. In addition, the PD must name the persons appointed for the construction and operating phase for the first time 2 weeks before the beginning of the pipe-laying work and must inform the Mining Authority of Stralsund in writing without delay of any changes or additions.

If this plan approval is transferred by legal transaction to a third party (transferee), the new responsible person(s) is/are to be nominated without delay to the Mining Authority of Stralsund and to the GDWS[25]. Until this declaration is delivered, the previous holder of the rights will remain entitled and bound under this plan approval. Legal relationships under civil law will not be affected by this provision.

A.3.1.2 The designated responsible person must ensure that the regulated equipment obligations, rules of conduct and reporting obligations are carried out without delay and in full.

A.3.1.3 Installation plans containing firm specifications for each of the following points must be submitted to the "Wasserstraßen- und Schifffahrtsamt Stralsund"[26] (hereinafter: "WSA Stralsund") in good time, but at least 6 weeks before the beginning of each work section of the offshore pipe-laying work:

- Construction time schedule specifying the planned times, deployment plan for the vehicles and floating equipment, which must be specifically named;
- required equipment, space and time for all work sections in each phase of construction preparation and installation work in all relevant shipping lanes, where these may be affected,
- traffic safety concept for the construction activities,

[24] Forestry Authority of the State of Mecklenburg Vorpommern.
[25] Directorate General Waterways and Shipping.
[26] Waterways and Shipping Administration of Stralsund.

- anchor concept, showing how many tension anchors must be dropped in every construction section and where, and how and with what equipment and within how much time the work units will be moved when crossing all fairways / shipping lanes (tugs or similar), and stating which taut wires are used in which direction and of what length, and what equipment and how much time is required to move the tension anchors;
- statement on the passing distance needed on both sides by the entire work unit (working vessels, including barges, tension anchors, tugs, raised pipeline, etc.),
- statement on the traffic areas which, taking account of the necessary minimum distances, must remain free of obstacles or passable in every individual construction section,
- measures for the supervision of the different work steps and in particular for achieving the necessary cover height,
- measures in case of any deviations from the necessary cover height or other events, in consequence of which an impact on the construction process or the safety and efficiency of shipping traffic is to be expected,
- name, radio call sign and nationality of the pipe-laying ship and of each work vessel and equipment unit used,
- names, address as well as telephone contact information for the responsible person(s) designated in accordance with A.3.1.1 for the construction phase.

Each building section must be coordinated with the WSA Stralsund before the beginning of the pipe-laying work at sea.

A.3.1.4 For the announcement of the construction work for shipping, it is necessary before the beginning of the work to include the pipelines route and the marine dumping area (interim storage) on the official sea charts. To this end, the WSA Stralsund is to be informed at its request of the respective route coordinates and of the interim storage coordinates.

A.3.1.5 The PD must inform the WSA Stralsund by tel. + 49 3831 249-360, fax +49 3831 249-309 or email to wsa-stralsund@wsv.bund.de of the beginning of the work at least 4 weeks in advance. WSA Stralsund will then arrange for the proper notices to skippers (BfS)[27].

A.3.1.6 To the extent possible in view of a proper construction process, The PD must ensure the continued use of shipping lanes, inasmuch as this is possible with a functioning construction process. The construction activity must be planned and carried out in such a way that complete closure of the fairways / shipping lanes is avoided if at all possible, or reduced to the shortest necessary extent. If a temporary closure of the fairway is necessary, WSA Stralsund must be notified in writing (with reasons) of the duration of the closure in a good time, but at least 2 weeks before the beginning of the closure.

[27] Information service for skippers by the Federal Waterways and Shipping Administration

Non-self-propelled mechanical excavators may only be used in areas of intersection with shipping lanes if there is an adequate possibility for passing ships to avoid the excavators or if the excavators are able to change their position in such a way that other ships can pass without an increased risk of collision in case of imminent danger.

A.3.1.7 The vessels and floating equipment being used must set or, as the case may be, give all the signals described by the "Seeschifffahrtsstraßen-Ordnung"[28] (hereinafter: "SeeSchStrO") and the "Kollisionsverhütungsregeln"[29] (hereinafter: "KVR"). The identification of all work vessels and equipment involved as well as their conduct at sea must comply with the international collision prevention rules as well as the SeeSchStrO. Likewise, the vessels and equipment must be equipped with VHF voice communication. During the work, all vessels used must ensure they stay tuned permanently to VHF channel 16, DSC channel 70 and the international emergency frequency of 2,187.5 kHz. Continuous VHF radio contact must be maintained with the "Verkehrszentrale Warnemünde"[30]. The instructions given by the staff of the waterway and shipping administration must be followed. The start, end, any significant interruption and the resumption of work must be reported daily to:

- the "Verkehrszentrale Warnemünde" under Wolgast Traffic on VHF channel 09 or tel. +49 381 20671-841, -844 or, Stralsund Traffic on VHF channel 67 or tel. +49 381 20671-841, -843 and
- the "Seewarndienst Emden"[31] in Emden per fax, email or telephone.

The following information is necessary for this: name, call sign, function of the vessels involved, current position, expected path and planned activity indicating the pipelines affected in the 24 hours after the report.

Instructions given by the nautical staff of the "Verkehrszentrale Warnemünde" must be followed.

A.3.1.8 Traffic safety must be ensured by the PD with its own vessels. In all work steps with possible effects on shipping along the route, at least one traffic safety vessel must be deployed permanently on site exclusively for the purpose of ensuring traffic safety. This vessel must permanently observe the shipping traffic (visually and by means of radar/AIS). In the area approaching Świnoujściefrom the west as well as landward from the fairway buoy "Landtief A", at least two traffic safety vessels must be deployed during all work steps within and close to the shipping lanes/fairways (Landtief, Schumachergrund, Ariadnegrund, eastern approach to Greifswald, approach to Lubmin) in accordance with the requirements described in A.3.1.9.

A.3.1.9 The traffic safety vessel(s) deployed by the PD must have a maximum speed of at least 15 kn through the water and must comply with the safety requirements of the "BG Verkehr"[32]. In addition, the traffic safety

[28] Maritime Shipping Routes Regulations
[29] Collision Prevention Rules
[30] Traffic Control Center in Warnemünde
[31] Sea Warning Service Emden
[32] Employers' Liability Insurance Association for the Transport and Traffic Industry.

vessels must be adequately crewed and must satisfy the following requirements:

- crewed by suitable nautical personnel (nautical certificate in accordance with STCW 95, rule 1172),
- equipped with at least two interconnected VHF radio telephones, one RT-frequency radio set or equivalent technology and two radar sets, at least one of which must be equipped with the ARPA function,
- the serviceability of the equipment must be evidenced by maintenance certificates (not older than 12 months) issued by a service center approved by the BSH33,
- equipped with AIS: display of the received AIS signals on board on the basis of an electronic sea chart and in combination with a radar display,
- equipped with an approved radar transponder (X-band and S-band).

A.3.1.10 Safety messages must be broadcast on the frequencies prescribed by international law (content: position and heading of the pipe-laying unit, necessary safety clearance, malfunctions, special incidents, etc.):

- in the event of other vessels approaching the pipe-laying unit / construction site to within a distance of less than 1 nautical mile, if their course does not allow a dangerous proximity to be ruled out.
- in other cases where this appears necessary in the light of a reasonable assessment of the situation.

In case of any special incidents, the "Verkehrszentrale Warnemünde" and the WSA Stralsund must be informed promptly by telephone and in writing. The following information must be given: name, call sign, function of the vessel involved, indication of the pipeline route(s) which may be affected, current position, nature of the special incident (e.g. malfunction, delay, accident, marine pollution, discovery of explosive ordnance, localisation of an underwater obstacle, damage to navigation signs, etc.)

A.3.1.11 The PD must set up a coordination unit. The purpose of the coordination unit is to coordinate the specific construction process before the beginning of any crossing of fairways and shipping lanes in such a way (taking into account all ship passages which may be affected by any restrictions) that possible interference with traffic is minimised. In particular, any closure of fairways and shipping lanes must be discussed here. Also, possible short-term requirements of possible ship passages are to be coordinated to allow any necessary interruption of the work and the passage of ships. The coordination unit should therefore be staffed with representatives of the PD or its subcontractors, the "Lotsbrüderschaft WiRoSt"[34], the port authorities of Stralsund, Greifswald and Lubmin, the harbour companies concerned as well as representatives of the waterways and shipping administration.

[33] Federal Maritime and Hydrographic Agency.
[34] Pilots' Association Wismar / Rostock / Stralsund.

A.3.1.12 In case of a dangerously near approach by other vessels or if a reasonable assessment of the situation makes this necessary, the traffic safety vessel must take further traffic safety measures. Where appropriate, individual vessels must be addressed directly to point out a possible safe passage. To the extent necessary, the Morse code letter "U" is to be signalled with the morse lamp and/or white flares are to be fired, and, carefully considering the given circumstances and conditions, all measures must be taken which would be necessary to avert a direct danger according to established seafarers' practices. The "Verkehrszentrale Warnemünde" must be informed without delay about the implementation of such measures.

A.3.1.13 The exact position (kilometre mark and depth) of the pipelines must be calibrated. The procedure used for the documentation must be suitable to reliably determine and show the location of the pipeline with the necessary accuracy. After completion of the installations, an as-built drawing must be presented within six months after the end of the laying work, showing all completed installations including any intersecting installations with all real coordinates. The as-built drawing must show the depth of the pipelines (in relation to the seabed at the time of the measurement), the coordinates of the route including the kilometre mark, the route inflexion points as well as any intersecting installations with subsea cables and the microtunnel etc., and must be submitted to the WSA Stralsund in duplicate and in writing and in digital form (ASCII format). For the as-built documents, the depth charts must be prepared from the water line with the depths referred to NHN 2016 using the coordinate system UTM / ETRS 89, and submitted to the WSA Stralsund in a scale of 1:1,000 in duplicate on paper as well as digitally (PDF format). The ASCII data must be sent to the WSA Stralsund on a digital data medium (separately for each completed measurement line) with the depth referred to NHN 2016 and using the coordinate system UTM / ETRS 89.

A.3.1.14 During the work, a report is to be prepared daily at the same time, containing at least the following information:

- the vessels used during the working day and their function,
- the ascertained length of all pipeline sections laid or buried so far,
- the rough progress of construction work done so far in the respective pipe-laying sections (exploration, trench excavation, trench filling, etc.),
- planned activities in the 24 hours from the time of the reporting, stating the pipeline section concerned.

This report is to be sent per email to the Mining Authority of Stralsund and the WSA Stralsund.

After the completion of meaningful route sections, but at least once a month, the exact location of the respective pipe section is to be reported to the WSA Stralsund by email by stating the starting, end and inflexion points as well as distinctive points, and also the associated actual cover height in each case.

A.3.1.15 The existing navigation signs showing the shipping lanes as well as the measuring points and cables etc. must be observed with special care during the work. Damage caused in the course of the work must be adjusted with the owners. In case of any damage to navigation signs owned by WSV, the damage must be adjusted with the WSA Stralsund. Navigation signs which are temporarily removed must be reinstalled at their original position after the completion of the construction work. Any damage and any temporary removal of navigation signs must be notified to the WSA Stralsund in the report according to A.3.1.14 (without delay in the case of temporary removal).

A.3.1.16 The PD must not install any signs and lights in the course of the installation activities which disrupt shipping or more specifically cause confusion with navigation signs, adversely impair their effect, or can mislead or obstruct skippers through glare effects or reflections.

A.3.1.17 Items lost in the course of the work, e.g. anchors or equipment which can impair the safety and efficiency of shipping traffic must be located and salvaged without undue delay, or, if that is not possible, marked temporarily. The loss must be reported to the WSA Stralsund in the report under A.3.1.14. In case of a discovery of explosive ordnance or of objects suspected of constituting explosive ordnance or of munitions, an appropriate report has to be made. In addition, if explosive ordnance or objects suspected of constituting explosive ordnance or munitions are located, the further course of action must be coordinated with the ordnance disposal service.

A.3.1.18 Any pollution of the sea with oil or other substances which can lead to harmful changes of the physical, chemical or biological condition of the sea water and/or the sea floor must be avoided. In particular, oil residues from machinery, faeces, packaging, waste as well as sewage must not be discharged into the sea. In case of any pollution, this must be reported without delay to the WSA Stralsund in the report under A.3.1.14.

A.3.1.19 No work tools, ropes or other objects may find their way into the sea or be left behind on the sea floor. After the completion of the pipe-laying work, the PD must prove to the GDWS (Kiel office) and the WSA Stralsund by means of suitable measures (e.g. video recordings/side scan sonar recordings) that the route corridor itself is clean.

A.3.1.20 The dredging work must be done in such a way that excessive excavation in the fairways is excluded. Moreover, the dredging work and the filling of the pipeline route must be done in a way to create a sea floor as flat as possible. No ridges or ledges must be created. The backfilling of the soil after the installation of the pipeline in the trench must be done in such a way that merely the process-related tolerance levels are not exceeded.

A.3.1.21 If shipwrecks, parts of wrecks or other culturally-historically relevant discoveries are made during the work, the "Landesamt für Kultur- und Denkmalpflege M-V" must be informed without delay. In addition, the WSA Stralsund is to be informed accordingly in the report according to A.3.1.13.

A.3.1.22 The PD must submit the inspection and maintenance plan described in the application documents (cf. application document, Part C.01, Chapter 4.4.5.3) to the Mining Authority of Stralsund and the WSA Stralsund prior to commissioning at the latest. This plan must show in particular with what test methods, at what intervals, by which inspectors (qualification) and on the basis of what standards the integrity of the pipelines is checked regularly or, as the case may be, on special occasions.

A.3.1.23 In the first four years of the operation of the high pressure natural gas pipeline, the height of cover, the external condition and the geographical location of the pipelines must be checked annually and proved to the Mining Authority of Stralsund and the WSA Stralsund.

Areas critical under location aspects must be checked several times within one year in coordination with the WSA Stralsund. The nature and scope of the necessary monitoring measures for the following years will be decided in each individual case on the basis of the results obtained.

A.3.1.24 The results of the required inspections are to be submitted to the Mining Authority of Stralsund and the WSA Stralsund no later than eight months after being recorded, in writing and on data media with the geographical coordinates in accordance with the World Geodetic System 1984 (WGS 84) and the respective km markers of the pipeline routes.

The status report to be submitted for the documentation of the inspection will then be discussed at an annual official meeting between the PD, the Mining Authority of Stralsund, the BSH as well as the WSA of Stralsund.

A.3.1.25 If it is established outside the fixed inspection intervals that there have been changes to the installation or its surroundings (damage, position, etc.) which can have an effect on the safety and efficiency of shipping traffic, the WSA Stralsund is to be informed without delay.

A.3.1.26 If so-called "critical freespans" arise, the PD must take suitable measures in coordination with the WSA Stralsund to restore the area of the pipeline section concerned to a condition in conformity with the legal requirements.

A.3.1.27 If scouring, flattening or similar damage to the waterway is caused by the measure, the PD must eliminate the impairments at its own expense.

A.3.1.28 External maintenance and repair work may be carried out only after prior coordination with the Mining Authority of Stralsund and the WSA Stralsund. Such work must be announced in writing and coordinated in good time, in any case at least two weeks prior to the commencement of work. In case of special urgency, the maintenance and repair work must be reported without delay to the Mining Authority of Stralsund and the WSA Stralsund and, to the extent possible in each case, must be coordinated with them. The rights of the Mining Authority of Stralsund and the WSA Stralsund to issue additional orders regarding the details of any stationary construction site operation are expressly reserved.

A.3.1.29 The gas pipelines may be laid only on the prescribed route, including the specified cover heights.

A.3.1.30 Measures for the fulfilment of the statutory duties of the Federal Government to maintain the federal waterways and to ensure traffic safety on the federal waterways, including the research and surveying work necessary for this, must not be impaired by the work in connection with the installation of the pipelines. Except in case of imminent danger, such measures must show consideration for the construction work and must be reported to the coordination unit (sec. 31 para. 5 WaStrG).

A.3.1.31 The emergency plan described in the application documents (cf. application document, Part C.01, Chapter 4.4.5.5) is to be submitted to the Mining Authority of Stralsund and the WSA Stralsund. The emergency plan must in particular contain information as to which business unit of the PD is to be informed in case of emergencies or similar circumstances, and to how to proceed in the event of any damage to the pipeline. The emergency plan must be continuously amended and updated by the PD.

A.3.1.32 A separate permit from the WSA Stralsund pursuant to sec. 31 WaStrG is necessary for the installation of measuring points and all measuring facilities. The informal application must be received in by the WSA Stralsund in good time (but at least 8 weeks before the planned installation).

A.3.2 Fishing

A.3.2.1 The beginning of work at sea is to be reported at least 4 weeks in advance to the "Landesamt für Landwirtschaft, Lebensmittelsicherheit und Fischerei M-V"[35] and to the fishermen operating in the affected area, or to the fishery associations representing them.

A.3.2.2 Attention must be paid to fishing gear laid out by commercial fishermen as well as fish trap locations; damage to the fishing gear used by the commercial fishermen and impediments to fishing are to be avoided. If the relocation or, as the case may be, abandonment of fish traps is necessary, this is to be coordinated with the fishing company concerned or with the respective fishing cooperative.

A.3.2.3 The studies conducted annually by the institute for Baltic Sea fishery "Thünen-Institut" regarding the occurrence and frequency of herring larvae (as part of the Rügen Herring Larvae Survey) must not be adversely affected by the pipeline installation work. Actions must be coordinated in good time if measuring stations need to be relocated or if the measures for the installation of the pipeline can evidently lead to an adverse effect on the studies.

A.3.3 Immissions protection

A.3.3.1 The immissions emanating from the construction site of the PD must not make any relevant contribution to the immission guide values set out in the "Allgemeine Verwaltungsvorschrift zum Schutz gegen Baulärm"[36]

[35] State Office for Agriculture, Food Safety and Fishery of the State of Mecklenburg-Vorpommern.
[36] General Administrative Regulation for the Protection against Construction Noise.

(hereinafter: "AVV Baulärm") of 19 August 1970 (supplement to BAnz. no. 160 of 1 September 1970) being exceeded during the construction phase at the relevant immission locations within the area affected by the construction site.

A.3.3.2 The requirements of the "32. Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes"[37] (hereinafter: "32. BImSchV") of 29 August 2002 (BGBl. I p. 3478), most recently amended by Art. 83 of the Regulation of 31 August 2015 (BGBl. I p. 1474), are to be implemented.

A.3.3.3 The immissions from the operation of the facility of the PD must not make any relevant contribution to the immission guide values set out in the "Sechste Allgemeine Verwaltungsvorschrift zum Bundesimmissionsschutzgesetz (Technische Anleitung zum Schutz gegen Lärm)"[38] (hereinafter: "TA Lärm") of 26 August 1998 (GMBl no. 26/1998, p. 503) being exceeded at the relevant immission sites within the area affected by the facility.

A.3.3.4 When contracting the construction work to a contractor, the obligation to comply with the existing noise protection regulations must be imposed upon the contractor by the PD.

A.3.3.5 Thoroughfares and service routes onshore must be paved in consideration of the foreseeable traffic load. Dust emissions due to construction activities, traffic or atmospheric influences must be avoided or minimised through suitable measures such as humidification, cleaning or paving.

A.3.3.6 In the course of the construction work the immission guide values set out in the acoustic study of 21 December 2016 (cf. application document, Part I2.06, Part I2.07) must be complied with and, if need be, sound protection measures capable of being evidenced must be taken. The following immission guide values must not be exceeded at the relevant immission sites:

Industrial areas	day/night 70 dB(A)
Commercial areas	day 65 dB(A) night 50 dB(A)
Special area (Marina Lubmin)	day 65 dB(A) night 50 dB(a)
General residential areas (municipality of Lubmin)	day 55 dB(A) night 40 dB(A)
Exclusive residential areas (municipality of Spandowerhagen)	day 50 dB(A) night 35 dB(A)

During the night time plus the day time with greater sensitivity (8 p.m. to 7 a.m.) the following minimum distances must be kept by backhoe dredgers and pipe-laying barges in accordance with the acoustic study of construction noise offshore (volume of materials I2.06):

[37] 32nd Regulation for the Implementation of the Federal Emissions Control Act.
[38] Sixth General Administrative Regulation under the Federal Emissions Control Act (Technical Guideline Noise).

- to the nearest point on the coast line in the area of Lubmin
  - backhoe dredger not in convoy: 4,000 m
  - pipe-laying barge not in convoy: 1,500 m
  - backhoe dredger and pipe-laying barge in convoy: backhoe dredger 4,600 m and pipe-laying barge 2,600 m
- to the nearest point on the coast line in the area of Rügen / Thiessow
  - backhoe dredger and pipe-laying barge in convoy: backhoe dredger 3,100 m, pipe-laying barge on the pipeline line.

The distances may be smaller if the emission parameters stated in the sonic expert opinion on construction noise (cf. application document, Part I2.06, Table 5) are guaranteed in each case by the respective manufacturer of the device and this is proved beforehand to the Mining Authority of Stralsund by means of a manufacturer's confirmation.

A.3.3.7 The implementation of the noise reduction measures provided in the noise immission forecasts is to be checked regularly by a recognised body in the course of the ecological construction supervision / construction monitoring. The test reports are to be delivered to the Mining Authority of Stralsund.

A.3.3.8 In accordance with the "LAI-Hinweise zur Messung, Beurteilung und Verminderung von Erschütterungsimmissionen"[39] (LAI Länderausschuss für Immissionsschutz; May 2000) in the course of the construction work, the guide values according to DIN 4150, Part 2 (Vibrations in building; effects on humans in buildings – June 1999) and according to DIN 4150, Part 3 (Vibrations in building; effects on buildings) must be complied with in accordance with the expert statement on vibrations (cf. application document, Part I2.11).

A.3.3.9 The lighting necessary for the installation and the safe operation of the gas pipeline must be limited to the necessary extent in terms of timing and space. The attraction effects on insects are to be minimised by means of suitable anti-glare measures and the use of suitable light sources; spotlights are to be used in such a way that the maximum upward inclination is 40°.

A.3.3.10 The emergency diesel generator described in the application documents (cf. application document Part I1.04, Chapter 2.6) is to be operated as follows:

- The emergency power generator may be operated only with EL heating oil with a maximum sulphur content of 0.1% by wt. according to DIN 51603, Part 1. Compliance with the maximum sulphur content must be proved by a supplier's confirmation.
- The emergency power generator must be installed and operated in such a way that the following emission threshold values are not exceeded in the exhaust gases of the emergency diesel generator at the emission sources:
  - Dust 80 mg/m3

[39] Guidelines of the Working Committee of the Federal Government and the Federal States for the measurement, assessment and reduction of vibrational immissions.

- Formaldehyde 60 mg/m3

- The emission threshold values refer to the exhaust gas volume at normal conditions (temperature 273.15 K, pressure 101.3 kPa) after deducting the moisture content of water vapour, and to an oxygen content in the waste gas of 5% by volume.
- Before commissioning the facility, a manufacturer's declaration must be provided to the competent supervisory authority, confirming that a generating set is used which reliably complies with the above-mentioned emission values.

A.3.4 Specifications under waste disposal law

A.3.4.1 The PD must apply state of the art procedures when operating the facility in order to avoid waste. Priority is to be given to recycling waste in accordance with the state of the art within the meaning of sec. 3 para. 23 of the "Gesetz zur Förderung der Kreislaufwirtschaft und Sicherung der umweltverträglichen Bewirtschaftung von Abfällen"[40] (hereinafter: "KrWG") of 24 February 2012 (BGBl. I p. 212), most recently amended by Art. 2 para. 9 of the Act of 20 July 2017) (BGBl. I p. 2808). Non-recyclable waste is to be disposed of in a manner consistent with the public interest pursuant to secs. 15 et seq. KrWG.

A.3.4.2 The disposal of the listed waste types must be carried out by an authorised specialist company. Disposal / recycling certificates or, as the case may be, declarations of acceptance by authorised disposal companies as well as the confirmation of the competent authority regarding waste for disposal must be kept as proof.

No.	In-house designation	Waste code acc. to AVV[1)]	Designation acc. to AVV [1)]	Annual quantity (t/a)
1	Hydraulic oil	13 01 10*	Mineral based non-chlorinated hydraulic oil	1
2	Household waste	20 03 01	Mixed municipal waste	10

AVV[1)]: "Verordnung über die Einführung des Europäischen Abfallverzeichnisses in Deutschland"[41] (hereinafter: "AVV") of 10 December 2001 (BGBl. I p. 3379), most recently amended by Art. 2 of the Regulation of 17 July 2017 (BGBl. I p. 2644).

A.3.4.3 Proof of the proper disposal of waste must be provided to the "Staatliches Amt für Landwirtschaft und Umwelt Vorpommern"[42] (hereinafter: "StALU Vorpommern"), the waste management authority responsible for the waste producer, before the beginning of the waste disposal in accordance with the requirements under the "Verordnung über die Nachweisführung bei der Entsorgung von Abfällen"[43] (hereinafter: "NachwV") of 20 October 2006 (BGBl. I p. 2298), most

[40] Act on the Advancement of the Recycling Economy and Securing Environmentally Friendly Waste Disposal.
[41] Regulation on the Introduction of the European List of Waste Materials.
[42] State Office of Agriculture and the Environment in Vorpommern.
[43] Regulation on the Documentation of the Disposal of Waste.

recently amended by Art. 11 para. 11 of the Act of 18 July 2017 (BGBl. I p. 2745). According to sec. 6 para. 1 sentence 2 NachwV, the waste producer must send a copy of the waste disposal certificate to the competent authority no later than before the beginning of the disposal.

A.3.5 Monument protection

A.3.5.1 The navigation barrier of 1715 mentioned in the documents (Ostsee VII, Mönchgut, Fpl. 67) (cf. application document, Part D1.01, Chapter 3.2.10) in the Bay of Greifswald must be taken into consideration in the course of the construction work. Existing wrecks must be documented before the beginning of the laying work, and care must be taken during the pipe-laying work to ensure that these memorials are not damaged. Should wrecks have to be salvaged, the characteristic piles of ballast stones which make the seabed memorial visible above the sea floor must be restored after the completion of the construction phase instead of the salvaged ship wrecks.

A.3.5.2 The beginning of the earthworks must be notified in advance in writing and in a binding manner to the Lower Monument Protection Authority and to the Landesamt für Kultur und Denkmalpflege M-V. If archaeological finds (pieces of broken urns, stone settings, walls, remains of walls, woods, wooden constructions, urn shards, skeletal remnants, coins etc.) are made during the earth work or conspicuous soil discolorations are discovered, in particular signs of fire, this must be reported without delay in accordance with sec. 11 para. 1 and 2 DSchG M-V. The duty to report these is incumbent upon the discoverer, work supervisor, the owner of the land, or chance witnesses who recognise the value of the object. The finds and their location must be preserved in an unchanged condition according to sec. 11 para. 3 DSchG M-V. This obligation ends five working days after receipt of the notification and, in case of written notification, no later than after one week. This period can be extended for a reasonable time by the Mining Authority of Stralsund in agreement with the Lower Monument Protection Authority for the purpose of an expert investigation (sec. 11 para. 3 DSchG M-V).

A.3.5.3 The measures for the protection of the cultural heritage described in the application documents (cf. application document, Part J.01, Chapter 10.9.2.1, p. 446 et seq.) must be supplemented as follows:

- analysis of the geographical prospection data in view of possible ground monuments,
- diving exploration or, as the case may be, evaluation of the anomalies found in view of their characteristics as ground monuments,
- evaluation of the ground monuments found thereby or already previously known in view of the effects of the construction activities on them,
- determination and implementation of suitable measures to secure or salvage and document the ground monuments concerned,

- archaeological involvement in any potentially necessary munitions clearance,
- arrangements for handling chance finds during the construction phase,
- determination and implementation of suitable measures for the sustained safety of ground monuments that are salvaged, for example through storage at suitable places in the coastal waters,
- monitoring after the completion of the construction phase.

The archaeological measures must cover the ground monuments in the entire area affected by the construction activity, i.e. in the route corridor as well as the anchor corridor, and must be carried out by competent experts recognised by the competent Monument Protection Authority.

A.3.6 Use of water resources

A.3.6.1 The beginning and the end of the construction activity (excavation and dumping work, structural works, water table lowering, discharge of water) must be notified in writing to the Mining Authority of Stralsund and to the StALU Vorpommern as the competent Lower Water Authority (UWB) in advance at least two weeks beforehand.

A.3.6.2 It must be ensured that only dredged material free from harmful substances and largely free from organic substances, which under the "Gemeinsame Übergangsbestimmungen zum Umgang mit Baggergut im Küstenbereich"[44] ("GÜBAK", August 2009) can be stored at the marine interim storage (dumping site), will be taken there. Where old munitions from past wars are concerned, the PD must ensure that only material containing no remnants of war-time munitions greater than a modelled magnetisable metal mass of 15 kg per object is brought to the interim storage site. Excavation material with an organic content >3%, cohesive soil (glacial till, clay) as well as excavated material with a pollutant content in excess of the guide value (RW) 2 of the GÜBAK, August 2009 must not be brought to, or deposited for interim storage at, the marine interim storage site (dumping site).

A.3.6.3 The Mining Authority of Stralsund and the StALU Vorpommern are to be informed before the beginning of the filling work about the origin of the external material used for filling the trench. This external material must be free from pollutants, i.e. its pollutant content must not exceed the guide values (RW 1) set out in the GÜBAK, and its structure / condition in the cover over the pipe trench must be comparable with the material originally excavated, unless that material was originally glacial till/clay, or a different condition is necessary in the area of the Boddenrandschwelle for reasons relating to the erosion stability of the cover over the pipeline.

A.3.6.4 After completion of the construction work, a supervision programme in accordance with sec. 10 GÜBAK (August 2009) is to be carried out for the marine interim storage (dumping site) and the pipeline route in the form of monitoring the repopulation / revitalisation of the sea floor. The

[44] Joint Transitional Provisions for Handling Dregded Material in the Coastal Area.

extent of monitoring is to be coordinated with the competent Water and Nature Conservation Authority.

A.3.6.5 On March 31st of a calendar year, a mass balance for the preceding calendar year is to be submitted to the Mining Authority of Stralsund and the UWB, containing the following minimum information:

- volume of the total dredged material,
- volume of dredged material / external material dumped and subsequently returned,
- volume of the soil mass washed away and remaining at the dumping site.

The report to the UWB must be made in digital form by means of a "Meldeformular für Baggergut für die OSPAR- und Helsiniki Kommission"[45] in accordance with Annex 1 to the GO BAK.

A.3.6.6 The volume of groundwater pumped is to be determined and recorded using suitable measuring equipment.
At least two weeks before lowering the groundwater, the PD must prepare a monitoring programme for the groundwater observation and agree this with the UWB. Before and during the dewatering measure, the groundwater level must be observed at appropriate locations (inter alia in the inflow and outflow zones) by means of groundwater measuring points (water levels).
The results of the groundwater monitoring must be submitted to the Mining Authority of Stralsund and the UWB at their request.

A.3.6.7 The planned dewatering measures must be carried out by appropriate specialised companies in accordance with the recognised rules of technology. The dewatering measures must be limited to the extent absolutely necessary for the measure.
The holder of the permit is responsible for all damage caused in consequence of the water table drawdown or, as the case may be, by discharge of the pumped groundwater into the body of water.

A.3.6.8 Evidence-protecting measures must be taken at buildings and infrastructure facilities in the area of the dewatering measures if the drawdown cone reaches the buildings or infrastructure facilities, and the owner demands this.

A.3.6.9 The use of water resources is subject to a fee. According to sec. 16 para. 1 no. 2 LWaG, the party liable for the charge must pay a fee for the withdrawal, extracting or draining of groundwater. For this purpose, the UWB is to be informed of the water volumes actually taken ("Landesamt für Umwelt, Naturschutz und Geologie M-V"[46] "Declaration for the fee for water withdrawal" form), by January 31st of each year for the preceding year.

A.3.6.10 If the groundwater pumped up, the Bodden water or the pressure testing water is found to be contaminated (e.g. evidently, through smell), suitable clean-up measures must be taken before the discharge into

[45] Reporting Form for Excavated Material for the OSPAR- and Helsinki Commission.
[46] States Office for the Environment, Nature conservation and Geology of Mecklenburg-Vorpommern.

Trench 60, and if need be the water resources usage is to be discontinued. The Mining Authority of Stralsund and the UWB have to be informed without delay. If the withdrawn groundwater is contaminated with suspended particles or sediments, a mechanical clean-up must be carried out (e.g. Baleen filter, sedimentation basin) before any discharge into surface waters in order to minimise the suspended sediment load. To avoid ochre sedimentation, measures such as storage tanks, ventilation or the like must be taken if necessary. The groundwater must not undergo any deleterious change prior to discharge.

A.3.6.11 The water resources usage for the discharge of collected precipitation water from paved areas (roofs, streets) into two drain pipes and through troughs into the groundwater comprises:

Discharge quantity	approx. 155 l/s relating to a
total area of	approx. 10,500 m^2
impermeable area of	approx. 9,400 m²
precipitation quantity of	162.4 l/s*ha ($r1_{5, T=5}$ =147.6 l/s*ha + 10%)

Location:

Water:	Groundwater
City/municipality:	Lubmin
District:	Vorpommern-Greifswald
State:	Mecklenburg-Vorpommern
Location:	Reference system ETRS89, UTM (6 degrees), zone 33, operating premises (Pig station Nord Stream 2)

Corner point	Easting value	Northing value
A	33,411,544.08	6,000,565.61
B	33,411,651.19	6,000,663.87
C	33,411,816.80	6,000,483.32
D	33,411,709.70	6,000,385.07

A.3.6.12 In case of any change in the groundwater pollution from the precipitation water discharged into the groundwater, which may result among other causes from a changed use of the drainage areas, subsequent installation of a clean-up measure may be necessary; changes with effects on water resources usage (e.g. usage / pollution of the drainage areas) must be reported to the competent UWB without delay including proper documentation. The competent UWB will then decide on the admissibility or, as the case may be, on additional requirements regarding the precipitation water to be discharged.

A.3.6.13 The construction, the operation and the maintenance of the sewage facilities must be carried out in accordance with the generally recognised rules of technology (e.g. DIN norms, DWA rules) as applicable.

A.3.6.14 The holder of the permit is obliged in accordance with sec. 101 WHG to allow the Water Supervisory Authorities to take measures, including the

official supervision of waste water discharge, and must bear the costs for this in accordance with sec. 92 para. 2 LWaG.

A.3.6.15 All accidents with water-endangering substances must be reported without delay to the competent UWB or the nearest police station.

A.3.6.16 Before the commissioning of facilities for the handling of water-endangering substances, a facility description (tabular listing) must be submitted to the UWB in accordance with the requirements of the "Verordnung über Anlagen zum Umgang mit wassergefährdenden Stoffen"[47] (hereinafter: "AwSV") of 18 April 2017 (BGBl. I p. 905).
Necessary periodic inspections must be fixed, summarised in the form of a test and maintenance overview, and submitted to the UWB prior to commissioning. For the facilities where the regulation referred to above defines special requirements in its chapter 3, the proof must be submitted to the UWB before commissioning. Any defects found through the tests referred to above or to monitoring must be remedied without delay by the operator of the facilities.

A.3.6.17 The operator of the facility for the handling of water-endangering substances must continuously monitor for the absence of leaks at the facility and the functioning of the safety equipment. Deviations from the intended operation as well as any necessary measures must be recorded. The proper condition of the facilities must be checked by an authorised expert in accordance with the test and maintenance overview (cf. ancillary provision in A.3.6.16). The test report must be submitted without delay to the competent UWB.

A.3.6.18 If, in consequence of the operation of the facility for the handling of water-endangering substances, these substances enter the water or the soil, suitable measures must be taken without delay to prevent any further leakage, and minimise the effects. Escaped water-endangering substances are to be removed (e.g. containment and absorption) in such a way that harmful soil changes or the pollution of water resources need no longer be feared. In the event of an escape of water-endangering substances, the UWB or the nearest police station must be notified without delay. The obligation to report this exists also where it is suspected that water-endangering substances are escaping from the facility.

A.3.6.19 The competent UWB must be informed specifically of the storage of methanol and iron(III) chloride ($FeCl_3$) necessary for the extension of nutrient reduction in the measures:

- Measure for nutrient reduction in the Bay of Greifswald through the integration of extra filtration in the sewage treatment plant at Greifswald-Ladebow
- Measure for nutrient reduction in the Bay of Greifswald through the integration of extra filtration in the sewage treatment plant at Stralsund
- Measure for nutrient reduction in the Kleiner Jasmunder Bodden including the integration of extra filtration in the sewage treatment

[47] Regulation concerning facilities for the handling of water-endangering substances.

plant at Bergen

- Measure for nutrient reduction in the Lobber See and the Bay of Greifswald including the integration of extra filtration in the sewage treatment plant at Göhren.

The planning, construction and operation of these storage facilities must comply with the provisions of the AwSV.

A.3.6.20 All facilities which use water resources in accordance with this permit must be operated, maintained and serviced in such a way that they perform their purpose at all times and that any impairment of the common good and any nuisance to third parties are avoided.

A.3.7 Interim storage

A.3.7.1 Depth soundings for the "Nord Stream 2" marine interim storage site are to be taken at least two weeks before the beginning of soil shifting and no later than four weeks after the end of the measure. The results of the depth soundings are to be delivered to the WSA Stralsund in a paper form (in duplicate) and in a digital form.

A.3.7.2 The dredged material from the project is to be stored in principle at the designated marine interim storage site, depending on the soil type selectively in accordance with measure instruction sheet M3. The PD will ensure that soil types are brought to the marine interim storage site which can be stored there in accordance with the provisions of the GÜBAK 2009. Insofar as old munitions from past wars is concerned, the PD will ensure that no material is brought for interim storage which contains munitions remnants greater than a modelled magnetisable metal mass of 15 kg per object. An execution plan is to be submitted to the Mining Authority of Stralsund and the WSA Stralsund six weeks before the beginning of dumping.

A.3.8 Nature Conservation

A.3.8.1 The beginning of construction work is to be reported in good time to the competent Nature Conservation Authority. In addition, the PD must inform the Lower Nature Conservation Authority of the district of Vorpommern/Greifswald in good time about any schedule changes regarding the construction work onshore.

A.3.8.2 The avoidance and minimisation measures specified in the application documents (cf. application document, Part G.01, Chapter 9, p. 238 et seq.) must be implemented. In addition to the avoidance and minimisation measures, it must be ensured that bird habitats (e.g. moulting sites, bird staging grounds) are avoided when choosing the access routes to the construction site, that the use of the water resources is limited to the absolutely necessary degree in terms of time and space, and that sediment displacement and impurities are minimised through the use of suitable technology.

A.3.8.3 All construction-related traffic must use the shipping lanes shown on the nautical charts as much as possible, and the routes from the shipping lanes to the construction sites or, as the case may be, to the interim storage site must be kept as short as possible. Logistic plans are to be submitted to the WSA Stralsund and the Mining Authority of Stralsund before the beginning of construction, showing that these requirements are being observed, and reasons must be given in case the shipping lanes or a direct route from the shipping lanes to the construction site or the interim storage site cannot be used.

A.3.8.5 The PD is required to define clearly the proposals contained in the environmental impact study (cf. application document, Part D.01, Chapter 10) for the project monitoring by the beginning of the work in each route section, and to coordinate with the competent Nature Conservation Authorities. Possible cross-border effects must be taken into account. This agreed project-specific monitoring concept for the construction and operating phase of the pipeline, including the coordinates of the study areas and positions for the investigation equipment and the sampling points for the construction phase, must be submitted to the Mining Authority of Stralsund for scrutiny and approval no later than two months after the Plan Approval Decision is issued. The same applies to the monitoring concept for the operating phase, which is to be submitted to the Mining Authority of Stralsund two months before the beginning of operations for scrutiny and approval.

The right to issue further instructions regarding the project-related monitoring is reserved insofar as these are necessary to monitor compliance with the determined measures for the avoidance and minimisation of the intervention and of its actual extent.

A.3.8.6 Ecological monitoring of construction (including the pedological aspects) must be commissioned. The ecological construction monitor supervises and documents the proper implementation of avoidance and minimisation measures on site (cf. application document, Part G.01, Chapter 9) and of all the other ancillary provisions regarding nature conservation and must be performed by properly trained specialised personnel.

In particular, the following aims of ecological monitoring of construction are to be observed:

- assurance and control of the measures for conflict avoidance and minimisation,
- implementation of the monitoring concept,
- observance of the target maximum values for turbidity, separation of various substrates in the course of the excavation work in accordance with the approved measures M4/M5 (cf. application document, Part G.02), supervision of the restoration of the biotope structure in the area of the pipe trench,
- separation of the dredged material during interim storage at the marine interim storage site (dumping site),
- bird habitats (e.g. moulting sites, staging grounds) to be avoided

when choosing access paths to the construction site,

- use of the water resources limited to the absolutely necessary degree in terms of time and space,
- sediment displacement and impurities are minimised through the use of suitable technology.

The ecological construction monitor participates in construction consultancy meetings and instructs staff involved in the construction work with regard to the nature conservation and ecological aspects of the construction work. In case of any deviation from nature conservation requirements, it must document these. The PD must inform the Plan Approval Authority without delay of any such deviations. The documentation of the ecological monitoring of construction must be submitted at least once a month to the Plan Approval Authority or without delay if separately requested.

The contact persons for the ecological monitoring of construction must be named in writing to the Nature Conservation Authority by the Plan Approval Authority in good time before the beginning of any work. A progress report is to be submitted monthly to the Nature Conservation Authority to show the status of implementation and for the purpose of control, and a final report must be submitted no later than six months after the work has ended in each case (onshore, offshore).

A.3.8.7 The construction time restrictions under nature conservation law as documented in the plan documents (cf. application document, Part G.02) must be observed.

A.3.8.8 27.8862 ha for reforestation are bindingly allocated to the Nord Stream 2 project from the development plan for pooled space of the Entsorgungswerk für Nuklearanlagen GmbH ("EWN"), in accordance with Table 11-7 of the supporting landscape management plan (cf. application document, Part G.01, Chapter 11.1, p. 280, Table 11-7; sec. 3 of the agreement between the PD and EWN of 19 December 2017).

In total, 30.6573 ha must be available onshore as compensatory space (cf. application document, Part G.01, Chapter 11.1, p. 280, Table 11-7). The remaining 2.7711 ha of compensatory space onshore (cf. application document, Part G.01, Chapter 11.1, p. 479) must be made up for through further first afforestation.

The proper execution of the measures in accordance with the requirements of the development plan no. 1 "Industrial and Commercial Park Lubminer Heide" or, as the case may be, the HzE 1999 must be confirmed by the competent Forestry Office and the Lower Nature Conservation Authority of the district of Vorpommern-Greifswald (acceptance protocol or similar). The confirmation and a map clearly showing the allocated reforestation areas are to be submitted to the Mining Authority of Stralsund before the commissioning of the approved installation.

A.3.8.9 363.31 ha compensational area equivalents (KFÄ) from the recognised eco-account measure "Fischlandwiesen" (VR-007) shall be offset in accordance with sec. 9 para. 1 and 2 ÖkoKtoVO M-V. On application by the PD, a further 124.82 ha KFÄ from the recognised eco-account

measure "Fischlandwiesen" (VR-007) shall be set off in accordance with sec. 9 para. 1 and 2 ÖkoKtoVO M-V, in addition to the mandatory compensatory requirements for offshore interventions.

A.3.8.10 Following an application by the PD, a compensation obligation amounting to 1,000 ha KFÄ and its implementation in the form of the "Polder Bargischow" nature conservation measure is transferred to "Landgesellschaft M-V" in accordance with sec. 14 para. 4 ÖkoKtoVO M-V, in addition to the compensation requirements for offshore interventions.

A.3.8.11 The PD is obliged to implement the preferred solution set out in the technical concept studies of 6 September 2017 by Born und Ermel on the further nutrient reduction for the municipal sewage treatment plants at Bergen und Göhren, and in the feasibility / concept studies of September 2017 by ehp Umweltplanung GmbH regarding the sewage treatment plants at Greifswald-Ladebow and Stralsund for an additional reduction of nutrients, in particular nitrogen, in each case at the PD's expense, and in accordance with the descriptions in the supplementary volume: Concrete specifications (Chapter 2.5 of Document W-PE-EIA-OFG-REP-802-KORLOBGE-02; Chapter 2.1.3.1 of Document W-PE-EIA-OFG-REP-802-KORKJBGE-02 as well as Chapter 2.1 and 2.2 of Document W-PE-EIA-OFG-REP-802-KORKLAGE-02).

The requirements of the following permits under water resources law apply here: 1. Änd. (1st amendment) WE_04/KA/03/99 of 18 December 2017 (Bergen); 6. Änd. (6th amendment) WE_14/KA/02/99 of 19 December 2017 (Göhren); 2012/045-2/9655/E8/2.Ä of 21 December 2017 (Stralsund); 2012/356/9655/E8/4.Ä of 21 December 2017 (Greifswald).

Moreover, the planning and construction agreements concluded in this respect between the PD and the operators of the sewage treatment plants named above must be fulfilled by the PD. The PD must prove to the Mining Authority of Stralsund before the beginning of the pipe-laying work for the Nord Stream 2 pipeline in the Bay of Greifswald, which could result in substantial impairment of FFH habitat type 1160, that the constructional changes to the above-mentioned sewage treatment plants are admissible under building law. This proof is to be provided by submitting building permits (sec. 59 LBauO M-V) or by demonstrating that the construction does not require a permit or by proving an exemption from the permit requirement (secs. 61, 62 LBauO M-V).

A.3.8.12 The PD must ensure that the facilities for nutrient reduction provided in A.3.8.11 will operate for at least 15 years from commissioning.

A.3.8.13 The commissioning of the technical measures set out therein for the reduction of nutrient discharge into the Bodden waters of Rügen must be reported to the Mining Authority of Stralsund by 31 December 2019 at the latest. The proof of nutrient reduction to be provided according to the decision named above must also be submitted to the Mining Authority of Stralsund.

A.3.8.14 The right is reserved to set a compensatory amount to be paid in accordance with sec. 15 para. 6 BNatSchG in the event that

compensation measures ordered to be taken prove in retrospect to be unfeasible or insufficient, and any compensation requirement resulting from this cannot be covered by other suitable real compensation measures or eco accounts.

A.3.8.15 During the work and when setting up and operating the construction site and storage sites onshore, the requirements of DIN 18920 ("Vegetationstechnik im Landschaftsbau – Schutz von Bäumen, Pflanzenbeständen und Vegetationsflächen bei Baumaßnahmen"[48], 2002-8) must be observed.

A.3.8.16 In addition to action sheets M8 to M11 (cf. application document, Part G.02), light sources with a harmless colour spectrum (e.g. sodium vapour lamp) must be used in order to minimise a light trap effect on insects, insofar as this is admissible under the provisions of labour legislation.

A.3.8.17 The CEF measures 1 and 2 (Continuous Ecological Functionality measures; cf. application document, Part G.01) must be carried out and be effective before the action is taken. The functionality of these CEF measures must be ensured during the entire sustenance period.

A.3.8.18 The completion of the CEF measures must be reported. After the completion of each measure, an official acceptance by the Lower Nature Conservation Authorities and the Mining Authority of Stralsund must be carried out.

A.3.8.19 To avoid breaches of species protection law, in particular injury and death, in respect of the moor frog, which is strictly protected under the BArtSchV[49] and Annex IV FFH, amphibian protection fences are required in the area of the Pig Station. The amphibian protection fence must be set up for the time period between the beginning of March and the end of October. The ecological construction monitors will check the installation of the amphibian protection fences and continuously monitor them and, if so required due to weather influences, adjust the time period during which the amphibian protection fence must be installed. Moreover, the ecological construction monitors will ensure the proper installation of traps at all passageways along the amphibian fence during the main migration period from the beginning of March to the end of May and from the beginning of August to the end of October. The daily inspection of the traps in the morning hours and the release of all animals caught in the traps outside the danger zone will also take place under the supervision of the ecological construction monitors.

A.3.8.20 The suspected wintering grounds of the common long-eared bat in the Northern area of the Pig Station (cf. application document, Part F.07, Chapter 5.1.3.2.4, p. 79) must be checked for the presence of bats before felling the tree concerned. If the wintering grounds are found to be occupied by bats, these must be properly resettled. Should resettling not be possible, the tree concerned is to be felled one segment at a time. Segments containing winter roosts must be taken down carefully and

[48] Vegetation technology in landscaping – protection of trees, plant stock and vegetation areas in the course of building measures.
[49] Federal Species Protection Regulations.

taken to a suitable new location. The entry to the roosts must be closed during the work. The loss of the tree accommodating the winter roost must be offset by hanging up boxes suitable for the common long-eared bat in the proportion of 1:7 at a sufficient distance from the construction site. The location of any substitute quarters must be agreed on with the Lower Nature Conservation Authority.

A.3.8.21 The construction pits and earth depository must be set up in such a way that sand martins cannot settle there.

A.3.8.22 The extension area of the site of Community importance, "Westrügensche Boddenlandschaft mit Hiddensee" (DE1544-302) provided for in Annex 3 to the draft "Landesverordnung zur Änderung der Natura 2000-Gebiete-Landesverordung"[50] (cf. publication of 8 August 2017, AmtsBl. M-V p. 578) is set as a precautionary coherence securing measure at approximately 40 ha, as shown on the map in Annex 1 to this Plan Approval Decision.

A.3.8.23 Before the beginning of offshore construction work, it must be shown to the Plan Approval Authority by means of an agreement with the owner and the operator of the facility concerned that at least approx. 125,000 m³ of soil with a higher organic content (>3%) and approx. 155,000 m^3 of cohesive soil can be disposed of in compliance with the provisions of public law in such a way that any release at sea is excluded.

A.3.8.24 Before the beginning of offshore construction work, it must be proved by means of supply agreements that at least 750 Tm^3 of embedding material of a suitable quality is available from one or several approved storage sites. It must be shown by means of a suitable list that, in view of the required sediment characteristics, sufficient quantities of the embedding material necessary in each case to restore comparable sediment conditions will be available, in particular also the quantities of autochthonous bed-load material with a grain size of 63 to 200 mm which are necessary to restore hard soils.

A.3.9 Woodland and Forestry

A.3.9.1 The beginning and completion of the conversion of woodland must be reported to the Forestry Office of Jägerhof and the Mining Authority of Stralsund.

A.3.9.2 According to sec. 15 para. 8 sentences 2 and 3 of the "Waldgesetz für das Land Mecklenburg-Vorpommern"[51] (hereinafter: "LWaldG") in the version of the publication of 27 July 2011 (GVOBl. M-V p. 870), most recently amended by Art. 14 of the Act of 27 May 2016 (GVOBl. M-V p. 431), the forest areas may be felled and cleared only immediately before the actual use in accordance with the plan approval. Until then, the forest owner remains obliged to properly manage the forest.

According to sec. 20 para. 1 LWaldG, a distance of 30 metres must be kept from the forest as protection against the danger of windfall and

[50] Draft State Regulation to amend the Natura 2000 areas – State Regulation.
[51] Forestry Act for the State of Mecklenburg-Vorpommern.

forest fire when erecting facilities for the temporary accommodation of personnel.

A.3.9.3 Regarding the implementation of the compensation measures under forestry law, reference is made to the ancillary provision in A.3.8.8.

A.3.9.4 Should it become apparent in the course of the construction activity that additional forest areas will have to be used temporarily/permanently, this must be reported to the Mining Authority of Stralsund and to the Forestry Office of Jägerhof in advance. The Mining Authority of Stralsund will then decide in consultation with the competent Forestry Authority whether a plan revision procedure is necessary (sec. 76 VwVfG M-V).

A.3.9.5 The construction work must not cause any damage to the forest, neither above ground nor due to earthwork in the root area. Damage to neighbouring forest areas must be ruled out by suitable measures. Further protective measures as described in the application documents (Part G.02, Chapter 3.3, 3.4, S3 and S4) must be implemented.

A.3.9.6 The filling of ground and soil solidification/sealing in adjoining forest areas must be refrained from. The storage of building materials as well as the parking of construction machines in the surrounding forest areas is prohibited under sec. 18 para. 2 LWaldG.

A.3.9.7 Should any pruning of forest trees be necessary, this work on tree branches must be coordinated with the Forestry Office of Jägerhof and the forest owner concerned before the beginning of the measures. Any work on tree branches must be carried out by expert personnel.

A.3.10 Infrastructure

A.3.10.1 The PD (or a legal successor to the rights under this Plan Approval Decision) must refrain from any activities in the area of the intersection with the subsea cables of 50Hertz Offshore GmbH which impedes, or renders more difficult, the cable laying work for the network connections approved by Plan Approval Decision of 9 July 2015 (hereinafter also: "AC Systems" or "Cable"). This is the Plan Approval Decision of the Ministry for Energy, Infrastructure and State Development of Mecklenburg-Vorpommern (EM) for the construction and the operation of 6 AC Systems (220 kV) for the network connection of the Offshore Windpark Cluster "Westlicher Adlergrund" and "Arkona-See" from the beginning of the 12-nautical mile limit to the landfall point Lubmin (sea route), Ref. VIII-667-00006-2013/005-004 Seetrasse. The first sentence of this provision does not apply if 50Hertz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 expressly consents to the use of the area of intersection by the PD in writing, or if ancillary provisions A.3.10.3 or A.3.10.7 apply.

A.3.10.2 The area of intersection is marked in colour on Figs. 4 and 6 in the document "Szenarien der 50Hertz-Trassenverläufe im Kreuzungsbereich mit der Nord Stream-2-Pipeline"[52].

[52] Scenarios of the 50Hertz routes within the area of intersection with the Nord Stream 2 pipeline.

A.3.10.3 This Plan Approval Decision includes the following changes of the Plan Approval Decision of 9 July 2015 as a necessary follow-up action regarding other facilities:

a. The intersection with the Nord Stream 2 pipeline (formerly: Pipeline system NEXT) must deviate in its design from no. 6.7.2.2 of the Explanatory Report and the Annexes 3.2.2 folio 2, 4.1 and 4.2 and from Figs. 3-6 of the technical Explanatory Report (TER) and the description in document C.11 of the PD,

aa. in the event ("2018a") that the most eastern AC system (cable 261) under the approved plan in the area of intersection is laid before the Nord Stream 2 pipeline in the area of intersection, and the pipelines are laid in the area of intersection by 31 October 2018, as described in the document "Szenarien 50Hertz-Trassenverläufe im Kreuzungsbereich mit der Nord Stream 2-Pipeline", Figures 3 and 4, in relation to the three western AC Systems (285, 286 and 261; in the plan approval of 9 July 2015: 282, 285, 286 (= cables 4 to 6)),

or

bb. in the event ("2018b") that cable 261 has not yet been laid in the area of intersection before the pipelines are laid in the area of intersection, and the pipelines are laid in the area of intersection by 31 October 2018, as described in the document "Szenarien der 50Hertz-Trassenverläufe im Kreuzungsbereich mit der Nord Stream-2-Pipeline", Illustration 5 and 6, in relation to cables 4 to 6 as well as 261.

b. In the course of the execution planning for the area of intersection to be submitted in accordance with no. 1.4.1 a) and 1.4.2.5 c) of the Plan Approval Decision of 9 July 2015, the necessary adjustments of the current route and to the construction work currently planned must also be shown insofar as they are not yet dealt with in the document according to A.3.10.3 a. aa. and bb.

c. 50Hertz Offshore GmbH or any legal successor to their rights under the Plan Approval Decision of 9 July 2015 must inform the Mining Authority of Stralsund, the Ministry for Energy, Infrastructure and Digitization M-V (EM) and the PD in a binding manner by 1 August 2018 at the latest whether cable 261 will be laid in the area of intersection on 1 September 2018. If it states that that is the case, the company will be obliged under the conditions set out A.3.10.3 d. to complete any work in the area of the intersection which impedes or makes the laying work for the approved Nord Stream 2 project more difficult by 31 August 2018 (or by a later point in time, if the PD consents in writing).

d. In the time period from 1 September 2018 up to 31 October 2018, 50Hertz Offshore GmbH must refrain from any activity in the area of intersection which impedes or renders more difficult the laying work for the plan-approved pipelines, if cumulatively
on 1 August 2018

- this Plan Approval Decision is executable,
- the PD has begun major construction work using installation ships in German coastal waters
  and
- the PD has declared in text form to the Mining Authority of Stralsund, EM and the developer of the network connection that there are no indications for the PD to believe that anything stands in way of the laying of the pipelines in the area of intersection in the time period from 1 September 2018 up to 31 October 2018.

If the PD has already informed the Mining Authority of Stralsund, the EM or 50Herz Offshore GmbH or any legal successor to their rights under the Plan Approval Decision of 9 July 2015 before 31 October 2018 that the pipe-laying work in the area of intersection has been completed, 50Hertz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 has the right to fully use the area of intersection from that time, insofar as that is compatible with the pipelines then having been laid.

A.3.10.4 The PD has to prove in writing by 1 August 2018 at the latest in a suitable manner to the Mining Authority of Stralsund, the EM and 50Herz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 that the conditions set out in the ancillary provision A.3.10.3 are fulfilled.

A.3.10.5 The PD must submit a precise pipe-laying schedule to 50Hertz Offshore GmbH or any legal successor to their rights under the Plan Approval Decision of 9 July 2015 and the Mining Authority of Stralsund in good time before the beginning of any construction work, but no later than on 1 August 2018, showing the time and the object of the construction work in the area of intersection.

A.3.10.6 In a case where ancillary provision A.3.10.3 d. applies, the PD is obliged to notify the Plan Approval Authority, the EM and 50Herz Offshore GmbH or any legal successor to their rights under the Plan Approval Decision of 9 July 2015 of the completion of the laying work in the area of intersection. This must be done in writing without delay and no later than on 31 October 2018. The PD is also obliged to leave the area of intersection clear and in the original sea floor condition (backfilled trench and smooth sea floor in accordance with the requirements of the Plan Approval Decision) from the stated point in time, but no later than 1 November 2018, and thereafter to refrain from any activity which stands in the way of or renders more difficult the laying work for the AC connections.

A.3.10.7 In the event that the pipelines are not laid in the time period from 1 September 2018 to 31 October 2018, the right is reserved, after hearing the arguments of 50Hertz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 and reasonably taking into consideration their interests, to review the decision regarding the construction of the intersection with the AC Systems still not laid at the planned time for laying the pipelines, and on the duration of the pipe-laying work. In this case, in good time before the beginning of work in the

area of the intersection, the PD is obliged to submit documents to the Plan Approval Authority, the EM and 50Herz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015, showing the intersection as then planned.

A.3.10.8 The PD must on presentation of proof refund to 50Hertz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 all extra expenditures incurred in consequence of the planned changes through this Plan Approval Decision or a planning supplement decision, if any, insofar as such expenditures are reasonable.

A.3.10.9 Before beginning the construction activity in the area of intersection, the PD must agree contractually with 50Herz Offshore GmbH, or any legal successor to their rights under the Plan Approval Decision of 9 July 2015, on the conditions for the planned intersections. The conclusion of an agreement must be proved to the Mining Authority of Stralsund and the EM. The right of the Mining Authority of Stralsund to take a final decision on the conditions for the planned intersections should the PD and 50Hertz Offshore GmbH, or any legal successor to their rights under the Plan Approval Decision of 9 July 2015, fail to conclude any such agreement within one month of service of this Plan Approval Decision upon PD, but no later than 18 April 2018, is reserved.

A.3.10.10 The PD must – if demanded by 50Herz Offshore GmbH or any legal successor to their rights under the Plan Approval Decision of 9 July 2015, and the necessary cable/operating data are made available – prepare an impact assessment report for the area of intersection on the basis of recommendation no. 3 of the "Arbeitsgemeinschaft für Korrosionsfragen"[53] ("AfK-3", text identical with DVGW worksheet GW28) and recommendation no. 11 (AfK-11, text identical with DVGW worksheet GW28) or comparable legislation, considered by the expert to be appropriate, for the pipelines with the AC Systems already laid and those already planned, and must take it into consideration when designing the touch and corrosion protection for pipelines. The report must be submitted to the Mining Authority of Stralsund, the EM and 50Hertz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 no later than two months before the beginning of work in the area of intersection.

A.3.10.11 The PD must determine by means of an independent engineering report the mechanical load on the power cables to be crossed, and prove that the sinking of the pipelines into the sea floor to be expected in the area of intersection will not cause any reduction in the agreed vertical minimum distance between the pipeline and the power cable of 1 m. The report must be submitted to the Mining Authority of Stralsund, the EM and 50Hertz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 no later than two months before the beginning of construction work in the area of intersection.

A.3.10.12 The PD must backfill the trench in the intersection area exclusively with sand consisting of various grain sizes (in particular no marl, no stones

[53] Working group on corrosion questions.

and no peat) and then flatten the sea floor in accordance with the specifications in this Plan Approval Decision. The PD must prove to the Mining Authority of Stralsund, the EM and 50Hertz Offshore GmbH or any legal successor to their rights under the Plan Approval Decision of 9 July 2015, no later than six months after the completion of the construction activities in the area of intersection, that the planned laying depth or the planned cover height in the area of intersection, as the case may be, was achieved in order to enable the vertical minimum distance between the power cable and the pipelines.

A.3.10.13 The PD must prove to the Mining Authority of Stralsund, the EM and 50Hertz Offshore GmbH or any legal successor to their rights under the Plan Approval Decision of 9 July 2015, at least two months before the beginning of work in the area of intersection, that the installation corridor is free from obstacles (in particular ferromagnetic objects > 15 kg).

A.3.10.14 The PD, 50Hertz Offshore GmbH or any legal successor to the rights under the Plan Approval Decision of 9 July 2015 must make available to each other the information, data and documents needed for the proper implementation of their projects.

A.3.10.15 Intersection structures must be constructed in accordance with the state of the art as regards technology and in such a way that shipping and fishing vessels are adequately and permanently protected against anchorage damage or the like. Crossings must take place in an area of 200 m on both sides of the intersection structure at a right angle as far as possible.

A.3.10.16 Drawings of the intersections or, as the case may be, the intersection structures must be submitted to the WSA Stralsund in good time, but no later than one month before the beginning of the work in the area of the intersections. They must show the geographical position, a clear depth reference, the water depth to be expected above each intersection structure as well as the material used (stones, gravel, concrete mats, synthetic mats or the like).

A.3.10.17 The appropriate conditions and information submitted by the operators of the third-party pipes to be crossed in the onshore area (high-pressure gas pipelines, data cables, water pipes etc.) must be observed. All operators of third-party pipes are to be informed at an early time about the beginning of construction work and to be consulted on the detailed plan to the extent necessary to safeguard their interests.

A.3.10.18 The execution plans for crossing the existing railway infrastructure by means of microtunnels must be submitted in good time to the State Railway Supervisory Authority for a technical railway examination.

A.3.10.19 The section of the beach concerned at the coastal resort of Lubmin must be secured or marked in a suitable manner during the undercrossing by microtunnel.

A.3.11 Building legislation

A.3.11.1 The access routes and the connections for electricity, water, firefighting water and sewage as well as the unification easement for the plots affected by the construction work are to be secured under public law by an entry into the Register of Building Encumbrances for the district of Vorpommern-Greifswald before the beginning of construction work in accordance with sec. 4 para. 1 and 2 LBauO M-V. The Mining Authority of Stralsund is to be informed accordingly.

A.3.11.2 For all buildings falling into building classes 1 to 3, containers, bridges, supporting walls, stands and other physical structures which are not buildings, the declaration of the structural engineers regarding the fulfilment of the criteria set out in the list of criteria (sec. 14 para. 2 in conjunction with Annex 2 to the "Verordnung über Bauvorlagen und bauaufsichtliche Anzeigen"[54] (hereinafter:"BauVorlVO M-V") of 10 July 2006 (GVOBl. M-V p. 612), amended by Regulation of 28 June 2016 (GVOBl. M-V p. 519)) must be submitted to the Building Supervisory Authority no later than together with the start of construction notification according to sec. 72 para. 9 and sec. 82 para. 1 and 2 LBauO M-V. The Mining Authority of Stralsund is to be informed accordingly.

A.3.11.3 For the proof of stability for the new construction of the workshop building, the appropriate structural proof / calculations and the related construction plans must be submitted to the Lower Building Supervisory Authority in good time, but at least four weeks before the planned beginning of building work, in each case in duplicate. The Mining Authority of Stralsund is to be informed accordingly.

A.3.11.4 For the buildings falling into building classes 4 to 5, the structural data must be submitted to the Lower Building Supervisory Authority in good time before the beginning of construction work (sec. 66 para. 3 LBauO M-V). The Mining Authority of Stralsund is to be informed accordingly.

A.3.11.5 Conditions imposed by the Building Supervisory Authority in consequence of an examination of the structural data become part of the building permit. The substantive requirements must be fulfilled when preparing and executing the project.

A.3.11.6 Necessary controls of the constructive building supervision, for which the Lower Building Supervisory Authority will commission a test engineer, must be agreed on by the PD with him in good time (sec. 66 para. 3 LBauO M-V). The Mining Authority of Stralsund is to be informed accordingly.

A.3.11.8 The issuer of proof or any other person entitled to provide proof within the meaning of sec. 66 para. 2 sentence 3 LBauO M-V must, together with the notification regarding the intended beginning of use, confirm the conformity between the fire protection certificate and the actual building work. The Mining Authority of Stralsund is to be informed accordingly.

[54] Regulation on Required Construction Documentation and the Notification of the Building Supervisory Authorities.

A.3.11.9 The Building Supervisory Authority and the Mining Authority of Stralsund are to be informed in writing in accordance with sec. 53 para. 1 LBauO M-V, sec. 72 para. 9 and sec. 82 para. 1 and 2 LBauO M-V) of:

- the responsible construction manager / qualified person
- the beginning of building work
- the beginning of use.

A.3.11.10 Together with the notification regarding the intended beginning of use, the construction manager / qualified person must present a declaration stating that the construction activity was carried out in accordance with public building law, the current technical building rules and the approved construction project. The Mining Authority of Stralsund is to be informed accordingly.

A.3.12 National defence

A.3.12.1 The timing of the construction phases as well as the shipping traffic involved during the pipe-laying work within the military training areas in the 12-nautical mile zone must be reported to the Navy Command:

DO EXAS
Uferstraße
D-24960 Glücksburg
tel. 0049 (0) 4631 6666-3228/-3221
fax: 0049 (0) 4631 666-3229
Email: markdoeinsmoc2exas@bundeswehr.org;

Outside office hours:
DOOPER
Uferstraße
D-24960 Glücksburg
tel. 0049 (0) 4631 6666-3228/-3202
fax: 0049 (0) 4631 666-3209

as early as possible, but at least one month before the beginning of the construction work in each of the route sections.

At least three working days before the entry of the pipeline-laying and escort vessel into the area concerned, the Navy Command must again be notified of the construction work. Short-term changes in the specified process must be reported without delay to the military authorities named above.

A.3.12.2 The use of the Remotely Operated Vehicles (ROV) described in the application documents (cf. application document, Part C.01, Chapter 3.3.2.5) during the construction phase and after commissioning, which are to be limited to the necessary extent, must be reported to the Navy Command in good time prior to deployment, but at least 20 working days in advance.

A.3.13 High Pressure Gas Pipeline Regulation

A.3.13.1 Prior to commissioning in accordance with DNV-OS-F101 (October 2013), sec. 3, D200, it must be proved that the envisaged Pressure Safety System (PSS) will have a defined Safety Integrity Level (SIL) which ensures a maximum admissible incidental pressure of only 5% (γ_{inc} = 1.05) above the Design Pressure (DP) during the entire service life of the high pressure natural gas pipeline.

A.3.13.2 No later than six weeks before commissioning, it must be proved that the steel pipes manufactured with a wall thickness of 26.8 mm will fulfil the requirements for the material characteristics "U" in accordance with DNV-OS-F101 (October 2013), sec. 7, I500, and that a utilisation of the nominal material strength with a factor of α_u=1.0 is admissible.

A.3.13.3 A precondition for the waiver of the conventional system pressure test according to DNV-OS-F101 (October 2013) and for the implementation of the planned pre-commissioning concept is the fulfilment of the requirements named in DNV-OS-F101 (October 2013), sec. 5, B203, table 5-1, as well as the requirements additionally imposed by the standards body, which follow from the DNVGL-ST-F101 rules (October 2017) in respect of the waiver of a conventional system pressure test. Furthermore, the obligations to provide proof regarding the deviation from the 75% criteria named in DNV-OS-F101 (October 2013), sec. 5, B203, table 5-1, must be fulfilled. The entire documentation involved in this and the deviations approved by the legislator as well as proof approved accordingly are to be submitted to the expert prior to commissioning.

A.3.13.4 In addition to the detailed description of the planned pre-commissioning concept (cf. Dok. WEN-PCO-POF-REP-800-DRYCPTEN, Rev. 02 or more up to date), a direct and verifiable comparison must be made between a conventional pressure test according to the DNV-OS-F101 (October 2013) and the pre-commissioning concept. A primary result of this comparison is to be the comparison between detectable leakage rates (conventional / alternative) and the proof of an at least equivalent safety level. The documentation is to be submitted to the expert in good time before commissioning.

A.3.13.5 Technologies used which are not covered by any standards and are used by certified personnel and certified test technology must undergo a certification programme carried out by independent and qualified specialised personnel which will confirm the specified and necessary qualities (in accordance with the planned pre-commissioning concept) in writing. The relevant documentation is to be submitted to the expert in good time prior to commissioning.

A.3.13.6 Every test technology which forms a part of the planned pre-commissioning concept must, apart from the individual description of the technical characteristics, also contain an individual assessment of the probability of detection of errors in the form of a probability calculation and risk analysis. An overall risk analysis of the planned pre-commissioning concept must evaluate the results as a final evaluation in

comparison with a conventional system pressure test. The expert is to be involved in all processes in this respect.

A.3.13.7 Should proof of an safety level of the planned pre-commissioning concept at least equivalent to a conventional system pressure test not be furnished, the pipes must be tested by means of a water pressure test in accordance with DNV-OS-F101 (October 2013), sec. 10, J in conjunction with sec. 5, B202.

A.3.13.8 The process sequences for the qualification of the welding processes and the welding personnel must be submitted to the expert for an assessment prior to the beginning of the welding work. The taking of test welds and details regarding the location, performance and examination of the test weld must be agreed on in good time with the expert.

A.3.13.9 The specification for leak monitoring must be submitted to the expert in good time before commissioning.

A.3.13.10 The test concepts for the testing of the guarantee welds as well as the circumferential welds inside the microtunnels must be submitted to the expert in good time before commissioning.

A.3.13.11 The test instructions documented in the comment sheets for the documented specifications regarding the area of the high pressure gas pipeline regulation must be progressed completely to status "C" ("closed") before commissioning.

A.3.13.12 All non-destructive tests and installation tests for the supervision of the production and installation of the pipes or the pipework installation must be completed successfully and without remaining defects before commissioning. The related reports must be submitted to the expert in good time before commissioning.

A.3.13.13 The successful installation and the testing of the safety equipment prior to commissioning must be confirmed by means of a test report. The pressure protection for downstream equipment must be proved, and proof must be provided that no interaction takes place with other pipes, including interaction with connected pipelines. As regards the upstream area of the pipeline system, a confirmation by the operator of proper completion of the construction work in accordance with relevant provisions must be presented for the pipeline sections outside the scope of application of the High Pressure Gas Pipeline Regulation, stating that there are no safety concerns regarding the commissioning of the overall installation. The documents must be available to the expert in good time before commissioning.

A.3.13.14 In case of any deviation from the test bases and specifications relevant to the installation, the expert must be informed and his consent must be obtained in good time. Such consent must then be submitted without delay to the Mining Authority of Stralsund.

A.3.13.15 A copy of the preliminary certificate according to sec. 6 para. 1 no. 1 GasHDrLtgV must be submitted without delay to the Mining Authority of Stralsund, and the further proof according to sec. 6 para. 1 no. 2 GasHDrLtgV in good time. The final test in accordance with sec. 6 para. 2 GasHDrLtgV must be carried out within twelve months after the

preliminary certificate is issued. A copy of the final certificate is to be sent thereupon to the Mining Authority of Stralsund without undue delay.

A.3.13.16 The commissioning of the high-pressure gas pipeline is to be notified to the Mining Authority of Stralsund (sec. 6 para. 3 sentence 1 GasHDrLtgV). Trial operation will be considered to constitute commissioning.

A.3.14 Safety at work

A.3.14.1 A coordinator is to be appointed for the construction site to perform the construction contractor's duty to coordinate the planning and execution of the construction work between the undertakings involved (sec. 3 of the "Verordnung über Sicherheit und Gesundheitsschutz auf Baustellen"[55] (hereinafter: "BaustellV") in the version of 10 June 1998 (BGBl. I p. 1283), most recently amended by Art. 27 of the Act of 27 June 2017, (BGBl. I p. 1966)). No later than two weeks before the set-up of the construction site, the necessary advance notice must be sent to the competent occupational safety office (sec. 2 para. 2 sentence 2 BaustellV).

A.3.14.2 Hazard assessments as well as documentation regarding hazardous areas (Ex zones) must be prepared (sec. 3 of the "Verordnung über Sicherheits- und Gesundheitsschutz bei der Verwendung von Arbeitsmitteln"[56] of 3 February 2015 (hereinafter: "BetrSichV") (BGBl. I p. 49), most recently amended by Art. 5 para. 7 of the Regulation of 18 October 2017 (BGBl. I p. 3584) in conjunction with secs. 6, 11 of the "Verordnung zum Schutz von Gefahrstoffen"[57] of 26 November 2010 (hereinafter: "GefStoffV") (BGBl. I p. 1643, 1644), most recently amended by Art. 148 of the Act of 29 March 2017 (BGBl. I p. 626)), which must be attached to the detailed planning as well as the execution planning.

- A3.14.3 Before the foundation and laying work or any other work requiring an intervention in the foundation soil, the necessary occupational safety measures resulting from any danger to the employees due to explosive ordnance must be established within the framework of a methodological description and a related risk assessment. The following must be taken into consideration especially here:
- "The Arbeitshilfen Kampfmittelräumung"58 - AH KMR (Federal Ministry for the Environment, Nature Conservation and Reactor Safety and Federal Ministry of Defence),
- the "Landesverordnung zur Verhütung von Schäden durch Kampfmittel"59 of 8 June 1993 (GVOBl M-V p. 575),

[55] Regulation on Safety and Health Protection on Building Sites.
[56] Regulation regarding Safety and Health Protection when using Work Equipment.
[57] Regulation for the Protection against Hazardous Substances.
[58] Working Guide on Explosive Ordnance Clearance.
[59] State Regulation on the Prevention of Damage caused by Explosive Ordnance.

- the "Handlungsanleitung zur Gefährdungsbeurteilung und Festlegung von Schutzmaßnahmen bei der Kampfmittelräumung der DGUV-Information 201-027"[60] (previously BGI 833).

A.3.14.4 The PD must rule out detonations.

A.3.14.5 If diving work is carried out during the construction phase and the operations, the DGUV Regulation 40 "Diving work", BGV C23, and the "Leitfaden Taucherarbeiten Offshore"[61] of the DNV GL is binding on all diving companies operating there. For diving work during which breathing gas with a different composition than compressed air is used, the prior approval of the competent employers' liability insurance association (BG Bau) must be obtained in accordance with sec. 22 para 1 of the DGUV rule "Diving work" BGV C23. This applies also to diving companies from abroad.

A.3.14.6 If compressed air work is necessary during work on the microtunnel, the requirements of the "Verordnung über Arbeiten in Druckluft"[62] of 4 October 1972 (BGBl. I p. 1909), most recently amended by Art. 103 of the Act of 29 March 2017 (BGBl. I p. 626) and of the RAB 25 "Work in compressed air" of the Committee for Safety and Health Protection on building sites must be implemented.

A.3.14.7 The requirements of the "Arbeitszeitgesetz"[63] (hereinafter: "ArbZG") of 6 June 1994 (BGBl. I p. 1170, 1171), most recently amended by Art. 12a of the Act of 11 November 2016 (BGBl. I p. 2500) and of the "Verordnung über die Arbeitszeit bei Offshore-Tätigkeiten"[64] (hereinafter: "Offshore-ArbZV") of 5 July 2013 (BGBl. I p. 2228) must be complied with to the extent applicable. In case of any deviations from this, an exceptional permit must be applied for to the competent Industrial Safety Authority.

A.3.15 General

A.3.15.1 The gas pipeline may be laid only on the approved route, including the described minimum cover heights (cf. application document, Part I2.01, explanation minimum cover height, Table 1). The horizontal installation tolerance must not exceed a maximum of ±7.5 m in non-embedded areas. Within the excavated trench, the installation tolerance for the pipeline must not exceed ±3 m. The lateral deviation of the route necessary for construction reasons in the areas of the AWTI is to be limited to a maximum value of 1.5x water depth.

A.3.15.2 Before the commissioning of the high pressure natural gas pipeline, an alarm and hazard prevention plan within the meaning of sec. 7 of the "Gesetz über den Katastrophenschutz in Mecklenburg-Vorpommern" [65]

[60] Instructions for the Risk Evaluation and laying down Protective Measures for Explosive Ordnance Clearance.
[61] Guideline Diving Work Offshore.
[62] Regulation on Work in Compressed Air.
[63] Working Time Act.
[64] Regulation on the Working Time in Case of Offshore Works.
[65] Act on Disaster Control in Mecklenburg-Vorpommern.

(hereinafter: "LKatSG M-V") in the version of the publication on 15 July 2016 (GVOBl. M-V), most recently amended by correction on 7 September 2016 (GVOBl. M-V p. 793), must be submitted to the administrative authority of the district of Vorpommern-Greifswald for approval. It must contain in particular information on:

- the route,
- responsible persons,
- measures in the event of damage, on-call duties, alarm, material and deployment plan for damage control.

The alarm and hazard prevention plan must provably be coordinated with the operator of the planned and directly adjoining natural gas receiving station Lubmin 2.

A.3.15.3 A fire protection concept and a fire-fighting plan must be prepared for the onshore area in accordance with DIN 14905 (firefighting plans for structural installations, 2007-05). The municipal authorities responsible for preventive fire protection and technical assistance in the event of an incident and the other competent authorities as well as the authorities responsible for regional deployment decisions must be given a copy of this concept. A list of the authorities and parties to be notified must be attached. The local fire department(s) and the further emergency response teams to be deployed must be trained and instructed on the basis of the object-related deployment plans to be prepared by the competent fire department.

The fire protection concept and the fire-fighting plan must be coordinated with the operator of the planned and adjoining natural gas receiving station Lubmin 2. The result of this consultation is to be shown to the Mining Authority of Stralsund.

A.3.15.4 Fixed points of the official geodetical base networks, orientation marks or boundary marks of any kind must not be damaged or impaired (sec. 26 para. 4 of the "Gesetz über das amtliche Geoinformations- und Vermessungswesen"[66] (hereinafter: "GeoVermG M-V") of 16 December 2010 (GVOBl. M-V p. 713)). Necessary safeguards or displacements must be applied for in good time from the "Amt für Geoinformation, Vermessungs- und Katasterwesen"[67] or from the cadastral office of the district.

A.3.15.5 No fuels and lubricants may reach the subsurface. Sufficient quantities of binding agents must be kept available. Any ground contamination must be removed promptly by removing the contaminated soil. The removed soil is to be disposed of at the expense of the PD; any ground contamination and disposal are to be reported to the Mining Authority of Stralsund.

A.3.15.6 Before and during the Construction work in the development plan area "Industrie- und Gewerbegebiet Lubminer Heide", project-related consultations must be carried out provably and regularly with Entsorgungswerk für Nuklearanlagen GmbH, the "Zweckverband

[66] Act on the Official Geo-Information and Surveying System.
[67] Office for Geo-Information, Surveying and Cadaster Issues.

Energie- und Technologiestandort Freesendorf", the competent Road Construction Authorities and the other undertakings operating at that location, to the extent that is necessary to rule out or reduce to a minimum restrictions caused for these undertakings by the construction work. Proof, in particular minutes of meetings, must be made available to the Mining Authority of Stralsund at its request.

A.3.15.7 It cannot be ruled out that explosive ordnance may be found occasionally even in areas not known to contain explosive ordnance from past wars. The work must for this reason be done with due care. Should objects suspected of being explosive ordnance or munitions be found, the work at the location of the finds and its immediate surroundings must be discontinued immediately for safety reasons and the "Landesamt für zentrale Aufgaben und Technik der Polizei, Brand- und Katastropenschutz M-V"[68] must be notified; further measures will be decided in each case.

A.3.15.8 The competent authority must be informed without delay of any temporary or definite cessation of the operation of the natural gas pipeline.

A.3.15.9 In the event of a foreseeable definite cessation of operations, the PD must prepare a concept for the handling of the pipeline after decommissioning. The concept must examine the environmental, technical and legal aspects. It must be delivered to the competent authority for a final decision.

A.4 Notes

A.4.1 The plan approval does not include the permits necessary for the implementation of the project in the area of the German continental shelf.

A.4.2 Any deviation from the construction times documented in the plan documents or from the construction time restrictions and construction technologies requires an application to and permission from the Mining Authority of Stralsund.

A.4.3 If the project is to be changed entirely or partly before its completion, these changes must be submitted to the Mining Authority of Stralsund. The Mining Authority of Stralsund will then decide on the further permitting procedure in accordance with sec. 43d EnWG, sec. 76 VwVfG M-V.

A.4.4 Any change of the extent of water resources usage and of the mode of operation and procedure must be reported in advance to the competent Water Authority, which decides on the admissibility of the change, and must be proved by means of documentation.

A.4.5 The general requirements of unnamed network operators regarding construction activities and for the operation of pipelines within the area of their facilities must be observed.

[68] State Office for Central Tasks and Technology of the Police, Fire and Disaster Control M-V.

A.4.6 The PD is responsible for detecting and investigating existing cables, pipes, obstacles and other objects and for all protective measures resulting from this.

A.4.7 In the course of the pipe-laying work the PD must observe the generally recognised rules of technology and the standards of care necessary in the construction industry.

A.4.8 The holder of the permit for water resources usage is liable in accordance with the provisions of the law for any damage that may occur and provably results from his undertaking or facility.

A.4.9 It is recommended that the designated expert for the preliminary and final certificate be consulted before the beginning of work with regard to the nature, extent and execution of the tests according to sec. 6 para. 1 and 2 GasHDrLtgV. Experts within the meaning of A.3.13 are experts in accordance with sec. 11 para. 1 GasHDrLtgV.

A.4.10 The statutory provisions regarding the admissibility of work on Sundays and holidays and at night must be observed.

A.4.11 The statutory provisions including related regulations, directives and rules regarding industrial safety and health protection, technical safety, the law governing hazardous substances as well as the construction site regulations must be observed.

A.4.12 The PD must take care that passing ships or, as the case may be, the safety and efficiency of shipping traffic will be obstructed or impaired to the smallest possible extent during the construction phase.

A.4.13 For necessary transport area restrictions during the building activities, an order on the basis of traffic law must be obtained from the competent Road Authorities in accordance with sec. 45 para. 6 of the "Straßenverkehrs-Ordnung"[69] ("StVO") of 6 March 2013 (BGBl.I, p.367), most recently amended by Art. 1 of the Regulation of 6 October 2017 (BGBl. I p. 3459).

A.4.14 Should it become apparent in the course of the use of the pipeline that the technical safety requirements for the pipeline are not or are no longer satisfied, the Plan Approval Authority may review the necessary and technically-feasible measures in accordance with sec. 49 para. 5 EnWG.

[69] Road Traffic Regulation.

B Rationale

B.1 Description of the project and construction

B.1.1 General

The PD is planning to build the natural gas high-pressure pipeline, measuring some 1,225 km in length, as a DN1200 double pipeline (Pipeline A and B). This starts in Russia in Narva Bay, north of the border with Estonia, and ends in Germany near Lubmin at the receiving plant. The project Nord Stream 2 pipeline comprises two parallel strings (Pipeline A, North-West Pipeline and Pipeline B, South-East Pipeline) with a transport capacity of approx. 27.5 billion m^3 per annum each. The aim is to put the first line of the Nord Stream 2 Pipeline into operation in October 2019. Completion and commissioning of the second line is planned for November 2019.

B.1.2 Route

From Narva Bay, the route runs westwards through the Gulf of Finland virtually parallel to the border of the Exclusive Economic Zone (EEZ) between Finland and Estonia and then curves southwards and enters the Swedish EEZ. Inside the Swedish EEZ the route runs east of the Swedish island of Gotland and parallel to the border of the Latvian EEZ. It then swings in a south-westerly direction, running south of the Danish island of Bornholm. Finally, the pipeline turns south-south-west and crosses the border of the EEZ between Denmark and Germany, south-east of the Adlergrund area. The route is essentially the same as the existing Nord Stream Pipeline already in operation. In the figure below, the route of the Nord Stream 2 pipeline is marked as a blue line and the borders of the various EEZ are shown as grey lines.

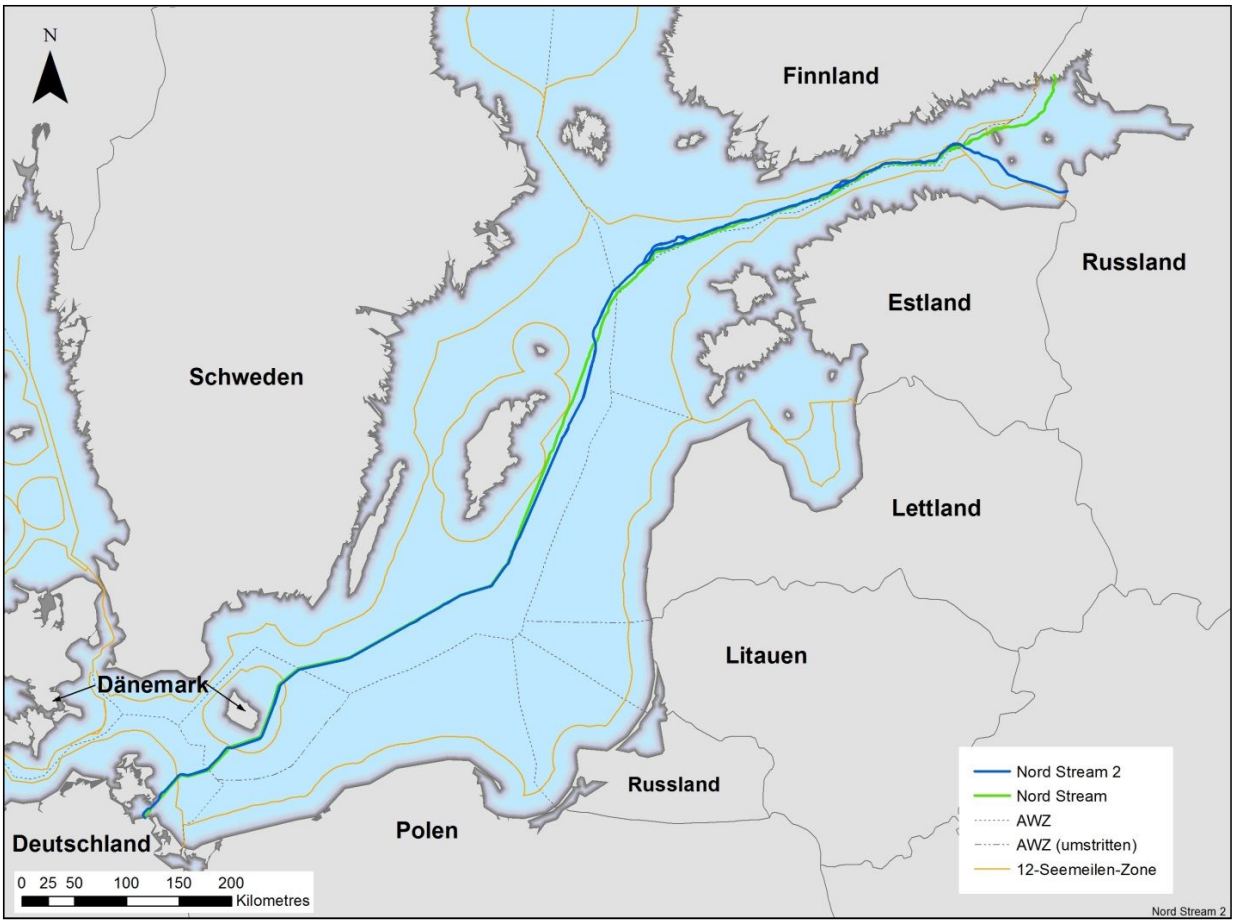

Figure 1: Full route of the pipeline through the Baltic Sea
[Source: Application documents]

The route of the Nord Stream 2 pipeline crosses the border of the Danish-German EEZ after approx. 1,141 km (starting at the landfall in Russia). After this crossing south-east of the Site of Community Interest (SCI) "Adlergrund", the route initially swings slightly northwards and then southwards, running relatively straight in a south-westerly direction as far as the 12 nautical mile border and then in a south-south-westerly direction. Within German territorial waters the route continues in a south-westerly direction as far as the Boddenrandschwelle. In the area of landfall buoys Landtief A and B as far as the bay threshold Boddenrandschwelle, it runs parallel to the shipping lane "Landtief Approach". In the area of the Boddenrandschwelle, an arc is then initiated in a westerly direction, and after another change of direction north of "Schumachergrund" the route continues in a south-westerly direction towards the landfall point near Lubmin. The standard distance between the two parallel pipelines in the German sector is approx. 55 m. Due to the situation on the seabed and in order to avoid or reduce interventions on the seabed, the two lines will not run strictly parallel in certain areas. This can result in distances between the two pipeline strings of up to approx. 65 m. The next figure shows the route in the German area.

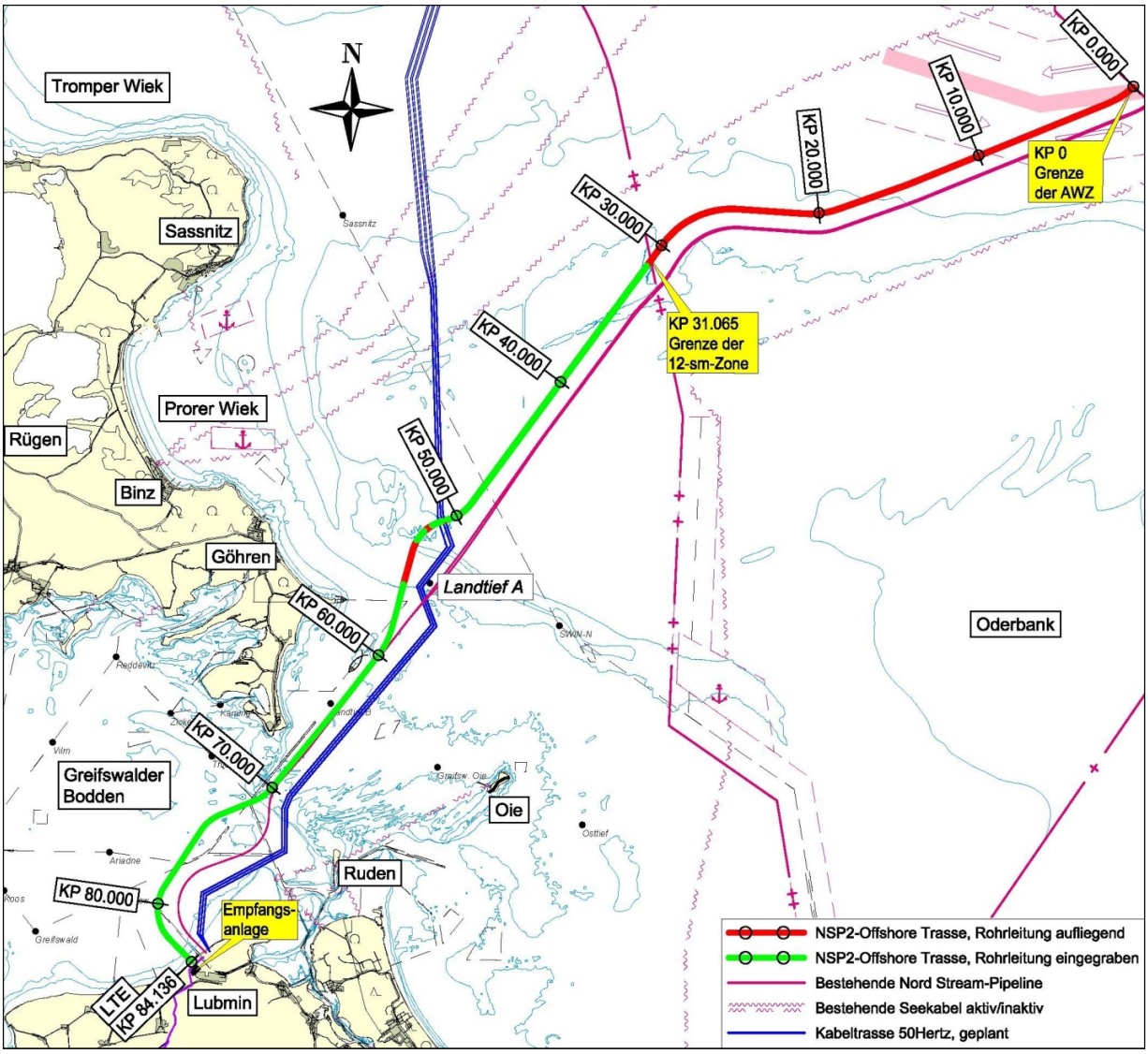

Figure 2: Route of the pipeline through the German area of responsibility
[Source: application documents]

The 2016 State Development Programme of the state of Mecklenburg-Western Pomerania (LEP M-V) defines a "Marine Area Reserved for Pipelines" in which route sections KP 32,412 to KP 52,475, KP 53,811 to KP 72,032 and KP 76,210 are located up to the landfall near Lubmin. Due to the high degree of rigidity of the pipe and the resulting bending radius of >2,500 m, full positioning in this reserved area is not possible. The figure below shows the pipeline route in this reserved area.

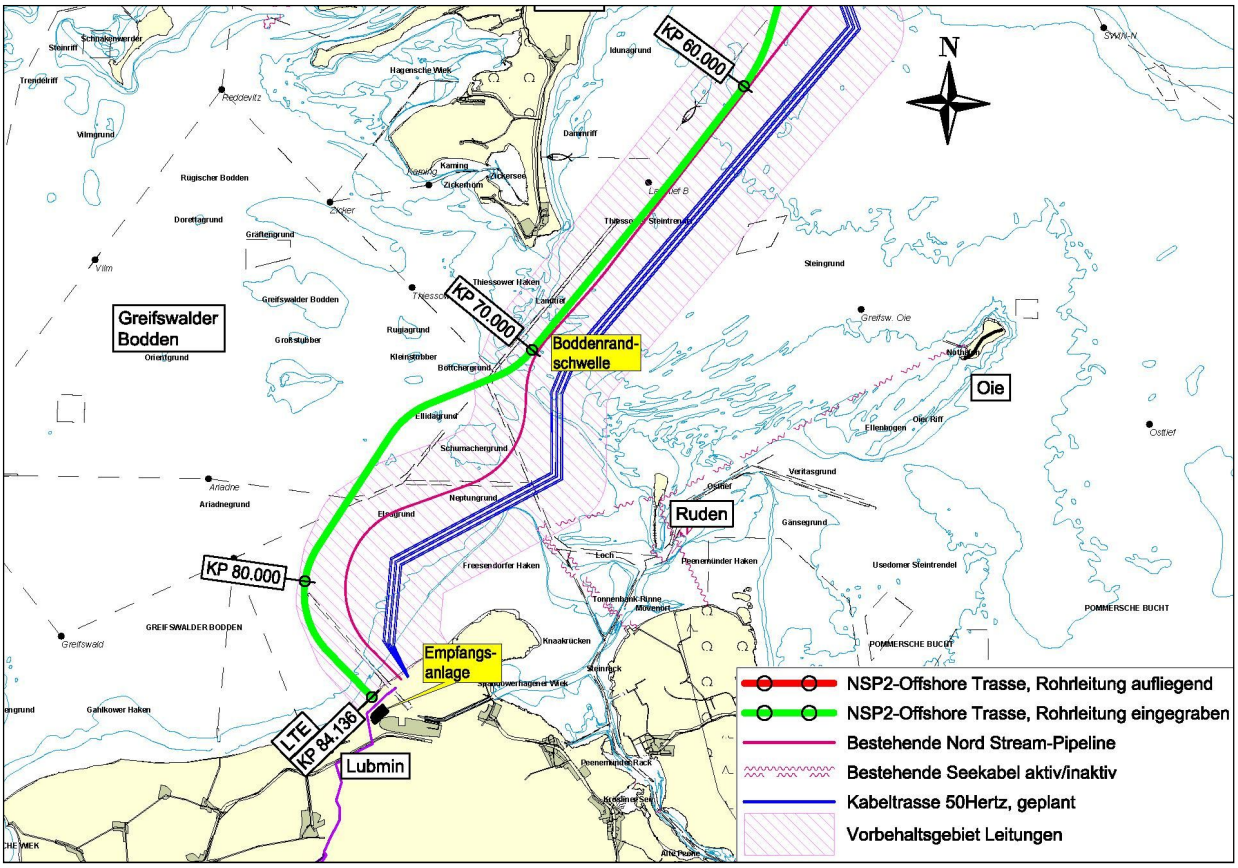

Figure 3: Route of the pipeline in the marine area reserved for pipelines
[Source: Application documents]

In the immediate landfall area, the pipeline crosses the coastline in a straight line from north-west to south-east as well as the shore area, thereby reaching the pig receiver station and the planned handover point (natural gas receiving terminal Lubmin 2) at the required land installations which are planned.

The central line of the pipeline crosses the border of the German EEZ, intersects the 12 nautical mile border and then crosses the coastline at the coordinates shown in the table below and with the pipeline spacing as described.

Table 5: Intersection point of the central line of the pipeline with the EEZ border, the 12 nautical mile zone and the coastline

Border	**Pipeline** (Ger-Z33_LineA/B_ Rev.04_MT-Lubmin2)	**Easting** (ETRS-89 / UTM Zone N33)	**Northing** (ETRS-89 / UTM Zone N33)	**Lateral distance from the central line**	**Kilometre point** (in relation to Pipeline A, German area)
EEZ	Central line	466.768 m	6,052.414 m	+ 28.3 m	(0.000)
12 nm	Central line	438.361 m	6,042.193 m	+ 27.5 m	31.065
Coastline	Central line	411.344 m	6,000.911 m	+ 7.0 m	(84.136)

In the course of its offshore path, the route of the Nord Stream 2 pipeline intersects the approved route of six submarine three-phase current submarine cable systems (220 kV) within the German area of responsibility. One of the functions of these six

220 kV submarine cables will be to connect the "Arkonabecken Südost" and "Wikinger" offshore wind farms to the mainland. The cables installed prior to the laying of the pipeline (currently two, at the time of pipeline installation three) will be crossed by the pipeline (the pipeline will rest on the seabed). In the intersection area of the cables to be installed after the pipeline has been laid, the pipeline will be buried in the seabed to a depth of 1.0 m in order to allow subsequent crossing of the pipeline by the cables.

The pipeline crosses several shipping lanes or runs parallel to them in close proximity. The details are set out in the application document, Part C.01, Section 2.1.6.1. In the area of KP 11,763 to KP 49,815, the Nord Stream 2 pipeline runs inside military training areas at a maximum distance of approx. 1,200 m from the existing Nord Stream pipeline.

In terms of the pipeline route on land, it crosses several lines of various kinds, a public road and a railway track. The required vertical spacing between the infrastructural facilities to be crossed and the micro-tunnel in the transition area between water and land will be taken into account during the planning phase and implemented by means of appropriate construction measures.

After crossing the EEZ border, the pipeline runs in a south-westerly direction between the northerly Sites of Common Interest (SCI) "Adlergrund" (DE1251-301) and "Westliche Rönnebank" (DE1249-301) as well as the southerly SCI "Bay of Pomerania with Oderbank" (DE1652-301). Inside the EEZ, the pipeline crosses the bird sanctuary "Bay of Pomerania" (DE1552-401). Within the 12 nautical mile zone, the pipeline crosses the SCIs "Greifswalder Boddenrandschwelle and parts of the Bay of Pomerania" (DE1749-302) and "Greifswalder Bodden, parts of the Strela Sound and the northern tip of Usedom" (DE1747-301). The bird sanctuaries "Western Bay of Pomerania" (DE1649-401) and "Greifswalder Bodden and Southern Strela Sound" (DE1747-402) are also crossed.

The north-westerly pipeline (Pipeline A, North-West Pipeline) of the Nord Stream 2 pipeline system is to be fully completed by the end of October 2019 and therefore be available for filling with natural gas. Installation will start at the coastline in the area of Lubmin and will be implemented up to a water depth of approx. -17.5 m in an open pipe trench with subsequent soil coverage. Up to an installation point at approx. KP 54,400, a second-generation pipe-laying vessel (pipe-laying barge) will be deployed. Further laying of Pipeline A in the German area of responsibility will be completed by a third-generation pipe-laying barge or a fourth-generation pipe-laying vessel. As a general rule, installation of the Nord Stream 2 pipeline will be carried out using the well-established S-lay method.

The south-easterly pipeline (Pipeline A, South-East Pipeline) of the Nord Stream 2 pipeline system is to be fully completed by the end of November 2019 and therefore be available for filling with natural gas. Installation of Pipeline B will be carried out in the same direction and with the same apparatus as that of Pipeline A.

B.1.3 Connection to the existing gas pipeline network

The Nord Stream 2 pipeline is to be linked to the gas pipeline network according to the PD concept both in Russia and in Germany (cf. application document, Part A.01, Chapter 5.5).

In Russia, the Nord Stream 2 pipeline is mainly to be fed from the natural gas sources of the Yamal Peninsula. The Bovanenkovskoye gas field (also known as Bowanenkowo or Bovanenkovo) on the Yamal Peninsula will supply a considerable proportion of the natural gas to be transported via the Nord Stream 2 pipeline to Europe. The infrastructure measures required for this purpose in the internal Russian pipeline system are already being implemented. The length of the pipeline from the feed point near Bovanenkovskoye to the feed point to the Nord Stream 2 pipeline near Ust-Luga is approx. 3,000 km.

The first stage of the route section from Bovanenkovskoye to Ukhta (approx. 1,200 km) will be extended via an additional double string. The nominal size of each pipeline is DN1400. They will be operated at a pressure of 120 bar and the transport capacity will be 115 billion m³ per annum. The construction of the first pipeline from Bovanenkovskoye to Ukhta started as long ago as 2008 – it was commissioned in 2012. What is more, additional compressor stations were completed and commissioned in 2013 and 2014. The construction of an additional pipeline was carried out in 2012, and this was commissioned at the end of 2016.

Natural gas transport pipelines are already in operation from Ukhta to Gryazovets and on to Torzhok. This section is also to be developed and commissioned at the same time as the Nord Stream 2 pipeline goes into operation. In order to implement this capacity extension, two additional lines are planned between Ukhta and Gyrazovets with a nominal size of DN1400 each and a transport capacity of 45 billion m³ per annum per line. The total length of the route section is approx. 970 km. The last section on the route from the Bovanenkovskoye gas field to Ust-Luga is the section from Gryazovets to Ust-Luga. In addition to being the starting point for the Nord Stream 2 pipeline, Ust-Luga is also the site of a planned LNG export terminal. Between Gryazovets and Ust-Luga, two lines are also planned over a distance of approx. 850 km and with a combined transport capacity of approx. 130 billion m³ per annum. Of this transport capacity, a volume of 55 billion m³ per annum is designated for feeding into the Nord Stream 2 pipeline.

The approval status for the construction and operation of the remaining pipeline section and the associated compressor stations from Gryazovets to Ust-Luga in the St. Petersburg region has also reached an advanced stage. State inspection and confirmation of the environmental impact assessment was carried out in September 2017. The final positive evaluation by the so-called Main State Expert Review (MSER) was carried out on 28.11.2017. The permit was issued on 20.12.2017. Construction has begun. Commissioning is planned to take place in the third quarter of 2019. The Russian pipeline projects are developed and certified based on the norms of the state technological supervisory body Rostekhnadzor.

On the German side, the link with the existing and new gas pipeline yet to be built is via the natural gas receiving terminal Lubmin 2 through the connecting line to the North German Gas Pipeline, which is already in operation (NEL, transport westwards), and the European Gas Pipeline Link (EUGAL, transport southwards). The EUGAL begins at the natural gas receiving terminal Lubmin 2, runs mainly parallel to and in close proximity to the Baltic Sea Pipeline Link (OPAL), which is in operation; it runs parallel to the Polish border east of Berlin and reaches the border between Germany and the Czech Republic near Deutschneudorf. In Mecklenburg-Western Pomerania and Brandenburg as far as the Weißack valve station, the pipeline is planned as a double string. From the Weißack station, the line will continue as a single string. In total, the EUGAL will be approx. 480 km in length with

a diameter of 1,400 mm in each case and a maximum operating pressure of 100 bar. In Brandenburg there are also plans to construct natural gas compressor stations and create tie-ins to the natural gas trunk lines NETRA (via FGL306) and JAGAL. The connecting line to the NEL will allow technical extension of up to 3.5 billion m³ per annum and, in the case of the EUGAL, of up to 51.4 billion m³ per annum of the natural gas volumes fed into Nord Stream 2.

Construction of the EUGAL is to begin mid-2018. Mechanical completion of String 1 of the EUGAL is planned for the end of 2019 and of String 2 for the end of 2020. At Deutschneudorf the line will be linked to the existing and new natural gas transport infrastructure of the Czech Republic. For this purpose, construction of an approx. 2-kilometre long connecting line is planned in the Czech Republic from the border (end of the EUGAL) to the existing border station Sankt Katharinenberg (Hora Svaté Kateřiny) and on to the pipeline node at Katharinenbach (Kateřinský Potok). The network operator Net4Gas is also planning additional expansion measures to increase Czech transport capacity.

B.1.4 Brief technical description

The Russian natural gas will be fed into the pipelines from the compressor station near Kurgalski (Narva Bay) at a pressure of up to 220 barg and a temperature of approx. 40°C. There will be no increase in pressure until landfall in Germany at Lubmin. Due to friction losses there is a continuous reduction in pressure. For this reason, the pipeline has been subdivided into three sections with different design pressures: a first section with 220 barg from Russia over a length of approx. 300 km, a central section with 200 barg over a length of approx. 375 km and a final section with 177.5 barg over a length of approx. 550 km. In Germany, the natural gas will normally land at the PD's pig receiver station at Lubmin with throughput at a minimum of 102 barg and at a temperature of approx. 0°C. At the subsequent natural gas receiving terminal Lubmin 2 operated by GASCADE Gastransport GmbH, the natural gas will be heated, fiscally measured and fed into the ongoing existing and planned land pipelines.

As a result of its route, the Nord Stream 2 system passes through the area of responsibility of several nations. In coordination with all approval authorities, the fundamental planning, construction and operating guideline was taken to be the internationally recognised rules issued by DNV-GL (Det Norske Veritas - Germanischer Lloyd), namely DNV-OS-F101 (Submarine Pipeline Systems; Oct. 2013). DIN EN 14161 (Petroleum and Natural Gas Industries – Pipeline Transportation Systems, July 2015) and the High Pressure Gas Pipeline Regulation GasHDrLtgV apply within the German area of responsibility, including the pig receiver station, in addition to DNV-OS-F101; in addition to this, the standard DIN EN 1594 (Gas infrastructure – Pipelines for maximum operating pressure over 16 bar – Functional requirements, Dec. 2013) is taken into account along with the regulations of the German Association for Gas and Water Applications (DVGW) for the land facilities of the pig receiver station.

The framework technical data of the Nord Stream 2 pipeline are summarised in the table. For more detailed descriptions, see the application document, Part C.01, Chapter 2.2.

Table 6: Framework data of the Nord Stream 2 pipeline

Characteristics	Data
Throughput	2x 27.5 billion m³ per annum
Transport medium	dry, sweet natural gas, in H gas quality
Length of pipeline	approx. 1,225 km
13 kW/14 kW	2x DN1200 (2x 48")
Internal diameter	1,153 mm (constant)
Wall thickness	26.8; 30.9; 34.6 and 41.0 mm
Pipe material	485 SAWL FD(U) acc. to DNV-OS-F101
Steel quantity	approx. 2.2 mill. t
Buoyancy control	by means of concrete coating, 60 to 100 mm thick, density: 3,040 kg/m³
max. operating pressures (nominal or design pressures)	177.5; 200 and 220 barg in three sections
Product life	> 50 years
Outer anti-corrosion protection	primary 3-layer PE jacket, at least 4.2 mm secondary: cathodic anti-corrosion protection by means of galvanic sacrificial anodes (in the German area of responsibility: aluminium)
Internal coating	at least 90 µm epoxy with Rz ≤ 3 µm

The pipeline will be installed using the S-lay method, the most frequently applied laying procedure used worldwide for offshore pipelines with a large diameter. Construction and installation pose the greatest strain on offshore pipelines and therefore detailed planning and high-quality implementation of the building measures are required, taking into account the natural impact of wind, water, waves, temperatures and seabed conditions, including consideration of environmental protection and historical munitions. For safety reasons in terms of both human beings and the environment, the Nord Stream 2 pipeline will be built solely in a corridor which is free of munitions. Nord Stream 2 AG as the project developer has undertaken great efforts and surveyed the route using cutting-edge technology in order to ensure it is free of munitions. In the event of munitions being found in the construction area of the pipeline route, the first option will be to consider re-routing the pipeline and the second option, if the first is not possible, will be to clear the munitions professionally prior to pipeline construction.

From a water depth of more than -17.5 it is no longer necessary to lay the pipeline in a trench. From this depth, the pipeline is placed on the seabed. Only in limited areas might it be necessary to implement local levelling of the seabed (cf. application document, Part C.01, Chapter 3.3.8) so as to minimise sagging of the pipeline in areas where the seabed is uneven.

In water depths of less than -17.5 m, the pipelines will be laid in an excavated, open-cut pipe trench (pre-lay trenching) for safety reasons (positional stability and

protection from external impact). The planned coverage of the pipeline for this area follows the recommendations of the studies carried out for this purpose (cf. application document, Part I.02, Part I3.07, Part C.04). Amongst other things, the risk of shipwrecks in the area of the Nord Stream 2 pipeline is taken into consideration. Based on positional stability calculations and the requirements in terms of safety from the impact of third parties as well as for reasons of environmental protection, both lines of the Nord Stream 2 pipeline will be laid in four sections along the route in trenches and covered with soil. The coverage and therefore the trench depths vary depending on local safety requirements. Between KP 31,488 and KP 50,619 there will be two single-line trenches, between KP 50,912 and KP 51,569 and between KP 52,112 and KP 52,850 there will be two single-line trenches in the area of the cable intersection, between KP 55,565 and KP 57,061 there will a Y-section (two single-line trenches leading into a single trench), between KP 57,061 and the offshore end of the micro-tunnel (KP 83,800) there will be a joint double-line trench as far as the landfall point in Germany at Lubmin (cf. application document, Part C.01, Chapter 3.1.2.4; Part C.04).

- The base width of a joint trench for both pipelines will be approx. 8.5 m in straight sections and approx. 10.5 m on bends.
- Where each pipeline is laid in a separate trench, the base width will be approx. 5 m in straight sections.
- The planned minimum coverage varies along the route between 0.5 m and 2.2 m. Based on the seabed profile and water depths, increased coverage may be necessary on a local basis. In addition, minimum distances from the pipeline to the mean water level are to be observed in certain intersections with shipping lanes in the Bay of Greifswald.
- In the area of the intersection with the approved sea cables (a total of six three-phase submarine cable systems within the German area of responsibility), it will be partially necessary to lay the pipeline in a trench with 1 m coverage so that future submarine cables can be laid over the pipeline (cf. application document, Part C.11).

In order to create the open trench, floating, mechanical and hydraulic apparatus will be used in water depths of up to -17.5 m. For example, trench digging within the SCI will be carried out using mechanical digging apparatus instead of hydraulic digging apparatus (cf. application document, Part C.01, Chapter 3.3.3.6). In view of the mixed soils to be found there, this will allow the trench profile to be optimised with the aim of reducing the area of intervention, while also reducing turbidity losses. This will also have the effect of reducing the volume of dredged material. The material will be transported away by means of transportation vessels (barges) and either stored at the offshore tipping point or at a spoil ground on land or else put to a different use, depending on the properties of the material. In order to backfill the trench, the material will likewise be taken from the marine stockyard using floating apparatus and then returned to the trench. In order to keep soil excavation and therefore the storage quantity to a minimum, the necessary trench width will be reduced to a minimum and the slope angle of the trench being excavated will be adapted to local soil conditions.

In the transition area between sea and land, the pipelines emerging from the sea will run in a shared trench, after which each of the two pipelines will be routed in a separate micro-tunnel of approx. 700 m in length. In the micro-tunnels they will pass

underneath the shallow water area, the coastal zone, various gas and supply lines, a road and a railway line before reaching the onshore start of the micro-tunnel to the north at the edge of the pig receiver station. In this section, the pipelines have an altitude gain of approx. 6 m (cf. application document, Part C.01, Chapter 3.1.3, 3.3.5). In the underground pipeline section designed as a sheet piling trench before the onshore start of the micro-tunnel, an underground anchor block will be installed as a fixed bearing. The anchor block is a large concrete foundation designed to prevent changes in length to the pipeline due to pressure and temperature fluctuations, thereby creating a defined boundary point between the offshore pipeline ducting and the pig receiver station. After the anchor block, the pipeline continues underground within the sheet piling trench before emerging from the ground by means of a double arc (ground-air transition). The axis of the pipeline at this point is at a height of approx. 8.4 m above sea level (AMSL) or 1.8 m above the ground of the pig receiver station.

The main valves of the Nord Stream 2 pipeline system within the German area of responsibility are 48" safety shut-off valves with bypass, the isolation coupling, a 48" x 38" T-piece, a pig trap with two 48" shut-off valves, 38" shut-off valves of the discharge bypass lines leading into the natural gas receiving terminal Lubmin 2, two 38" x 36" T-pieces and a blow-out unit. The valves will be welded. The 48" valves are piggable. The valves meet the requirements of DNV-OS-F101 and DIN EN 14161. Detailed planning specifies and stipulates the design, execution, material, inspection and markings based on the applicable norms and regulations. In addition, an operations building is planned with electrical operating facilities, offices and bathroom facilities as well as a workshop and warehouse.

At the beginning of the pipeline in Russia (Narva Bay), the natural gas will be fed into the system in the area of the pig sending station. The gas then flows approx. 1,225 km to the pig receiver facilities in Germany. The headquarters for operation of the pipeline is the Nord Stream 2 MCC (Main Control Centre). This is located in Zug (Switzerland), the headquarters of Nord Stream 2 AG. The pipeline itself does not have any control facilities; the flow of gas is controlled via the compressor station in Russia and the natural gas receiving terminal Lubmin 2 in Germany. For this reason, the operating states are monitored permanently by means of the Pipeline Control and Communication System (PCCS) so as to check whether the pipeline is operating within the normal range. If an excessive operating pressure occurs, the entry valves on the Russian side are automatically closed in order to prevent further feeding of natural gas, and/or gas intake is increased on the German side.

The individual construction processes impact in different ways on the ecosystem in the various seasons. In order to avoid these negative effects, especially in view of the herring spawning season and the resting of sea birds, the PD has determined the following time periods for construction work in the German area of responsibility as part of the pipe laying schedule:

- from 15.05. to 31.12.: Construction work in the offshore route section between the landfall at Lubmin and KP 53, i.e. mainly at Greifswalder Bodden (herring spawning season and sea bird resting period),
- from 01.09. to 31.12.: Construction in the offshore route section between KP 53 and KP 17 (sea bird resting),
- from 15.05. to 31.12.: Construction in the offshore route section between KP 17 and KP 0 (German EEZ boundary) (sea bird resting),

- from 15.05. to 31.10.: Stationary construction work and creation of the above-water tie-ins in the offshore route section between KP17 and KP10 (sea bird resting).

Along the pipeline from Russia to Germany, the water depths in the shallow water areas vary by as much as 210 m in the central Baltic Sea. This requires the use of differing pipe laying equipment along some sections of the route. In view of the time period available for construction of the pipeline, equipment will be used which ensures the greatest possible speed of laying. Due to the seabed relief and therefore the predominant water depths of less than - 25 m in the German area of responsibility, in extreme cases less than -5 m (e.g. the landfall point at Lubmin and at Boddenrandschwelle), the use of pipe laying equipment will be necessary that is equipped to deal with work in such water depths, although this will only allow a slow speed due to the design of such equipment. In route sections with sufficient water depths and outside the German area of responsibility, pipe-laying vessels with a high pipe-laying speed are to be deployed. However, the use of these pipe-laying vessels requires water depths of at least -20 m. In order to change the pipe laying equipment as necessary at the transitions between the sections as determined by the water depths, the pipe string installed in one route section will be laid on the seabed and then be taken up by the other pipe laying equipment for continued installation. If two pipe strings have be laid from opposite directions to each other, these will be connected to each other after being placed on the seabed by means of an Above-Water Tie-In (AWTI). An AWTI will also be necessary if the end of the pipe string for continued laying is not available until after installation of the subsequent pipe string has started. Details of the construction sequence and period are described at length in the application document, Part C.01, Chapter 3.2.

Laying of the Nord Stream 2 pipeline will be executed using the so-called "S-lay" method (see also the figure below) by pipe-laying vessels (pipe-laying barges) of the second, third and fourth generation. The pipe string produced on the pipe-laying barge will be laid continuously on the seabed in a controlled S-curve. The S-curve of the pipe being laid will be controlled and monitored on the pipe-laying barge by means of controlled shifting and dynamic positioning. In the micro-tunnel in the transition area between water and land, the pre-fabricated pipe strings on board the pipe-laying barges will be pulled in from the sea by means of linear hoists; the pipe-laying barge will be positioned for this purpose at a fixed location approx. 1,000 m off the coastline.

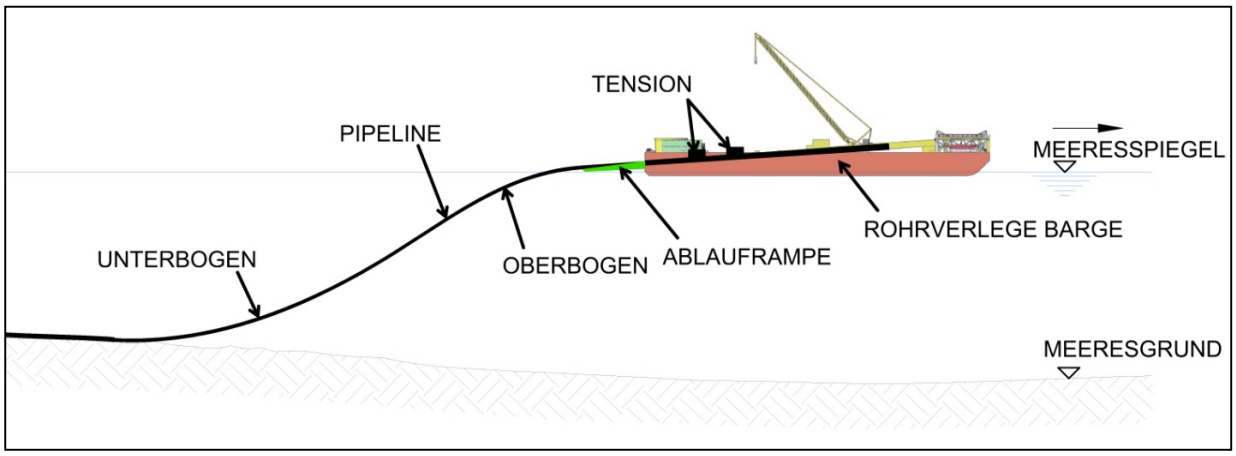

Figure 4: S-lay method
[Source: Application documents]

On board the pipe-laying barge, the pipe string is produced from individual pipes on a fabrication line. The fabrication line of the pipe string starts in the bow section and ends in the stern section of the pipe-laying barge. On the pipe-laying barge, the pipes are connected in industrial fashion at several welding stations by means of semi-automated or fully automated welding methods applied by specially trained and qualified welders to form a continuous pipeline string.

Inspection of the welding seams is carried out by means of non-destructive testing methods. Automatic ultrasound techniques are applied on the pipe-laying barges. Testing procedures and acceptance criteria for the approval of the welding seams will be determined with the inspector according to the GasHDrLtgV. The work frequency and the quality of the welding have a considerable impact on the pipe-laying speed and thus directly determine the time required to install the pipeline. After inspection of the individual weld seams, the pipe connection points are coated for the purpose of anti-corrosion protection. After this, the existing recess is filled up to the thickness of the concrete coating. Then the pipe-laying barge is warped around the finished pipe string length.

The pipe-laying barges of the second and third generation planned for use in the German area will be positioned and warped by means of an anchor system. This system commonly consists of ten to twelve hoists and anchors which are controlled centrally from the bridge of the pipe-laying barge. The pipe-laying vessels of the fourth generation which are planned for use are dynamically positioned, though at certain points they are also positioned using an anchor system.

Pre-commissioning of the Nord Stream 2 pipeline will be carried out according to the technical set of rules DNV-OS-F101. Along its length, the pipeline is subdivided into three sections with design pressures of 220, 200 and 177.5 barg. Pre-commissioning of the Nord Stream 2 pipeline in terms of seal testing by means of compressed air is subdivided into the activities of cleaning and gauging, internal inspection by pigging and seal testing by means of compressed air to identify leaks. Prior to the start of pre-commissioning work on seal testing by means of compressed air it is necessary for the offshore section of the pipeline to be completed as a continuous pipe string from Russia to Germany. An inspection of the entire offshore pipeline will take place in the form of internal and external inspections as well as seal testing using compressed air. For cleaning and gauging purposes, the air in the pipeline will be compressed to a pressure of 25 to 30 bar. This pressure will be maintained for the duration of pre-commissioning. Gauging the pipeline serves to secure the pipeline cross-section and identify errors in the pipeline sections and weld seams. Internal inspection of the pipeline by pigging in conjunction with external high-resolution investigation of the pipeline position by means of remote-control underwater vehicles (Remotely Operated Vehicles, ROV) will form the basis of dry pre-commissioning. In the process of dry pre-commissioning by means of seal testing using compressed air to identify leaks, the focus – in addition to cleaning and gauging – is on internal inspection of the pipeline so as to detect or rule out damage. For this purpose, so-called intelligent pigs (Pipeline Inspection Gauges, PIG) pass through the pipeline driven by the airflow. High-resolution measuring methods are used which can detect the smallest changes in the pipeline. In this way it is possible to ensure that the integrity of the pipeline is not impaired. In addition, the precise geographical location of the pipeline is gauged and checked (cf. application document, Part C.01, Chapter 4.1.2).

Alternatively, it would be possible to seal test the Nord Stream 2 pipeline by means of water. This is subdivided into the activities flooding / cleaning / gauging, seal testing by means of water, connection of pipeline sections, dewatering and drying. For the purpose of tightness testing using water, the pipeline sections with a different design pressure must first be separated from one another. The water pressure test must be carried out in the various sections according to their design pressures; after completion of the pressure tests, the second stage would be to connect the individual pipeline sections to each other by means of underwater tie-ins (hyperbaric welding). After connection of these sections, the two 1,225-kilometre pipelines could be dewatered, dried and then gauged (cf. application document, Part C.01, Chapter 4.1.3).

Pre-commissioning for the land section of Pipeline A and Pipeline B will be carried out jointly. For this purpose, a temporary connection must be created by means of appropriate connecting pieces of the land sections of Pipeline A and Pipeline B. The specific stages of pre-commissioning involve the same procedures as for seal testing by means of water, with the addition of a seal test using nitrogen/helium. After completion of pre-commissioning, the land sections of the pipeline are connected by means of an adaptor to the respective offshore pipelines by applying golden welds. Up until the time of pre-commissioning, the land sections that have already been inspected will be sealed so as to prevent internal corrosion and the ingress of air and water (cf. application document, Part C.01, Chapter 4.1.4).

Commissioning of the Nord Stream 2 pipeline system will also be carried out according to DNV-OS-F101 and DIN EN 14161, DVGW G463 / G469. There are various options when it comes to filling the pipeline with natural gas. One well-established method is to initially fill the pipeline from Russia with 100,000 Nm³ of nitrogen as a buffer. The natural gas is fed into the pipelines immediately after this nitrogen filling. When the Nord Stream 2 pipeline system is commissioned, the permanent compressor station in Narva Bay (section from Gryazovets to Ust-Luga in the St. Petersburg region) can be bypassed so that the gas is fed directly into the pipeline from the Russian facilities on the mainland. For this reason, the compressor station does not necessarily have to be available for the gas filling process. If the compressor station is not available, a temporary gas drying facility and compressor unit will be required. By contrast, pre-commissioning and commissioning activities at those parts of the facilities required for operation of the Nord Stream 2 pipeline system do have to have been completed. At the German receiving terminal at Lubmin, first air, then nitrogen and finally a mixture of nitrogen and natural gas will be securely discharged into the atmosphere via the blow-out unit. The concentration of the nitrogen/natural gas mixture is monitored by a natural gas chromatograph.

The operational objective is the daily uninterrupted transport of natural gas in the contractually specified amounts. The transport processes can be defined as the day-to-day operation of the Nord Stream 2 pipeline system for the transport of natural gas through the pipeline. In order to achieve this reliably and safely, the PD will collaborate with the respective operators of the compressor station and the natural gas receiving terminal Lubmin 2. The Nord Stream 2 pipeline system has a Pipeline Control and Communication System (PCCS) including the necessary cut-off facilities.

The operators of the compressor station in Narva Bay and those of the natural gas receiving terminal Lubmin 2 will operate their facilities so as to be able to supply or receive the required daily amount. The PD and the operators of the compressor

station and natural gas receiving terminal will coordinate daily supply amounts based on the transport and supply contracts. The PD will monitor gas transport and ensure that the pipeline system is operated within the framework of its operating capacity. The operating data of the facilities will be continuously exchanged. This also includes data relating to the fiscally measurement and analysis of the relevant quantity of natural gas at the Russian compressor station in Kurgalski as well as at the German landfall facility in Lubmin.

The pipeline itself does not contain any control elements, only safety, monitoring and cut-off facilities. If the pressure monitoring system reports that the operating pressure limits have been reached, the information is forwarded to the operator of the compressor station and the operator of the receiving terminal in order for them to be able to take measures accordingly at their respective facilities. Normally, such measures involve reducing the amount being fed into the pipeline, increasing the intake amount or a combination of the two. Communication with the stations is carried out directly via a telephone hotline with the station controllers using a redundant, distributed control system. This system is used to read in and process all measurement values and status signals from the pipeline system and to pass this information on to the Nord Stream 2 Main Control Centre (MCC). The entire pipeline system is monitored by the continuously staffed Main Control Centre (24 h/d - 7 d/week). The compressor station in Russia and the natural gas receiving terminal in Germany are equipped with workplace computers and display terminals for emergency and manual local intervention. During normal operation, these stations are not staffed and are only activated by the MCC in the communication system after a disruption or at the request of local maintenance personnel (cf. application document, Part C.01, Chapter 4.4.2, 4.4.4).

Maintenance and repair are based on regular inspections and external route inspections to check the horizontal and vertical position of the Nord Stream 2 pipeline on or in the seabed, inspections of the cathodic anti-corrosion protection and inspections using intelligent pigs. Maintenance and inspection work on the pipeline serves to secure the transport of natural gas and the integrity of the pipeline system. The inspection intervals will be determined based on observation of key parameters in consideration of their overall importance to the pipeline system and adapted depending on the results of inspections already carried out, operational requirements and/or the detection of defects.

Damage to the pipeline is very unlikely but cannot be completely ruled out. Minor and major damage is repaired based on inspection and damage reports and only after intense planning (planned repairs). The repair measure to be implemented is determined based on an evaluation of the damage, the environmental conditions, the impact of the damage on the integrity of the pipeline system and the technologies available, in coordination with the authorities responsible. Such measures can range from "no action" to "replacement of a pipe section". Damage and defects which do not require immediate intervention will be eliminated by means of planned repairs. Damage and defects which require immediate intervention, whether for safety reasons and/or in order to ensure the availability of the pipeline, are classified as unplanned repairs and have to be executed promptly. These include all emergency scenarios. The detailed procedure in this case will be set out in an emergency response plan describing responsibilities, flow of information, contact partners of the various authorities and initial measures (cf. application document, Part C.01, Chapter 4.4.5 et seq.).

B.1.5 Planning of nature conservation measures

The Landscape Conservation and Management Plan includes an assessment of the state of the natural environment and landscape as well as the environmentally relevant impact of the project. Landscape conservation measures are indicated to avoid or reduce the consequences of intervention, and potential compensation measures as well as CEF and damage limitation measures are determined and described in detail.

The supplementation and specification of the Landscape Conservation and Management Plan in the course of the ongoing administration procedure has led to an updated calculation of the scope of intervention according to the "Notes on Intervention Management" issued by the State Office for the Environment, Environmental Protection and Geology of Mecklenburg-Western Pomerania (HzE, 1999) and also according to the "Notes on Intervention in the Marine Area" (HzE marine) introduced by the Ministry of Agriculture and Environment of Mecklenburg-Western Pomerania in the course of the administrative procedure. In addition to specification of the initially planned compensation measures, the following were added to the plan approval procedure: further technical measures in wastewater treatment plants to reduce nutrients, compensation measures by Landgesellschaft M-V mbH, fulfilled through implementation of the nature conservation measure "Polder Bargischow", and subsequently the possibility of crediting eco-points from the eco account "Fischlandwiesen" (No. VR-007). The relevant details are set out in Section B.4.8.4.

B.2 Previous planning stages

B.2.1 Regional planning procedure

The route applied for in the section through German territorial waters runs through the Bay of Pomerania and the Bay of Greifswald ('Greifswalder Bodden'), approx. from KP 55 as far as the landfall point at Lubmin within the "Marine Area Reserved for Pipelines", as defined by the State Directive on the State Development Programme of Mecklenburg-Western Pomerania (LEP-LVO M-V) dated 27.05.2016 (GVOBl. M-V p. 322, corrected p. 872). The State Development Programme of Mecklenburg-Western Pomerania (LEP M-V 2016) contains the objectives and principles of regional and state planning covering the entire state territory of Mecklenburg-Western Pomerania including the 12 nautical mile zone or that are of importance to how the different areas of the state relate to each other. Reserved areas are areas in which certain regionally important functions or uses are to be given particular weighting when balanced against competing regionally important uses. Reserved areas have the legal character of regional planning principles (LEP M-V 2016, p. 19). Only when cables and lines are installed outside such a reserved area is a territorial impact assessment generally required by means of a regional planning procedure (LEP M-V 2016, Section 8.2, p. 99).

According to Section 8.2 of the LEP M-V 2016, the clustering of supply lines within the "Marine Area Reserved for Pipelines" aims to keep impairments caused by other usage claims and fragmentation effects to a minimum, facilitating pipeline-laying in areas where this causes as little conflict as possible. The course of the Nord Stream 2 pipeline is in accordance with these regional planning requirements in terms of its routing through the Bay of Greifswald ('Greifswalder Bodden'). The routing outside the Bay of Greifswald up to the boundary of the 12 nautical mile zone is also predetermined by the reserved area (cf. ibid., Section B.1.2, Fig. 3). The requirements of regional planning are also being checked as part of the plan approval procedure (cf. Section B.4.8.1). A separate regional planning procedure was therefore not necessary (cf. Section 16 Paragraph 2 ROG).

B.2.2 Additional procedures

At the national level, the entire Nord Stream 2 project also impacts on part of the German continental shelf. For this section, the **approval procedure under mining law** is currently being carried out by the Stralsund Mining Authority and the Federal Maritime and Hydrographic Agency (BSH) according to Section 133 paragraph 1 sentence 1 No. 1 and 2 of BBergG dated 13.08.1980 (BGBl. I p. 1310); last amended by virtue of Item 2 Section 4 of the Act dated 23.07.2017 (BGBl. I p. 2808). The procedure according to Section 133 Paragraph 1 sentence 1 No. 2 BBergG also involves the BSH examining the environmental compatibility of the project according to Section 133 Paragraph 2a BBergG.

The approval under mining law according to Section 133 Paragraph 1 sentence 1 No. 1 BBergG for the construction of the transit pipeline was issued on 02.11.2017.

Based on the international course of the high-pressure natural gas pipeline, in addition to the national approval procedures, a cross-border **environmental impact assessment according to the Espoo Convention** (Act on the convention of 25.02.1991 on environmental impact in a cross-border context and the amendment

to the convention agreed on at the second conference of the parties in Sofia on 27.02.2001 (Espoo Convention Act) dated 07.06.2002, amended with the Second Espoo Convention Act dated 17.03.2006 (BGBl. II 2002 p. 1406, 1435; BGBl. II 2006 p. 224)) was also carried out.

The entire route of the high-pressure natural gas pipeline passes through areas outside German jurisdiction, including the Exclusive Economic Zones (EEZ) of the countries Russia, Finland, Sweden and Denmark as well as through Russian and Danish territorial waters in the Baltic Sea (cf. Section B.1.2, Fig. 1). According to the Espoo Convention (Article 2 Paragraph 4 to Paragraph 6), every state in which a project with potential cross-border impact is planned, ('parties of origin' Russia, Finland, Sweden, Denmark and Germany), are to inform the potentially 'affected contractual parties' (Russia, Finland, Sweden, Denmark, Germany, Estonia Latvia, Lithuania and Poland) of the project as early as possible (notification) and give them the opportunity to take part in the national EIA procedures. The public in the country in question is to be informed of the project. The opportunity to submit a statement must be provided.

According to Section 8 Paragraph 1 UVPG in the version valid for this plan approval procedure, the authority responsible informs the authority responsible named by the other country of the project based on appropriate documents and requests notification within an appropriate deadline in order to find out whether participation is desired if a project can potentially have a significant impact on the protected assets described in Section 2 Paragraph 1 sentence 2 UVPG in another country or if another such country requests participation. If participation is deemed to be necessary, the authority responsible gives the authority responsible in the other country and other authorities of the other country specified by it the opportunity to submit a statement at the same time and covering the same scope as the authorities to be involved according to Section 7 UVPG, based on documents pursuant to Section 6 UVPG and based on other information according to Section 9 Paragraph 1a and 1b sentence 1 No. 2 UVPG. Section 73 Paragraph 3a VwVfG M-V is applied accordingly. Furthermore, the supreme federal and state authorities responsible are to conduct consultations within an agreed, appropriate time frame with the other country, in particular regarding the cross-border environmental impact of the project and regarding the measures to avoid or reduce such an impact, as far as this is necessary or if the other country requests it (Section 8 Paragraph 2 UVPG). The same applies according to Article 7 of the agreement dated 11.04.2006 between the Government of the Federal Republic of Germany and the Government of the Republic of Poland on the implementation of the convention dated 25.02.1991 concerning environmental impact assessment on a cross-border basis (German-Polish EIA agreement dated 13.04.2007, BGBl. 2007 II, p. 595).

The cross-border environmental impact assessment described above was carried out according to the regulations of the UVPG, the Espoo Convention and the German-Polish agreement.

The countries Finland, Sweden, Denmark and Germany informed (notified) the contractual parties of the project in a joint communication dated 08.04.2013, and Russia did so in a communication dated 01.05.2013. In addition to the notification communications, the documents compiled by the PD (appendix to the notification of the contractual parties affected according to Article 3 Paragraph 2 Espoo Convention: Project Information March 2013) were sent in the respective national language.

The notification communications and the project information were publicly posted in the form of the "Scoping Document for the Nord Stream Expansion", as the Nord Stream 2 project was called at the time before being renamed, during the period from 16.04. to 15.05.2013, in Lubmin Administrative District, at the Stralsund Mining Authority and at the Federal Maritime and Hydrographic Agency in Hamburg and Rostock for the purpose of the approval procedures in the German area according to common local publication practice. It was possible for anyone to comment on the project sections in Russia, Finland, Sweden and Denmark as well as in Germany.

The Federal Republic of Germany responded to the notifications of the countries Russia, Finland, Sweden and Denmark with its communication dated 13.06.2013 and requested to participate in the national EIA procedures of the countries Russia, Finland, Sweden and Denmark. In the respective reply, reference was made to the fact that statements submitted within the framework of the German participation procedure were discussed at the scoping meeting, to the extent that cross-border aspects applied, and a summary was enclosed. On 26.06.2013, a joint scoping meeting was held with the Stralsund Mining Authority and the Federal Maritime and Hydrographic Agency in Stralsund at which cross-border survey needs were also discussed. In the communication dated 15.07.2014, the contractual parties concerned were informed by the Stralsund Mining Authority of the scope of the provisional survey.

All contractual parties affected by the 'Nord Stream 2' project responded to the notification by Germany: Russia in its communication dated 21.05.2013, Finland in its communication dated 14.06.2013, Sweden in its communication dated 18.06.2013, Denmark in its communication dated 17.06.2013, Estonia in its communication dated 13.06.2013, Latvia in its communication dated 18.06.2013, Lithuania in its communication dated 18.06.2013 and Poland in its communication dated 18.06.2013.

On 06.04.2017, the PD submitted the environmental impact study for the purpose of cross-border consultation to the parties of origin Russia, Finland, Sweden, Denmark and Germany (Espoo Report and Atlas, April 2017; cf. application document, Parts J.01, J.02).

Russia, Finland and Sweden began consultations with Germany as a potentially affected contractual party and sent the Espoo Report and Atlas in its communication dated 06.04.2017 with a request for statements by 30.06.2017.

Denmark began consultations with Germany as a potentially affected contractual party and sent the Espoo Report and Atlas in its communication dated 20.06.2017 with a request for statements by 26.09.2017.

Germany itself, like the other four parties of origin, began consultations with all Baltic states as potentially affected contractual parties and sent the Espoo Report and Atlas in its communication dated 06.04.2017 with a request for statements by 30.06.2017 (in the national language and English; paper and digital version). The Republic of Poland and the Kingdom of Denmark received additional national application documents from the German procedure in their respective national languages. For the Republic of Poland these were: the generally comprehensible, non-technical summary of the environmental impact assessment for the area of the offshore border of the German EEZ to the landfall point, the chapter of the environmental compatibility study on cross-border effects, the section "Project and approvals", including the summary of the examination of alternatives and the

summary of the Technical Explanatory Report, the materials volume "Minimum Coverage Depths", the FFH compatibility studies (FFH-VU) on the EU bird sanctuary (SPA) PLB990003 "Zatoka Pomorska" and SCI PLH990002 "Ostoja na Zatoce Pomorskiej" and the full set of German application documents in German. Denmark received the following documents in Danish in addition: the generally comprehensible, non-technical summary of the environmental impact assessment for the area of the offshore border of the German EEZ to the landfall point, the chapter on the environmental compatibility study of cross-border effects, the section "Project and approvals", including the summary of the examination of alternatives and the summary of the Technical Explanatory Report.

In the communication dated 07.04.2017, the Espoo Report and Atlas were also sent to the national bodies representing public interests and other agencies involved in the procedure in Germany with a request to provide a confirmation of receipt and statement.

The entire planning documents were displayed as part of the consultation procedure after timely notification in each case as follows: Bergen auf Rügen Administrative District (as is locally customary on 10.04.2017), Lubmin Administrative District (as is locally customary on 10.04.2017), Möngut-Granitz Administrative District (as is locally customary on 07.04.2017), Usedom-Nord Administrative District Administrative District (as is locally customary on 10.04.2017), Municipality of Putbus (as is locally customary on 10.04.2017), Anklam-Land Administrative District (as is locally customary on 10.04.2017), Stralsund Mining Authority (as is locally customary in the M-V Bulletin and posted on 10.04.2017), Federal Maritime and Hydrographic Agency (publicly in *Nachrichten für Seefahrer* of the 14th calendar week and the newspaper *OZ* on 10.04.2017), including the documents (Espoo Report and Atlas, April 2017; Sections J.01, J.02) on the cross-border environmental impact assessment – from 18.04. to 17.05.2017. The notifications included the indication that the opportunity was provided to view the application documents at the display locations and that everyone had the opportunity to submit a statement in writing or by declaration up until two weeks after termination of the display period.

The Espoo Report and Atlas dated 25.07 to 24.10.2017 were displayed as part of the cross-border environmental impact assessment carried out by Denmark as follows after timely notification in each case: Lubmin Administrative District (as is customary locally from 17.07.2017), Stralsund Mining Authority (as is locally customary in the M-V Bulletin and posted on 17.07. and 14.08.2017), Federal Maritime and Hydrographic Agency (publicly in *Nachrichten for Seefahrer* of the 28th and 32nd/33rd calendar week, the newspaper *Die Welt* on 17.07. and 11.08.2017). The notifications included the indication that the opportunity was provided to view the application documents at the display locations named and that everyone had the opportunity to submit a statement to the German authorities and to the Danish Ministry of Environment and Food by no later than 24.10.2017.

As part of the consultations, statements arising from the public participation of the individual contractual parties affected were reciprocally submitted from 30.06.2017, namely by Russia, Finland, Sweden, Denmark, Estonia, Lithuania, Latvia, Poland and Germany.

In its communication dated 18.08.2017, Poland requested consultation according to Article 5 of the Espoo Convention and according to Article 7 Paragraph 4 of the German-Polish EIA agreement. The consultations with Poland took place on

05.12.2017 in Berlin. The draft protocol of this meeting was sent to Poland in a communication dated 08.01.2018.

At the international level, in addition to the Espoo procedures described above and the approval procedures in the German section, **additional approval procedures** are required according to the respective national law of the other four countries whose territory or EEZ area the Nord Stream 2 pipeline passes through. The following sets out the current status of the approval procedures in the other countries involved.

Russian Federation
The Espoo consultations were concluded on 30.06.2017 and the PD responded to the statements submitted. The consultation period for the Russian environmental impact assessment (EIA) was completed on 04.10.2017 and the statements were integrated in the final EIA which was presented for final state appraisal on 10.11.2017. The positive statement made by the state environmental assessors on 23.01.2018 will be followed by the final review of the project draft by the Russian Ministry of Construction. This provides the basis for overall construction approval. The latter is expected to be issued in April 2018 (cf. communication of BMUB dated 16.01.2018). The area planning (comparable to a German regional planning procedure) for the Nord Stream 2 project has already been confirmed by local and regional authorities; confirmation at federal level is likewise expected to be issued soon.

Republic of Finland
On 03.04.2017, Nord Stream 2 AG handed over the report on the project within the Finnish EEZ as well as the Espoo Report and Atlas, April 2017, to the Finnish authority responsible for the environmental impact assessment (EIA). The EIA documentation was put on public display from 07.04.2017 to 05.06.2017. During this process, 32 statements and 5 assessments were received. The EIA procedure finished with the statement by the Finnish authority responsible for conducting the procedure on 26.07.2017. The responses of Nord Stream 2 AG to the statements received in the course of the Espoo procedure were conveyed to the Finnish Ministry of the Environment, which forwarded these replies to the parties of origin and the affected parties. The main aspects raised in the statements before and during the EIA procedure concerned the clearance of munitions, the impact on marine mammals and Natura 2000 assessments. These issues were incorporated in the permit applications described below.
The permit application for the EEZ was submitted on 18.09.2017 and sent to the Finnish Ministry of Economic Affairs and Employment. The deadline for submission of statements was 01.12.2017. The permit application concerning water rights was submitted to the responsible authority in Southern Finland on 19.09.2017. The consultation phase began at the beginning of October 2017 and ended 30 days later. The most important issue in the Finnish section of the Nord Stream 2 pipeline is the clearance of 85 munitions objects. Various mitigation measures have been planned due to the potential impact of underwater noise on marine mammals during clearance work (e.g. bubble curtains). This will significantly reduce potential impact on marine mammals. The assessment of the impact of the Nord Stream 2 project on Natura 2000 areas was carried out in a separate document. In the final analysis, Nord Stream 2 AG showed that no significant impairment of the defined protected assets was to be anticipated in the Natura 2000 areas. Both permits are currently

being processed and are expected to be issued in spring 2018 (cf. communication of BMUB dated 16.01.2018).

Kingdom of Sweden
The application for the construction and operation of the Swedish section of the Nord Stream 2 pipeline was submitted as long ago as September 2016 to the Swedish Ministry of Enterprise and Innovation. After an initial administrative participation in autumn 2016, the application was supplemented in February 2017, including an assessment of the potential impact in a newly proposed Natura 2000 area in the Baltic Sea (Hoburgs Bank and Norra Midjsöbanken). After this supplement, involvement of the public began in Sweden including the public display of the Espoo Report and Atlas, April 2017. The application documents were sent to 69 public interest bodies and other parties affected. Public participation ended in June 2017. A total of 44 statements were received. The responses on the part of the PD were the subject of a consultation phase with all stakeholders. This was completed in mid-October 2017. There then followed a final statement by the PD setting out which measures will be applied in response to the factual objections still remaining after the consultation (see below). This statement was forwarded by the Swedish Ministry of Enterprise and Innovation responsible for the procedure to selected public bodies whose objections remained and had been taken up by the PD, and the bodies were offered the opportunity to make a final statement by 05.12.2017. The final statements were submitted as necessary; the Swedish Ministry of Enterprise and Innovation terminated participation and is currently drawing up the permit decision. All in all, the entire range of procedural stages has been completed.
In terms of the newly proposed Natura 2000 area Hoburgs Bank and Norra Midsjöbanken, the conclusions drawn by the environmental experts clearly indicate that there is no risk that sensitive habitats located more than 4 km from the pipeline route will suffer any negative impact. They also state that there is no danger regarding damage to the harbour porpoise (whether permanently or temporarily), nor do they see any risk of noise impacting on this species during the construction and operation of the Nord Stream 2 pipeline. Furthermore, it is stated that any potential impact on birds is negligible. It is possible that a permit will be issued in spring 2018 (cf. communication of BMUB dated 16.01.2018).

Kingdom of Denmark
The permit application for the construction and operation of the Danish section of the Nord Stream 2 pipeline was submitted to the Danish energy authority in April 2017 together with the environmental impact assessment (EIA) and the Espoo Report and Atlas, April 2017. Public participation in Denmark in connection with the national EIA started in June 2017 and ended on 19.09.2017. On 29.08.2017, the public consultation took place on Bornholm, where local, national and other interest groups and private individuals had the opportunity to ask questions and express potential concerns. A total of 13 statements were received by the energy authority. The public display of the Espoo Report and Atlas, April 2017, ended on 23.10.2017. The statements received during the course of this procedure were responded to by the PD on 30.11.2017 and passed on to the authority responsible for the procedure, the Danish energy agency.

The PD firmly believes that the route applied for, as described in the permit documents, is the optimum routing based on environmental and safety considerations. The route applied for, geared towards the route of the existing Nord Stream pipeline, is based on information provided by the Danish authorities during

the successful planning and implementation of the Nord Stream project. Based on the existing legal framework, Nord Stream 2 AG expects the Danish permit to be issued in the first quarter of 2018.

For the sake of completeness and as a precautionary measure, attention is drawn to a Danish law which invests permit-issuing authorities in the area of Danish territorial waters with new powers. This law came into effect on 01.01.2018 and is essentially applicable to permit application procedures not yet completed at this time. If the Danish foreign minister were to apply this new law for reasons of foreign, defence or security policy and rule against the routing of the Nord Stream 2 pipeline through Danish territorial waters near Bornholm, this might lead to a shifting of the route shown in the permit documents to outside the Danish 12 nautical mile zone. If this were to occur, an alternative route through the Danish EEZ would be possible and this is also deemed to be feasible from both a technical and environmental point of view. As a precautionary measure, the PD has already initiated a route survey (Survey Campaign) in the not entirely impossible event that Denmark applies this law and rules out routing the Nord Stream 2 pipeline through Danish territorial waters. If the recommendation of the Danish foreign ministry does not go against the routing, the permit can be issued in the first quarter of 2018; otherwise the permit for the altered pipeline route in Denmark will be delayed.

Due to coordinated planning, care has been taken to ensure that the pipeline routes at the international borders and in the transition area of the German territorial waters / continental shelf are directly connected and that cross-regional transport and supply is ensured by means of a continuous pipeline route.

B.3 Assessment under procedural law/legal formality

B.3.1 Legal foundation

The plan approval is subject to EnWG.
The procedure is carried out according to Sections 43 sentence 1 No. 2, 43a et seq. EnWG, Section 72 et seq. VwVfG M-V in conjunction with Section 1 Paragraph 3 VwVfG.

B.3.2 Responsibility

According to Section 2 of the EnWZustLVO M-V) of 29.12.2005 (GVOBl. M-V 2006 p. 13), the Stralsund Mining Authority is, among other things, the authority responsible for executing Section 43 Paragraph 1 sentence 1 No. 2 EnWG in conjunction with Section 3a UVPG for gas supply lines with a diameter of more than 300 mm and therefore the responsible consultation and plan approval authority for the plan approval procedure.

According to Section 3 EnWZustLVO M-V, the Stralsund Mining Authority is the authority responsible for executing GasHDrLtgV and therefore responsible for such projects as high-pressure gas pipelines which lead via territorial waters to an onshore station from transit pipelines.

B.3.3 Necessity of the plan approval procedure

According to Section 43 sentence 1 No. 2 EnWG, the construction and operation of gas supply lines with a diameter of more than 300 mm require plan approval by the

authority responsible under state law. The plan approval is to take into consideration public and private interests affected by the project. According to Section 3 UVPG in conjunction with Annex 1 No. 19.2.1, gas supply lines which are more than 40 km long and have a diameter of more than 800 mm also require an EIA. The EIA is a dependent part of the plan approval procedure. The environmental impact of the project is to be assessed and taken into account in considering and deciding on the admissibility of the project.

The purpose of the plan approval is to fundamentally settle all problems posed by the project in an orderly manner and in accordance with applicable law as well as by means of a solution which does justice to all those involved. Insofar as the law allows scope for planning freedom, the aim is to weigh up and balance the interests involved, essentially in a single, comprehensive process, and to overcome any hindrances if necessary.

No other administrative decisions are essentially necessary over and above the plan approval, in particular public permits, awards, permissions, authorisations or other plan approvals. Such decisions are included in the plan approval under energy law (Section 75 Paragraph 1 VwVfG M-V). The plan approval decision does not replace permits under water law, however; nonetheless, based on Section 19 Paragraph 1, 3 WHG, the Stralsund Mining Authority decides in consultation with the responsible water authority on the issue of permits under water law.

B.3.4 Structure of the procedure

The national scoping meeting was held on 26.06.2013 (Section 5 UVPG in the version valid up to 15.05.2017; hereinafter o. v. – old version). The purpose was to coordinate the scope of the environmental impact assessment (EIA), based on the content of the expert statements, including cross-border surveys, and also the content of the application documents. The anticipated survey scope was determined by the Stralsund Mining Authority and the Federal Maritime and Hydrographic Agency on 05.05.2014.

On 22.03.2013, supplemented on 16.12.2016, the PD submitted a total of three applications for approval of the project according to BBergG and EnWG to the Stralsund Mining Authority and to the Federal Maritime and Hydrographic Agency, among other things applying for execution of the plan approval procedure according to Section 43 sentence 1 No. 2 EnWG for the German territorial waters including landfall and compensation measures

The plan approval procedure was opened after presentation of the complete plan on 07.04.2017.

Within the framework of the plan approval procedure implemented according to sections 43 et seq. EnWG, Sections 73 et seq. VwVfG M-V, an environmental impact assessment was also carried out as a dependent part of the plan approval procedure (Section 2 Paragraph 1 UVPG o. v.); among other things, the environmental impact assessment also involved the participation of the public as well as the cross-border participation of the public and authorities.

The following authorities, institutions and associations were sent the application documents of 07.04.2017, by agreement with the Federal Maritime and

Hydrographic Agency, and were asked to submit statements and/or objections regarding the project and the application documents by 31.05.2017:

- 50Hertz Transmissions GmbH, grid operation
- Anklam-Land Administrative District
- Bergen auf Rügen Administrative District
- Regional Planning Office for Western Pomerania
- Lubmin Administrative District
- Mönchgut-Granitz Administrative District
- Usedom-Nord Administrative District
- Federal Foreign Office, Dept. 504 (Special Areas of International Law)
- Bauernverband Mecklenburg-Vorpommern (Mecklenburg-Western Pomerania Farmers' Association)
- Biosphere Reserve Authority, South-East Rügen
- BUND Germany e.V., Federal Chairperson
- Federal Office of Civil Protection and Disaster Assistance, Dept. II.A
- Federal Office for Infrastructure, Environmental Protection and Services of the German Armed Forces, Kiel Competence Centre; K4
- Federal Office for Infrastructure, Environmental Protection and Services of the German Armed Forces, Dept. Infra I
- Federal Agency for Nature Conservation
- Federal Agency for Nature Conservation, Vilm branch
- Federal Office for Agriculture and Food
- German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Dept. G I 2 (Fundamental issues of environmental law; law relating to environmental assessments)
- German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Dept. N II 3 (N I 5)
- German Federal Ministry for Transport and Digital Infrastructure, Dept. WS15 (Law relating to federal waterways)
- German Federal Ministry for Transport and Digital Infrastructure, Dept. WS16 (Marine policy)
- German Federal Ministry for Transport and Digital Infrastructure, Dept. WS23 (Transportation regulations, navigation)
- German Federal Ministry for Transport and Digital Infrastructure, Dept. WS24 (Environmental and climatic issues)
- German Federal Ministry for Economic Affairs and Technology, Dept. II A 4 (Gas and oil)
- German Federal Ministry for Economic Affairs and Technology, Dept. III C 5 (European gas network regulation)
- Federal Network Agency, N4 Third-party procedures
- Federal Network Agency, Dept. 226
- Bundesverband WindEnergie e.V.

- Deutsche Telekom AG, -submarine cables-
- Deutscher Fischerei-Verband e.V. (German Fishery Association)
- Deutscher Motoryachtverband e.V., Central Administration Office (German Motor Yacht Association)
- Deutscher Segler-Verband (German Sailing Association)
- E.ON Climate & Renewables CE GmbH
- Federal Railway Authority, Hamburg/Schwerin branch
- Entsorgungswerk für Nuklearanlagen GmbH, P1TG
- GASCADE Gastransport GmbH
- Directorate-General, Waterways and Shipping Office, Aurich site
- Directorate-General, Waterways and Shipping Office, Kiel site
- Hanseatic City of Anklam, FB1
- Iberdrola Renovables Offshore Germany GmbH
- State Office for Health and Social Affairs, Mecklenburg-WP, Dept. of Operational and Product Safety + Dept. of Occupational Protection and Technical Safety
- State Office for Culture and the Preservation of Historical Monuments M-WP
- State Office for Agriculture, Food Safety and Fishery, Dept. of Fishery and the Fish Industry
- State Office for the Environment, Nature Conservation and Geology M-WP, Güstrow
- State Police and Emergency Services
- State Forestry M-WP, public agency
- Landesverband der Kutter- und Küstenfischer M-V e.V. (State Association of Cutters and Inshore Fishery)
- District of Western Pomerania-Greifswald
- District of Western Pomerania-Rügen
- Leibnitz Institute for Baltic Sea Research, Warnemünde
- Marina Lubmin GmbH
- Marin Command, Subdivision GEO, attn. Mr. Offenborn
- Ministry of Energy Infrastructure and Digitalisation M-WP, Dept. 2
- Ministry of Energy Infrastructure and Digitalisation M-WP, Dept. 3
- Ministry of Energy Infrastructure and Digitalisation M-WP, Dept. 4
- Ministry of Internal Affairs and Sport M-WP, Dept. 250
- Ministry of Agriculture and the Environment M-WP
- Ministry of Economics, Employment and Health, Coordination Unit
- NABU Germany e.V., Federal Chairperson
- Offshore Forum Windenergie GbR
- Baltic Sea Resort Binz
- State Agency for Agriculture and the Environment, Western Pomerania
- Municipality of Putbus

- Municipality of Sassnitz
- Department of Roads, Neustrelitz
- Department of Roads, Stralsund
- Thünen Institute (OF); German Federal Research Institute for Rural Areas, Forestry and Fisheries, Institute of Baltic Sea Fisheries
- Federal Environment Agency
- University and Hanseatic City of Greifswald
- Verband Deutscher Reeder (Association of German Shipowners)
- Wasser- und Bodenverband "Rügen" (Rügen Water and Ground Association)
- Stralsund Water and Shipping Authority
- WDCS Whale and Dolphin Conservation
- WWF Germany, Department of Seas and Coasts, Project Office Baltic Sea
- Zweckverband Wasserversorgung und Abwasserbehandlung Rügen (Association of water supply and wastewater treatment facilities, Rügen)

In the course of the consultation procedure and after due notification in each case, the complete set of planning documents was displayed from 18.04. to 17.05.2017, followed by confirmation of their correctness:

- Bergen auf Rügen Administrative District (as is locally customary on 10.04.2017), PE on 22.05.2017
- Lubmin Administrative District (as is locally customary on 10.04.2017), PE on 22.05.2017
- Mönchgut-Granitz Administrative District (as is locally customary on 07.04.2017), PE on 23.05.2017
- Usedom-Nord Administrative District (as is locally customary on 10.04.2017), PE on 01.06.2017
- Municipality of Putbus (as is locally customary on 10.04.2017), PE on 31.05.2017
- Anklon-Land Administrative District (as is locally customary on 10.04.2017), PE on 30.06.2017
- Stralsund Mining Authority (as is locally customary in the M-WP Bulletin and posted on 10.04.2017), from 18.05.2017
- Federal Maritime and Hydrographic Agency (publicly in *Nachrichten für Seefahrer* of the 14th calendar week, the newspaper *Die Welt* and the newspaper *Ostsee-Zeitung* on 10.04.2017), display in Hamburg and Rostock, from 26.01.2018

The notifications included the indication that the opportunity was provided for everyone to view the application documents and to make a statement in writing or by declaration within two weeks of termination of the display period.

Numerous viewings were undertaken; 165 written objections were submitted by private individuals and four statements by associations.

Most participants made their statements on the planning documents in writing. Numerous deadline extensions were granted in advance on request.

The statements and objections received are available and were passed on to the PD.

The requirements for waiver of a discussion meeting according to Section 43a No. 2 sentence 1 EnWG were not met.

The discussion meeting was announced in good time (Bergen auf Rügen Administrative District, Lubmin Administrative District, Mönchgut-Granitz Administrative District, Usedom-Nord Administrative District, Municipality of Putbus, Anklam-Land Administrative District, M-WP Bulletin, Stralsund Mining Authority (as is customary locally on 03.07.2017 in each case), Federal Maritime and Hydrographic Agency (publicly *Nachrichten für Seefahrer* of the 28th calendar week, the newspapers *Die Welt* and *OZ* on 07.07.2017))

All those involved in the procedure under energy law including those with objections were invited in writing and the day planned for participants and objectors to discuss their concerns was announced (Stralsund Mining Authority in its communication dated 27.06.2017, BSH in its communication dated 07.07.2017).

Discussions were carried out jointly with the Federal Maritime and Hydrographic Agency from 17 to 21.07.2017. The objections and statements, as well as statements from the cross-border participation of authorities and public, were discussed with those present who had raised objections or concerns as well as with the bodies responsible for representing public interests in a specific area. At the end of each day of negotiation, the consultation authorities ascertained by questioning that there were no more requests to speak.

The minutes of the discussion meetings prepared and approved by the Federal Maritime and Hydrographic Agency, including documents handed over or announced during the discussion sessions and presentations shown by the PD, were sent to all those involved in the procedure and those who had raised objections in a communication dated 27.09.2017.

In response to the statements and objections and as a result of the discussions, the PD altered or supplemented parts of its planning documents and incorporated these alterations in the procedure (Plan Supplement No. 1 Supplementary Volume: Specifications).

These were the alterations or supplements involved:

- 1 Compensation concept
- 2 Compensation measure – Island of Schadefähre
  Annex 1 Maps HzE 1999
  Annex 2 Maps HzE marine
- 3 Measures to improve the ecological state of the Kleiner Jasmunder Bodden (Rügen)
  Annex 3 Maps (HzE 1999)
  Annex 4 Maps (HzE marine)
  Annex Feasibility study – Bergen wastewater treatment plant
  Annex 1: Existing wastewater treatment facilities
  Annex 2: Dimensions
  Annex 3: Required dimensions

Annex 4: Basic flow sheet
Annex 5: Site plan

- 4 Measures to improve the water balance in the lowland area of the lake 'Lobber See' and reduce nutrient discharge in the Bay of Greifswald ('Greifswalder Bodden').
  Annex 1 Explanations regarding the method used in balancing the changes in the N and P discharges in the Lobber See lowland area
  Annex 2 Maps
  Annex Feasibility study – Göhren wastewater treatment plant
  Annex 1: Existing wastewater treatment facilities
  Annex 2: Dimensions
  Annex 3: Required dimensions
  Annex 4: Basic flow sheet
  Annex 5: Site plan
- 5 Measures to reduce nutrient discharge from Greifswald- Ladebow and Stralsund wastewater treatment plants
  Annex Feasibility study – Greifswald-Ladebow wastewater treatment plant
  Annex 1: Site map – further cleaning of Greifswald-Ladebow wastewater treatment plant
  Annex Feasibility study – Stralsund wastewater treatment plant
  Annex 1: Site map, northern area – further cleaning of Stralsund wastewater treatment plant
  Annex 2: Site map, northern area – further cleaning of Stralsund wastewater treatment plant
- 6 Compilation of measure sheets
- 7 Plot directory for the measures

In a communication dated 02.11.2017, those affected for the first time or more severely than before and the environmental associations involved in the procedure were informed of the alteration/supplement according to Section 73 Paragraph 8 sentence 1 VwVfG M-V and they were given the opportunity to submit statements or objections within the statutory period of two weeks.

The documents were provided to the following authorities, institutions and associations:

- Biosphere Reserve Authority, South-East Rügen
- BUND M-V e.V., Federal Chairperson
- State Office for the Environment, Nature Conservation and Geology M-WP, Güstrow
- Landesanglerverband M-V e.V. (State angler association)
- State Forestry Mecklenburg-Western Pomerania, public agency
- District of Western Pomerania-Greifswald
- District of Western Pomerania-Rügen
- Landgesellschaft M-V mbH
- NABU Germany e.V., Federal Chairperson
- NABU M-V e.V, State Chairperson

- Lawyers Kremer Werner
- Regionale Wasser- and Abwassergesellschaft Stralsund mbH
- State Agency for Agriculture and the Environment, Western Pomerania
- University and Hanseatic City of Greifswald, internal wastewater treatment plant
- Wasser- and Bodenverband "Rügen" (Rügen Water and Ground Association)
- WWF Germany, Department of Seas and Coasts, Project Office Baltic Sea
- Zweckverband Wasserversorgung and Abwasserbehandlung Rügen (Association of water supply and wastewater treatment facilities, Rügen)

It is possible to waive the display of an altered plan potentially impacting on another municipality if according to Section 73 Paragraph 8 sentence 2 VwVfG M-V in conjunction with Section 73 Paragraph 3 sentence 2 VwVfG M-V the group of those affected and of the associations (Section 73 Paragraph 4 sentence 5 VwVfG M-V) are known and they are given the opportunity to view the altered plan within an appropriate period of time. The documents were not displayed in the administrative districts not affected by the project to date, the Hanseatic City of Stralsund and the University and Hanseatic City of Greifswald, since the group of those affected is known and by sending the altered planning documents to those mentioned in the above listing and to the operators of the wastewater treatment plants, the requirements of Section 73 Paragraph 8 sentence 2 VwVfG M-V in conjunction with Section 73 Paragraph 3 sentence 2 VwVfG M-V were met.

Section 73 Paragraph 8 sentence 1 VwVfG M-V also requires a supplementary consultation procedure if a plan that has already been displayed is altered according to Section 73 Paragraph 3 sentence 1 VwVfG M-V. The alteration of the plan may not affect the concept of the project as a whole, thereby preserving its identity. This regulation only applies to alterations to the plan made during the pending procedure after display but before approval according Section 74 VwVfG M-V. Subsequent alteration of the plan during the procedure does not trigger an entirely new procedure, it simply modifies the subject of the ongoing procedure. In the present case, the consultation requirements according to Section 73 Paragraph 8 sentence 1 VwVfG M-V were met in terms of the altered planning documents, regardless of whether the plan alteration actually affected the area of responsibility of an authority, an association according to Section 73 Paragraph 4 sentence 2 VwVfG M-V or the interests of third parties, whether for the first time or more significantly than before. Ultimately, the measures to improve nutrient reduction in the active Stralsund and Greifswald-Ladebow wastewater treatment plants contained in the altered plan 'Plan Supplement No. 1' are only expected to include measures on the premises of the wastewater treatment plant in question and the aim is achieve positive environmental effects beyond these premises.

In spite of the objections and statements received regarding the altered plan 'Plan Supplement No. 1', no new discussion meeting was required (Section 43a No. 3 EnWG), because the content of the written statements is sufficiently comprehensive for plan approval and can be incorporated in the decision without further discussion.

In response to the statements on Plan Supplement No. 1: 'Supplementary Volume – Specifications', the PD submitted Plan Supplement No. 2: 'eco account Fischlandwiesen' to the Stralsund Mining Authority on 30.11.2017. The supplement

to the documents was communicated to those affected for the first time or more significantly than previously and to nature conservation associations involved in the procedure in the communication dated 01.12.2017, and an opportunity was provided for statements and objections to be submitted within two weeks (Section 73 Paragraph 8 sentence 1 clause 2 VwVfG M-V).

These were the alterations or supplements involved:

- Supplement to the application for plan approval – eco account Fischlandwiesen Annex: Annex 2 and 3 on the notification of UNB V-R

The documents were provided to the following authorities, institutions and associations:

- BUND M-V e.V., Federal Chairperson
- State Office for the Environment, Nature Conservation and Geology M-WP, Güstrow
- Landesanglerverband M-V e.V. (State angler association)
- District of Western Pomerania-Rügen
- Landgesellschaft M-V mbH
- NABU Germany e.V., Federal Chairperson
- NABU M-V e.V, State Chairperson
- Lawyers Kremer Werner
- State Agency for Agriculture and the Environment, Western Pomerania
- WWF Germany, Department of Seas and Coasts, Project Office Baltic Sea

Another display and its announcement are not required, if no case arises according to Section 73 Paragraph 8 sentence 2 VwVfG. In the case of Section 73 Paragraph 8 sentence 2 VwVfG M-V, it is possible to waive a display of the altered plan, if according to Section 73 Paragraph 3 sentence 2 VwVfG M-V the group of those affected and associations (Section 73 Paragraph 4 sentence 5 VwVfG M-V) were known and given the opportunity to view the altered plan within an appropriate period of time. The already implemented measure "Renaturing of Fischlandwiesen" is already available as an eco account. In Plan Supplement No. 2, the PD simply applies for the inclusion in its compensation concept of eco points from this eco account. As such, no impact is caused by the approved plan. For this reason, no display is required. Apart from this, the above-mentioned authorities, institutions and associations were given the opportunity to view the altered planning document.

Also the consultation requirement was met in terms of the parties listed above according to Section 73 Paragraph 8 sentence 1 clause 2 VwVfG M-V in conjunction with Section 73 Paragraph 3 sentence 2 VwVfG M-V.

According to Section 43a No. 3 EnWG, no discussion was held on the statements and objections received relating to the plan alteration.

In its communication dated 01.12.2017, the PD announced the construction of the high-pressure gas pipeline, enclosing the documents required and the expert statement according to Section 5 GasHDrLtgV.

In a communication dated 21.12.2017, the nature conservation associations known in the state were informed of the expert environmental statements received regarding the application documents and the plan alterations as well as other documents relating to nature conservation (Section 63 Paragraph 2 BNatSchG).

B.3.5 Other procedural issues

The plan approval decision meets the procedural requirements. The application is admissible.

The applicant is a suitable project developer. The definition of a suitable project developer of a project submitted for plan approval is provided by the relevant specialist legislation (BVerwG, judgement dated 25.07.2007, 9 VR 19.07, juris headnote 1, point 6).

In this case this is EnWG. According to Section 43 sentence 1 No. 2 EnWG, the construction, operation and alteration of gas supply lines with a diameter of more than 300 mm are subject to a plan approval. According to the legal definition of Section 3 No. 20 EnWG, gas supply networks include all long-distance supply networks belonging to one or more energy supply companies (EVU) or operated by them. According to the legal definition of Section 3 No. 18 EnWG, energy supply companies include legal entities which supply energy to others, operate an energy supply network or hold the power of disposition over an energy supply network as the owner. Overall consideration of the provisions mentioned shows that any energy supply company that either owns the pipeline or operates it can be the project developer of gas supply networks and therefore also of gas supply pipelines. This means that the applicant in this case is a suitable project developer. The applicant is an energy supply company and intends to operate and retain ownership of the approved pipeline.

B.4 Assessment under substantive law

B.4.1 Plan justification

The requirement of plan justification applies to the Nord Stream 2 project. Plan justification is an unwritten requirement of any sectoral planning and is a reflection of the principle of proportionality to which all state action is subject. The requirement of plan justification is met if, considering the objectives of the relevant sectoral planning legislation, there is a need for the intended project, i.e. the planned measure is necessary from this point of view. This does not mean the project has to be unavoidable, but that it must be necessary within reason (BVerwG, judgement dated 06.04.2017, 4 A 2.16 etc., juris marginal note 32; BVerwG, judgement dated 16.03.2006, 4 A 1075.04, juris marginal note 182; BVerwG, judgement dated 22.03.1985, 4 C 15.83, juris guiding principle 1 and marginal note 16; BVerwG, judgement dated 07.07.1978, IV C 79.76, juris marginal note 53).

The plan justification for the gas supply pipeline project Nord Stream 2 is to be found in EnWG. According to the above jurisdiction, this applies if the project is necessary within reason from the perspective of the relevant objectives of EnWG in relation to gas supply. The objectives of EnWG are stated in Section 1 Paragraph 4 EnWG, while Section 1 Paragraph 1 EnWG states the intent of the law according to its

wording (cf. also BT-Drs. 18/7317, p. 75). However, it is recognised that Section 1 Paragraph 1 EnWG defines the benchmark for the assessment of necessity under plan approval law within the context of plan justification. According to Section 1 Paragraph 1 EnWG, one of the purposes of the law is to ensure a secure, economical, consumer-friendly, efficient and environmentally compatible supply of gas via a pipeline to the general public that is increasingly based on renewable energies.

A pipeline project is especially necessary in the context of the energy sector where it serves to close a gap in supply or ensure security of supply. A supply gap exists when energy needs in a supply region cannot be sufficiently covered at present or in the foreseeable future. In the case of existing energy needs, the key point is whether there are technical alternatives to energy supply coverage which would make the pipeline project unnecessary. When assessing needs, therefore, it is necessary to examine the use of existing infrastructure as a means of transportation as an alternative option to cover needs, other than the construction of new, additional pipelines. If energy needs can be covered by means of transportation, there is no need to build a new gas supply pipeline (cf. BVerwG, judgement dated 11.07.2002, 4 C 9.00, juris marginal note 28). In order to create an uninterrupted, fail-safe energy supply, the capacities are to be designed on a redundant basis (Salje, EnWG, Section 1 marginal note 27; Hellermann/Hermes, in: Britz/Hellermann/Hermes, EnWG, Section 1 EnWG marginal note 26). In addition to the aspect of security of supply, the need for a pipeline can also arise from competitive considerations, if and because the construction of additional pipeline capacity strengthens competition (cf. BT-Drs. 14/4599, p. 161).

Ensuring a secure and reliable energy supply system by implementing suitable measures such as the construction and extension of energy plants, as pursued by EnWG, is a public task of the greatest importance. Securing the supply of energy, which is a public service requirement, is an indispensable need of all citizens in order to ensure a dignified existence (BVerfG, decision dated 20.03.1984, 1 BvL 28/82, juris marginal note 37; BVerfG, decision dated 10.09.2008, 1 BvR 1914/02, juris marginal note 12). Performing this public task is also assigned by EnWG to energy supply companies organised in the private sector (cf. Section 2 Paragraph 1 EnWG).

Judging against these objectives, the project approved here is necessary and therefore justified. It is a demonstrated planning objective of the project developer to construct and operate Nord Stream 2 as an additional transportation route to link the Russian natural gas reserves with the European transportation network in the form of two parallel pipelines, starting near Ust-Luga in Russia and running through the Baltic Sea to Lubmin in Germany, parallel as far as possible to two pipeline strings of the Nord Stream pipeline already in operation, in order to cover the increased need for natural gas in the EU from 2020 onwards (cf. application document, Part A.01, Chapter 1). In terms of timing, the project developer plans to put both pipeline strings into operation at the end of 2019 (cf. application document, Part A.01, Chapter 1). The particular, concrete objective of Nord Stream 2 in terms of energy management is to transport approximately 55 billion m³ or natural gas per annum from Russia through the Baltic Sea to Germany, from where a link will be provided to the European long-distance pipeline network via the planned natural gas receiving terminal Lubmin 2 and via the connecting line to the North German Gas Pipeline already in operation (NEL, transport in a westerly direction) and to the planned European Gas Pipeline Link (EUGAL, transport in a southerly direction) (cf.

application document, Part A.01, Chapter 1). This will ensure a needs-oriented supply of natural gas to Germany and Europe (cf. application document, Part A.01, Chapter 5.3.2.8). It is not possible to cover anticipated future needs by using existing long-distance natural gas pipelines, especially not by means of the Nord Stream pipeline, the central corridor/Ukraine or Yamal-Europe (see below, Section B.4.1.1).

The plan approval authority is convinced of the particular importance of this project in terms of ensuring a secure energy supply to Germany and Europe, essentially borne out by the application documents submitted by the project developer, including expert analyses and statements, the embodiment of the administrative procedure and the authority's own plan approval procedures, for example the plan approval procedure for the Nord Stream pipeline and other plan approval procedures under energy law conducted by the plan approval authority. The information extracted from the application documents which provide the basis for the plan approval has been examined; the plan approval authority is likewise convinced of its correctness.

This is based in detail on the following reasons:

B.4.1.1 Goal conformity with Section 1 Paragraph 1 EnWG

B.4.1.1.1 Security of energy supply

The project to construct and operate the long-distance natural gas pipeline Nord Stream 2, which is the subject of this procedure, serves to ensure the secure supply of network-bound energy by importing an additional natural gas quantity of approx. 55 billion m³ per annum by secure technical means to Germany and Europe. Nord Stream 2, which is part of an overall energy concept (cf. application document, Part A.01, Chapter 5.5.2), will connect the natural gas reserves of Russia to the existing natural gas transport system in Europe, namely via the planned natural gas receiving terminal Lubmin 2 to the planned EUGAL and via the NEL connecting link yet to be constructed to the NEL, which is already in operation. The natural gas receiving terminal Lubmin 2, the connecting link to the NEL and the EUGAL will be planned by GASCADE Gastransport GmbH. According to the overall energy concept of Nord Stream 2, the incoming gas is to be transported further via the NEL connecting link (AL NEL) in a westerly direction through the NEL and in a southerly direction through the EUGAL (cf. application document, Part A.01, Chapter 5.5.2). The new infrastructure will enable the natural gas to be supplied to Germany and north-western Europe as well as via the gas hub in Baumgarten (Austria) to Central and Southern Europe (cf. application document, Part A.01, Chapter 3.2.4). Nord Stream 2 will strengthen and supplement the existing gas transportation route of the Nord Stream pipeline through international waters into the domestic European market. In this way, Nord Stream 2 improves security of supply within the Federal Republic of Germany and the entire European Union with its 28 (or in future 27) member states, as well as in Switzerland and Ukraine (and subsequently the United Kingdom), in particular due to the extension of existing import routes and the associated increase in transport capacity (cf. application document, Part A.01, Chapter 5.3.2.2).

This additional consideration of the Europe-wide supply situation is imperative. As a result of the implementation of the third EU energy package and the increasingly networked European gas infrastructure that this created, a pool model is being put into operation in the EU-28 member states in which gas can be fed in and out at any

point (cf. application document, Part A.01, Chapter 5.3.2.3.2). It is true to say that a needs analysis is still being conducted at national level. Since the import of natural gas can no longer be fundamentally allocated to individual member states, however, with natural gas being imported and distributed in the single market via external EU borders, this is now a question of supplying the whole of the EU (cf. application document, Part A.01, Chapter 5.3.2.3.2).

The project makes a key contribution to closing the natural gas supply gap in the Federal Republic of Germany and the European Union (seen as the EU-28 member states), supplemented with anticipated natural gas imports on the part of Switzerland and Ukraine from the EU-28 member states. It is true to say that the further development of overall demand and gas production in the EU is essentially subject to a large number of uncertainties. This is reflected in the differing results of forecasts of the development of natural gas demand published by the EU-28 and OECD Europe, based on consideration of target or reference scenarios (cf. application document, Part A.01, Chapter 5.3.2.4.1.1). Figure 5-3 of the application document, Part A.01 names published studies on the development of natural gas demand that used target and reference scenarios, and maps out the various forecasts. Even considering moderate assumptions in the conservative reference scenarios used to assess a potential supply gap, essentially confirmed based on updated annual data for 2017 and the so-called EU Reference Scenario supplemented with the natural gas exports to Switzerland and Ukraine, it is anticipated that there will be an additional, medium-term need for natural gas imports in the EU-28 of 26% by the year 2045 (cf. application document, Part A.01, Chapter 5.3.2.4.1.1, 5.3.2.4.1.3, 5.3.2.4.3, Fig. 5-11; application document, Part "Further points concerning plan justification after implementation of the consultation procedure", last revised: 22.11.2017, Chapter 2).

The forecast is that the demand for natural gas among the EU 28 will remain virtually stable between 2015 and 2050 (cf. application document, Part A.01, Chapter 5.3.2.4.1.2). The demand for natural gas in Switzerland will increase within the same period by approx. 3 billion m³/year, the Ukrainian demand for imported natural gas will be approx. 16 billion m³/year from 2020 (cf. application document, Part A.01, Chapter 5.3.2.4.1.3). Demand among the EU 28, together with Switzerland and the Ukraine will therefore be approx. 494 billion m³/year (cf. application document, Part A.01, Chapter 5.3.2.4.1.3 and Figure 5-7). Since this is anticipated to stand in contrast with sharply decreasing natural gas production in the EU, particularly in the UK, Germany, Italy, Denmark and the Netherlands, which is not likely to be compensated for by an increase in natural gas production in other EU countries, namely Romania, Poland and Cyprus, or by the production of biogas, or by an increase in natural gas imports into the EU from third countries, a conservative estimate is required which already anticipates an additional natural gas import demand of 30 billion m³ in 2020 and 57 billion m³ in 2025, increasing to a peak level of 123 billion m³ in 2045 and subsequently dropping to an additional import demand still at 110 billion m³ in 2050 (cf. application document, Part A.01, Chapter 5.3.2.4.2.2, 5.3.2.5.3 and Fig. 5-23). To be able to close the coverage gap which will emerge from 2020 onwards, additional natural gas supplies must be made available. There are fundamental technical, economic and/or political obstacles to an increase in pipeline gas imports from Norway, North Africa (Algeria, Libya) via the so-called Southern Corridor, in addition to the decreasing natural gas reserves in those countries (cf. application document, Part A.01, Chapter 5.3.2.5.1.2 to 5.3.2.5.1.4). The poor condition of the facilities and the need for their refurbishment are obstacles

to any increase in imports from Russia via the so-called Central Corridor/the Ukraine, and even allowing for the emergency refurbishment programme for the Urengoi-Pomary-Uschhorod pipeline, it is only possible to anticipate a (maximum sustainable) transport capacity of 30 billion m^3/year; the latter may potentially be available for longer than assumed in the reference case which formed the basis for planning, but it will not be sufficient to cover additional import demand (cf. application document, Part A.01, Chapter 5.3.2.5.1.1, application document, Part "Further points concerning plan justification after implementation of the consultation procedure", as at : 22.11.2017, Chapter 3). In view of the forecast of an LNG deficit in the early 2020s, LNG will likewise be unable to economically meet the future net import demand of the EU 28 together with that of the Ukraine and Switzerland (cf. application document, Part A.01, Fig. 5-11 and Chapter 5.3.2.5.2), neither will it be able to meet the above-mentioned additional import demand.

The planned construction of Nord Stream 2 will provide an additional supply option for Russian natural gas, thereby improving demand coverage and supply security for the Federal Republic of Germany and the EU 28, together with the Ukraine and Switzerland, and also contribute to meeting the anticipated additional demand from 2020 onwards. Even leaving other risks out of the equation that are related to natural gas imports such as the complete unavailability of the Central Corridor via the Ukraine, further worsening of the tense situation on the LNG market or other risks relating to supply and demand such as a further reduction in the EU 28's own production or a sharper increase in demand than forecast, the import gap of 52 billion m³/year still exceeds the typical capacity usage of the Nord Stream 2 pipeline of 90% from 2024, and therefore of 50 billion m³/year (cf. application document, Part A.01, Fig. 5-24). The natural gas import gap will therefore grow beyond usage of the existing transport infrastructure and the infrastructure planned with the Nord Stream 2 pipeline (cf. application document, Part A.01, Chapter 5.3.2.5.3).

Further developments in terms of overall demand for natural gas and EU gas production as well as the import options for pipeline and LNG gas are subject to a wide range of uncertainties. However, a clear trend can be detected for the Nord Stream 2 pipeline, whereby the risks to which natural gas supply is subject from 2020 will be much more serious than the probability of contrary developments such as a reduction in demand, an increase in production on the part of the EU 28 or an increase in gas import volume from different sources (cf. application document, Part A.01, Chapter 5.3.2.6).

Unless additional natural gas volumes are contracted in the EU (together with Switzerland and the Ukraine), a supply gap will emerge ranging from 30 billion m³ in 2020 and up to 123 billion m³ of natural gas in 2045 (cf. application document, Part A.01, Figure 5-23). The Nord Stream 2 project as a whole will be able to close part of this supply gap with the additional natural gas quantities supplied of approx. 55 billion m³/year, probably from the end of 2019.

The Nord Stream 2 long-distance natural gas pipeline will also contribute to the diversification of natural gas transportation routes into the EU as a connection between the Russian natural gas deposits and the German and European long-distance natural gas pipelines. When it is complete, it will additionally optimise and secure the provision of as to supply national markets in the EU. The Nord Stream 2 pipeline will connect the existing extraction areas in Russia, especially the Yamal Peninsula, to the European natural gas market via the shortest route (cf. application

document, Part A.01, Chapter 5.3.2.5.1.1). This also provides logistical relief for existing transit routes.

The diversification of transport routes not only provides the option of bringing additional quantities of gas to the Southern and Eastern European markets, it will also make it possible to switch to this transportation route in the event of a supply disruption. Nor is it the case that the construction and operation of the Nord Stream 2 pipeline significantly increases the dependence of Europe or Germany on Russian natural gas, since building the pipeline of itself does not involve any obligation to make use of the transport capacity, and the natural gas supplied will be sold on the European markets, which are subject to competition. In addition, transport capacity will be created which is in line with the actual transportation needs of the market (cf. Section 11 Paragraph 1 sentence 1 EnWG) and which cannot be covered by other means using existing pipeline networks or alternative transportation (LNG gas, pipeline gas) or production facilities (biogas). The planning authority knows from its own sources that the natural gas transportation volumes requested initially on a non-binding basis based on the more-capacity market survey were largely confirmed by binding bookings on the part of market participants in the annual auctions held in March 2017. What is more, onshore pipeline networks do exist to link Russian gas fields to the EU and Germany. In terms of transit capacity via the Central Corridor and in particular through the Ukraine, however, these are subject to considerable uncertainties, as was already mentioned. Neither the Central Corridor nor the other existing pipeline networks can be expanded to meet the additional needs calculated in an economically and ecologically effective manner to satisfy the anticipated additional transport volume by 2045 of 123 billion m³ of natural gas, nor are these alternatives capable of linking the gas fields in the north of Russia to the EU (cf. application document, Part A.01, Chapter 5.3.2.5.1.1, 5.3.2.5.3). What is more, this cannot be achieved using the full capacity of the Nord Stream pipeline, firstly since this was already using 80% of its capacity in 2016, so any increase in capacity is barely possible here and, secondly it was not possible to use the full capacity of the Nord Stream pipeline, primarily as a result of the limitations of the OPAL pipeline (cf. application document, Part "Further points concerning plan justification after implementation of the consultation procedure", status: 22.11.2017, Chapter 1.3.2).

In view of the lack of actual additional pipeline capacity and based on Russia's northern natural gas reserves in the regions of Nadym-Pur-Taz and Yamal which can be tapped into or expanded via network access, there is a need for the entire planned transport capacity provided by the present project (cf. application document, Part A.01, Chapter 5.3.2.5.1.1). Even the Nord Stream 2 pipeline itself cannot satisfy the complete future transport demand for the EU in future, as shown by comparing the planned transport capacity of the project (55 billion m³/year) with the anticipated import gap described above. However, the project does make a major contribution to meeting the emerging demand for natural gas import.

In view of the obligation to ensure a secure supply to the population of natural gas and taking into account the fact that a run-up period of several years is regularly necessary prior to commissioning the necessary energy infrastructure facilities for planning and construction, it is right to evaluate potential additional natural gas import demand, not – as sometimes encouraged in the context of public participation – based on so-called target scenarios aimed at meeting all agreed energy policy goals within the desired period of time and leaving aside technical, economic and

social/political limitations to one side, not to mention the existing market inertia and the probability of achieving such goals.

Instead, what is required here, as the preceding analysis shows, are what are known as reference scenarios based on continuing the energy policy goals that have already become enshrined in law and are therefore more reliable than the goals on which the target scenarios are based, which have been agreed on simply at the political level (cf. application document, Part A.01, Chapter 5.3.2.4.1.1). This is in line with the approach adopted by long-distance network operators to date in establishing a scenario framework according to Section economic Paragraph 1 p. 4 EnWG. In the most recent scenario framework 2018-2028, target scenarios are also referred to (EUCO30 and EUCO+40) in calculating demand, but only for final energy needs and therefore for only a part of the total gas demand to be forecast overall (scenario framework for the gas network development plan 2018-2028 of the long-distance network operators, status: 11.08.2017, p. 16 et seq., 32). The Federal Network Agency accepted the use of these target scenarios in its confirmation but also indicated certain reservations (reference, 8615-NEP Gas 2018-2028 – Confirmation of Scenario Framework, p. 27) and noted that it is not possible to reliably assess whether a different forecast would reflect the actual development of gas needs more accurately (ibid.). The main reason given by the long-distance network operators for using the EUCO target scenarios of January 2017 was that the 2014 reference scenario used to date was obsolete. This does not apply in comparison to the EU reference scenario of 2016. The EU reference scenario does justice to the applicable European goals to reduce greenhouse gas emissions, while the EUCO scenarios are based on an energy efficiency target of 30% that has not yet been finally agreed on. What is more, the gas needs forecast for the long and medium term have not proved to be true. On the contrary, total gas demand adjusted for temperature has increased continuously since 2014 (application document, Part "Further points concerning plan justification after implementation of the consultation procedure", as at: 22.11.2017, Chapter 2.1, and Part "Expert opinion, analysis of developments in the course of 2017 in view of the report "Status and Perspectives of the European Gas Balance", p. 11 et seq.).

The use of target scenarios that assume a much-reduced natural gas consumption in the long term and therefore project only a limited expansion of the natural gas infrastructure or none at all means that if the underlying forecast turns out not to be true, there will be a supply shortage and therefore a significant increase in natural gas prices as well as considerable conflict in connection with secure, economical natural gas supply; however, the use of reference scenarios means that if a lower gas demand occurs than forecast, this will only result in a (partial) underutilisation of the capacity provided by the infrastructure constructed as well as none or less widespread environmental impact and thus less conflict with ecological compatibility (cf. Section 1 Paragraph 1 EnWG; application document, Part "Further points concerning plan justification after implementation of the consultation procedure", status: 22.11.2017, Chapter 1.2). Also based on this "asymmetry of risks" (cf. application document, Part "Further points concerning plan justification after implementation of the consultation procedure", status: 22.11.2017, Chapter 1.2, 3), which involves a more significant impact in the event of non-occurrence of the forecast developments based on target scenarios than in the case of non-occurrence of developments forecast in reference scenarios, the approved plan is correctly based on (conservative) reference scenarios (cf. application document, Part A.01, Chapter 5.3.2.4.1).

The goal conformity of the project is therefore to be confirmed, since supply security is increased based on the creation of additional transport capacity and redundancies are provided in the event of failure of other import pipelines (cf. on the relevance of this aspect to supply security BNetzA, resolution dated 25.02.2009, BK7-08-010, p. 53, 55).

As well as reliability of supply, the reliable gas supply strategy also includes technical security and thus the lack of risk posed by long-distance gas facilities to human beings and objects (Hellermann/Hermes, in: Britz/Hellermann/Hermes, EnWG, 3rd edition 2015 § 1 para. 25). The plan takes into account the technical safety of the long-distance natural gas network in its construction and operational phases, in particular in terms of occupational safety and environmental protection, in terms of the safety of the pipeline itself as well as the safety and ease of shipping traffic during and after pipeline installation (cf. application document, Part A.01, Chapter 3.4; application document, Part C.01, Chapter 5). The safety of the long-distance gas pipeline itself is assured since the pipelines are coated accordingly (on the inside) and sheathed (on the outside) based on hydraulic calculations, design pressure and planned lifetime (cf. application document, Part C.01, Chapter 2.2.3). The long-distance natural gas pipeline will be tested for tightness and strength prior to commissioning by means of a system pressure test with water (so-called water pressure test) and/or undergo a seal test using compressed air as well as an internal inspection using pig trains; the strength test will be conducted in this case by means of testing all pipeline parts using compressed air (cf. Offshore Standard DNV-OS-F101; application document, Part A.01, Chapter 3.3.3.1, 3.3.3.2; application document, Part C.01, Chapter 4.1.2, 4.1.3, 4.1.4). Offshore Standard DNV-OS-F101 applicable in the latter case meets the requirements of security of energy facilities according to Section 49 Paragraph 1, Paragraph 4 EnWG.

B.4.1.1.2 Affordability, consumer-friendliness and ecological compatibility of the energy supply

The Nord Stream 2 project also meets the goal of affordable energy supply according to Section 1 Paragraph 1 Alt. 2 EnWG. A project meets the goal of affordability if the energy supply can be secured on competitive terms (Säcker/Timmermann, in: Säcker, Berliner Kommentar Energierecht [Berlin Commentary on Energy Law], Volume 1, Half-Volume 1, 3rd edition, Section 1 marginal note no. 21; Hellermann/Hermes, in: Britz/Hellermann/Hermes, EnWG, 3rd edition 2015 § 1 para. 30; Kment, in: Kment, EnWG, 2015 § 1 para. 6). The additional import capacity created by Nord Stream 2 is subject to competition in the German and European gas market with all other offers of other natural gas suppliers; it increases competition among the latter and, as the planning authority firmly believes, is able to reduce the price level on the EU gas market. The stimulus created for further transport of the natural gas supplied by Nord Stream 2 to expand the downstream natural gas infrastructure will likewise improve competition; the planned connections to the existing and planned natural gas infrastructure (North German Pipeline (NEL), Yamal Gas Pipeline Link (JAGAL), North German Natural Gas Transversal (NETRA), European Gas Pipeline Link (EUGAL) and the link pipeline to the NEL (AL-NEL)) will lead to further integration of the European gas market, thereby increasing competition within the latter. The expansion of the transport infrastructure and the diversification of transportation routes which

construction of the approved project involves will increase competition in the area of natural gas transport (cf. application document, Part A.01, Chapter 5.3.2.8). At the same time, this counters the emergence of a supply shortage, thereby contributing to a higher level of price stability (cf. application document, Part A.01, Chapter 5.3.2.8).

It can therefore be affirmed that the project complies with the goal of affordability. This applies all the more since the volumes to be fed out in Germany are subject to regulation (cf. Sections 12, 13 GasNZV), thereby also ensuring a price level which is customary for the market.

In terms of ensuring a public supply of gas via the Nord Stream 2 project, the gas supply is also environmentally compatible according to the goals set down in Section 1 Paragraph 1 EnWG in the sense that natural gas supply meets the demands of sustainable, cost-effective and economical use of energy, ensuring sustainable, low-impact use of resources and impacting as little as possible on the environment (cf. Section 3 no. 33 EnWG). This is because natural gas is the fossil fuel which generates the lowest level of emissions of all fossil fuels when combusted, in terms of producing greenhouse gases and as well as other substances such as particulates (cf. application document, Part A.01, Chapter 5.3.2.2, 5.3.2.3.1). As such, natural gas also has the lowest level of CO_2 emissions when combusted (cf. application document, Part A.01, Chapter 5.3.2.3.3.1).

If one considers the EU 28 energy mix, natural gas has also ousted less environment-friendly fossil fuels such as coal (cf. application document, Part A.01, Chapter 5.3.2.3.1). As a result, the increased use of natural gas as an energy source also contributes to goal achievement in view of the goal of reducing CO_2 emissions so as to remain below a global temperature rise of less than 2 K or 1.5 K compared with the pre-industrial era temperature level (Article 2 Paragraph 1 lit. a Paris/Paris Agreement dated 12.12.2015), since natural gas, as shown, has a much lower level of CO_2 emissions than any other fossil fuels (cf. application document, Part A.01, Chapter 5.3.2.3.3.1).

Also taking into account the goals of the Paris Climate Agreement and in view of the decarbonisation goals set out in the Kyoto Protocol (Article 3 in conjunction with Annex A and B of the Kyoto Protocol) and in connection with the energy turnaround, all of which strive to achieve a virtually carbon-neutral economy by 2050 and which can essentially only be achieved by increasing the share of renewable energy sources (cf. Section 1 Paragraph 2 EEG 2017) as well as by increasing energy efficiency and energy saving (cf. application document, Part A.01, Chapter 5.3.2.3.3), natural gas remains, as the planning authority believes, an energy source whose use is necessary and important to maintain supply security during the transition phase until the above goals are achieved. Recent studies (thinkstep) also demonstrate that the natural gas coming into the European natural gas market via the Nord Stream 2 pipeline has a carbon footprint which is between 2.4 and 4.5 times smaller than LNG gas (possibly) supplied by potential providers from Australia, the USA, Algeria and Qatar to the European natural gas market (cf. application document, Part A.01, Chapter 5.3.2.7.1). The carbon footprint of the natural gas transported via the Nord Stream corridor to Europe is also 61% or 46% smaller than that of natural gas transported via the Central Corridor or via Yamal-Europe from Russia to Central Europe (cf. application document, Part A.01, Chapter 5.3.2.7.1), so it therefore contributes to providing an environmentally compatible pipeline-bound supply of natural gas.

Due to its specific usage properties, gas is consumer-friendly as defined by Section 1 Paragraph 1 Alt. 3 EnWG. What is more, since the project is geared towards increasing price stability on the European natural gas market, it will also serve the purpose of a consumer-friendly supply of gas to the general public.

B.4.1.1.3 Efficiency of energy supply

The Nord Stream 2 project also meets the goal of ensuring an efficient supply of natural gas to the general public as defined by Section 1 Paragraph 1 Alt. 4 EnWG since, as demonstrated, it has a much smaller carbon footprint than alternative transport options for natural gas into the EU and uses little primary energy resources in producing, transporting and distributing energy; the project is energy-efficient (cf. Salje, EnWG, 2006, ¦ Section 1 para. 46; Britz/Hellermann/Hermes, EnWG, 3rd edition 2015 § 1 para. 36). Since the project promotes competition between natural gas suppliers in the EU gas market and contributes to price stability (cf. application document, Part A.01, Chapter 5.3.2.7.2), it is also cost-efficient.

B.4.1.2 Effectiveness and undistorted competition

EnWG aims to secure effective and undistorted competition in the supply of electric power and gas and ensure the high-performance and reliable long-term operation of energy supply networks.

The construction of the long-distance natural gas pipeline Nord Stream 2 likewise meets this goal since it is designed to improve competition and improve the performance capacity of the gas supply network. The Nord Stream 2 project further diversifies the transport routes into the EU as well as the natural gas fields available to supply the EU. What is more, the additional capacity means that additional volumes of natural gas can access the market. Both of these aspects serve to improve competition.

B.4.2 Section formation / projection

B.4.2.1 Description of the overall energy management strategy

Nord Stream 2 forms part of an overall energy management strategy and allows the natural gas reserves of Russia to be linked to the existing natural gas transport system in Central Europe (cf. application document, Part A.01, Chapter 5.5.2). The overall strategy essentially consists of the various Nord Stream 2 offshore pipeline projects, the Lubmin 2 natural gas receiving terminal with the connecting line to the already operating NEL (AL NEL) and the Lubmin-NEL valve station (AS) as well as the long-distance natural gas pipeline EUGAL, the Radeland 2 natural gas compressor station, the Yamal Gas Link Line connecting line (AL JAGAL) and the construction of other ancillary facilities. The EUGAL and the Lubmin 2 natural gas receiving terminal along with the AL NEL and the AS, the Radeland 2 natural gas compressor station and the AL JAGAL all have the same project developer, namely GASCADE Gastransport GmbH based in Kassel. The project developer for the Nord Stream 2 pipeline is Nord Stream 2 AG of Zug, Switzerland.

The Nord Stream 2 strategy as a whole aims to permit additional transport of Russian natural gas along a supply route which is generally parallel to the Nord Stream pipeline through the Baltic Sea to the Federal Republic of Germany and on to Europe. The Nord Stream 2 pipeline, starting near Ust-Luga in Russia, is fed with natural gas from the fields of the Yamal Peninsula, in particular the Bowanenkowo gas field. The offshore pipeline consists of two strings and is one of the largest gas infrastructure projects in Europe with a total capacity of 55 billion m³ per annum, (27.5 billion m³ per annum per pipeline string). The Nord Stream 2 pipeline – in accordance with the territories and Exclusive Economic Zone it passes through – is made up of sections in Russia, Finland, Sweden, Denmark and Germany. The German section – in accordance with the federal structure of the Federal Republic of Germany and the responsibilities arising from this – is made of the sections of the 12 nautical mile zone including the landfall point and the continental shelf. For the area of the 12 nautical mile zone and the landfall point, authorisation is necessary and possible by means of plan approval according to Section 43 clause 1 (2), clause 3 EnWG (Stralsund Mining Authority being the responsible authority). For the continental shelf, approval is required from the point of view of mining according to Section 133 Paragraph 1 clause 1 no. 1 BBergG (Stralsund Mining Authority being the responsible authority) as well as approval regarding regulations pertaining to the use and utilisation of the waters over the continental shelf and the air space over these waters according to Section 133 Paragraph 1 clause 1 no. 2 BBergG (the Federal Maritime and Hydrographic Agency, BSH, being the responsible authority).

The Lubmin 2 natural gas receiving terminal, for which a separate plan approval process is being carried out, consists of the facility sections of the natural gas receiving terminal itself, the AL NEL, the AS Lubmin-NEL and the starting point of the EUGAL, but it is not further subdivided into subsections. The section of the Lubmin 2 natural gas receiving station is currently at the planning stage.

The EUGAL – according to the federal structure of the Federal Republic of Germany – in turn consists of the following subsections, which are currently undergoing plan approval:

- Mecklenburg-Western Pomerania section (length approximately 102 km)
- Brandenburg section (length approximately 272 km)
- Saxony section (length approx. 106 km) with the plan approval sections Dresden and Chemnitz

In the Mecklenburg-Western Pomerania section of the EUGAL, the application for plan approval was submitted on 02.10.2017; the complete application documents were submitted on 09.10.2017. The route section was going through the process of public participation up to 27.12.2017. In the Brandenburg section, which is generally parallel in its route to the existing long-distance natural gas pipeline OPAL and runs from Neuenfeld, Municipality of Schönfeld, District of Uckermark to the valve and pig station south of Weissack as a double string and, passing Hirschfeld to the north-east, runs in a southerly direction as a single string as far as the state border of Saxony (Municipality of Grossthiemig, District of Elbe-Elster), which is currently also going through the consultation procedure. Parallel to this, the regional planning procedure for the "Long-distance natural gas pipeline EUGAL, Brandenburg section" was concluded with a positive state planning assessment on 07.12.2017 (cf. Ministry for Infrastructure and Agriculture, Reg.-No. 1520/2016/N). In the Saxony route section, both the Dresden plan approval section and the Chemnitz section are

currently passing through the phase of public participation. In the Dresden plan approval section, which starts north of Oelsnitz-Niegeroda, Municipality of Lampertswalde, District of Meissen and runs up to the border of the District of Sächsische Schweiz-Osterzgebirge (Municipality of Wilsdruff) / District of Mittelsachsen (Municipality of Reinsberg), the EUGAL and OPAL run essentially parallel to each other. The same applies to the Chemnitz plan approval section, which ends near Deutschneudorf in the District of Erzgebirgskreis and will provide a gas pressure regulation and measurement facility as an export station for the export of gas to the Czech Republic.

All in all, therefore, a complex overall energy management strategy is involved which is subdivided according to German planning law into the three individual projects Nord Stream 2, natural gas receiving terminal Lubmin 2 and EUGAL. The individual EUGAL project is in turn subdivided from a planning point of view into three planning sections; the project Nord Stream 2 with its various sections is also the subject of other national and international approval procedures.

B.4.2.2 Section formation – Nord Stream 2

As described above, the Nord Stream 2 project runs within German jurisdiction through the 12 nautical mile zone and the EEZ, then leaves German jurisdiction and crosses the territories or EEZ of Denmark, Sweden, Finland and Russia. The present approved route section of the Nord Stream 2 pipeline therefore constitutes one part of this pipeline. As set out above, authorisation of the project in the 12 nautical mile zone and the EEZ is carried out based on various legal foundations (EnWG, BBergG; cf. Section B.2.2 above). What is more, different authorities are responsible for the approval decisions (cf. on the relevance of responsibility delimitations in terms of the legitimacy of section formation BVerwG, verdict dated 15.12.2016, 4 A 4.15, juris marginal note 28).

In view of the above-mentioned differing responsibilities and in view of the diverse difficulties which detailed route planning can involve, it is appropriate to realise an overall planning strategy in subsections only (BVerwG judgment of 15.12.2016, 4 A 4.15, juris para. 26). The formation of sections allows a viable, effectively manageable and in particularly clearly comprehensible plan approval procedure to be carried out (BVerwG, verdict dated 15.12.2016, 4 A 4.15, juris para. 28, which adopts the standpoint of BVerwG decision of 21.12.1995, 11 VR 6.95, juris para. 26; BVerwG decision of 29.11.1995, 11 VR 15.95, juris para. 9; BVerwG judgment of 26.06.1981, 4 C 5.78, juris para. 31; BVerwG Order 03.07.1996, 11 A 64.95, juris para. 29).

According to the above, section formation is also legitimate from the overall planning point of view. In particular, the approved section of an energy line project does not have to be assigned an independent supply function (BVerwG judgment of 15.12.2016, 4 A 4.15, juris para. 28; citing BVerwG decision of 21.12.1995, 11 VR 6.95, here para. 26 and BVerwG decision of 30.12.1996, 11 VR 25.95, here para. 22).

The subdivision of the Nord Stream 2 pipeline as set out is in line with the stated standards. The individual subsections of the project or the individual national or international sections do not have to be assigned an independent supply function. The long-distance pipeline network is so widespread that planning a complete long-distance network is inappropriate in a single procedure.

Once the already initiated national and international authorisation procedures for all sections are completed, the two pipeline strings of the Nord Stream 2 pipeline are to be constructed in a single operation. Since the construction of the project is planned from the outset as a linear integrated project, there is no need to provide the typical interim solutions that would be required in the case of genuine section formation. The projection of the project as a whole also results in a positive overall assessment, so the project as a whole is not confronted with any insurmountable obstacles (cf. on this point Section B.4.2.3 below). For this reason, no linking of the construction periods of the sections was required, which would have meant waiting with the start of construction of one section until the last subsection of the Nord Stream 2 pipeline had been given final approval. Otherwise, permissible section formation and the necessities on which this was based would be undermined.

What is more, the Nord Stream 2 pipeline and the Lubmin 2 natural gas receiving terminal with ancillary facilities as well as sections of the EUGAL are essentially being planned across states and countries in parallel planning procedures and according to the applicable authorisation processes and are to be constructed in a single operation in each case. Any problems arising in subsequent sections have been taken into consideration. This ensures that the project developer – and this can also be regarded as a reflection of the principle of problem-solving in plan approval processes – is able to implement a gradual approach that is especially efficient and effective for large-scale projects, with the associated advantage of the prompt realisation of the various subsections.

B.4.2.3 Projection

In the formation of sections, consideration should also be given to whether there are any foreseeable insurmountable obstacles to the project as a whole and thus in planning the subsequent route sections in practical or legal terms. For this purpose, case law has developed the requirement of a projection in the form of a "provisional positive overall assessment" based on objective facts (BVerwG judgment of 15.12.2016, 4 A 4.15, juris para. 29; BVerwG judgment of 06.11.2013, 9 A 14.12, juris para. 151; BVerwG judgment of 11.07.2001, 11 C 14.00, juris para. 21; BVerwG decision of 23.11.2007, 9 B 38.07, juris para. 20; BVerwG judgment of 19.05.1998, 4 A 9.97, juris para. 69 et seq.; BVerwG judgment of 28.02.1996, 4 A 27.95, juris para. 31; BVerwG judgment of 08.06.1995, 4 C 4.94, juris para. 68). This is because an overall plan that is objectively confronted with insurmountable obstacles in its implementation fails to fulfil its constitutive mission. If the overall planning is objectively unfeasible from the outset, it cannot be approved.

In terms of the projection of the planning for the entire route of Nord Stream 2, it is determined that the realisation of Nord Stream 2 is not confronted with any insurmountable obstacles either from a national or international point of view; the feasibility of these sections is not ruled out based on a summary appraisal of the facts. It is also determined that the overall energy policy strategy pursued, consisting of the Nord Stream 2 project, the Lubmin 2 natural gas receiving terminal and EUGAL does not face any insurmountable obstacles from the point of view of the present plan approval section.

B.4.2.3.1 Nord Stream 2

For the Nord Stream 2 project, an application was submitted within the German area of responsibility to the Stralsund Mining Authority for plan approval for the area of the

12 nautical mile zone and the mainland, and an application for approval was also submitted under mining law according to Section 133 Paragraph 1 clause 1 no. 1 BBergG as well as to the Federal Maritime and Hydographic Agency regarding regulations pertaining to the use and utilisation of the waters over the continental shelf and the air space over these waters according to Section 133 Paragraph 1 clause 1 no. 2 BBergG for the construction and operation of a transit pipeline.

The issue of approval according to Section 133 Paragraph 1 clause 1 no. 2 BBergG for the section of the Nord Stream 2 pipeline situated within the German continental shelf is to be carried out by the Federal Maritime and Hydrographic Agency soon, according to that authority (cf. communication dated 25.01.2018). Risk to the life or health of persons or objects or damage to overriding public interests, in particular a case according to Section 132 Paragraph 2 no. 3 BBergG which might lead to the approvals applied under Section 133 Paragraph 1 BBergG being dismissed, since they cannot be prevented or compensated for by time limitation, conditions or requirements (cf. application document, Part A.01, Chapter 5.4.3), do not pose a prognostically insurmountable obstacle to the section of Nord Stream 2 located in the EEZ. The same applies to approval under mining law according to Section 133 Paragraph 1 clause 1 no. 1 BBergG. On 02.11.2017 (Ref.: 663/NordStream2/Section 133, Reg. no. 3622/17) the Stralsund Mining Authority already issued a partial approval for the construction of Nord Stream 2 in the area of the German continental shelf under mining law. Issue of the approval for the construction and operation of Nord Stream 2 for this section according to Section 133 Paragraph 1 clause 1 no. 1 BBergG is imminent. Since the Stralsund Mining Authority and the Federal Maritime and Hydrographic Agency conducted the respective approval processes in close collaboration and the application documents were valid for both the plan approval procedure and the permits under Section 133 Paragraph 1 clause 1 BBergG, the Stralsund Mining Authority is also aware of the lack of insurmountable obstacles in the section of the German continental shelf from its own perspective.

In addition to the above observation, the application documents contain an examination of the question as to whether construction of the Nord Stream 2 pipeline is confronted with insurmountable obstacles (cf. application document, Part A.01, Chapter 5.5.1; application document, Overall planning projection). The documents conclude this is not the case. The Stralsund Mining Authority agrees with this conclusion. In terms of the route sections which fall under the jurisdiction of other states, namely Denmark, Sweden, Finland and Russia, no insurmountable obstacles to approval can be detected from the outset. In the above countries, the variously required applications for approval of the project section located in the respective territory have been submitted (cf. application document, Part A.01, Chapter 5.5.1; application document, Part "Overall planning projection", Chapter 2-5). What is more, it emerges from the status of the approval procedures outlined in detail in Section B.2.2 (cf. also application document, Part "Overall planning projection", Chapter 2-5) that issue of approvals in the above-mentioned countries is imminent in each case. This applies to the route section in Denmark regardless of whether the Nord Stream 2 pipeline runs through the Danish 12 nautical mile zone as currently planned or, as a result of the change in legislation described in Section B.2.2 relating to the powers of the Danish approval authorities and their application, has to be re-routed to the Danish EEZ (cf. application document, Part "Overall planning projection", Chapter 5). For the sake of completeness, it should be pointed out that re-routing in Denmark would probably not lead to a different routing in Germany (EEZ and 12 nautical mile zone) (PD information dated 15.12.2017). In the course of

the Swedish approval procedure, any potential impact of the construction and operation of the Nord Stream 2 pipeline on the newly proposed Natura 2000 Area "Hoburgs Bank and Norra Midjsöbanken" in the Baltic Sea has been taken into account (cf. application document, Part "Overall planning projection", Chapter 4). The natural gas infrastructure required on the Russian side to feed the natural gas to the starting point of Nord Stream 2 has also been already constructed and is in operation or will be commissioned no later than the planned commissioning of Nord Stream 2 in 2019 (probably in the 3rd quarter) (cf. also Section B.2.2 on this point).

The assessment that the project does not face any insurmountable obstacles from the outset is based firstly on experience gained from the Nord Stream project and the insights drawn in this context regarding ways of reducing any negative impact caused by the project, for example in terms of the ecosystem, and secondly based on the environmental impact assessment carried out according to the Espoo Convention for the entire Nord Stream 2 project (cf. in particular application document, Part J.01, Chapter 7-10), Strategic Marine Planning (cf. application document, Part J.01, Chapter 11) and the pipeline planning and construction approach for the sections of the Nord Stream 2 pipeline situated outside German jurisdiction as set out in document J.01. The documents submitted to the Stralsund Mining Authority as part of the Nord Stream 2 plan approval procedure take into account not just issues relating to the environmental impact of the project, species/habitat protection and nature conservation but also other matters which could potential pose insurmountable obstacles to the project. The Stralsund Mining Authority was involved in the Espoo process. This did not give the plan approval authority any reason to believe that the project was confronted with an insurmountable obstacle.

As such, the Nord Stream 2 project does not face any insurmountable obstacles as matters currently stand.

B.4.2.3.2 Lubmin 2 natural gas receiving terminal / EUGAL

For the sake of clarity, it should first be noted that the Nord Stream 2 project is a self-contained project that is being operated by a different project developer to that of the Lubmin 2 natural gas receiving terminal and EUGAL project considered below. Nevertheless, the Mining Authority also applied the aforementioned principles developed by jurisdiction in relation to section formation, since the Nord Stream 2 project would not have any meaningful energy management function on its own, without construction of the onshore natural gas receiving terminal Lubmin 2 and/or EUGAL (cf. application document, Part A.01, Chapter 1, 3.2.4, 5.3.2.7.2, 5.5). It was necessary to do justice to these functional interdependencies.

For this reason, the Mining Authority examined whether any insurmountable legal or practical obstacles face the other projects of the overall energy management strategy of which the Nord Stream 2 project forms a part, from the point of view of the present plan approval section for the area of the 12 nautical mile zone and the landfall point on the mainland. This is not the case.

The natural gas receiving terminal Lubmin 2 project is currently undergoing plan approval. The consultation procedure (cf. Section 73 VwVfG M-V) has already been completed. According to this, there are no legal or practical obstacles facing the Lubmin 2 natural gas receiving terminal project as things currently stand.

The EUGAL project is undergoing plan approval in relation to all sections; the various consultation procedures are currently in progress. In the federal states of Brandenburg and Saxony, regional planning processes have been carried out for all sections of the EUGAL. Environmental impact assessments were integrated in the regional planning procedures. The EUGAL project developer has been presented with positive regional planning assessments for the project as a result of the regional planning process. Based on these positive regional planning assessments, planning has been optimised in the subsequent planning stage, also by undertaking FFH compatibility assessments and compilation of reports under species protection law, consequently specifying and setting out in greater detail any issues relating to the law of habitat and species protection. Section formation is based on the responsibilities of the various authorities in the individual federal states. As such, the feasibility of the project was examined both in terms of the project as a whole and the individual sections.

All insights available to the Stralsund Mining Authority from the above planning stages were also incorporated in the assessment of the Nord Stream 2 project in the Mecklenburg-Western Pomerania plan approval section. Here, the Stralsund Mining Authority did not limit itself to simply considering the area which falls within its own responsibility, i.e. the natural gas receiving terminal Lubmin 2 project and EUGAL up to the state border of Mecklenburg-Western Pomerania. The Stralsund Mining Authority also referred to the application documents required for assessment of the Nord Stream 2 project in the Brandenburg, Dresden and Chemnitz plan approval sections as submitted by the project developer GASCADE, as well as assessing information on the section in the Czech Republic (cf. Section B.1.3). The Stralsund Mining Authority thus incorporated all relevant insights drawn from the above documents in the assessment of approval of the Nord Stream 2 project.

Based on the above examinations it is determined that no insurmountable legal or practical obstacles confront the natural gas receiving terminal Lubmin 2 and EUGAL project. The plan approval authority therefore believes that it is neither evident nor certain that the Nord Stream 2 project faces insurmountable legal or practical obstacles in its subsequent course.

B.4.3 Variant selection/decision

As part of the examination of alternatives, both technical and spatial variants were considered, the latter taking into account general planning principles, technical, environmental and regional planning aspects differentiating between the offshore and onshore pipeline route and the receiving facility, taking into account any impact on private property The examination included the application documents (cf. for example application document, Part A.01, Chapter 6; application document, Part B.01; application document, Part J.01, Chapter 0.4.4, 0.5, 5.4.6, 5.5.1.1), the statements submitted on these in the course of the consultation procedure and the outcome of the discussions. The result of the examination that there is no reasonable alternative. The examination allowed for the fact, for example, that it is possible to rule out at an early stage those route variants which a rough analysis showed to be less appropriate; alternative pipeline routes which might be seriously considered were examined and objectively weighed up against one another. Clarification of the matter was undertaken to the extent that this seemed necessary in order to arrive at an objective decision and to ensure an effective process was followed (cf. BVerwG judgment of 15.12.2016, 4 A 4.15, juris para. 32; BVerwG

judgment of 09.06.2004, 9 A 11.03, juris para. 57; BVerwG decision of 05.03.2003, 4 B 70.02, juris para. 15; BVerwG decision of 20.12.1988, 7 NB 2.88, juris para. 22, established case law). Furthermore, when it came to variant selection, routing principles were taken into account in accordance with their appropriate weighting, in particular the clustering option whereby multiple linear infrastructures are to be kept as parallel as possible (cf. BVerwG, verdict dated 15.12.2016, 4 A 4.15, juris marginal note 35; BVerwG judgment of 30.05.2012, 9 A 35.10, juris para. 31 et seq.; BVerwG decision of 22.07.2010, 4 VR 4.10, juris para. 30 et seq.; BVerwG decision of 15.09.1995, 11 VR 16.95, juris guiding principle 1 and para. 30 et seq.).

Other planning principles used are the separation requirement (cf. Section 50 BImSchG), whereby incompatible and conflicting uses are to be kept geographically apart wherever possible, and the requirement to ensure that the pipeline length is kept to a minimum (cf. application document, Part B.01, Chapter 5.1; cf. also application document, Part "Derivation of the pipeline route in the German area of responsibility", Chapter 2). The assessment criteria for meeting the general planning principles are shown in Tab. 5-1 of the application document, Part B.01, Chapter 5.1. The planning principles and comparative criteria to be given particular consideration in relation to the offshore pipeline route, the receiving terminal and the onshore pipeline route as well as assessment criteria relating to technical matters and the use of private property are described in Chapter 5.2 of the application document, Part B.01, and summarised in Tab. 5-2 (Chapter 5.2.2), 5-3 (Chapter 5.2.3) and 5-4 (Chapter 5.2.4.1). The general environmental impact of the Nord Stream 2 project in terms of construction, facilities and operation are examined in the application document, Part B.01, in Chapter 3.4, according to protected assets and separately according to the offshore route and onshore impact. The environmental planning principles and comparative criteria are set out in Chapter 5.3 of the application document, Part B.01, and are described and also summarised in table form, separated according to offshore pipeline route section, receiving terminal and onshore pipeline route section, in Chapters 5.3.2-5.3.4 (cf. application document, Part B.01, Tab. 5-5 in Chapter 5.3.2, Tab. 5-6 in Chapter 5.3.3 and Tab. 5-7 in Chapter 5.3.4), whereby a distinction is drawn between planning principles which cannot be fulfilled or can only be fulfilled by means of specially approved exceptions, and weighting criteria which can be weighed against other issues. In this chapter, protected assets mentioned in UVPG are considered under material law, also in terms of impairment of Natura 2000, nature conservation and landscape conservation areas (cf. Sections 23, 26, 34 BNatSchG), prohibitions under species protection law (cf. Section 44 BNatSchG) and the impairment of FFH habitat types, also from the point of view of land consumption. The regional planning principles and comparative criteria taken into account (goals and principles of regional planning) are also set out, likewise according to the above differentiation according to the project elements, in Chapter 5.4 of the application document, Part B.01, and set out in summary form there in Tab. 5-8 and 5-9.

For regional planning purposes, a target area was initially selected. Based on the results found, large-scale route corridors were initially considered and then finally, building on this, small-scale alternative routes were examined, whereby alternatives were ruled out at each planning level that were preferable and/or not tolerable (cf. application document, Part B.01, Chapter 4.2.4, Chapter 9.3).

B.4.3.1 Target areas

Based on the fact that the Nord Stream 2 pipeline – following the clustering principle of the Nord Stream pipeline – is routed from the east into the 12 nautical mile zone (cf. on this point also the application document, Part "Derivation of the pipeline route in the German area of responsibility", Chapter 3, 4.1), the entire coastline can theoretically be considered from the Bay of Lübeck in the west as far as the Polish border in the east. Conceivable landfall points therefore lie either west of Rügen or in the Bay of Pomerania, east of Rügen.

The conceivable target areas west of Rügen or in the Bay of Pomerania were described based on the planning principles and comparative criteria set out above and set out in comparative form in Tables 6-2 (general planning principles), 6-3 (technical criteria), 6-4 (environmental criteria) and 6-5 (regional planning criteria) (cf. application document, Part B.01, Chapter 6.2).

There are both technical and environmental arguments against the target area west of Rügen. For example, if the pipeline came ashore west of Rügen, a huge soil replacement would be required of approx. 3 to 12 million m³ to create a load-bearing subsurface, whereby it would not be possible to ensure acceptable procurement of a sufficient quantity of replacement material. In addition, it would be necessary to carry out a trench excavation in shallow water and in shipping areas, with a volume of approx. 3 to 6 million m³. Disposing of the excavated soil (mud) onshore would not be feasible to the extent required. The excavation would also mobilise pollutants (heavy metals) trapped in the mud. The pipeline leading into the target area west of Rügen would have to be directed (and buried) to run parallel along the Kadetrinne shipping lane, which is used by approx. 50,000 to 69,000 ships per year, thereby resulting in impairment of the safety and ease of shipping during the construction of Nord Stream 2 as well as generally resulting in conflicts with the aim of the regional planning goal of "priority shipping areas". According to assessments undertaken by the German armed forces, routing into a target area west of Rügen would impinge in an unacceptable manner on military interests and the requirement to coordinate with defence interests, specifically with military training areas, thereby countering one of the goals of regional planning. The Stralsund Mining Authority agrees with this assessment. Other routing options west of Rügen are ruled out due to the requirement to bypass existing or priority-designated offshore wind farms to the north, the necessity of bypassing the munitions sinking zone in the Plantagenetgrund area and bypassing of the coastal protection priority areas as designated by LEP M-V. Also, any pipeline section leading into the target area west of Rügen will be at least 200 km longer than those leading into the Bay of Pomerania. The former are also subject to limitations in terms of their capacity to be clustered with existing infrastructure lines and result in both offshore and onshore crossing of FFH areas. A sufficiently large area to construct the receiving terminal would be available in the target area west of Rügen, namely west of Rostock, but this would not be located in a pre-established industrial area and would therefore conflict with regional planning goals. By contrast, there are several landfall points available within a pre-established industrial environment east of Rügen. Starting from a landfall point west of Rügen, a distance of 50 km has to be overcome before reaching the nearest available high-pressure natural gas pipeline NEL and a distance of at least 200 km until the OPAL is reached; in each case private property would be affected.

As such, the plan approval authority is of the conviction that a comparison of the determined alternatives indicates that routing of the pipeline into the target area west

of Rügen is significantly disadvantageous even at the offshore stage and is an unreasonable option as compared to landfall in the Bay of Pomerania. The alternative of landfall in the target area west of Rügen is therefore ruled out in preference for the alternative of landfall in the Bay of Pomerania. In addition, the above alternative would involve a much longer onshore pipeline route with the relevant impact on the ecosystem and on private property.

B.4.3.2 Large-scale variants

On a large scale within the Bay of Pomerania, routing via Rügen / Mukran was also considered in addition to the approved variant of routing through Bay of Greifswald (cf. application document, Part B.01, Chapter 7). The alternative route corridors are shown in Fig. 7-2 of the application document, Part B.01, Chapter 7.1.3. Furthermore, as a third variant, pipeline routing was considered via Usedom (cf. application document, Part B.01, Chapter 7.2).

The above alternative routes are compared, as was the case in the selection of target areas, in terms of the general planning principles set out in the application document, Part B.01, Chapter 4 and 5, the technical criteria, the extent to which private property is affected and also in terms of environmental and regional planning criteria, whereby a distinction was once again drawn between the offshore pipeline section, the receiving terminal and the onshore pipeline section (cf. application document, Part B.01, Chapter 7.2-7.5).

The alternatives to landfall in the Bay of Greifswald and Rügen/Mukran were initially assessed in detail (cf. application document, Part B.01, Chapter 7.3 and 7.4) and subsequently compared to each other in the form of a criteria-based variant comparison (cf. application document, Part B.01, Chapter 7.5). The decision matrices for the individual criteria are shown in Chapter 7.5 of the application document, Part B.01 in Tab. 7-11 to 7-18. Previously, the alternative pipeline routes running via Usedom were examined, assessed and ruled out (cf. application document, Part B.01, Chapter 7.2); crossing the Bay of Pomerania, the island of Usedom and the Peenestrom is not to be given preference over the alternatives of crossing the Bay of Greifswald with landfall near Greifswald or landfall on Rügen/Mukran due to the significant technical, environmental and regional planning conflicts involved in the Usedom variants. This can be gleaned from the criteria-based comparison undertaken for this purpose for the Usedom variants (Option 1 and 2), the outcome of which is summarised in the decision matrices of Tab. 7-1 to 7-4 of the application document, Part B.01.

The conceivable offshore pipelines sections of the Usedom alternative (Option 1 and 2) are set out in in Figure 7-3 (cf. application document, Part B.01, Chapter 7.2.1). The following aspects are also arguments against a pipeline section via Usedom in the considered Options 1 and 2 (cf. application document, Part B.01, Tab. 7-1 to 7-4 in Chapter 7.2.1-7.2.3 and Chapter 7.2.4): On the island of Usedom, there are no areas near the coast which are currently designated for industrial/commercial use in terms of planning and/or current practice; there is also a lack of sufficient infrastructure which would permit construction site management. On the island of Usedom, there is therefore no landfall option which would allow the construction and operation of the necessary receiving terminal.

Routing to Usedom leads to conflicts with offshore regional planning goals since such routing would either cross military training areas and newly intersect these

(Usedom Option 1) or else cross the FFH area "Greifswalder Boddenrandschwelle and Parts of the Bay of Pomerania" along a length of approx. 10 km, and therefore run through biotopes along its entire length which are to be attributed to the habitat type 1170 "Reefs" (Usedom Option 2). On the other hand, the alternative of landfall in the Bay of Greifswald only crosses reef areas along a length of approx. 4 km. In addition, there are no suitable landfall possibilities and no sufficient logistical infrastructures which would allow reliable construction in a seemingly reasonable manner. Assuming a landfall option on Usedom, between Karlshagen and Trassenheide, the onshore route section – in addition to other conflicts – would either result in considerable construction risks, in the case of construction of a micro-tunnel, or, if no micro-tunnel were used, environmental conflicts such as a breach of the prohibition to impact on Natura 2000 areas

Other arguments against landfall on Usedom are the regional planning resolutions for the island as a focus area for tourism and the regional planning goal that priority is to be given to internal development over external development if interior areas are available elsewhere under planning law. Landfall on the island of Usedom is therefore not only not preferable it is also unacceptable due to the lack of suitable areas in which to construct the receiving terminal and because of the other conflicts and difficulties indicated.

The comparison based on evaluated pipeline route alternatives for landfall according to the criteria described above for landfall in the Bay of Greifswald or on Rügen near Mukran indicates that the pipeline route alternative in the Bay of Greifswald is to be given preference over the alternative routings to Rügen/Mukran (Option 1 or 2) and that other alternatives are unreasonable. This is based in particular on the following considerations: Even in the only industrial area which can be considered on Rügen, the port of Mukran, there is not a sufficient amount of space available on which to construct the receiving terminal.

In terms of regional planning, the alternative of Rügen/Mukran gives rise to conflicts with the installation of port-related commercial enterprises and also with tourist usage, which is very important to Rügen. In addition, the onshore routing via Rügen/Mukran impacts on more private property over a distance of at least 68 km up to integration in the NEL and over another approx. 25 km until the OPAL is reached than is the case with the alternative routing via the Bay of Greifswald. What is more, the Rügen/Mukran alternative would require crossing of three coastlines from an onshore point of view, including the Strela Sound, involving considerable construction risks; by contrast, the Bay of Greifswald alternative involves landfall directly on the mainland and therefore only a single coastline crossing, which is unavoidable in the case of offshore projects. In terms of the offshore pipeline section, it is especially significant to note that the Rügen/Mukran variant involves a new fragmentation of the military training areas that is not compatible with the interests of the German armed forces and is not acceptable in view of the security situation and defence readiness of alliance partners, whereas in the case of the Bay of Greifswald alternative, parallel routing with the Nord Stream pipeline does not involve any new fragmentation of military training areas.

The longer offshore pipeline route variant through the Bay of Greifswald runs entirely through Natura 2000 areas, but at the same time it is located in marine priority areas reserved for supply lines. What is more, the FFH habitat types and marine biotopes are only subject to local intensive impairment through construction work; any significant impairment under habitat protection law can be ruled out. Due to the fast

regeneration of benthic flora and fauna, the overall impact is only temporary. The offshore section of the Rügen/Makran route alternative runs 77% within Natura 2000 areas and outside marine pipeline lanes and marine priority areas reserved for supply lines.

In terms of the onshore pipeline route, it cannot be ruled out at that landfall at Rügen/Mukran would involve significant impairment of the FFH area "Kleiner Jasmunder Bodden with peninsulas and Schmaler Heide" (DE1547-303); other Natura 2000 areas would be crossed, involving permanent impairment of habitat types as well as the risk of committing breaches under species protection law as well as the certainty of conflicts arising under species protection law. The onshore section of the Rügen/Mukran alternative also results in impairments (Option 1) or breaches (Option 2) of regional planning goals. For these and other reasons (e.g. impairment of shipping during the construction period), the variant with landfall in Sassnitz/Rügen mooted in the course of the public participation process is also ruled out.

These disadvantages of a routing via Rügen/Mukran are so severe that this variant is ruled out as unacceptable. The plan approval authority accepts the fact that the routing through the Bay of Greifswald also has disadvantages such as routing through the FFH area and the requirement of having to install the pipeline in an excavated trench over a lengthier distance; however, these are to accepted as tolerable in view of the legal assessments of the arguments against Rügen/Mukran. Due to its 90% parallel routing with the Nord Stream pipeline, the Bay of Greifswald variant also adheres to the clustering principle, it is the routing alternative with the shortest total length – considering offshore and onshore sections together – and, unlike the Rügen/Mukran alternative, it meets the separation requirement.

The preferred route via the Bay of Greifswald, defined as the result of the comparison of variants, emerges as the best and only tolerable pipeline route overall in terms of the offshore pipeline section, the receiving terminal and the onshore pipeline section when environmental, regional planning, technical and private ownership criteria are taken into account in combination with general planning principles.

B.4.3.3 Small-scale variants

Having established that the Bay of Greifswald alternative is the preferred large-scale variant after consideration of the Bay of Pomerania target area, small-scale pipeline route variants were examined with regard to potential landfall areas, namely the landfall areas of Lubmin and Vierow (cf. application document, Part B.01, Chapter 8). The alternative pipeline corridors are identical from the starting point at the border to the German EEZ up to the forking point at KP 75: the route corridors diverge from the forking point as shown in Figure 8-1 of the application document, Part B.01, Chapter 8.

The above alternative routes were compared, as was the case in the selection of the large-scale variant, in terms of the general planning principles set out abstractly in the application document, Part B.01, Chapter 4 and 5, the technical criteria, the extent to which private property is affected and also in terms of environmental and regional planning criteria, whereby once again a distinction was once again drawn between the offshore pipeline section, the receiving terminal and the onshore pipeline section (cf. application document, Part B.01, Chapter 8.1-8.3). The routing

alternatives to Vierow and Lubmin were initially assessed in detail (cf. application document, Part B.01, Chapter 8.1 and 8.2) and subsequently compared to each other in the form of a criteria-based variant comparison (cf. application document, Part B.01, Chapter 8.3). The decision matrices for the individual criteria are shown in Chapter 8.3 of the application document, Part B.01 in Tab. 8-20 to 8-27.

Based on the comparison of the small-scale alternatives of Vierow and Lubmin conducted according to the above-mentioned criteria, it was determined that the routing to Lubmin with a closed coastline crossing by means of a micro-tunnel is preferable to routing to Vierow because the former is the alternative which has the least negative impact on the ecosystem as well as on other usage claims. This is based in particular on the following considerations: The high-pressure gas pipeline leading to Lubmin is the preferable variant according to general planning principles, since it is approx. 3.4 to 4.1 km shorter that the pipeline routing to Vierow, so the former also involves less use of land space and less soil excavation volume. In addition, it ensures maximum clustering of the route to Lubmin with the Nord Stream pipeline as well as with existing supply lines, both offshore and onshore. In addition, routing to Lubmin offers consistently load-bearing soil throughout while routing to Vierow would involve replacement of some 4 km of soil with external material due to insufficient load-bearing capacity.

It is true that both landfall in Lubmin and landfall in Vierow require resolution of existing conflicts in the landfall area by means of constructing a micro-tunnel. However, while in the case of landfall in Lubmin this passes underneath the beach and a protected coastal wood, is only some 700 m long, uses the latest technology, does not involve unacceptable construction risks and requires only some 90 days more construction time than a coastal crossing in open construction, whereas landfall in Vierow involves passing underneath a preceding reef of a distinctive nature by means of a micro-tunnel measuring some 1,200 m in length. Construction of the micro-tunnel in the Vierow variant requires extension of the offshore section. What is more, boring a tunnel of this length not only requires an exceptional technical solution, which also incurs high costs and requires the overall construction period within the German section of to be extended by almost one year, it also involves a significant risk in terms of construction technique since it passes through cohesive soil with very varied grain sizes. In addition, the Lubmin alternative allows the NEL to be reached with a pipeline length of 120 m; unlike the Vierow variant, therefore, it is not necessary to construct a separate gas pressure regulation and measurement facility. The Vierow alternative would be technically feasible, but due to the above reasons the Lubmin alternative is the preferable variant both in terms of the offshore and onshore pipeline routing.

What is more, the Vierow alternative involves interventions in private property, both in the construction of the receiving terminal and also in terms of the subsequent onshore pipeline route. Freehand acquisition of the areas for the receiving terminal can be ruled out.

The Lubmin variant impacts less on habitat types relevant to FFH areas and legally protected biotopes than the Vierow variant in the offshore section, whereby there is less impact if a micro-tunnel is constructed than if the coastline is crossed by means of an open trench.

Construction of the receiving facility at the Vierow site also shows disadvantageous effects on both human and landscape protection assets due to the nature of the

construction process and the facilities since the installation would have a visual impact due to the lack of visually sheltering landscape elements, in spite of observing an 800-metre distance from the nearest populated area with an exclusively residential function. By comparison, positioning of the receiving terminal at the Lubmin site takes up some 4 ha more space but does not involve such a visual impact since it is situated inside a wooded area which has a sheltering effect. In the Lubmin variant, due to the existing sheltering effect of the vegetation structure, there is only a temporary, short-distance impact of low to medium intensity on the nearest areas of the town of Lubmin with sole residential function situated approx. 980 m away; this impact is due to construction in the form of noise, pollutant and dust generation as well as visual agitation.

As the Vierow pipeline alternative route is longer, it also involves more use of land within the Natura 2000 areas, FFH habitat types and protected marine biotopes; this impact can be reduced due to the closed coastline crossing, but this is still less preferable than the land use involved in the Lubmin alternative with an open coastline crossing. Coastline crossing by means of a micro-tunnel in the Lubmin alternative results in less use of the above land types and habitat types. In particular, crossing non-load-bearing soil (mud area) in the Vierow alternative results in further disadvantageous effects as compared to the Lubmin variant, since along the length of this construction section impairments to the water quality occur as a result of construction, namely sediment turbulence (silt, organic components) and clouding, as well as the release of nutrients and pollutants, and restoration of the original conditions is not possible due to the fact that soil replacement is required. Neither would it possible to restore the FFH habitat type 1170 "Reefs" in the shallow water and the cliff in the beach area of Vierow. The effects of sediment turbulence, clouding and the release of nutrients and pollutants occur in the Lubmin variant too, but in this case the impact is low to very low; in this case it is possible to restore the original conditions. What is more, the Vierow variant does not allow the conditions for an exemption from statutory biotope protection to be fully met. By contrast, the habitat types and legally protected marine biotopes affected in the Lubmin variant can be restored.

In terms of the onshore pipeline route section, arguments in favour of the Lubmin variant include not just the fact that this, like the receiving terminal, is situated in a development area that is covered by a development plan, but also that the length of the pipeline up to the nearest connection lines (NEL, OPAL) is only approx. 120 m. The offshore route section of the Vierow alternative runs for approx. 3.5 km before it reaches the nearest connection lines, passing through hitherto undeveloped land dedicated to agricultural use, it is situated to some extent, like the receiving terminal, inside a high-quality staging area for staging birds, it involves scare effects from construction over up to 300 m on both sides of the projects and it also requires a watercourse to be crossed through swamp-like lowlands and the construction of additional gas pressure regulation and measurement facilities for integration in the NEL, thereby involving additional use of land.

What is more, the offshore section of the Lubmin alternative runs for longer in the priority area reserved for supply lines according to the LEP M-V and comprises shorter intersection lengths with priority areas dedicated to shipping than is the case in the Vierow alternative. Building the receiving terminal in Vierow would make the settlement of port-related industrial and commercial enterprises more difficult, running counter to regional planning goals to a much greater extent than in Lubmin,

since the harbour area in Vierow is much smaller than in Lubmin, and it is only in Lubmin that areas for a receiving terminal have already been incorporated in development plans. In terms of the regional importance of the harbour, Lubmin offers sufficient space for the settlement of (harbour-related) enterprises, so this does not stand in opposition to the construction of the natural gas receiving terminal at this site, especially since the LEP M-V does not require incoming industrial enterprises to be harbour-related here. In regional planning terms, the Lubmin site is not only designated as a (regional) harbour and industrial/commercial site but also as a site to secure and further develop an energy production location that is not based on nuclear fission or the use of coal (Goal No. 5.3 Energy, Section 5 LEP M-V). Since the necessary requirement for the above-mentioned energy production from gas is the presence of high-pressure gas pipelines, Lubmin is, in terms of the overall regional planning perspective, better suited as a site than Vierow, especially considering that in Lubmin it is possible to do justice to the principle of giving priority to interior development over exterior development. Considering the possibilities of linking to the NEL and also the requirement to extend the long-distance network, the Lubmin site – unlike the Vierow site – offers complete clustering with existing long-distance pipelines; at the same time, less space is used in order to establish the link.

The approved variant of Lubmin is thus that which least impacts on area protection and also the preferable small-scale variant taking into account general planning principles, technical criteria and impact on the property of private individuals as well as environmental and regional planning criteria.

B.4.3.4 Technical variants

In addition to the different pipeline routings, various technical alternatives were examined, firstly offshore laying of the Nord Stream 2 pipeline using the S-lay method and secondly using the floating/dragging method applying the J-lay or R-lay technique. Of these pipeline laying methods, the S-lay method – which is the most modern technique for laying offshore pipelines with a large diameter – is the most suitable option for laying the Nord Stream 2 pipeline since it is also excellently suited to the water depths to be found in the area of installation (cf. application document, Part B.01, Chapter 3.3.1).

The digging a trench for the pipeline, required for various reasons, can be carried out either by laying the pipeline in an open trench (so-called pre-lay trenching) or by means of subsequent trenching (so-called post-lay trenching) (cf. application document, Part B.01, Chapter 3.3.2).

What is more, potential variants for coastline crossing were examined, namely coastline crossing in open construction, i.e. by means of an open trench (sheet piling trench), using the HDD method (Horizontal Directional Drilling), using the direct pipe method and coastline crossing by means of closed construction, i.e. by means of a micro-tunnel (cf. application document, Part B.01, Chapter 3.3.3, Chapter 8). Coastline crossing by means of a micro-tunnel is the preferable variant based on the criteria of construction technique, environmental impact and regional planning, in particular for the following reasons and regardless of the spatial routing. Although crossing a coastline by means of an open trench is the most low-risk and reliable type of coastline crossing, it involves underground engineering along the entire length of the coastline crossing, with the resulting impact on the environment (cf. application document, Part B.01, Chapter 3.3.3.2, Chapter 9.2). The environmental impact of the coastline crossing in open construction was therefore examined for the

small-scale variants of Vierow and Lubmin and compared with the impact of the closed coastline crossing, taking the example of a coastline crossing by means of a micro-tunnel. According to this analysis, the coastline crossing in closed construction is especially preferable due to the following reasons. From an environmental point of view, a coastline crossing in open construction in the Lubmin alternative, for example, leads to use of natural coastal forest and protected biotopes (dunes, sandy beach), which can be avoided by means of a closed coastline crossing involving a micro-tunnel. At the Vierow site, too, the coastline crossing using a micro-tunnel would result in less use of space and less movement of soil material and soil excavation (cf. application document, Part B.01, Chapter 8.1.2.3.1.4, 8.2.2.3.1.4).

The use of protected areas for construction purposes (FFH area, EU bird sanctuary, landscape protection area, nationally important wetlands (FnB)) remains at a much lower level with the coastline crossing variant by means of a micro-tunnel as compared to the variant of coastline crossing in an open trench (cf. application document, Part B.01, Chapter 8.1.1.3.2, 8.2.1.3.2). In the Vierow variant, the coastline crossing by means of a micro-tunnel could avoid intervention in FFH habitat type 1110 "Sandbanks", for example, as well as protected marine biotypes according to LUNG 2011 NIF – seabed with fine to medium sands and NIG – stones; in the Lubmin variant the micro-tunnel option fully avoids intervention in the FFH habitat type 1140 "Windwatt" as well as the legally protected marine biotope NIX – "Exposed windwatt with sand and pebbles" (cf. application document, Part B.01, Chapter 8.1.1.3.2, 8.2.1.3.2). Furthermore, in the Vierow variant the use of non-stably restorable FFH habitat type 1170 "Reefs" is reduced by approximately half (cf. application document, Part B.01, Chapter 8.1.1.3.2, 8.1.3.2).

In the Lubmin variant, the coastline crossing by means of an open trench results in the permanent loss of protected coastal woods and thus has a significant environmental impact. In the case of an open coastline crossing, the offshore pile driving for the sheet pile dam results in the disruption of disruption-sensitive species; this can be avoided with the closed coastline crossing. This more than makes up for the fact that the alternative of the coastline crossing by micro-tunnel requires a longer construction period of 50 days and is thus the less preferable alternative in terms of noise emissions, given the period of 200 or 250 days required for construction alone (cf. application document, Part B.01, Chapter 8.2.1.3.2). Generally speaking, the coastline crossing by micro-tunnel has much less impact on protected environmental assets than the open coastline crossing, not least due to the fact that it takes up less space (cf. application document, Part B.01, Chapter 8.1.2.3.1, 8.2.2.3.1). Also, the coastline crossing by micro-tunnel does not impair other infrastructures to be crossed (cf. application document, Part B.01, Chapter 8.2.2.2.2); in terms of regional planning, too, this method enables conflicts to be avoided (cf. application document, Part B.01, Chapter 8.1.2.4.6, 8.2.2.4.4.1).

Of the methods for closed coastline crossing, the HDD technique, the Direct Pipe method and the construction of a micro-tunnel up to a length of some 1,000 m, depending on the individually applicable factors, represent the state of the art in terms of trenchless coastline crossing and do not involve any unreasonable construction risks provided the above total length is observed (cf. application document, Part B.01, Chapter 3.3.3.2). The main argument in favour of a coastline crossing by micro-tunnel is that the wall of the micro-tunnel has the effect of protecting the pipeline by separating it from the soil; by contrast, the product pipe used for the HDD and Direct Pipe coastline crossing methods comes into direct

contact with the surrounding soil. In terms of the coastline crossing by micro-tunnel, pipe production on the pipe-laying barge can be carried out without any use of extra space within the standard area of an industrial manufacturing facility, independently of environmental factors and ensuring a high level of reliability and quality of the pipes produced; by contrast, in the case of coastline crossing using the HDD or Direct Pipe method, a special production line would have to be set up comprising outdoor welding, coating and testing stations which would therefore be weather-dependent in terms of quality (cf. application document, Part B.01, Chapter 3.3.3.2, Chapter 9.2). What is more, the coastline crossing by means of micro-tunnel results all in all in a (somewhat) shorter pipeline route length than the coastline crossing by means of open trench (cf. application document, Part B.01, Chapter 8.3.1, Tab. 8-20). Based on the advantages, the coastline crossing required for the construction of the Nord Stream 2 pipeline is to be effected by means of a micro-tunnel, even if this requires twice the construction time and cost than an open trench, as well as 50% higher costs than the other coastline crossing methods (cf. application document, Part B.01, Chapter 3.3.3.2, Tab. 3-4).

B.4.4 Environmental impact assessment

The construction and operation of the long-distance natural gas pipeline Nord Stream 2 for which plan approval is sought requires an environmental impact assessment (EIA) according to Section 3b Paragraph 1 in conjunction with Section 19.2.1 of Annex 1 of UVPG o. v. The applicable law according to Section 74 Paragraph 2 UVPG is UVPG in the version valid prior to 16.05.2017.

According to Section 2 Paragraph 1 sentence 1 in conjunction with Section 3 Paragraph 1 UVPG, the environmental impact assessment is a dependent component of the plan approval procedure. The environmental impact assessment encompasses the determination, description and evaluation of the impact of the project on the protected assets according to UVPG o. v. According to Section 12 UVPG o. v., the plan approval authority evaluates the environmental impact of the project based on the summary description according to Section 11 UVPG o. v. and takes this evaluation into account in arriving at its decision as to the reliability of the project in terms of its environmental precautions as defined by Sections 1, 2 Paragraph 1 sentence 2 and 4 UVPG o. v. according to applicable laws.

According to Section 6 UVPG o. v., the project developer is required to submit the documents that are relevant to the decision regarding the environmental impact of the project to the authority responsible (plan approval authority) at the beginning of the procedure, and this was done. The content and scope of the required documents are set out in detail in Section 6 UVPG o. v.

The summary of the environmental impact according to Section 11 UVPG o. v. is essentially based on the environmental compatibility study (cf. application document, Part D1.01) and the Landscape Conversation and Management Plan (cf. application document, Part G.01) submitted by the PD (each with the relevant expert assessment, detailed specifications and technical information – application document, Part B.01, B.2.1, B.2.2 and C.1.2 along with the supplementary volume Specifications, Part B.1, B.2.2 and C.3). The summary of the environmental impact and the evaluation of the environmental impact of the project in terms of the protected assets is subdivided for the sake of clarity in to "offshore" for the pipeline route and "onshore" for the landfall. This covered evaluation of the entire range of the environmental effects of the approved project.

Involvement of the authorities and the general public was effected – also on a cross-border basis – by way of the consultation procedure (Sections 7, 8, 9, 9a UVPG o. v.). In addition to the environmental compatibility study (ECS) and the Landscape Conservation and Management Plan (LCMP) including supplementary specifications and the various consultant reports and specifications on which these were based, the plan approval authority took into account the statements and comments made by those involved in the procedure, the "Documentation relating to the Nord Stream 2 Environmental Compatibility Study for the Consultation according to the Espoo Convention" and the results of its own investigations in examining the environmental impact of the project.

B.4.4.1 Summary of the environmental impact of the project (Section 11 UVPG)

This chapter describes the environmental impact of the project as well as measures by which its significant disadvantageous environmental effects are to be avoided, reduced or balanced out. Where significant environmental effects are not balanced out, a description is provided of compensatory and substitute measures.

B.4.4.1.1.1 Potential construction-related factors

The potential construction-related factors considered focus on the offshore pipeline corridor, the marine interim storage site and the offshore shipping routes for the offshore construction site as well as the onshore construction area in the various applicable zones.

- Temporary onshore use of space (creation of construction site access routes and construction site set-up areas, assembly and storage areas), in particular the resulting loss of habitat, changes of habitat, upper soil loss, soil compression, barrier and trap effects
- Changes to the surface morphology/sediment sequence caused by offshore excavation and pipe-laying work, in particular the resulting loss of habitat, changes in habitat, release of suspended sediment (turbidity plumes), release of nutrients and pollutants through re-suspension of sediment, impact on currents, increase or reduction of sedimentation, any damage to or loss of hitherto undiscovered cultural or other assets, closure of the construction area to other users (e.g. fishery or shipping)
- Noise emissions during the construction period and tremors, in particular scare effects on animals (also caused by underwater noise), change in residential and leisure functions and the visual impact of the landscape
- Visual disruptions caused by construction work, in particular scare effects or attraction of animals (e.g. caused by construction site lighting), changes in the visual impact of the landscape or in its residential/leisure function
- Air pollutant and odour emissions during the construction period, in particular changes to the air quality situation, the residential and leisure function and the visual impact of the landscape
- Water retention measures, leading to impact on aquifers and groundwater dynamics

- Introduction of water required for construction to surface waters (in particular groundwater extracted from underground, and water used for pressure testing of the pipeline in the area of the pig receiving station), potential introduction of pollutants to surface waters as a result
- Any handling loss (waste, pollutants), leakage, refuse created during construction work
- Restoration after the operation phase: the facilities of the Nord Stream 2 pipeline are planned to operate for at least 50 years (cf. application document, Part C.01, Chapter 1.2.1.3, p. 37). The effects of renaturation are comparable to those of the construction phase.

B.4.4.1.1.2 Potential facility-related factors

- Onshore use of space by newly built facilities and paving areas and clearance of a security area on both sides of the terrestrial pipeline where higher growth is involved, in particular the resulting loss of soil, changes in the horizon, changes in soil properties, habitat loss, changes in groundwater recharge, barrier effects, closures, limitations, potential risks and impairments in relation to other uses
- Visual disruptions caused by the facilities, in particular the resulting changes in the visual impact of the landscape, fragmentation and scare effects or attraction of animals (the latter as caused by facility lighting)
- Pipelines in sea waters, in particular resulting in permanent change to the sediment structure and morphology of the seabed as well as closures, limitations, potential risks to other uses
- Pipelines lying on the seabed, in particular resulting in changes to local current pattern and settlement by sea organisms
- Substance release from the material of the sacrificial anodes and the coating at the welded seams of the pipeline segments

B.4.4.1.1.3 Potential operation-related factors

- Noise emissions caused by facility operation as well as by monitoring, repair and maintenance work on land and at sea (in particular the noise of the gas flowing through the pipelines, blow-out unit operation, traffic noise)
- Visual disruptions caused by facility operation as well as by monitoring, repair and maintenance work on land and at sea (in particular lorry traffic and shipping, light)
- Air pollutant and odour emissions caused by facility operation as well as by monitoring, repair and maintenance work on land and at sea
- Temperature differences between the pipelines containing the gas and the marine environment surrounding them, in particular the resulting change in temperature conditions in the sediment/sea water
- Disruptions during operation, in particular flushing of the pipeline

B.4.4.1.2 The protected asset of the community and public health

In evaluating the impact of the project on the community and public health, aspects are to be taken into account which are relevant and sensitive in terms of residential and residential environment functions as well as leisure functions within the potential area of impact of the project. Protection of public health is an aspect of particular importance here. Other usage functions (fishery and shipping) are considered under the protected asset of cultural heritage and other property (cf. Section B.4.4.1.8).

B.4.4.1.2.1 Existing conditions and evaluation of existing conditions

B.4.4.1.2.1.1 Existing offshore conditions

Leisure function

Sports shipping is especially relevant as an offshore leisure activity in the area under examination. For sailing boats and motor boats, the Bay of Greifswald offers the advantage that numerous harbours and other attractive destinations are located here at a distance of (less than) one day's travel. In the inner coastal waters (Bay of Greifswald), there is a much higher level of sports boat traffic than on the open sea waters of the Bay of Pomerania. The greater the distance from the coast, the less volume of sports boat traffic there is. The main period of usage is during the tourist season from April to October (cf. application document, Part D1.01, Chapter 3.2.3, p. 111). The most intensely frequented areas are the southern coast of the Bay of Greifswald, the coastal zone around Mönchgut and the areas of the approaches and navigation channels (Landtief, Schumachergrund fairway). As a result of the growing use of Lubmin harbour, there has been an increase in the number of trips made to the latter. Passenger transport is mainly relevant along the coast of Rügen. What is more, Ruden – an island to the north of Usedom – is increasingly accessed from the island of Usedom (cf. application document, Part D1.01, Chapter 5.7.1, p. 444).

According to the Mecklenburg-Western Pomerania Regional Development Programme 2016 (LEP M-V 2016), the coastal waters of the Bay of Pomerania and the Bay of Greifswald are designated as priority marine areas for tourism.

Evaluation of existing conditions

Leisure function

The waters of the Bay of Greifswald, the Boddenrandschwelle and the coastal areas of the Bay of Pomerania are very important from the point of view of maritime leisure use. Off the coasts, the Bay of Pomerania is mainly used by sports shipping as a transit area; for this reason, moderate importance is assumed in terms of the maritime importance in this area (cf. application document, Part D1.01, Chapter 7.5.2, p.453).

B.4.4.1.2.1.2 Existing onshore conditions

Residential and residential environment function

The nearest residential zones to the planned pig receiving station and the landfall area of the pipeline are Lubmin (approx. 1 km away) and Spandowerhagen (approx. 2 km away).

The sea resort of Lubmin mainly consists of loosely distributed individual houses with a high share of residential greenery. The town is largely defined by its tourist infrastructure with shops and restaurants well as as other infrastructural facilities. Various facilities are available near the residential areas for the purpose of leisure. Due to the high level of tourism, the local population is already exposed to sound and light emissions from traffic. The commercial and industrial spaces of B Plan Area no. 1 "Industrial and commercial area Lubminer Heide" are sheltered off from the town itself by means of a noise and visual protection wall which has already been implemented, as well as by means of the surrounding wooded areas (cf. application document, Part D1.01, Chapter 5.7.1, p. 449).

The town of Spandowerhagen consists of residential buildings only, surrounded by spaces dedicated to agricultural use. With the exception of a small harbour and boat hire centre, there are no specifically designated leisure opportunities here. The grounds of the former nuclear power plant and the interim storage facility Nord are located between the town of Spandowerhagen and the project area of the pig receiving station / Nord Stream 2 pipeline, so Spandowerhagen is already subject to visual impairment.

The nearest residential areas to the offshore construction project (pipeline route section) are located on the island of Rügen, namely in the area of the southern tip of Mönchgut peninsula. The town of Thiessow is closest to the Nord Stream 2 pipeline route here (approx. 2 km), while the towns of Klein-Zicker, Lobbe and Göhren are further away from the planned pipeline route at distances of more than 3.6 km.

Thiessow exhibits the typical residential, service and holiday buildings and uses of a Baltic Sea resort. The centre of the town is situated west of the Südpferd barrier beach (moraine elevation), so there is some sheltering from the sea waters with the planned pipeline route.

The shortest distance to the Nord Stream 2 pipeline from the island of Ruden is approx. 5.4 km. The island is only inhabited by a small number of individuals who take care of it. The harbour is situated on the eastern side of the island, on the side facing away from the Nord Stream 2 pipeline route.

The shortest distance from the marine interim storage facility to a town applies to the Baltic Sea resort of Zinnowitz on the island of Usedom (approx. 4.8 km away) (cf. application document, Part D1.01, Chapter 5.7.1, p. 441 et seq.).

Leisure function

Since 1999, Lubmin is the only town situated in the Bay of Greifswald with the status of a recognised sea resort. This status is only granted according to Section 3 No. 3 of the "Gesetz über die Anerkennung als Kur- und Erholungsort in Mecklenburg-Vorpommern" (GVOBI – spa resort law) in the version published 29.08.2000 (GVOBl. p. 486), most recently amended by Article 2 of the Act dated 23.02.2010 (GVOBI. M-V p. 101, 113) if particular criteria are met such as impeccable bathing water quality, climactic properties and a level of air quality which is conducive healing and leisure.

Close to the offshore construction project there are the wooded areas of the Lubminer Heide with hiking and riding trails as well as a bathing beach between the town itself and the Lubmin marina. The area of Freesendorfer Wiesen only has a small number of paths and is barely used for leisure purposes because of its more difficult accessibility. Due to the activities pursued in the commercial and industrial area of Lubmin, as a result of the industrial harbour, the substations/switching station and the traffic associated with these via the L262, there is already some existing exposure to noise. The railway facilities in the area under examination are currently not in use. Existing visual impairments derive from the grounds of the former power plant and the interim storage facility Nord, the Greifswald landfall station, the high-voltage lines and the corridor of the existing pipelines OPAL/NEL (cf. application document, Part D1.01, Chapter 5.7.1, p. 449).

The beach on the eastern and south-eastern side of Mönchgut peninsula, which faces the planned pipeline route, is frequented particularly intensively during the bathing season and used for leisure purposes. The focus areas here, also outside the main season, are the beach sections in the residential areas. The shortest distances to the Nord Stream 2 pipeline route from the Südpferd beach area is approx. 1.6 km. The southern section of the outer coast between Südperd and Lobber Ort is between 1.6 and 4 km away from the pipeline route. The northern part of this coastal section and the beach between Lobber Ort and Nordperd is >3.7 km from the course of the pipeline route (cf. application document, Part D1.01, Chapter 5.7.1, p. 442).

The beach area around Zinnowitz on Usedom is also used intensively by swimmers during the summer. The distance to the planned marine interim storage facility from here is approx. 4.8 km (cf. application document, Part D1.01, Chapter 5.7.1, p. 441 et seq.).

In the Regional Development Programme of Western Pomerania (RREP VP 2010), the town of Lubmin with the areas to the east up to the industrial area Lubminer Heide and the area around Spandowerhagen east of the industrial area are designated as a tourism development area. On the island of Rügen, according to RREP VP, the towns of Thiessow, Lobbe and Göhren form a focus area for tourism along with the entire beach section of Mönchgut peninsula on the eastern side. Zinnowitz on the island of Usedom is also located within a tourism focus area.

According to the Regional Development Programme Mecklenburg-Western Pomerania 2016 (LEP M-V 2016), both Lubmin and Spandowerhagen are designated as priority areas for tourism, along with the surrounding open landscape areas and the entire Mönchgut peninsula as well as the island of Usedom.

In the Expert Landscape Structure Plan Western Pomerania (GLRP VP, LUNG M-V 2009), Lubmin with its landscape area near the coast is described as an "area of outstanding importance in order to secure the leisure function of the landscape". "Special importance" is attached to the wooded areas south of L262. The entire Mönchgut peninsula and the island of Usedom are designated as an "area of outstanding importance in terms of landscape-based leisure".

Evaluation of the existing conditions

Residential and residential environment function

The towns of Lubmin, Spandowerhagen, Thiessow, Klein Zicker, Lobbe, Göhren and Zinnowitz are very important in terms of their residential and residential environment

function, while the open spaces near the residential areas with their garden landscape, harbour facilities etc. are of moderate importance in this regard. Sensitivity to sound and pollutant emissions corresponds to the respective level of importance (cf. application document, Part D1.01, Chapter 5.7.2, p. 452).

Leisure function

The sea resort of Lubmin, the beach area in front of it, and the wooded areas of Lubminer Heide are highly important as tourism development areas for leisure use and thus highly sensitive in terms of noise and pollutant emissions. The Freesendorfer Wiesen area is of lesser importance in terms of leisure use due to its more difficult accessibility.

The municipalities of the Mönchgut peninsula and the island of Usedom, which are regarded as focus areas for tourism, are very important in terms of their leisure function. Sensitivity to noise and pollutant emissions is likewise rated as high in this case (cf. application document, Part D1.01, Chapter 5.7.2, p. 452).

B.4.4.1.2.2 Environmental impact

The approved project results in the following impact on the community, including public health:

B.4.4.1.2.2.1 Offshore

The following offshore environmental effects are to be expected as a result of the project, taking into account the approved avoidance and reduction measure ME1 (observance of statutory provisions to reduce the impact of emissions in the sea area (Mecklenburg-Western Pomerania coastal waters) (cf. application document, Part D1.01, Chapter 6.2.6.2.1, p. 655 et seq.):

Construction-related effects

The visual impact created during the construction phase from mid-May until the end of December only occurs within a short period of time with respect to each pipeline route section and, depending on construction or pipe-laying activity, in several construction phases generally lasting from days to weeks. During the respective construction phase, the excavation and pipe-laying unit is visually "absorbed" to some extent by the existing professional shipping as well as other boat traffic such as sports boats and fishing boats. In particular, however, the pipe-laying barge is significantly more dominant as compared to "normal" shipping in visual terms. The usual shipping in the area of the Bay of Greifswald and east of the adjacent sea waters includes fishery vehicles, smaller ships, sports boats and similar types of boat. The impact of visual agitation on the bay and the zone near the coast is of medium to high intensity over a medium distance and for a short period of time. For the pipeline route sections in the Bay of Pomerania which are further from the coast, only a temporary, slight (short-lived) visual impact is to be expected (in terms of the community and public health, where the primary focus is land-based locations). In terms of light emissions generated by the project, no exceeding of the light emission guideline figures is expected, including in the nearby residential and leisure areas.

Apart from this, short-term effects over medium distances can occur at low to high intensity depending on the distance from the light source. Construction-related effects due to noise emissions occur on a temporary basis over medium distances and with a high to low intensity, depending on the distance from the source of the noise. Noise emissions of high intensity mainly occur when certain items of construction machinery are used, such as large diggers (the noisiest being the backhoe dredgers). The short-term, medium-distance noise emissions of the remaining construction activity is is absorbed within the effects described above at low intensity. During construction work, the ships, construction machinery, vehicles, pumps and other equipment used release various air pollutants. Statutory emission limitations will be observed and short-term effects of low intensity are to be expected over medium distances as a result. Other short-term effects with medium-distance zones of influence and low intensity are caused by transportation movements to supply the construction and pipe-laying work as well as by a safety zone set up around the construction and pipe-laying technology (cf. application document, Part D1.01, Chapter 6.2.6.2.1, p. 664, Tab. 6-45).

Facility-related effects

No impact on the community and public health is anticipated by the Nord Stream 2 pipeline as a result of the facilities (cf. application document, Part D1.01, Chapter 6.2.6.2.1, p. 664, Tab. 6-45).

Operation-related effects

The effects on the protected asset as a result of operation due to external inspections are negligible. When repairs are carried out, comparable effects are to be expected in terms of visual impact, noise and pollutant emissions as during the construction phase, though they will vary in terms of the intensity of impact. The intensity of effect is much lower than during the construction phase and depends on the type of measures to be carried out as well as the size of the pipeline section affected. Very short-term effects over small distances of varying intensity are expected (depending on the type and scope of the repair) (cf. application document, Part D1.01, Chapter 6.2.6.2.1, p. 664, Tab. 6-45).

Details of the above-mentioned avoidance and reduction measures are to be found in the application documents (cf. application document Part G.01, Chapter 9.1, p. 239 et seq.) and in Section B.4.4.1.9.1.

B.4.4.1.2.2.2 Onshore

The following onshore environmental effects are to be expected as a result of the project, taking into account the approved avoidance and reduction measure ME2 (avoidance/reduction due to observance of the statutory provisions on emissions) (cf. application document, Part D1.01, Chapter 6.2.6.2.2, p. 665 et seq.).

Construction-related effects

For the land area, the particularly anticipated construction-related effects are pollutant and dust ingress, visual agitation and tremors. The construction-related impairment of populated areas due to noise depends on the type of use of the areas in question, the intensity of impact (amount of noise), the distance of the areas concerned from the source of noise and the duration and period (night work) of the effect. Residential, residential environment and leisure areas are affected by

construction noise. The project also borders on areas already dedicated to commercial and industrial use. No significant impairment of commercial and industrial areas and areas designated as having a residential environment and leisure function (health hazards to workers/population) as a result of pollutant and dust emissions is anticipated during the construction phase due to the nature of the project, the distance from populated areas, effective aeration of the area and medium-term effects. There may be impairment of leisure areas due to noise, pollutant/dust ingress and visual agitation during the construction phase. Leisures areas in the wider area and in the affected zones are largely difficult to access or subject to existing impairment (partial areas of the Lubminer Heide located closer the project), so medium-term impairment due to noise and visual agitation is rated as low (cf. application document, Part D1.01, Chapter 6.2.6.2.2, p. 669, Tab. 6-46). The statutory limits for light emissions will be observed. Construction-related impacts due to limited accessibility and the interruption of road traffic will not occur. The project area directly affected by construction measures has no significance for leisure use. In the course of commissioning, the existing nitrogen buffer between the pipeline section filled with air and with natural gas above the blow-out unit on the grounds of the pig receiving station will be blown out vertically upwards into the atmosphere. Based on a study carried out for assessment purposes, the impairments arising from this are rated as short-term, medium-distance and generally low (cf. application document, Part D1.01, Chapter 6.2.6.2.2, p. 669, Tab. 6-46). It is also possible that tremor emissions will occur in connection with the planned construction measures in creating a start trench for the micro-tunnel (installation of the sheet wall by means of a vibro hammer and during planned compression work. Impairments due to tremors will be short-term (assessment-related tremors for a duration of 18 days) and over medium distances (cf. application document, Part D1.01, Chapter 6.2.6.2.2, p. 669, Tab. 6-46).

Facility-related effects

The area of the pig receiving station will be lost in terms of possible development as residential space, since it will not be possible to use this space for other buildings. The pig receiving station is to be built in a sub-area of the Lubminer Heide, which will therefore not be available as a recreational area. The space is already subject to impairment due to commercial and industrial facilities in the surrounding area and is located in a zone which has been secured for commercial and industrial usage under urban land use planning (B Plan No. 1 "Lubminer Heide industry and commerce area"). Potential residential and leisure areas will not be lost as a result of the facilities since the area has already been designated for commercial and industrial usage under urban land use planning and is subject to prior impairment (cf. application document, Part D1.01, Chapter 6.2.6.2.2, p. 669, Tab. 6-46).

Operation-related effects

The emissions arising as a result of the low volume of vehicle traffic generated are regarded as being negligible. Visual impairments may be produced as a result of operation due to light emissions from the pig receiving station. In view of existing impairments, the impact is to be rated as low. Potential noise and air pollutants (methane) will occur on a short-term, local basis in connection with blow-out events. The operation-related impact on the community and public health is of low impairment intensity, local and short-term (cf. application document, Part D1.01, Chapter 6.2.6.2.2, p. 669, Tab. 6-46). Operation-related effects caused by monitoring and maintenance work (inspections, checking the state of the outer coating of the

pipeline, the pipe supports, the valves – for leakages – and the electric and hydraulic fittings) are rated as low and only relevant to the immediate vicinity of the pig receiving station. Any impact on populated areas and leisure zones situated are negligible.

Details of the above-mentioned avoidance and reduction measures are to be found in the application documents (cf. application document Part G.01, Chapter 9.1, p. 239 et seq.) and in Section B.4.4.1.9.1.

B.4.4.1.3 Animals, plants and biological diversity

B.4.4.1.3.1 Population and population evaluation

The data basis for the protected assets animals, plants and biological diversity on the offshore, i.e. marine area and the onshore, i.e. terrestrial area was compiled using tested methods on site in the active areas according to the specified survey scope (Mining Authority of Stralsund & BSH 2014, Mining Authority of Stralsund 2016) (cf. application document, Part I1.03, Section 5, pp. 22).

A key principle for evaluating project-related impacts on the flora and fauna is the comprehensive recording and evaluation of the potentially affected biotope types, because this involves a highly integral attribute with significance in terms of the importance of various structures as habitats (biotope function) and because the circumstances of the intervention works are essentially biotope type-related. Furthermore, any special faunistic functions are derived from the particular importance of individual animal species / groups of animal species / animal communities, which are to be taken into consideration as required when investigating the intervention works.

According to section 2 (1) sentence 1 no. 1 UVPG, the biological diversity must also be taken into consideration when evaluating the environmental sustainability of projects. “Biological diversity” is understood to mean the diversity of life on Earth, from genetic diversity to species diversity, to the diversity of the ecosystems. The 1992 Convention on Biological Diversity (CBD) combines three objectives for dealing with biological diversity: the preservation of biological diversity, the sustainable use of its constituents and the equitable sharing of the benefits of the use of genetic resources.

As part of the protected asset of biological diversity, potential (negative) environmental impacts of the project on plants, animals and ecosystems are examined with respect to:

- the genetic diversity (changes/reduction/loss of genotypes of wild species and domesticated forms)
- the species diversity (direct or indirect loss of a species population, impairment of the sustainable use of a species population), and
- the ecosystem diversity (substantial impairment or loss of ecosystems and land-use types and/or of their characteristics structures or processes, impairment of the sustainable use of one or more ecosystem or land-use types by humans in a way that renders the use destructive or unsustainable).

Genetic diversity

Genetic diversity within the species (intraspecific diversity) is, with respect to the objective of preserving the overall biological diversity, of great importance. An illustration is contained in the population description and evaluation for plants and animals in Sections B.4.4.1.3.1.1 (offshore) and B.4.4.1.3.1.2 (onshore).

Species diversity

Species diversity, i.e. the number of species, is examined in the population description and evaluation for plants and animals in Sections B.4.4.1.3.1.1 (offshore) and B.4.4.1.3.1.2 (onshore). In line with the specifications in the anticipated survey scope and the investigations carried out, these describe and evaluate the biotope types macrophytes, macrozoobenthos, fish and cyclostomes, staging birds and marine mammals, along with the amphibians, reptiles, ground beetles, bats, breeding birds and terrestrial mammals for the respective investigation area in both the sea area (offshore) and the terrestrial area (onshore). The determined number of observed species is listed in the submitted environmental impact assessment (cf. application document, Part D1.01, Section 5.5.2.1, p. 250, Table 5-44, Section 5.5.3.1, pp. 253-4, Table 5-46, Section 5.5.3.1, pp. 258-9, Table 5-47; etc.); species diversity is taken into consideration as part of the respective population evaluation in the environmental impact assessment under the criterion “diversity and individuality” (cf. application document, Part D1.01, Section 5.5, pp. 200).

Ecosystem diversity

Since a community is unable to exist without its biotope, it is inevitable that the third level of biological diversity comprises symbiotic unions and their habitats, i.e. ecosystems (Wittig & Niekisch 2014[70]). The diversity of the ecosystems and land-use types in the investigation area was assessed by means of the biotope mapping in the submitted environmental impact assessment (cf. application document, Part D1.01, Section 5.5.1.3, pp. 208) and a corresponding presentation and evaluation of the marine and terrestrial biotopes in section B.4.4.1.3.1.1 (offshore) and B.4.4.1.3.1.2 (onshore).

B.4.4.1.3.1.1 Offshore

Marine biotopes

Population

The marine area is predominantly structured according to the salinity gradient from the more saline area of the 12 nautical mile zone (Bay of Pomerania) to the fresher and less exposed Bay of Greifswald and its shoreline (landfall area). The various seabed conditions that depend on the distribution of the sediments are also relevant

[70] Wittig, R., Niekisch, M. (2014): Biodiversität: Grundlagen, Gefährdung, Schutz. Biodiversity: Foundations, threats, protection. Springer Verlag.

to the biotope types. There is also a significant link between this substrate distribution and the presence of macrophytes and the macrofauna of the benthos, and the presence of demersal, i.e. seabed-dwelling, fish species. Staging or over-wintering seabird species that prefer the benthic species as food also concentrate accordingly in areas where the substrate offers a high density of benthic species, especially large shellfish stocks. For the long-tailed duck and some species of diver, the herring spawn that appears in the spring is also a significant nutritional basis.

The spatial distribution of biotope-forming structures:

Up to the border of the 12 nautical mile zone to the former Oder bed (KP 30 to KP 52), the seabed of the Bay of Pomerania comprises homogeneous fine and medium sands with low silt contents and isolated blue mussel conglomerates. Marl and chalk beds were identified in places. Blue mussel populations were found on individual stones and boulders located in sinks. The depth fluctuates between 18 m and 15 m, so that there is no potential for colonisation by macrophytes.

In the Sassnitz channel (roughly KP 53 to KP 54), there are, due to exposure, more finely grained sediment conditions at a depth of roughly 19 m.

The interim marine storage site east of Usedom island - and likewise in the area of the Bay of Pomerania - is homogeneously structured. It is predominantly fine sand with high medium sand contents and low silt contents, with coarse sand in the north-west. The large areas of rocks bordering on the south are excluded from use as an interim storage and are therefore not examined in further detail.

Due to the depth of around 10 to 13 m, there are no favourable conditions for macrophytes to establish themselves in the area of the interim storage and its vicinity (cf. application document Part D1.01, Section 5.5.1.3.2, p. 223 and Part D2.06, Map 8).

Along the pipeline route on the eastern edge of the Boddenrandschwelle south of the old Oder bed (roughly from KP 55), there are initially near-surface silty fine sands, which turn into areas of sand further south. These exhibit greater localised medium and coarse sand contents than the deeper areas and are partly covered with shell detritus or drifting algae. There are also large areas of boulders and rocks, which in water depths <13 m (roughly from KP 59) are covered with macrophytes and blue mussels (cf. application document, Part D1.01, Section 5.5.1.3, pp. 208).

The near-surface substrate in the shallow waters of the Boddenrandschwelle is characterised by variable sedimentary residue and sand on top (in the flattest area predominantly coarse sand and gravel), in the rippled sand of which shell detritus – sediment of mussel shells – has accumulated. In the north-eastern area there are areas of stone and boulders with macroalgae growth on them. Drift algae were often also found, while blue mussel populations were not evident (cf. application document, Part D1.01, Section 5.5.1.3, p. 213).

The pipeline route in the Bay of Greifswald predominantly runs through areas of fine and medium sand. In the area of the Schumachergrund and Elsagrund, there are also areas of boulders and rocks that are partly covered with hydrozoans and in water depths < 6 m partly with macrophytes. Additional habitat structures on the planned route include shell detritus deposits (esp. soft-shell clam), as well as smaller areas of fine sand and silt and isolated boulders on coarse sand with gravel. In the shallow waters exposed to waves of the landfall site there are predominantly macrophyte-free areas of sand. The shallowest water depth - apart from the landfall

site - is approx. 4.5 m and is found north of the Elsagrund (cf. application document, Part D1.01, Section 5.5.1.3, p. 214).

As part of the investigations along the planned route, as well as in the area of the interim marine storage site (location: north-east of Usedom), evidence was detected of the following list of marine biotope types (cf. application document, Part D1.01, Section 5.5.1.3, pp. 208 and part D2.06, Map 8).

Area of the Bay of Pomerania (border of the 12 nautical mile zone up to and including the Boddenrandschwelle and interim marine storage site):

- Seabed with fine to medium sands of the outer coastal waters of the Baltic Sea east of the Darss Sill (NOF), on moraine ridges over 1,000 m² FFH habitat type 1170;
- Seabed with silty fine sands of the outer coastal waters east of the Darss Sill (NOS);
- Boulder area of the outer coastal waters of the Baltic Sea east of the Darss Sill (NOR), over 1,000 m² of protected biotope according to section 30 BNatSchG, FFH habitat type 1170;
- Rocky area of the outer coastal waters of the Baltic Sea east of the Darss Sill (NOG), over 1,000 m² of protected biotope according to section 30 BNatSchG, FFH habitat type 1170;
- Outcropping marl and chalk beds of the outer coastal waters of the Baltic Sea east of the Darss Sill (NON), over 1,000 m² of protected biotope according to section 30 BNatSchG, FFH habitat type 1170;
- Gravel, coarse sand and shell detritus areas of the outer coastal waters of the Baltic Sea east of the Darss Sill (NOK), over 1,000 m² of protected biotope according to section 30 BNatSchG, on moraine ridges over 1,000 m² FFH habitat type 1170;
- Sandbank constantly covered by water of the outer coastal waters of the Baltic Sea east of the Darss Sill (NOB), over 1,000 m² of protected biotope according to section 30 BNatSchG, FFH habitat type 1110.

Area of the Bay of Greifswald (with landfall):

- Seabed with fine to medium sands of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIF), protected biotope according to section 30 BNatSchG, FFH Directive priority habitat types 1150 and 1160, on moraine ridges over 1,000 m² FFH habitat type 1170;
- Boulder area of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIR), protected biotope according to section 30 BNatSchG, FFH habitat types 1150, 1160 and 1170;
- Rocky area of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIG), protected biotope according to section 30 BNatSchG, FFH habitat types 1150, 1160 and 1170;
- Outcropping marl and chalk beds of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIN), protected biotope according to section 30 BNatSchG, FFH priority types 1150, 1160 and 1170;
- Sandbank constantly covered by water of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIB), protected biotope according to section 30 BNatSchG, FFH habitat type 1110;

- Silt substrate of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIT), protected biotope according to section 30 BNatSchG, FFH habitat types 1150 and 1160;
- Outcropping peat of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIO), protected biotope according to section 30 BNatSchG, FFH habitat types 1150 and 1160;
- Exposed windwatt with sand and gravel of the inner coastal waters of the Baltic Sea east of the Darss Sill (NIX), protected biotope according to section 30 BNatSchG, FFH habitat type 1140;
- Fairway (OAF)

Please refer to Section B.4.5 of this plan approval for further specific information on territorial protection. More detailed explanations on biotope protection can be found in Section B.4.8.5.2 of this plan approval.

Population evaluation

All of the named marine biotope types in the area of the 12 nautical mile zone, including the interim marine storage site, are evaluated as “very high”, particularly due to their classification as biotopes protected by law and their typical species configuration or their degree of naturalness. This does not apply to the biotope type NOF in the area of the interim marine storage site (evaluation level: medium) and the biotope type fairway (OAF) in the Bay of Greifswald (evaluation level: low) (cf. application document, Part D1.01, Section 5.5.1.4, pp. 224).

According to the “Landeserfassung der geschützten Biotope M-V” (LUNG M-V 2012[71]), the Baltic Sea and coastal biotopes make up a share of 61% of the biotope areas identified throughout the state, which reflects their fundamental importance for the federal state of Mecklenburg – Western Pomerania. According to this, around 170,000 ha are assigned to the Bodden waters, while a comparatively very small part of approx. 550 ha is assigned to the group of “marine boulder and stony areas, as well as gravel, rock and boulder beaches”. This reflects the great importance of the biotopes with hard substrates.

Macrophytes

Population

Due to their dependency on sunlight, macrophytes (spermatophytes and macroalgae) are only able to grow in water depths with sufficient light. Their distribution therefore varies according to the turbidity of the water (depending on the concentration of suspended matter and eutrophication-related phytoplankton blooms and drift algae mats). Macroalgae also require a hard substrate location.

Algae have different pigment compositions, which enable them to populate the different depth zones. While near-surface green algae use a similar spectrum to spermatophytes, red algae can still photosynthesise in low-light depth areas. The resulting zoning is a characteristic of the coastal regions. It can therefore be

[71] LUNG M-V 2012 (Pub.): Results of the first round of the state-wide biotope mapping in Mecklenburg – Western Pomerania

assumed that this basic distribution of the macrophytes is correspondingly pronounced not only in the documented pipeline route, but also in the areas bordering to the north-west and south-east.

In the Bay of Pomerania, red algae were detected in low and localised medium degrees of coverage up to the lower growth limit (light limitation). According to Marsh Jr. (1970[72]), red algae can be found in depths of up to 20 m. In the 19-m deep Sassnitz Channel, no macrophytes were detected.

On the eastern edge of the Boddenrandschwelle, south-west of the Sassnitz Channel, macroalgae grow on hard substrates in water depths of between 12.90 m and 4.40 m with a degree of coverage on closed areas of boulder or stone of up to 50%.

In the area of the Boddenrandschwelle, macrophytes were detected in water depths of between 2.80 m and 5.40 m. The coverage of the hard substrate varied in autumn 2015 between 0% and 50%, and in spring 2016 it sometimes exceeded 75%.

Macroalgae were detected on the few hard substrates of the Bay of Greifswald that are traversed by the route in spring 2016 in water depths of between 4.50 m and 5.80 m, with a degree of coverage of up to 25%.

Since the lower growth limit for spermatophytes in the Bay of Greifswald is less than 4 m, it is questionable whether the isolated spermatophytes observed along the pipeline route on soft substrates at water depths of between 5.40 m and 9.60 m grew there or were washed or drifted there.

In the area of the landfall site, isolated submerged spermatophytes on soft substrates were found from the wash margin to a water depth of 1 m. The degree of coverage varied between the sporadic presence of individual plants and insular plant growth, and in autumn 2015 and spring 2016 was less than 2%. In the depth area of 1.7 m to 5.4 m, very few individual plants of the common seagrass *Zostera marina* were recorded (cf. application document, Part D1.01, Section 5.5.2.1, pp. 248, Part D3.02, Part D2.06 and Part G. 01, Section 7.5.3, pp. 89-90).

The seabed of sand in the area of the interim marine storage site is, due to the deep water depth (approx. 10 m to 13 m) and the lack of hard substrate, macrophyte-free (cf. application document, Part D1.01, Section 5.5.1.3, p. 223, Part D1.05, Map 2, Sheet 5).

However, it is possible that a macrophyte population exists on the hard substrate area excluding the interim storage to the south-east of the interim storage. Here there are water depths of approx. 10 m (cf. application document, Part D1.01, Section 6.2.4.2, p. 542, Part D1.05, Map 2, Sheet 5).

Population evaluation

The area in the Bay of Greifswald populated with macrophytes (in particular as a result of heavy eutrophication) has declined from roughly 90% at the beginning of the 20th century to around 15% in the 1990s. Despite the reduction in anthropogenic nutrient inputs in the Bodden achieved since then, the degree of coverage has not significantly increased. They are therefore not classified as being of high value with regard to the criteria of “diversity and individuality” and “degree of naturalness”. On

[72] Marsh Jr., J.A. (1970): Primary Productivity of Reef-Building Calcareous Red Algae. Ecology, 51: 255–263.

the other hand, their high level of importance for both a future regeneration of the populations but also in particular as an essential habitat structure for the fauna – including herring – is undisputed. Based on the general assessment criteria “rarity and threat”, “regional and interregional importance”, “diversity and individuality” and “degree of naturalness”, the documented macrophyte populations are to be evaluated as follows, taking this existing environmental impact into account (cf. application document, Part D1.01, Section 5.5.2.2, pp. 250):

- In the area of the Bay of Pomerania with “low”,
- On the Boddenrandschwelle (including the stony areas north-east of the Boddenrandschwelle up to Höhe Nordperd) with “high”,
- On the stony areas in the Bay of Greifswald with “low”,
- In the landfall site with “high”,
- For the area under observation as a total population with “medium”.

Macrozoobenthos

Population

In the 12 nautical mile zone, a total of 30 species and two supraspecific taxa were detected at 31 stations in spring 2016. The most species-rich large group was the Crustacea, followed by the Polychaete, Mollusca and Oligochaeta. Species and taxa of the Cnidaria, Bryozoa and Platyhelminthes were also documented. Of the 30 species, the mussels *Limecola balthica* and *Mya arenaria*, the mudsnail (*Peringia ulvae*) and the Polychaeta species *Hediste diversicolor* and *Pygospio elegans* were detected at every station. Other species were likewise very often documented in the investigation area. While six species occurred regularly, two species were widespread in the area. Of the remaining 14 rare species, five were unique finds. The total abundance was 6,299.7 ind./m². The only eudominant main species with respect to abundance was *Peringia ulvae.* A further five species - only various Mollusca and Polychaeta species - occurred as subdominant main species. A value of 14,444.1 mg/m² was calculated for the total biomass, with the cockle *Cerastoderma glaucum* having the highest share of the biomass (43.1%), followed by the Baltic tellin *Limecola balthica* (26.0%). The biomass share of the remaining three main species – only Mollusca species – varied between 6.6% and 13.8%. At the stations investigated, predominantly small soft-shell clams were detected (approx. 54% individuals with a length of <6 mm; mussels >10 mm were rarely recorded, the largest recorded soft-shell clam: 21 mm in length).

In the Bay of Greifswald in spring 2016, 36 species and three supraspecific taxa were documented at 22 stations, whereby the Polychaeta were the most species-rich large group, followed by the Crustacea, Mollusca and Oligochaeta. The species and taxa Cnidaria, Bryozoa, Nemertea and Insecta were also recorded. Nine species, including four Mollusca and three Polychaeta species were detected at every station in the Bay of Greifswald. The Polychaeta species *Streblospio shrubsolii* was also found on a regular basis. A total of 13 species occurred regularly or were widespread. Of the remaining 13 rare species, five were unique finds. The total abundance in this area was 13,453.5 ind./m². The dominance structure contained a total of five species. While the mudsnail *(Peringia ulvae)* was the only eudominant main species, the soft-shell clam *(Mya arenaria)* was the only dominant main species. The remaining three species and taxa *(Corophium volutator, Limecola*

balthica, Marenzelleria sp.) were classified as subdominant main species or taxa. The total biomass was 73,645.6 mg/m². The dominance structure with respect to biomass was characterised exclusively by various Mollusca species, with *Mya arenaria* (57.7%) having the highest share of the biomass. The share of the remaining three main species varied between 3.3% and 21.5%. In the Bay of Greifswald, soft-shell clams with lengths of between 3 mm and 42 mm were recorded (approx. 58% of individuals had a length of ≤5 mm).

At landfall point Lubmin 2, eight species and two supraspecific taxa were recorded in 20 sample box hauls. The most species-rich large group here was the Mollusca with three species. Other detected large groups were the Polychaeta, Crustacea, Oligochaeta, Cnidaria, Bryozoa and Nemertea. The amphipod *Bathyporeia pilosa* and the Polychaeta species *Marenzelleria neglecta* were detected at every station in the investigation area. The moss animal *Einhornia crustulenta* and the mussel *Limecola balthica* were each only recorded at one station. While a value of 3,835.0 ind./m² was calculated for the total abundance, the total biomass was 5,867.9 mg/m². With respect to the abundance, only *Bathyporeia pilosa* (eudominant) and *Marenzelleria neglecta* (subdominant), along with the associated genera Bathyporeia (eudominant) and *Marenzelleria* (dominant) were determined as main species or main taxa. With respect to the biomass, the genus *Marenzelleria* had the greatest share with 50.1%, followed by *Marenzelleria neglecta* with 21.3%. The remaining three main species had shares of between 5.6% and 9.8%. A mere five specimens of the soft-shell clam were detected (lengths of between 3 mm and 13 mm).

In the interim marine storage site in spring 2016, 18 species and a supraspecific taxon were documented at 20 stations. The most species-rich large groups were the Polychaeta and Mollusca. The following large groups were also detected: Oligochaeta, Crustacea, Cnidaria and Bryozoa. The mussels *Limecola balthica* and *Mya arenaria*, the mudsnail *Peringia ulvae* and the Polychaeta *Hediste diversicolor* and *Pygospio elegans* were detected at every station. Two other species were likewise very regularly encountered in the investigation area. While seven species were detected regularly or were widespread, four species, including a unique find, were rarely found. A total abundance of 7,055.5 ind./m² was calculated. The dominance structure contained six species with respect to abundance, whereby *Peringia ulvae* was classified as a eudominant main species and *Mya arenaria* occurred as a dominant main species. The remaining species were subdominant main species with shares of between 5.4% and 7.0% of the total abundance. The total biomass was 22,115.7 mg/m². With respect to the biomass, four Mollusca species were classified as main species (*Cerastoderma glaucum* had the greatest share with 48.5%, while the shares of the other three species were between 5.4% and 24.3%). In spring 2016, soft-shell clams were documented in the interim marine storage site, with lengths of between 3 mm and 39 mm, with juvenile individuals with a length of 3 mm forming the greatest percentage share.

The following picture emerges with respect to the assessment:

Population evaluation

With regard to the overall assessment of the macrozoobenthos community along the planned Nord Stream 2 route, there is a low evaluation level for the area of the 12 nautical mile zone including the Bay of Greifswald and the Lubmin landfall point. Each of the criteria was evaluated as low for the landfall site. The exception to this

was the medium evaluation level for “rarity and threat” (recording of Category 3 Red List species) and for the section in the Bay of Greifswald. For the area of the 12 nautical mile zone, the criterion “diversity and individuality” was evaluated as medium, as typical species were documented in high abundances and other species and some Neozoa occurred in low abundances.

For the area around the interim marine storage site, the overall assessment of the macrozoobenthos communities also produced a low evaluation level. This resulted from the relatively low number of species (criterion “diversity and individuality”), the low regional and interregional importance, the low “rarity and threat” (species of Red List categories G and V or “least concern”), and the low “degree of naturalness” for the area (cf. application document, Part D1.01, Section 5.5.3.3, p. 276).

Fish and cyclostomes

Population

In the Bay of Greifswald, 22 fish species (with the greatest share, 5 species of limnic species) were recorded, and in the area of the landfall point in Lubmin a total of 12 fish species (one-off fishing with shore seines in June 2016). In the 12 nautical mile zone (border EEZ/12 nautical mile zone to Boddenrandschwelle, Bay of Greifswald fished separately) there were cod, flounder and plaice in all hauls. Herring, greater speckled sandeel, turbot and sprat were very prevalent in the hauls (70% to 90%). In the Bay of Greifswald, flounder, perch and black goby were detected in all of the hauls carried out. Herring, sand goby, sprat and pike-perch were regularly represented in this area (prevalence of 70% to 90%). In the Bay of Greifswald, on the other hand, no cod were caught at all, and plaice only appeared in two of the total 20 hauls (prevalence of 10%). In the area of the planned landfall point Lubmin 2, which was only fished with shore seines, the lesser sandeel had the highest prevalence (97.2%), followed by the common goby (91.7%) and the herring (66.7%). In comparison to the two other areas (12 nautical mile zone and Bay of Greifswald), the flounder had only a low prevalence (2.8%), but together with the herring, the greater speckled sandeel and the sand goby, they were the only of the total 31 detected fish species that occurred in all four areas (cf. application document, Part D1.01, Section 5.5.4.1, p. 280).

The share of pelagic species in the catches in the area of the landfall point was very low. In the 12 nautical mile zone, however, they represented more than a third of the total catch during the two campaigns (autumn 2015 and spring 2016), whereby sprat was the most common pelagic species in the hauls. In the Bay of Greifswald, the share of the pelagic species in the total catch in autumn 2015 was greater than that of the demersal species. This was predominantly determined by the abundant catches of sprat and pike-perch. In the spring, the share of pelagic species declined, which was mainly a result of the decrease in pike-perch in the hauls. The pike-perch share decreased from 17.18% in autumn 2015 to 0.68% in the spring. Only one pelagic species, the sprat, recorded a significant increase in share from autumn 2015 to spring 2016 (from 22.90% to 28.44%) (cf. application document, Part D1.01, Section 5.5.4.1, p. 280).

Various forms of existing environmental impact exist for the fish fauna in the investigation area, particularly as a result of fishing and eutrophication.

Population evaluation

With respect to the criterion “diversity and individuality”, an evaluation of “high” is made for the 12 nautical mile zone due to the species community typical of the habitat and high fish densities, and of “medium” for the Bay of Greifswald and the landfall point, because the species diversity there lies within the normal composition and there is a regular presence of an atypical species (black goby). The regional and interregional importance for the 12 nautical mile zone is evaluated as “medium” (regularly occurring habitat type, regional importance as spawning, growth, feeding and transit area), and “high” for the Bay of Greifswald and the landfall point (important spawning area for a variety of species; for the spring spawning herring it has high importance as a spawning area). The “rarity and threat” is categorised as “high” because of individual detections of species of Annex II of the FFH and species of Red List categories 0 to G. The “degree of naturalness” of the fish fauna was evaluated as “medium” because of the significant to high prevalence of, albeit time-limited, fishing activities and the influence on the length distribution of individual target fish species. Overall, the population of the fish fauna in the 12 nautical mile zone, the Bay of Greifswald and the landfall point was given the evaluation level “medium” on the basis of the individual criteria listed above (cf. application document, Part D1.01, Section 5.5.4.2, p. 307).

Staging birds

Population

The Nord Stream 2 route runs along the section of the border of the 12 nautical mile zone to the north-east of the Boddenrandschwelle within the registered bird sanctuary (SPA) “Westliche Bay of Pomerania”, which is of international importance as a wintering area, especially for sea ducks, loons and grebes. The route mainly runs through an area that is already severely environmentally impacted by shipping traffic (approach to Landtief and approach to Świnoujście). Furthermore, the deeper former riverbed of the Oder is less important for benthophagous sea ducks due to the seasonal hypoxia on the seabed. However, temporarily high densities of fish-eating species are identified here (esp. loons and auks).

The Bay of Greifswald is one of the most important wintering areas for waterfowl in the entire Baltic Sea Region (DURINCK ET AL. 1994). The Nord Stream 2 route mainly runs within the regional planning corridor designated by the federal state regional planning programme (LEP M-V 2016), with the route only affecting or crossing important staging areas in places, and in the vicinity of which there are existing environmental impacts due to parallel shipping lanes. This includes in particular the crossing of the eastern run-up to the Boddenrandschwelle in parallel to the fairway in the Landtief (by existing environmental impacts in the area due to shipping traffic and intensive fishing). From the western edge of the predominantly undisturbed important staging area in the area of “Freesendorfer Wiesen Insel Struck”, the Nord Stream 2 pipeline runs at a greater distance than the existing Nord Stream Pipeline. Both regions are important almost all year round for the waterfowl staging activity in the Bay of Greifswald. The eastern run-up to the Boddenrandschwelle is the most important regional feeding and staging area for long-tailed ducks and greater scaup during the herring spawning season. The reefs and macrophytes of this area represent one of the most important herring spawning grounds in the area of the Bay of Greifswald. In addition to the diving ducks and sea

ducks, grebes and mergansers also stop-over here in the spring. From March until September, the sea area is also the most important feeding area of the cormorant colony in the Bay of Greifswald. In late summer, the largest regional gathering of food-seeking little gulls and black terns can be encountered here. The shallow waters in the vicinity of the Freesendorfer Wiesen and the island of Struck function as a staging, feeding and moulting area for more than 50 waterfowl and wading birds. Therefore, in addition to the areas of the Karrendorf Wiesen, Ruden island and Peenemünder Haken count among the most important staging areas for waterfowl in the inner coastal waters of Mecklenburg – Western Pomerania. The Nord Stream 2 route runs along the western edge of the staging area, touching in particular on the daytime sleeping areas of over-wintering long-tailed ducks in the area between Freesendorfer Haken and Großen Stubber.

The area of the interim marine storage site off the coast of Usedom is, according to the results of the seabird monitoring conducted on behalf of the BfN (esp. MARKONES et al. 2015), used by seabird species in a similar way to the sea area off the Boddenrandschwelle south of the route. This area is of international importance as a wintering area for sea ducks as well as for loons and grebes. The area of the interim marine storage site has an existing environmental impact due to shipping traffic and cast net fishing and temporarily just as important for benthophagous sea ducks as it is for fish-eating species (loons and auks). High densities are identified, particularly at the time of the spring migration of common and velvet scoter, as well as for red-throated divers.

Population evaluation

The Bay of Pomerania, together with the Bay of Greifswald, forms the most important wintering area for seabird species on the German Baltic coast and one of the ten most important wintering areas in the entire Baltic Sea (DURINCK et al. 1994). The entire investigation area along the pipeline route is therefore classified as being of high value for seabird species. It is important to highlight the spatial differentiations in terms of the frequenting of the pipeline route by staging birds (resting bird densities) in this respect. It is to be noted, that sub-areas with a lower staging bird density function as compensatory habitats under certain circumstances (e.g. freezing over) and thus form a functional unit with the resting site centres. Furthermore, it is important to document the spatial and temporal staging activities of the individual bird species detailed above (in particular the seasonality of the resting activity). In order to evaluate the staging areas, a reduced value must be determined in the area evaluated highly overall of the route in the Bay of Pomerania and the Bay of Greifswald or just for the areas of the navigation channels, approaches and roadsteads of the investigation area due to the existing environmental impact caused by shipping traffic.

Since the majority of the individual criteria document that the area has high value and thus, overall, the investigation area is important for staging birds, the species group is classified as evaluation level “high” (cf. application document, Part D1.01, Section 5.5.5.2, p. 349).

The main species sensitive to anthropogenic disturbances by vessels are diving waterfowl. The sensitivity is species-specific and classified as “high” (loons and common scoter) or “medium” (cf. section on the construction-related impacts on seabird species). Seagulls regularly seek out moving vessels and are therefore not

considered sensitive. Benthophagous sea ducks have a high sensitivity to the permanent loss of their food in the form of benthic communities. In the case of a temporary impact, their sensitivity is “medium”. Fish-eating birds have a “medium” sensitivity to the formation of turbidity plumes. For all other seabird species the sensitivity is “low”.

Marine mammals

Population

From the group of mammals living in the sea, i.e. the whale species and seal species, the harbour porpoise, the common seal and the Baltic Sea grey seal occur in the German Baltic Sea and in the sea area under observation. The ringed seal met expectations as an occasional accidental migrant (cf. application documents, Section 5.5.6.1, p. 353).

The Bay of Pomerania in the area of the territorial waters recorded the highest density of harbour porpoise in the region (almost all year round). The harbour porpoise detections between 2010 and 2013 on the northern locations along the route within the 12 nautical mile zone showed the highest detection rates. Compared with the distribution of the fish-eating seabird species and the distribution of fishing activities, this find meets the expectations (cf. application documents, Section 5.5.6.1, p. 373). The Oder channel and the slopes of the Oderbank are obviously areas with regionally high fish biomass. Grey seals and common seal are regularly detected in the area of the Greifswalder Oie. It is therefore assumed that the territorial waters belong to the feeding area of the seals.

Harbour porpoise are only rarely present in the Bay of Greifswald to the crossing of the Boddenrandschwelle (cf. application documents, Section 5.5.6.1, p. 353).

Since 2005, the Bay of Greifswald has been permanently resettled by up to 73 grey seals. Grey seals were detected the whole year round along the overall pipeline route (cf. application document, Part D1.01, Section 5.5.6.1, pp. 362). The feeding areas of these animals are unknown. The same applies to their migrations. A press release dated 16/01/2017 announced that in autumn 2017, 23 dead grey seals were found on the northern coast of the Bay of Greifswald (http://www.ostsee-zeitung.de/Vorpommern/Stralsund/23-tote-Robben-in-der-Ostsee-Wurden-sie-ertraenkt, retrieved on 22/01/2018).

Individual common seals have been detected throughout the year in the investigation area. Ringed seals are sporadically registered (expectations) (cf. application documents, Section 5.5.6.1, p. 353).

In the southern-most locations of the Bay of Pomerania in the area of the territorial waters and near to the interim marine storage site, the harbour porpoise detections from 2010 to 2013 showed the lowest detection rates. Harbour porpoises are rarely detected in this area. Grey seals and common seals are regularly detected in the more northern area of the Greifswalder Oie, i.e. they are detected on almost every trip. It is therefore assumed that the vicinity of the interim marine storage site is sometimes visited by seals (expectations) (cf. application documents, Section 5.5.6.1, pp. 353).

Population evaluation

The overall assessment combines the high degree of vulnerability of the marine mammal species on the one hand, and the occurrence in low densities and use of the area only as a feeding and crossing area on the other. This takes into account the value of the investigation area in the spatial context with other Baltic Sea areas (presence of calving and resting places and duration of the presence in the observed sea area). Therefore, the importance of the observed sea area for marine mammals is estimated to be “medium” (cf. application document, Part D1.01, Section 5.5.6.2, p. 376).

The sensitivity of the harbour porpoise and seals to the construction-related project impacts in the sea area, in particular to the increased noise levels, e.g. due to the increase in shipping traffic, is low (no pile-driving). Marine mammals have a low sensitivity to stirred-up soil particles and the resulting clouded water, as no large-scale changes in the distribution of the organisms that serve as food for the marine mammals are expected. Overall, the sensitivity to the project impacts for all marine mammals is low.

B.4.4.1.3.1.2 Onshore

Biotope types / plants

Population

The project is localised within an area of Development Plan No. 1 “Industrie- und Gewerbegebiet Lubminer Heide”, which is characterised by pinewood forest and ruderal biotopes. In areas adjacent to the same, there are already industrial facilities (north-east) or some in the planning phase (project GASCADE Gastransport GmbH / Erdgasempfangsstation Lubmin 2; the planned or not yet approved projects do not (yet) have any impacts on the actual state of the biotope types and plants there), which adjoin the industrial port to the north-east and the site of the former nuclear power station to the east. Between the project location, port and power station / commercial area, the industrial area is characterised by vast, mainly vegetation-free or low-vegetation ruderal areas. In the peripheral areas of the latter, semi-natural woodland stadia of Scots pine, silver birch and aspen have also developed as a result of succession on sandy, dry locations and in ground depressions with cohesive soils created by water-logging, reed beds and moist shrubbery from meadows, partly with endangered sedges, rushes and tall forbs.

In the north of the project area there is an access road running parallel to a railway line. The industrial area is enclosed to the north by a noise barrier behind which lies a pipeline route.

The forest stand on the project area is incorporated in the pinewood forests of the Lubminer Heide, which extend to the north, west and south. The area to the north between the industrial area and the coast is a designated coastal protection forest. At the same time, the forest is used for tourism purposes. The side of the wood facing the Bodden is subject to the typical influences of the coast and is semi-natural. The soil behaviour is acidic. At locations where there is still dune terrain, the pine forest is designated as wooded coastal dunes.

On the south-western edge of the investigation area, there are the residential areas of Lubmin, and to the north of the industrial port lies the natural gas receiving terminal of the Nord Stream Pipeline. Further to the east lie the Freesendorfer Wiesen, which, in addition to salt meadows and mat grassland, wet and purple moor

grass meadows are also predominantly characterised by large-scale, species-poor intensive grassland.

While a mainly semi-natural coastal section stretches away to the east of the industrial port of Lubmin, in 2003, the Bodden coast of the coastal resort of Lubmin to the west of the port was heavily anthropogenically characterised by sand filling and the side filling of a coastal protection dune of around 2 m in height in front of the original sand cliff, so that along this coastal section the natural dune structures no longer exist.

The coastal area, the Freesendorfer Wiesen and a part of the forest to the west of the industrial area are parts of SCI “Bay of Greifswald, Teile des Strelasundes und Nordspitze Usedom”. The Freesendorfer Wiesen also belong to the “Peenemünder Haken, Struck und Ruden” nature reserve, the “Insel Usedom mit Festlandgürtel” landscape conservation area (L82) and the “Naturpark Insel Usedom” nature preserve (cf. application document, Part D1.01, Section 5.5.1.5, p. 231 and Part D3.10 - UVS appended maps for information purposes from UP (UmweltPlan, technical consultant of GASCADE Gastransport GmbH).

In the terrestrial investigation area, a total of 60 different biotope types were recorded (cf. application document, Part D1.01, Section 5.5.1.5, p. 243), which are only summarised here due to the overwhelming lack of impact by the project (according to LUNG 2010):

- 13 forest biotope types (W),
- 7 biotope types of copses, avenues and rows of trees (B),
- 5 coastal biotope types (K),
- 1 flowing water biotope type (F),
- 5 biotope types of unforested, eutrophic moors, bogs and shores (V),
- 5 biotope types of dry and nutrient-poor grassland and dwarf shrub heath (T),
- 6 biotope types of grassland and fallow grassland (G),
- 3 biotope types of marginal shrubland, ruderal areas and knotweed (R),
- 1 parkland biotope type in the residential areas (P),
- 14 biotope types in the residential, traffic and industrial areas (O).

For the most part, the flora in the investigation area consists of prevalent species commonly occurring in the area. This is strongly connected to the presence of habitats that are excessively characterised by humans and over-supplied with nutrients, and thus always create similar foundations on which the same plant species often grow. Over and above this, ten protected vascular plant species listed in the Red List of Mecklenburg – Western Pomerania or the ordinance on the protection of wild flora and fauna species (Bundesartenschutzverordnung - BArtSchV) dated 16/02/2005 (BGBl. I pp. 258, 896), last amended by Section 10 of the law dated 21/01/2013 (BGBl. I p. 95) were detected in the investigation area during the recording of the habitats (including centaury and sandy everlasting (cf. application document, Part D1.01, Section 5.5.1.5.1, p. 238, Table 5-37)). These are mainly species that occur in dry, moist and coastal habitats and also refer to correspondingly designated habitats with respect to the growth location in the investigation area (cf. application document, Part D1.01, Section 5.5.1.5.1, p. 237). As a value-adding species, sand everlasting (Helichrysum arenarium) could

potentially be found, but only in isolation, on the planned construction areas of the landfall site; it is often represented on the other site of Development Plan No. 1 “Industrie- und Gewerbegebiet Lubminer Heide” (cf. application document, Part D1.01, Section 6.4, p. 695). Sand everlasting occurs in pine forests, on forest edges and tracks (Hensel 2016[73]). However, this plant species was not detected by mapping conducted in the planned construction area of the Pig Receiving Station.

Population evaluation

Despite the existing environmental impacts on terrestrial biotopes outside the residential areas (by the previously stated coastal protection measures and eutrophication as a result of anthropogenic nutrient inputs, including the draining of grassland and pollution by contaminants resulting from previous uses), the 60 biotopes are mainly evaluated summarily as follows due to the many years of regeneration, the threat to them and their typically characteristic species mix (cf. application document, Part D1.01, Section 5.5.1.4, p. 244):

- 9 biotope types of very high value (mainly forests and grassland),
- 19 high value biotope types (mainly dry biotopes, woodland and forests),
- 9 medium biotope types (mainly wetland biotopes),
- 10 low value biotope types (mainly anthropogenically influenced locations),
- 14 biotope types of no particular importance (mainly settlements and infrastructure).

The following medium to high value biotope types occur in the vicinity of the proposed project components (cf. application document, Part D3.01, Map 9):

<u>Biotope types of very high value:</u>

Pine forest on acidic soil (WKA);

Other pine forest on dry to fresh locations (WKZ).

<u>Biotope types of high value:</u>

- Mixed pine forest on dry to fresh locations (WKX);
- Pioneer forest of native tree species on dry locations (WVT);
- Shrubbery on warm, dry locations (BLT), protected biotope according to section 30 BNatSchG and section 20 NatSchAG M-V;
- Copses of predominantly native tree species (BFX), protected biotope according to section 20 NatSchAG M-V;
- Former hedges of trees (BHA);
- Younger field hedges (BHJ), protected biotope according to section 20 NatSchAG M-V;
- Intensively used sandy beach of the Bodden waters (KSD);

[73] Hensel, W. (2016): Welche Heilpflanze ist das?: 170 Arten einfach bestimmen. Franckh Kosmos Verlag, 3. Auflage. [*Which medicinal plant is this? Easy identification of 170 species. Franckh Kosmos Verlag, 3rd Edition*]

- Damp shrubbery on eutrophic moor and bog locations (VWN), protected biotope according to section 30 BNatSchG and section 20 NatSchAG M-V;
- Pioneer sandy meadow on acidic locations (TPS), protected biotope according to section 30 BNatSchG and section 20 NatSchAG M-V.

Biotope types of medium value:

- Coastal protection planting on dunes (KDZ);
- Reed beds (VRL), protected biotope according to section 30 BNatSchG and section 20 NatSchAG M-V;
- Tall forbs meadow on heavily drained moor and bog locations (VHD);
- Damp shrubbery on heavily drained locations (VWD).

The flora of the investigation area mainly comprises prevalent, regularly occurring species (cf. application document, Part D1.01, Section 5.5.1.5.1, p. 237).

Only in dry, damp and coastal biotopes as growth areas were a total of 3 endangered species according to the Red List of Mecklenburg – Western Pomerania, and 6 species of the early warning list and 3 particularly protected vascular plant species according to the ordinance on the protection of wild flora and fauna species (Bundesartenschutzverordnung - BArtSchV) detected, but not any critically endangered species or those threatened by extinction or those strictly protected species (cf. application document, Part D1.01, Section 5.5.1.5, pp. 237-8).

Amphibians

Population

Spawning waters do not exist in the project location, and after the deconstruction of the former Lubmin sewage treatment works (EWN) in 2015/16 on the site of Development Plan No. 1 “Industrie- und Gewerbegebiet Lubminer Heide”, including its settling pond, they no longer exist in the vicinity either. Due to its location in a corner between the insurmountable barriers of the Bodden coast and the industrial port, it is not possible for any migration corridor to pass through the area. The area therefore only functions as a summer or winter habitat for amphibians.

Small individual numbers of the following species were detected in the area of the Pig Receiving Station and a 300-m radius during the mapping conducted in 2015/16: common toad, grass frog, moor frog, pond frog and smooth newt. Around 10 years ago, the tree frog was also detected to the south of the former outlet canal, which is why a (due to a lack of actual detection) potential presence of this species is also not ruled out in this area. All of the named species are endangered according to the Red List of M-V and are particularly protected according to BArtSchV; the moor frog and tree frog are also strictly protected as species listed in Annex IV of the FFH.

The nearest area with large populations of various amphibian species is located the other side of the industrial port in the Freesendorfer Wiesen with watercourses and wetland biotopes, as well as adjacent wooded biotopes as winter habitats (cf. application document, Part D1.01, Section 5.5.7.1, p. 383).

The cooling water system of the former nuclear power station that bisects the forests of the Lubminer Heide represents an existing environmental impact for amphibians in the investigation area. This has therefore prevented an exchange or inward migration of individuals of the Freesendorfer Wiesen. In addition to this bisection, use of the land for infrastructure also represents an existing environmental impact.

Population evaluation

With respect to the moor frog, it must be noted that this species is not only listed in the Red List of M-V (Annex 13 HzE 1999) and Germany (HAUPT ET AL. 2009[74]), but also in Annex IV of the FFH. According to the HzE (1999), this species exhibits medium sensitivity to the project impacts, whereby substantially negative environmental impacts of two of the four potential impacts can be assumed (bisection, change of habitat). In the investigation area there are no spawning waters, and so the investigation area does not represent an important habitat for the moor frog (cf. application document, Part D1.01, Section 5.5.7.2, p. 385). A potential spawning water, the former maturation pond of the sewage treatment works deconstructed in 2015/2016, no longer exists (cf. application document, Part D1.01, Section 5.3.1.2, p. 185). Relationships to the externally situated spawning waters were not determined during the mapping, and therefore no verifiable interactions are assumed. With seven animals in the entire mapping period, the species was the most frequently detected, and so a medium intensity of use of the investigation area is assumed. The population of the moor frog in the investigation area is also evaluated as being of “low” importance (cf. application document, Part D1.01, Section 5.5.7.2, p. 385).

The other detected species of grass frog, pond frog, common toad and smooth newt are of medium relevance for nature conservation, as they are classified as “endangered” in the Red List of M-V (Annex 13 HzE 1999). For all three species, Annex 13 HzE (1999) states a sensitivity to project-related impacts, whereby an impairment of the species by two of the four potential impacts is assumed (bisection, change of habitat). The investigation area does not offer the species an important habitat because of the lack of spawning waters in the immediate vicinity. The investigation area is used as a crossing area and wintering area. Between two and five animals of each species were detected, which indicates a low intensity of use of the investigation area. The importance of the populations of smooth newt, grass frog and common toad in the investigation area are classified as “low” (cf. application document, Part D1.01, Section 5.5.7.2, p. 386).

The tree frog is listed in both the Red List of M-V (Annex 13 HzE 1999) and Germany (HAUPT ET AL. 2009) as an endangered species and in Annex IV of the FFH. According to Annex 13 HzE (1999), this species has a sensitivity to project-related impacts, whereby an impairment of the species by two of the four potential impacts is assumed (bisection, change of habitat). The intensity of use of the investigation area, which here functions merely as a crossing area, is evaluated as low due to the one-off and currently unconfirmed detection of the tree frog. The same applies to the importance of the investigation area as a habitat, which, while richly

[74] Haupt, H., Ludwig, G., Gruttke, H., Binot-Hafke, M., Otto, C. & Pauly, A. (Red.) (2009): Rote Liste gefährdeter Tiere, Pflanzen und Pilze Deutschlands, Band 1: Wirbeltiere. Bundesamt für Naturschutz, Bonn-Bad Godesberg. [*Red List of the Endangered Animals, Plants and Fungi of Germany, Volume 1: Vertebrates. Federal Agency for Nature Conservation, Bonn-Bad Godesberg*]

structured, is neither suitable as a spawning water nor offers high groundwater levels. The population of the tree frog in the investigation area is also evaluated as being of “low” importance (cf. application document, Part D1.01, Section 5.5.7.2, p. 386).

Due to the existing habitat configuration and existing environmental impacts, the area of the receiving terminal is of minimal value for amphibians (cf. application document, Part D1.01, Section 5.5.7.2, pp. 385-6).

Reptiles

Population

During the mapping in 2015/16, the following reptile species were detected in different densities of individuals in the area of the pig receiving facility and in a 300-m radius: slow worm (numerous), grass snake (isolated) and common lizard (common). All of the named species are particularly protected according to BArtSchV; the slow worm and the common lizard are also endangered according to the Red List of M-V and the grass snake is critically endangered.

The main points of detection of the slow worm were in the forest edges exposed to the south-east along the noise barrier, between the paved tracks and forest edges to the south-west of the deconstructed sewage treatment works and in the transitions zone to the vast ruderal areas in the south-east of the investigation area.

Common lizards were predominantly detected on forest tracks and edges to the south-east of the noise barrier. As was the grass snake, for which there is assumed to be a stable local population (cf. application document, Part D1.01, Section 5.5.8.1, p. 386).

The insurmountable barriers mentioned for the amphibians species group also represent an existing environmental impact for the reptiles, to which is added the existing use of the area by infrastructure facilities (cf. application document, Part D1.01, Section 5.5.8.1, p. 388).

Population evaluation

According to the results of the mapping for the environmental impact assessment, slow worms were numerous and widespread in the investigation area. This species was detected particularly often in the transitions zones from the noise barrier to the pine forest. As a result, the slow worm intensively uses broad regions of the investigation area. In the Red List of M-V, the slow worm is listed as “endangered” (Annex 13 HzE 1999), which is why it is assigned medium relevance for nature conservation. Slow worms are only sensitive to bisection (Annex 13 HzE 1999).

With 17 detections, the presence of the common lizard was also often confirmed in the investigation area (cf. application document, Part D1.01, Section 5.5.8.1, p. 388, Table 5-93). Due to the documented presence, there is assumed to be large-scale use to the south-east of the noise barrier. In the Red List of M-V, the common lizard is listed as “endangered” (Annex 13 HzE 1999), which is why it is assigned medium relevance for nature conservation. According to Annex 13 of HzE (1999), the species is not sensitive to the project impacts of disturbance, bisection, change of habitat and collision (cf. application document, Part D1.01, Section 5.5.8.2, p. 388).

The grass snake is awarded high relevance to nature conservation, as this species, in Mecklenburg – Western Pomerania in particular, is categorised as “critically endangered” in the Red List (Annex 13 HzE 1999). Due to the isolated detected occurrences it is not possible to conclude that the area is used comprehensively and intensively. However, a stable local population can be assumed (cf. application document, Part D1.01, Section 5.5.8.2, pp. 388-9).

The reptile population detected in the investigation area can be fundamentally described as not or slightly sensitive to the project-related impacts. Apart from the common lizard, which exhibits no sensitivities whatsoever according to Annex 13 HzE (1999), slow worms and grass snake are sensitive to habitat bisection. Annex 13 HzE (1999) also documents for the grass snake alone a sensitivity to changes of habitat. The project makes particular use of forest habitats that do not represent a primary habitat for slow worms and grass snakes.

Due to the manifold suitable biotopes that alternate on a small scale, such as forest and wooded biotopes, and dry and open land locations, the investigation area provides favourable habitat structures for reptiles. The populations of the detected reptile species and the suitability of the investigation area as a reptile habitat are awarded an overall evaluation of “medium” (cf. application document. Part D1.01, Section 5.5.8.2, p. 389).

Ground beetles in the beach area

Population

The surveyed area exhibits extremely homogeneous biotope structures in both the beach and the dune area, in which a total of 27 ground beetle species were detected in 2015/16. The overwhelming majority of these are regarded as moderate to very common in Mecklenburg – Western Pomerania, although with seven species, the share of rare to very rare species is very high (approx. 25%). Five species are endangered according to the Red List of M-V: Harpalus autumnalis, Licinus depressus, Amara quenseli, Bembidion tenellum and Dyschirius bonellii. According to BArtSchV, Cicindela hybrida is particularly protected (cf. application document, Part D1.01, Section 5.5.9.1, pp. 389).

The cleaning of the beach for bathing purposes of washed-up seagrass used as a hiding place represents an existing environmental impact for ground beetles. Due to the distance from the centre of the municipality of Lubmin and the controlled access to the dunes, these represent only minor existing environmental impacts for ground beetles (cf. application document, part D1.01, Section 5.5.9.1, p. 392).

Population evaluation

At 27, the number of species of ground beetles detected here is typical for extreme habitats such as this. The number of endangered or highly specialised stenotopic species is high. The detected numbers of individuals were very low in 2015 and the first half of 2016 in particular. The targeted search resulted in only six ground beetle species, of which four were found only on the beach. Due to the detected spectrum of species with several Red List species, and since Cicindela hybrida is protected by law (“particularly protected species” according to BArtSchV), the population of the ground beetles species group is evaluated as “medium”. The presence of the

"responsibility species" Amara quenseli described in the population above does not affect this population evaluation, as the species occurs regularly along the Baltic coast of Western Pomerania and there are large, similar beach and dune areas in the vicinity of the landfall point, and so this is not of particular importance for the species (cf. application document, Part D1.01, Section 5.5.9.2, p. 392).

Bats

Population

The mapping in 2015/16 in the investigation area of the Pig Receiving Station detected signs of the following 13 bat species, which had already been detected in the investigations for previous projects in the area of the industrial port of Lubmin, the Lubminer Heide and the industrial area of Lubmin: brown long-eared bat, serotine bat, Natterer's bat, common noctule, Brandt's bat, greater mouse-eared bat, lesser noctule, soprano pipistrelle, Nathusius' pipistrelle, pond bat, Dauberton's bat, parti-coloured bat and common pipistrelle.

With the exception of the Brandt's bat and the pond bat, hunting activity of low to high intensity was detected in the investigation area for all species. For the species common noctule, soprano pipistrelle, Nathusius' pipistrelle and common pipistrelle, summer roots and mating territories were also detected in the investigation area.

Of the 13 named bat species, according to the Red List of M-V, three species are threatened by extinction (lesser noctule, pond bat and parti-coloured bat), two species are critically endangered (Brandt's bat and greater mouse-eared bat), three species are endangered (serotine bat, Natterer's bat and common noctule) and four species are potentially endangered (brown long-eared bat, Nathusius' pipistrelle, Dauberton's bat and common pipistrelle). All bat species are also strictly protected species according to Annex IV of the FFH (cf. application document, Part D1.01, Section 5.5.10.1, pp. 393).

Existing environmental impacts on bat species exist in the area of the Deutsche Ölwerke Lubmin and the industrial port due to the heavy illumination of the external areas. The evaluation of these areas for bats indicates that during the mapping, only very low or no hunting activities were identified in these areas (cf. application document, Part D1.01, Section 5.5.10.1, p. 412).

Population evaluation

All of the bat species present were listed in the Red List of Mammals in Mecklenburg – Western Pomerania with the degree of vulnerability as categories 1 ("threatened by extinction") to 4 ("potentially endangered") (Labes 1991[75]), and count among the species strictly protected by law according to BNatSchG and are listed in Annex IV of the FFH. The detected species greater mouse-eared bat (*M. myotis)* and the pond bat (*M. dasycneme*) are also listed in Annex II of the FFH (cf. application document, Part D1.01, Section 5.5.10.2, p. 413).

[75] Labes, R., Eichstädt, W., Labes, S. Grimmberger, E., Ruthenberg, H., Labes, H. (1991): Rote Liste der gefährdeten Säugetiere Mecklenburg-Vorpommerns [*Red List of the Endangered Mammals of Mecklenburg – Western Pomerania*].

For 11 of the detected species, hunting activities of low to high intensity were determined in the overall investigation area. Due to the identified spectrum of species and the identified hunting intensities, the investigation area is designated as a feeding habitat of high importance for bats. Summer roosts were detected for four bat species in the investigation area. Due to the identified species and the size, function and location of the determined roosts, the importance of the investigation area with respect to bats was evaluated as "medium". The various sensitivities of the detected bat species that are species-specific and relate to the individual impact factors are included in the population evaluation.

Based on the conservation status of the "bats" species group according to the Red List of M-V, Annex IV - Species of the FFH and the rich spectrum of species detected in the investigation area, the distribution of the species within the investigation area and the suitability of the investigation area as a habitat for various bat species, the bat population is designated a high importance overall (cf. application document, Part D1.01, Section 5.5.10.2, p. 413).

Breeding Birds

Population

The habitat configuration differentiates the area with the Pig Receiving Station surveyed in 2016 into four bird habitats (coastline, industrial area, pine forest and semi-open ruderal area), in which 59 species were detected as certain or probable breeding birds (cf. application document, Part D1.01, Section 5.5.11.1, p. 413). Three other species occurred in the area only as feeding guests or migratory birds. Of the 59 detected species, ten are listed under categories 1-3 of the Red List of Breeding Birds in Germany (tree pipit, common linnet, whinchat, skylark, grasshopper warbler, house martin, barn swallow, barred warbler, starling and northern wheatear), and eight in the Red List of Breeding Birds in Mecklenburg – Western Pomerania (tree pipit, whinchat, skylark, grasshopper warbler, tree sparrow, northern wheatear, wood warbler and woodcock). With the little ringed plover, wood lark, barred warbler, sand martin and long-eared owl, there were occurrences of five strictly protected species according to section 1 sentence 2 in conjunction with Annex 1 BArtSchV. With the wood lark, red-backed shrike and barred warbler, three species of Directive 2009/147/EC of the European Parliament and of the Council dated 30/11/2009 on the conservation of wild bird species (OJEU, No L 20) dated 26/01/2010 (hereinafter referred to as the EU Birds Directive) Annex I are represented. Eleven of the species present in the investigation area belong to the bird species with particular habitat requirements. The presence and distribution of the value-determining species are indicated and described in the environmental impact assessment (cf. application document, Part D1.01, Section 5.5.11, Fig. 5-130, p. 413).

According to the Red List of M-V, of the breeding birds, one species is threatened by extinction (northern wheatear), two species are critically endangered (grasshopper warbler and woodcock), and five species are endangered (tree pipit, whinchat, skylark, tree sparrow and wood warbler). According to section 1, sentence 2 in conjunction with Annex 1 BArtSchV, five species (little ringed plover, wood lark, barred warbler, sand martin and long-eared owl) are strictly protected, and the wood lark, red-backed shrike and barred warbler are also species listed in Annex I of the EU Birds Directive.

The aforementioned species with numbers given in brackets indicate the following breeding grounds in the four bird habitats (VLR) of the investigation area (cf. application document, Part D1.01, Section 5.5.11.1, pp. 413):

- VLR 1 Coastline: tree pipit (2) and red-backed shrike (1),
- VLR 2 Industrial area: tree sparrow (3), little ringed plover (3) and northern wheatear (3),
- VLR 3 Pine forest: tree pipit (8), wood lark (4), wood warbler (1), long-eared owl (1) and woodcock (1),
- VLR 4 Semi-open ruderal area: whinchat (1), skylark (10), grasshopper warbler (5), red-backed shrike (10), barred warbler (2), northern wheatear (1) and a sand martin colony (65), as well as – because of the habitat association on forest edges – on the edge to VLR 3 the tree pipit and wood lark there are also listed.

Wood larks, barn swallows and tree pipits occurred on marginal territories. A territory is considered a marginal territory if the centre of the territory lies just outside the investigation area. Part of the investigation area was surveyed during the breeding period and rearing of the breeding birds (cf. application document, Part D1.01, Section 5.5.11.1, pp. 413).

Existing environmental impacts on the breeding birds in the area are caused by the noise emissions from the traffic on the L262 road, and the operational traffic to and on the commercial and industrial facilities, use of the industrial port of Lubmin (cf. application document, Part D1.01, Section 6.2.4.3, pp. 615 and 623), air emissions from the HGV and shipping traffic (cf. application document, Part D1.01, Section 6.2.4.3, p. 618) and the visually disruptive stimuli associated with anthropogenic uses (cf. application document, Part D1.01, Section 6.2.4.3, p. 620), which also include light emissions from the traffic in the entire surrounding area and the commercial operations (cf. application document, Part D1.01, Section 6.2.4.3, pp. 622-3).

Population evaluation

The evaluation of the five criteria “presence of species of Annex I of the EU Birds Directive”, "classification in the Red List of Mecklenburg – Western Pomerania and Germany”, “presence of species with particular habitat requirements”, “spatial importance” and “strictly protected species” gives an overall assessment of the delineated aviafaunistic functional areas (bird habitats), in which each of the highest individual evaluations of a species was taken as representative of the classification of the overall assessment. Therefore, for example, with respect to the first of the named criterion, of the total 59 detected breeding birds, the red-backed shrike, wood lark and barred warbler belong to the species of Annex I of the EU Birds Directive, which corresponds to 5% of the breeding birds present. The investigation area is not part of an EU bird sanctuary (cf. application document, Part D1.01, Section 5.5.11.2, p. 429).

Due to their species configuration, bird habitats 2 and 4 are of high importance and bird habitats 1 and 3 of medium importance (cf. application document, Part D1.01, Section 5.5.11.2, pp. 428-9).

The varying sensitivities of the detected breeding birds (breeding birds are sensitive to noise to significantly differing degrees) that are species-specific and relate to the individual impact factors are included in the population evaluation (cf. application document, Part D1.01, Section 5.5.11.2, p. 429).

Mammals (except bats) - terrestrial

Population

Eurasian otter

In addition to the inland watercourses and bodies of standing water, the Eurasian otter also uses the coastal waters as a habitat. According to the management plan for the FFH area DE1747-301 “Bay of Greifswald, parts of the Strelasund and Nordspitze Usedom”, the entire coastline of the Bay of Greifswald belongs to the habitat of the Eurasian otter. As part of the investigations for the management plan for the FFH area “Bay of Greifswald, parts of the Strelasund and Nordspitze Usedom”, Eurasian otter habitats were identified in the area of the Struck peninsula and Freesendorf Lake, in the estuary area of the Ziese and in the area of the Wampen Reef, a considerable distance from the investigation area. According to the submitted environmental impact assessment, there are no Eurasian otter habitats that satisfy the typical territorial requirements of the aquatic and semi-aquatic Eurasian otter living in the investigation area itself. Reproduction and resting places are therefore not expected in the investigation area. The Eurasian otters detected in the vicinity of the project are therefore classified as migratory or looking for food, as their radius of action can extend into the investigation area. Eurasian otters were detected on two occasions to the south of the L262 in line with the former nuclear power station. There were sightings further away to the south of Lubmin and Spandowerhagen respectively. The technical consultant of the project developer estimates, however, that no constructions of that kind are to be expected in the investigation area and it is therefore possible to rule out any relevant presence for the investigation area (cf. application document, Part D1.01, Section 5.5.12.1, p. 430).

Beaver

The beaver *(Castor fiber)* does not live in the region; there are no habitats that enable population within the area of the investigation area (the nearest occurrence is in the estuary of the Peene at a distance of >7.5 km (http://www.umweltkarten.mv-regierung.de/atlas/, retrieved on 15/01/2018)) (cf. application document, Part D1.01, Section 5.5.12.1, p. 430).

Common dormouse

There are also no habitats that enable population in the investigation area for the common dormouse *(Muscardinus avellanarius)* (nearest occurrence on the island of Rügen) (cf. application document, Part D1.01, Section 5.5.12.1, p. 430).

Other species

From previous faunistic investigations of the area north of the upper outlet canal (I.L.N. Greifswald 1999)[76], which were also consulted for the relevant area of development plan No. 1 “Industrie- und Gewerbegebiet Lubminer Heide” area, occurrences of the root vole *(Microtus oeconomus),* striped field mouse*(Apodemus agrarius),* water shrew*(Neomys fodiens),* common hedgehog*(Erinaceus europaeus)* and brown hare *(Lepus europaeus)* species are known to be present. According to the Red List of M-V, the five species common hedgehog *(Erinaceus europaeus),* water shrew *(Neomys fodiens),* brown hare *(Lepus europaeus),* root vole *(Microtus oeconomus)* and striped field mouse *(Apodemus agrarius)* are endangered or potentially endangered (Red List categories 3 and 4 – Labes 1991). Regular occurrences of the hedgehog and striped field mouse in particular can be assumed; the choice of habitat is not optimal for the other species listed (less intensive use), (cf. application document, Part D1.01, Section 5.5.12.1, p. 430).

There are existing environmental impacts on mammals that cannot fly in the use of the area and the barrier effect of the traffic and industrial areas and the industrial port of Lubmin with access road. The use of the area for commercial and tourist purposes also creates visual and acoustic disturbances. Existing environmental impacts on species active at night occur in the area of the Deutsche Ölwerke Lubmin and the industrial port of Lubmin due to the heavy illumination of the external area (cf. application document, Part D1.01, Section 5.5.12.1, p. 431).

Population evaluation

As the main area of incidence of the Eurasian otter is the Spandowerhagener Wiek and the Struck peninsula by the Freesendorf Lake, the investigation area is of minor importance for the Eurasian otter (cf. application document, Part D1.01, Section 5.5.12.2, p. 431). Due to the low detected populations of other endangered species of mammal, such as the water shrew and root vole, and the sub-optimal habitat conditions of the biotope in the investigation area for these species, the investigation area is of no particular importance for these mammal species. The investigation area only offers a more important habitat for the striped field mouse and the common hedgehog. Overall, the submitted surveys for the investigation area could not identify any particular faunistic functions for the terrestrial mammals, so that it was classified as having a medium level of worth (cf. application document, Part D1.01, Section 5.5.12.2, p. 431).

With respect to the project impacts, there is low sensitivity (due to the mobility of the species and their ability to adapt) (cf. application document, Part D1.01, Section 5.5.12.2, p. 431).

B.4.4.1.3.2 Environmental impacts

[76] I.L.N. Greifswald (1999): Recherche zum Vorkommen von Säugetieren im Bereich des geplanten Standortes und der näheren Umgebung des GuD-Kraftwerks der VASA Energy bei Lubmin. Institut für Landschaftsökologie und Naturschutz Greifswald, Juli 1999 *[Research on the presence of mammals in the area of the planned site and immediate vicinity of the VASA Energy combined-cycle power station at Lubmin. Institute of Landscape Ecology and Nature Conservation Greifswald, July 1999*].

B.4.4.1.3.2.1 Offshore

Marine biotopes

For marine biotopes, taking into consideration the mitigation measures PT3 (minimisation of the intervention area in hard substrate biotopes within areas of common importance in the territorial waters of M-V), PT4 (minimisation of the intervention area in biotopes of the soft substrates in the Bay of Greifswald in the territorial waters of M-V), PT5 (reduction of turbidity plumes caused by the use of mechanical dredgers in the Bay of Greifswald and the Boddenrandschwelle in the territorial waters of M-V) and PT7 (restoration of the seabed of the trench areas and in the interim marine storage site in the territorial waters or M-V), the following impacts are to be expected as a result of the planned project in the sea area:

Construction-related impacts

As a result of the construction there will be localised impacts of high intensity in the area of the pipeline route and its immediate vicinity and in the interim marine storage site due to the dredging and backfilling (or temporary and final storage) of sediment. Despite the restoration of the relief and respective biotope structures with autochthonous material, the natural geological structure along the course of the pipe trench with alternating occurrences of hard and soft substrates will be permanently altered. On the basis of the Nord Stream Pipeline Offshore-Monitoring 2011-2016, it is assumed that the regeneration of the benthic communities will be complete within two to four years (Nord Stream-Pipeline Offshore-Monitoring 2011, pp. 171, pp. 309, pp. 346; Nord Stream-Pipeline Offshore-Monitoring 2012, pp. 170, pp. 317, pp. 366; Nord Stream-Pipeline Offshore-Monitoring 2013, pp. 109, pp. 252, pp. 334; Nord Stream-Pipeline Offshore-Monitoring 2014, pp. 64; Nord Stream-Pipeline Offshore-Monitoring 2016, pp. 57, pp. 110). In the greater vicinity of the trench and the interim marine storage site there will be short- and medium-term impacts of low intensity as a result of resuspension and sedimentation of silty and organic material. At the offshore landfall site, there are no mechanical impacts on the biotopes on the seabed (microtunnel) (cf. application document, Part D1.01, Section 6.2.4.2.1, p. 539).

Installation-related impacts

Installation-related impacts on marine biotopes initially include the laying of the pipeline in sections on the seabed. This will create a permanent, artificial, hard substrate over the naturally occurring sediments on short segments. Depending on the penetration depth of the light, this will be populated by epiphytes and epibenthos (high intensity). Due to the release of substances from sacrificial anodes and the coating of welds, it is assumed that there will be localised and permanent impacts of low intensity (cf. application document, Part D1.01, Section 6.2.4.2.1, p. 540, Table 6-21).

Operation-related impacts

In terms of operation, no relevant impact factors are expected offshore (cf. application document, Part D1.01, Section 6.2.4.2.1, p. 540, Table 6-21). By maintaining the 2 K criteria (measure BO1: no cooling down of the surrounding sediment by 2 K due to the minimum coverage of 50 cm, cf. Section B.4.4.1.9.1), no impact on macrophytes is to be expected as a result of the operation-related temperature impact of the Nord Stream 2 Pipeline.

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239).

Macrophytes

For macrophytes, taking into consideration the mitigation measures PT3 (minimisation of the intervention area in hard substrate biotopes within SCIs in the territorial waters of M-V), PT4 (minimisation of the intervention area in biotopes of the soft substrates in the Bay of Greifswald in the territorial waters of M-V), PT5 (reduction of turbidity plumes caused by the use of mechanical dredgers in the Bay of Greifswald and the Boddenrandschwelle in the territorial waters of M-V) and PT7 (restoration of the seabed of the trench areas and in the interim marine storage site in the territorial waters or M-V), the following impacts are to be expected as a result of the planned project:

Construction-related impacts

The construction-related impacts caused by the trenching of the pipeline and the associated population losses (subsequent repopulation of macrophytes) are localised, medium-term and of medium intensity (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 548, Table 6-22). Due to the very uneven distribution of macrophytes along the Nord Stream 2 route, there are project-related losses in the 12 nautical mile zone caused by their removal as a result of dredging work and anchor chains dragging along the seabed, which is mainly restricted to the hard substrates in the area of the Boddenrandschwelle and the area to the north of the Boddenrandschwelle (north-east of Nordperd) (cf. application document, Part D1.01, Section 5.5.2.1, pp. 248). However, consideration should be given when planning the anchor positions on outcropping sedimentary residues (hard substrates) to place as few anchor touchdown points as possible (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 469) in order to reduce as far as possible the loss of macrophytes due to anchor chains. The occurrences of macrophytes in the upper landfall site (with low degrees of coverage up to water depths of 1 m) are not threatened by population loss because they will be tunnelled under (microtunnel). The end trench of the tunnel lies in an area sparsely populated by macrophytes. After the opening of the tunnel and the recovery of the tunnel boring machines, the landward section of the pipeline here will run through the microtunnel, an anchor pile will be positioned as an abutment for the start of the laying of the pipeline in the Bay of Greifswald (the so-called dead-man anchor) and finally the AWTI will be laid in an extended trench section (cf. application document, Part D1.01, Section 1.2.1.2, p. 33). Due to the use of the area but in particular due to the sheer volume of shipping traffic and the unavoidable, associated turbulence, a high load is expected on the sparse vegetation in the deeper areas of the biotope.

The areas of the interim marine storage site are macrophyte-free (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 542).

The impairment due to shading and sedimentation as a result of the resuspension of sediment, formation of turbidity plumes, release of nutrients and contaminants, as well as the increase or reduction of the sediment are categorised as medium-scale, of short duration and low intensity (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 548, Table 6-22). The project-related suspension of the fine-grain portions and the organic materials in the dredged material leads to the formation of turbidity plumes and to the release of nutrients contained in the sediment or its pore

water. The nitrogen contained in the sediment is not categorised as relevant with respect to an increase in the competition for light by planktonic algae due to an increase in the same, as nitrogen is predominantly found in inert compounds in sediment and the eluate concentrations lie within the range of the average values of the concentrations in the open water of the Bay of Greifswald and the Bay of Pomerania (cf. application document, Part D1.01, Section 6.2.2.2, p. 504). A discharge of biologically available nitrogen in the water column of low intensity and short duration is therefore to be expected in terms of the impact. The impact of the project-related phosphate release on the propagation of pelagic algae is regarded as negligible, as the project-related phosphate release lies within the interannual variability of the external and internal inputs (cf. application document, Part D1.01, Section 6.2.2.2, p. 506).

Installation-related impacts

All of the installation-related impacts with respect to macrophytes (localised introduction of hard substrates; potential population of macrophytes, emissions of metals) are localised, permanent and of low intensity. The concrete coating of the pipeline sections laid on the sediment will offer a new settlement substrate for the macroalgae, whereby due to the burial depth of >10 m there is expected to be an overriding population of red algae in these sections. Macrophytes that populate hard substrates are also offered a new settlement substrate by all technically required rock placements. Impacts (e.g. restricted growth) on macrophytes due to the release of substances from the material of the sacrificial anodes and the coating of the welds are not regarded as worrying due to the only localised immissions from low concentrations. Due to the anoxic conditions in the seabed, the release of zinc from the sacrificial anodes leads to the formation of zinc sulphide, which will remain inert in the seabed. In terms of aluminium, the pH values of the sea water there will cause the formation of water-insoluble aluminium-hydroxide, which is not harmful for macrophytes (cf. application document, Part D1.01, Section 6.6.2, p. 731).

Operation-related impacts

In the event of external inspections, repair work and any correction of free spans, localised and short-term to permanent population losses, mobilisation of sediments, turbidity and sedimentation of low to high intensity are expected operation-related impacts (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 548, Table 6-22). Internal inspections with smart pipeline pigs and external inspections by means of e.g. a multi beam echosounder or video inspections of the pipeline by shipping vessel will be conducted without ground contact, which will fully protect macrophyte populations (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 545).

If corrections of free spans or other repair work is required on the pipeline, the same mechanisms of action - restricted in terms of space and time - are expected on macrophytes as for the construction of the pipeline, whereby the rock placements undertaken to correct free spans offer new settlement substrates (cf. application document, Part D1.01, Section 6.2.4.2.2, pp. 544).

The effect of the temperature conditions in the sediment does not have any impact on the marine plant communities (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 548, Table 6-22). By maintaining the 2 K criteria (measure BO1: no cooling down of the surrounding sediment by 2 K due to the minimum coverage of 50 cm), no impact on macrophytes as a result of the operation-related temperature impact of the Nord Stream 2 Pipeline is to be expected.

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239) and Section B.4.4.1.9 of this Plan Approval Decision.

Macrozoobenthos

For the macrozoobenthos species group, taking into consideration the mitigation measures PT3 (minimisation of the intervention area in hard substrate biotopes within SCIs in the territorial waters of M-V), PT4 (minimisation of the intervention area in biotopes of the soft substrates in the Bay of Greifswald in the territorial waters of M-V), PT5 (reduction of turbidity plumes caused by the use of mechanical dredgers in the Bay of Greifswald and the Boddenrandschwelle in the territorial waters of M-V) and PT7 (restoration of the seabed of the trench areas and in the interim marine storage site in the territorial waters or M-V), the following impacts are to be expected as a result of the planned project:

Construction-related impacts

Overall, the construction-related impact on the macrozoobenthos due to dredging work and interim storage in the area of the pipe trench and the interim marine storage site are characterised as localised, medium-term and of high intensity. There will be a short-term population loss and subsequent regeneration. Physical impairments of benthos organisms at suspended matter concentrations >50 mg/l (depending on the respective species group, the sediment type and currents, natural concentration in the area of 5 to 50 mg/l) due to turbidity plumes and sedimentation are expected to be localised and of short duration and low intensity. The laying of the pipeline on the seabed causes localised, short-term population loss and influences the surrounding areas to a high intensity. Overall, only a short section of the 3,943 km pipeline will be laid on the seabed in the 12 nautical mile zone, which corresponds to a share of 4.7% (cf. application document, Part G.01, Section 10.1.1, Table 10-2, p. 248). Due to the impact factor of the use of the area and temporary habitat change, there are localised, temporary (medium-term) population losses and subsequent regeneration of medium intensity (cf. application document, part D1.01, Section 6.2.4.2.3, pp. 549).

Installation-related impacts

The release of substances from the material of the sacrificial anodes causes no measurable impacts on the structure and function of the macrozoobenthos population; the impacts are localised, permanent and of low intensity. The installation-related use of the area and permanent habitat change due to the pipeline laid on the seabed (short sections in the 12 nautical mile zone) is evaluated as high intensity and a permanent change in the localised benthic population structure (cf. application document, part D1.01, Section 6.2.4.2.3, pp. 549).

Operation-related impacts

With respect to operation, localised, permanent impacts of low intensity are expected in relation to the temperature of the pipeline (no measurable impacts on the structure and function of the population). This is also the case for inspection and maintenance work, and for rock placements and the associated temporary population loss (and subsequent regeneration/formation of a benthic hard substrate community) (cf. application document, Part D1.01, Section 6.2.4.2.3, pp. 549).

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239) and Section B.4.4.1.9 of this Plan Approval Decision.

Fish and cyclostomes

For the species group fish and cyclostomes, taking into consideration the mitigation measures (Section B.4.4.1.9):

- PT1 (construction time restraint in the Bay of Greifswald and the south-west of the Bay of Pomerania up to KP 53 in the territorial waters of M-V),
- PT2 (construction time restraint in the Bay of Pomerania from KP 53 in the territorial waters of M-V),
- PT3 (minimisation of the intervention area in the hard substrate biotopes within SCIs in the territorial waters of M-V),
- PT4 (minimisation of the intervention area in the biotopes of the soft substrates in the Bay of Greifswald in the territorial waters of M-V),
- PT5 (reduction of turbidity plumes by the use of mechanical dredgers in the Bay of Greifswald and the Boddenrandschwelle in the territorial waters of M-V),
- PT6 (reduction in the light immissions from the seaward construction activities in the territorial waters of M-V) and
- PT7 (restoration of the seabed in the trench areas and the interim marine storage site in the territorial waters of M-V),

the following impacts are to be expected as a result of the planned project:

Construction-related impacts

While laying the pipeline, it must be assumed that the turbidity plumes and increase in the sound level will trigger scare effects and flight reactions in fish species. The construction-related loss of fishes by dredging and interim marine storage is negligible and not detectable. The majority of the construction-related disturbances and impairments are regarded as small-scale and temporary. By laying the pipeline in open trenches, more severe impacts are expected on fishes in the 12 nautical mile zone due to the construction. Taking into account the construction time window (PT1, PT2), the construction-related impacts on the fish and cyclostomes fauna are predicted to be localised, short-term and of medium intensity (cf. application document, Part D1.01, Section 6.2.4.2.4, pp. 559).

Installation-related impacts

The installation-related impacts due to the use of the area and permanent change of habitat when laying the pipeline on the seabed and the release of substances from the material of the sacrificial anodes (no measurable impacts) are localised, permanent and of low to medium intensity (cf. application document, Part D1.01, Section 6.2.4.2.4, pp. 559).

Operation-related impacts

If, contrary to expectations, there is a need to carry out repairs, then in theory, the same impacts could occur as occur during the construction of the pipeline. However, this would then be to a minor extent in terms of space and time, compared to the

construction of the pipeline, depending on the extent of the repair. The extent of the operation-related impact in the case of maintenance and repair work is evaluated as small-scale, short-term and of low intensity. An operation-related influence on the fish fauna by the cold natural gas in the pipeline has been ruled out (cf. application document, Part D1.01, Section 6.2.4.2.4, pp. 559).

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239) and Section B.4.4.1.9 of this Plan Approval Decision.

Staging birds

For staging birds, taking into consideration the mitigation measures PT1 (construction time restraint in the Bay of Greifswald and the south-west of the Bay of Pomerania up to KP 53 in the territorial waters of M-V), PT2 (construction time restraint in the Bay of Pomerania from KP 53 in the territorial waters of M-V) and PT6 (reduction in the light immissions from the seaward construction activities in the territorial waters of M-V), the following impacts are to be expected as a result of the planned project:

Construction-related impacts

In the staging areas, the driving-away of staging birds in the area of the construction activities is to be expected due to optical and acoustic disturbances (maximum disturbance radius of 1-2 km per vessel; for the pipe-laying fleet the result is areas of 50-100 km^2 in total). This occurs outside of the (main) staging period. The disturbances always only affect smaller sections of the species-specific staging areas. Along the Nord Stream 2 route, the main disturbances to waterfowl will occur during the summer staging activity in the shallow waters in the Lubmin area and in the area of the Boddenrandschwelle (great crested grebe, cormorant, terns and little gull). Since the construction time will be outside the main staging periods of the majority of seabird species, the disturbances are significantly restricted. There will most likely be temporary disturbances to sub-populations of individual species to the north and north-west of the Oderbank. These will predominantly affect guillemots and velvet scoter during the autumn. Once the construction phase is complete, disturbances of the intensity described will end. Since the relevant impacts will only occur temporarily (activities during the construction phase), short-term, localised to medium-scale impacts of low to medium intensity are assumed (cf. application document, Part D1.01, Section 6.2.4.2.5, pp. 573).

Installation-related impacts

Due to the existing monitoring results for the Nord Stream Pipeline 2011-2016, no installation-related impacts on staging birds are determined (cf. application document, Part I3.04, Section 4.4.5, pp. 179). The pipeline laid on the seabed represents the localised creation of new food resources due to the introduction of hard substrate, which does not have any negative impact on staging birds (cf. application document, Part D1.01, Section 6.2.4.2.5, pp. 580-1, Table 6-28).

Operation-related impacts

The extent of the operation-related impacts (disturbances in the event of inspection and repair work) is evaluated as medium-scale, short-term and of low intensity (cf. application document, Part D1.01, Section 6.2.4.2.5, pp. 580-1, Table 6-28).

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239) and Section B.4.4.1.9 of this Plan Approval Decision.

Marine mammals

For marine mammals, the following impacts are to be expected as a result of the planned project (mitigation measures are not required for these species groups):

Construction-related impacts

During the construction phase, marine mammals are temporarily disturbed by sound emissions. Sound emissions caused by dredging and pipe-laying work will lead to localised to medium-scale impacts of short duration and low intensity (cf. application document, Part D1.01, Section 6.2.4.2.6, pp. 589-590, Table 6-31). Relevant empirical and measured values (in particular underwater noise immissions) are available for the construction of the Nord Stream Pipeline (GERKE 2011[77], JOHANSSON & ANDERSSON 2012[78]), which have also been used in the submitted underwater noise immissions report (cf. application document, Part I3.05, Section 7, p. 25). No impacts on marine mammals were detected during the construction of the Nord Stream Pipeline. The recolonisation of the Bay of Greifswald by grey seals was not disturbed; rather, a significant increase in the seal presence was documented over the years (cf. application document, Part D1.01, Section 6.2.4.2.6, p. 588). The same applies to the harbour porpoise, for which, since 2008 in the Pomeranian Bight, in summer and autumn months an unlimited increase has been observed for harbour porpoises detected by measuring systems for listening to underwater noise. The underwater noise immission measurements during the construction of the Nord Stream Pipeline showed that the guide values with respect to harbour porpoise were never exceeded. The limit values with continuous sound (temporary hearing threshold shift of 188 dB and permanent hearing threshold shift of 203 dB) also proposed in the Espoo Report (cf. application document, Part J01, Section 10.6.4.2, p. 396, Table 10-39) were not reached. For seals, localised and short-term avoidance reactions of low intensity were identified with respect to visual disturbance by construction plant and operations. The classification of the environmental impacts in the submitted environmental impact assessment with respect to the grey seals also does not change due to the new circumstances of the 23 dead grey seals found on the northern coast of the Bay of Greifswald. This is because of the following. The Nord Stream 2 project will not lead to any significant increase in the risk of injury or death to grey seals. In the Bay of Greifswald, the grey seals regularly maintain distances of 100 m to 200 m from motorised vessels (Nord Stream Construction Monitoring 2010). Based on the Nord Stream Construction Monitoring 2010 measurement results, physical impairments of seals by sound emissions from construction fleet vessels have been ruled out (cf. application document, Part I3.05,

[77] Gerke, P. (2011): The Nord Stream Monitoring - Measurement of the hydro-sound pollution. Institut für technische und angewandte Physik GmbH (ITAP). Nord Stream report G-PE-LFG-MON-500-UNWNOISE-A.

[78] Johansson, A. T., Andersson, M. H. (2012): FOI Ambient Underwater Noise Levels at Norra Midsjöbanken during Construction of the Nord Stream Pipeline. FOI Report.

Section 6.1, p. 22, Table 7). The results of the underwater sound immissions measurements (Nord Stream Construction Monitoring 2010, pp. 99) from May until November 2010 as part of the Nord Stream project identified in the Bay of Greifswald average sound levels with and without construction activities of between 110 dB and 140 dB re 1 µPa, whereby a permanent hearing threshold shift and thus injury to the hearing organ of grey seals can only occur at 186 dB re 1 µPa (Southall et al. 2007[79]). Injuries to grey seals in the form of hearing damage are therefore ruled out. It is assumed that the grey seals are able to avoid the slow-moving pipe-laying fleet without any problems. No impacts on marine mammals were detected during the construction of the Nord Stream Pipeline. The recolonisation of the Bay of Greifswald by grey seals was not disturbed; rather, a significant increase in the seal presence was documented in the period from 2010 to 2016 (cf. application document, Part D1.01, Section 6.2.4.2.6, p. 588; Herrmann 2017[80]). No deaths resulting from the construction of the Nord Stream Pipeline were therefore detected. The nearest colonies in the vicinity of the planned Nord Stream 2 pipeline route are located in the Großen Stubber in the Bay of Greifswald at a distance of 3 km and in the Greifswalder Oie at a distance of 10 km. Since roughly the same number of 5-10 grey seals was observed on the Großen Stubber constantly during the construction period of the Nord Stream project (Nord Stream Construction Monitoring 2010, p. 120), the driving-away of the animals by the construction work is ruled out. With respect to grey seals, it was identified that there was merely a minimal increase in the sound level during the construction work for the Nord Stream Pipeline in the vicinity of the colony on Großen Stubber, which did not lead to a change in the intensity of use of this colony (cf. application document, Part D1.01, Section 6.2.4.2.6, p. 588).

As already discussed, the investigations conducted during the construction of the Nord Stream Pipeline in the Bay of Greifswald created an average sound level with and without construction activity of between 110 dB and 140 dB re 1 µPa. The construction-related sound input was therefore very low in comparison to the continuous prevalent shipping traffic and the resulting existing environmental impact of 102-112 dB re 1 µPa2 in the investigation area (cf. application document, Part I3.05, Section 4, p. 12, Table 2). As already discussed, no changes in abundance were identified during the construction of the Nord Stream Pipeline in the nearest colony on Großen Stubber.

In connection with the pipe-laying (direct disturbance of near-surface sediments, formation of turbidity plumes), localised, short-term impacts of low intensity were predicted for the marine mammals seals and harbour porpoise.

Installation-related impacts

Installation-related impacts are not relevant for marine mammals. There are no negative impacts on marine mammals resulting from the buried pipeline or pipeline laid on the surface (cf. Application document, Part D1.01, Section 6.2.4.2.6, pp. 589, Table 6-31).

Operation-related impacts

[79] Southall, B.L., Bowles, A.E., Ellison, W.E., Finneran, J.J., Gentry, R.L., Greene, C.R. et al. (2007): Marine mammal noise exposure criteria: initial scientific recommendations. Aquatic Mammals, 33, 411–521.

80 Herrmann, C. (2017): Robben in Mecklenburg-Vorpommern im Jahr 2016. [*Seals in Mecklenburg – Western Pomerania in 2016*] Präsentation, LUNG M-V.

Operation-related impacts and disturbances resulting from external inspections and repair work are of short duration and low intensity (cf. application document, Part D1.01, Section 6.2.4.2.6, pp. 589-90, Table 6-31).

Biological diversity

The impact prediction of the environmental impacts on the protected asset “biological diversity” are based on the comments relating to the protected assets “animals” and “plants” in Section B.4.4.1.3.1.1 (offshore) and the comments in the submitted environmental impact assessment (cf. application document, Part D1.01, Section 6.4, pp. 691). The following can be determined with regard to the issues of biological diversity (cf. application document, Part D1.01, Section 6.4, pp. 692):

When evaluating the influence of the project-related impacts on the species diversity of macrophytes, particular attention was given to the offshore area in the 12 nautical mile zone and the coastal landfall site of Lubmin. Significant occurrences of macrophytes (red algae) are restricted to along the Nord Stream 2 route in the 12 nautical mile zone, in particular on the hard substrates in the area of the Boddenrandschwelle and the area to the north of the Boddenrandschwelle (north-east of the Nordperd). In terms of construction, as a result of the pipe-laying, macrophytes, in particular red algae, were removed in reef areas of the Boddenrandschwelle and on adjacent hard substrates in the Bay of Pomerania, near Nordperd, for the duration of the construction work. Once the restoration work is complete, the regeneration and recolonisation of the macrophytes on identical substrates can begin. In terms of the installation, the concrete coating of the pipeline and the localised rock placements where required for ensuring pipeline integrity even offer small and sessile habits of red algae a substrate near the lower growth limit that can be populated.

In the landfall site, spermatophytes grow with low degrees of coverage in water depths of up to 1 m. The crossing of the flat coastal area via a microtunnel means no loss of macrophytes is expected. The construction works commence at the offshore end of the microtunnel in a water depth of 2 m, with the excavation of the exit pit of the microtunnel. The installation of the exit pit and the pipeline trenches are also not expected to cause a population loss for the occurrences of macrophytes at the landfall site. The excavation of the exit pit and the pipeline trench may cause temporary and localised sediment disturbance, turbidity and layering of sediment on the plants, whereby only minimal impacts are expected on the occurrences of macrophytes. Therefore, no impacts are expected with respect to the biological diversity, as there will be no loss of entire species populations or genetic diversity. Ecosystem diversity will therefore also not be impaired (cf. application document, Part D1.01, Section 6.4, p 692).

In terms of the project, as already discussed, the macrozoobenthos will also be affected by the Nord Stream 2 project. In the offshore area, surface sediments and benthic habitat will be temporarily removed as a result of the laying of the Nord Stream 2 Pipeline. This intervention and the interim marine storage of the excavated material will kill off the macrozoobenthos living in the areas in question. The trenches will be backfilled with autochthonous material in order to restore the original relief and sediment structure as best as possible once the construction work is complete, and to ensure the benthic communities are able to regenerate quickly. The construction-related impact factors “turbidity plumes” and “sedimentation” will only create small changes to the structure and function of the macrozoobenthos in the

immediate vicinity of the trenches. The construction monitoring of the Nord Stream Project was able to document that the construction-related suspended matter concentrations in the vicinity of the dredging work also did not exceed the amplitude of the natural variability of the seston contents in the Bay of Greifswald (Nord Stream Baubegleitendes Monitoring, p. 120). The laying of the pipeline on the seabed has similarly minor impacts, as only small-scale, limited population losses are predicted. Instead, the concrete coating and the rock placements where required represent artificial hard substrate that can also be populated by epibenthic animal species. The temporary removal of reef structures during the construction of the Nord Stream 2 Pipeline leads to the destruction of the local communities that populate the surface of the hard substrate. Once the pipe has been laid on the sea bed, these hard substrate surfaces will be restored as part of the mitigation measure M3 stated in the pan (cf. Section B.4.4.1.9.1). The Nord Stream Monitoring shows that already after three years, comparable macrozoobenthos coenosis were found on the original reefs in terms of species numbers, abundance and biomass (cf. application document, Part I3.04, Section 4.1.6, p. 57). In terms of operation, only minor impacts on benthic communities are expected as a result of temperature changes, as there will be no cooling down of the seabed by more than 2 K with respect to the ambient temperature. Despite the localised, partly high impact intensities of the construction- and operation-related interventions, there will only be a minor impact on the overall macrozoobenthos diversity because the benthic communities will be able to be completely restored in the medium-term. Therefore, no impacts are expected with respect to the biological diversity, as there will be no loss of entire species populations or genetic diversity. Ecosystem diversity will therefore also not be impaired (cf. application document, Part D1.01, Section 6.4, pp. 692).

In terms of construction, the required dredging work and the temporary storage of the dredged material will lead to a temporary loss of habitat of the resident fish species, with the construction-related loss of individuals being rather insignificant. The majority of the fish species detected in the area of the planned route (cf. application document, Part D1.01, Section 5.5.4, pp. 280) are characterised by a high degree of mobility, because these species avoid unfavourable environmental conditions (e.g. habitat loss) and, conversely, can temporarily migrate back when the conditions improve and stabilise. During the Nord Stream Monitoring of small and young fish fauna, no negative influences on the progeny of less mobile species or stages of growth were detected in the area of the landfall site of the Nord Stream Pipeline (Nord Stream Offshore-Monitoring 2013, p. 6). These findings can be transferred to the Nord Stream 2 project. Only a short-term displacement of stationary demersal fishes was predicted during the laying of the pipeline on the seabed in some areas of the section of the route. As a hard substrate, laying the pipeline on the seabed represents a habitat loss in sandy marine areas for some fish species (especially flatfish). However, the pipeline itself that is laid on the seabed, and any necessary rock placements do actually lead to an increase in fish diversity and fish density (reef effect) (cf. verbatim report dated 26/09/2017, p. 446). Only in individual cases will there be behavioural reactions such as flight due to disturbances in the form of light and noise immissions or turbidity, because these disturbances will only be small-scale and short-term. The juvenile young and adult stages of most of the detected fish species can leave areas with increased light and noise immissions and sediment loads due to their considerable mobility. Benthic fish eggs are significantly more sensitive to sedimentations, whereby, due to the construction time regulations (mitigation measure M 6 Section B.4.4.1.9.1) and the reduction in

turbidity due to the use of mechanical excavators (mitigation measure M 4 Section B.4.4.1.9.1), it is never usually the entire spawning periods of the species that are affected by the laying of the pipeline and the dredging work only creates minimal sedimentation. In summary, the project-related impacts will not create any sustainable impacts on the diversity of the fish fauna. Therefore, no impacts are expected with respect to biological diversity, as there will be no loss of entire species populations or genetic diversity. Nor will ecosystem diversity be impaired (cf. application document, Part D1.01, Section 6.4, p 693).

In terms of the project, as already discussed, the offshore bird species will also be affected by the Nord Stream 2 project. As a result of visual and acoustic disturbances, a driving-away of staging birds in the area of the construction activities can be expected in the staging areas (maximum disturbance radius of 1 to 2 km per vessel (cf. application document, Part F.07, Section 6.1, pp. 151)). The majority of species are affected outside of their (main) staging period (cf. application document, Part F.07, Section 6.1, pp. 151). The disturbances always only affect smaller sections of the staging areas. Disturbances of waterfowl along the Nord Stream 2 route will mainly affect the summer staging activity in the shallow waters in the Lubmin area and in the area of the Boddenrandschwelle (great crested grebe, cormorant, terns and little gull). In this respect, the species of great crested grebe, cormorant, terns and little gull are not expected to experience any significant impairments due to the implementation of mitigation measures (cf. Section B.4.6). On the Boddenrandschwelle, the construction time including dredging work and backfilling of the pipe trench will last approx. 4 months (end of August to end of December). Since the construction time will be outside the main staging periods of the majority of seabird species, the disturbances are significantly restricted. There may be temporary disturbances of sub-populations of individual species to the north and north-west of the Oderbank. These species are easily able to avoid the slow-moving pipe-laying fleet and use other parts for staging or finding food. Once the construction phase is complete, disturbances of the intensity described will end. In general, there will be no project-related impacts on the diversity of the staging birds in the Bay of Greifswald and Bay of Pomerania. Therefore, no impacts are expected with respect to the biological diversity, as there will be no loss of entire species populations or genetic diversity. Ecosystem diversity will therefore also not be impaired (cf. application document, Part D1.01, Section 6.4, p 693).

With respect to marine mammals, the dredging and pipe-laying work are expected to lead to avoidance behaviour. Various investigation results, including the Nord Stream Monitoring (Nord Stream Baubegleitendes Monitoring, p. 120), suggest that the vessel and equipment noise depends on volume and frequency, as well as existing environmental impact of harbour porpoise can lead to behavioural reactions (cf. application document, F.07, Section 5.1.1.2.1, p. 49). Based on the very low increase in the sound levels that were measured at the “Großer Stubber” station during the construction of the first Nord Stream Pipeline (Nord Stream Baubegleitendes Monitoring 2010, p. 103), it is assumed that the construction noise during the construction of the Nord Stream 2 Pipeline is perceptible for seals (and harbour porpoise) but that damage to health can be ruled out. The construction work will also be taking place in a sea area where there is a heavy existing environmental impact by shipping traffic (cf. application document, Part I3.05, Section 4, p. 11; Part J02, Section 22), so that the zone of specific perceptibility of the construction vessels of the Nord Stream 2 fleet is low. The avoidance reactions can be characterised as medium-scale and short-term (cf. application document, Part D1.01, Section

6.2.4.2.6, p. 589, Table 6-31). The acoustic impact factors are superimposed by visual factors due to the very good distribution of sound under water. Sustainable and large-scale changes in the distribution of food organisms of grey seals and harbour porpoise that could cause a change in the hunting behaviour or a displacement of the hunting activities in other areas are not expected due to the construction of the pipeline. In summary, no impacts are expected as a result of the project on the diversity of the marine mammals, because there will not be any disappearance or permanent migration of species. Nor will ecosystem diversity be affected (cf. application document, Part D1.01, Section 6.4, p. 694).

The offshore habitats and biotopes that will be affected by the project-related impact are sub-ecosystems of the higher-level “Baltic Sea” ecosystem. In the area of the pipeline route, its immediate vicinity and the interim marine storage site, there will be construction-related, localised intensive impacts caused by the dredging and backfilling (and any temporary storage and final storage) of sediment (cf. application document, Part D1.01, Section 6.2.4.2.1, p. 540, Table 6-21). The installation-related laying of the pipeline on the seabed will lead to a change in substrate and thus to another biotope type in sub-areas. In areas of the pipeline laid on the seabed, only wide-spread biotope types will be affected, with a reef biotope being replaced by the laying of the pipeline on the seabed. Depending on the penetration depth of the light, this will be populated by epiphytes and epibenthos. The restoration of the seabed of the trench areas and in the interim marine storage site by mitigation measure M3 (cf. application document B.4.4.1.9.1) will lead to a complete regeneration of the biotope. A regeneration of the benthic communities within two to four years has been determined as part of the monitoring of the Nord Stream Pipeline during construction and operation (Nord Stream-Monitoring Seeboden 2011, Nord Stream Monitoring Seeboden 2012, Nord Stream Offshore-Monitoring 2015). In the greater vicinity of the trench and the interim marine storage site, there will be impacts of low intensity as a result of resuspension and sedimentation of silty and organic material. The crossing of the coast by a microtunnel is expected to prevent any impacts in the landfall site on biotopes, because there will be no mechanical impacts on the biotopes on the seabed. Only the construction of the exit pit at the end of the microtunnel will lead to a stress on marine biotopes, which will also be restored. In terms of operation, no impacts on communities of the marine biotope are expected as a result of temperature changes, as there will be no cooling down of the seabed by more than 2 K with respect to the ambient temperature. The project is only expected to have minor impacts on marine biotopes and marine ecosystem diversity. There will be no disappearance or conversion of rare biotopes. Ecosystem diversity will therefore not be impaired (cf. application document, Part D1.01, Section 6.4, pp. 694).

B.4.4.1.3.2.2 Onshore

Biotope types / plants

Biotope types

Crossing the coast with a microtunnel enables a non-disruptive crossing which results in no impacts on the existing habitat structures. Contrary to the illustrations in the application documents, the project developer will not be using an area to the south of Deutsche Ölwerke Lubmin GmbH as a car park and for the site office. The

“ruderal forb stands of fresh to dry locations (RHU)” biotope type is only proportionally affected by the project, but will be taken into full consideration in the impact and compensation balancing (Section B.4.8.4.3.1). For the terrestrial biotope types, taking into consideration the mitigation measures PT10 (construction of a fence around the operational area of the Pig Receiving Station and around the areas used during construction) and PT12 (wood conservation measures acc. To DIN 18920 during the construction period), the following impacts are to be expected as a result of the planned project:

Construction-related impacts

The construction-related loss and impairment of soils, soil compaction, changes to soil properties by technology strips (access road), construction facility areas, etc. lead to localised, medium-term to permanent biotope losses on the areas used during construction. Furthermore, medium-term to permanent, localised biotope losses are to be assumed in the areas used during construction as a result of land use, habitat loss (removal of vegetation) and soil removal in the area of the later operational facility (cf. application document, Part D1.01, Section 6.2.4.3.1, pp. 597-8, Table 6-32). As a result of the construction works, parts of the high-value mixed pine forest dry to fresh locations (WKX), low-value ruderal forb stands of fresh to dry locations (RHU), low-value ruderal heath grasses (RHK), low-value uncultivated land of transport and industrial areas (OBV), lower-ranking biotopes used as car parks or sealed open areas (OVP) and a farm road, un- or partially sealed (OVU) will be lost (cf. Application document, Part G.01, Section 10.2.1, pp. 262).

Due to the construction-related emissions from air pollutants (SO_2, NO_2, fine particulates, CO_2) and emissions from air emissions during pre-commissioning, the extent of the impacts is categorised as short-term, localised and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.1, pp. 597-8, Table 6-32). The nitrogen emissions affect practically only the areas used during construction (cf. application document, Part D1.01, Section 6.2.4.3.1, p. 595). The onshore construction and commissioning air pollution study shows that the limit value for NO_2 of the 39th Regulation for the Implementation of the Federal Immissions Control Act on Air Quality and Maximum Emissions (39. BImSchV) dated 02/08/2010 (BGBl. I S. 1065), last amended by Section 1 of the Regulation dated 10/10/2016 (BGBl. I S. 2244) of 40 µg/m³ will only be exceeded in the construction area. Outside of this, this limit value is far from being reached, whereby there is an existing environmental impact of 6 µg/m³ NO_2 in the ambient air in the investigation area (cf. application document, Part I2.04, Section 8.2, p. 43). With regard to SO_2 emissions during the construction period, these are only considered an offshore impact, because sulphur emissions only occur when vessels powered by heavy oil or MGO (Marine Gas Oil, ships diesel) are present (cf. application document, Part I2.04, Section 8.1, p. 40). Outside of the construction site, the fine particulate load is only slightly higher in the first year of construction, whereby, according to the nearest measurement station at Rostock, an existing environmental impact of 16 µg/m³ and a load of 19 µg/m³ outside of the construction site are predicted (cf. application document, Part I2.04, Section 8.3, p. 51). The emission of CO_2 is regarded as not harmful with respect to the affected biotopes.

With regard to onshore biotopes, the water maintenance measures will lead to impacts of a short-term, localised nature and a lower impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.1, pp. 597, Table 6-32). The expansion of the groundwater depression cone is max. 189 m, whereby a draw-down of approx. 1 m

will occur only in a radius of 40 m around the groundwater depression cone (cf. application document, Part I2.05, Annex 2). Sensitivity of the biotope to a reduction in groundwater is key to estimating the impact intensity. The biotope types in the vicinity of the Pig Receiving Station are found on anhydromorphic sandy soils and demonstrate no or low sensitivity to ground water depression (cf. application document, Part D1.01, Section 6.2.4.3.1, p. 594).

Installation-related impacts

In terms of installation, the use of the area by facilities (partial sealing, complete sealing) in the area of the Pig Receiving Station will lead to localised, permanent biotope losses, whereby the impacts for low-value ruderal stands (RHU / RHK) and farm roads / uncultivated land (OVU / OVB) are categorised as low in the overall evaluation, and as high for the high-value mixed pine forest (WKX) on dry to fresh locations (cf. application document, part D1.01, Section 6.2.4.3.1, p. 599, Table 6-32).

Operation-related impacts

In terms of operation, short-term, localised biotope impairments of low impact intensity are predicted as a result of inspection and maintenance work in the area of the Pig Receiving Station (cf. application document, Part D1.01, Section 6.2.4.3.1, p. 599, Table 6-32).

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239). With regard to the evaluation of environmental impacts on biotopes protected by law, please refer to Section B.4.8.5 of this Plan Approval Decision.

Plants

For the most part, the flora in the investigation area consists of prevalent species commonly occurring in the area. This is particularly associated with the occurrence of less specialised biotopes in ruderal and eutrophic locations. In the investigation area, vascular plant species that are “endangered” according to the Red List of Mecklenburg – Western Pomerania or “particularly protected” according to BArtSchV are detected especially in the dry, moist and coastal biotopes (cf. application document, Part D1.01, Section 5.5.1.5.1, p. 237, p. 240, Table 5-37).

Construction-related impacts

Due to having avoided using dry, moist and coastal biotopes, the clearance of vegetation does not include any known locations of endangered or particularly endangered vascular plant species. Construction-related emissions of air pollutants (SO_2, NO_2, fine particulates, CO_2) and emissions of air emissions during pre-commissioning can be regarded as not being an impairment to endangered or particularly protected vascular plant species, analogous to the comments regarding the affected onshore biotope types. In the area affected by emissions, there are no particularly sensitive vegetation populations and the construction-based immissions are only of low intensity for a short period. In the area of the groundwater depression cone (range of up to 189 m) of the open groundwater maintenance required on the construction side on 30 to maximum 120 days, there may be no influences on vegetation populations, as already commented under the onshore biotope types. There are no groundwater-dependent biotope types in the area affected (cf. application document, Part D1.01, Section 6.2.4.3.1, p. 594).

Installation-related impacts

There are also no locations of endangered or particularly protected vascular plant species in terms of the installation.

Operation-related impacts

Operation-related impacts by air pollution emissions on endangered and particularly protected vascular plant species are ruled out, as the immissions are only of low intensity during the operational period (cf. application document, Part D1.01, Section 6.2.4.3.1, p. 594). Inspection and maintenance work will take place on the site of the Pig Receiving Station if necessary. This will prevent endangered and particularly protected vascular plant species from being affected.

Ground beetles in the beach area

For the sub-protected asset discussed here, no mitigation measures are required, as apparent below. The following impacts are to be expected (cf. application document, Part D1.01, Section 6.2.4.3.2, pp. 600):

Construction-related impacts

Construction-related impacts caused by the interruption of exchange relationships between sub-habitats of ground beetles in the beach area, are categorised as localised and short-term with low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.1, p. 603, Table 6-33). With the planned crossing of the coast with the microtunnel and the removal of the construction traffic in the area of the pig receiver station, ground beetles in the beach area are not affected by any of the construction work (no losses of individuals from construction traffic, no impacts by emissions of air pollutants and dust).

Installation-related impacts

There are no potential installation-related impact factors for ground beetles in the beach area. The Nord Stream 2 Pipeline takes a non-disruptive crossing under the coastal strip in microtunnels approx. 10 m below the surface (cf. application document, Part C.03).

Operation-related impacts

Potential operation-related impacts of inspection and maintenance work depend on the type of work required, but are evaluated in principle as short-term and localised with medium impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.1, p. 603, Table 6-33). The area between the coastline and the fence of the natural gas receiving terminal is open to access by the public and is therefore accessed at regular intervals.

Amphibians

In order to prevent nature protection legislation events with regard to the moor frog, which is strictly protected by BArtSchV and Annex IV FFH, amphibian protection fences are planned for the area of the Pig Receiving Station according to ancillary provision A.3.8.19. The Nord Stream 2 Pipeline crosses the coastline via underground microtunnels, which prevents any impacts on the above-ground habitat

structures in this area. The following impacts are to be expected (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 604):

Construction-related impacts

The construction-related impacts affect an area which is identified as being of low importance as a habitat for amphibians (few instances of five different species in the investigation area, no spawning waters in the vicinity) (cf. application document, Part D1.01, Section 5.5.7.2, pp. 385). Construction-related impacts resulting from habitat loss are therefore classified as a permanent and localised loss (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 607-8, Table 6-34). Since there are no known key amphibian migrations for the relevant area, localised impacts of low impact intensity are expected as a result of the interruption of exchange relationships between sub-habitats of amphibians. Construction-related impacts resulting from losses of individuals (construction site traffic, open trenches) are classified as a localised, short-term loss (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 607-8, Table 6-34). In addition, the erection of amphibian protection fences according to ancillary provision A.3.8.19 during the construction phase almost entirely rules out any losses of individuals. Construction-related impacts resulting from emissions of air pollutants and dust are classified as localised, medium-term and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 607-8, Table 6-34).

Installation-related impacts

The use of land of the above ground parts of the Nord Stream 2 Pipeline within the fence of the Pig Receiving Station lead to installation-related partial and full sealing (incl. Station buildings, roads) and the creation of open and green spaces. Due to the permanent loss of function of the areas used by the facility, there will be permanent, localised impacts of low impact intensity for the low-value amphibian habitat. Installation-related impacts resulting from barrier, separation and deterrent effects due to keeping the operating site clear are classified as a localised, medium-term and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 607-8, Table 6-34).

Operation-related impacts

Potential impacts of inspection and maintenance work depend on the type of work required, but are evaluated in principle as short-term and localised with low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 607-8, Table 6-34).

Reptiles

In order to prevent nature protection legislation events with regard to the moor frog, which is strictly protected by BArtSchV and Annex IV FFH, amphibian protection fences are planned for the area of the Pig Receiving Station according to ancillary provision A.3.8.19. Reptile species also benefit from these protective measures, as the amphibian protection fences prevent them from entering the construction area. The Nord Stream 2 Pipeline crosses the coastline via underground microtunnels, which prevents any impacts on the above-ground habitat structures in this area. The following impacts are to be expected (cf. application document, Part D1.01, Section 6.2.4.3.4, pp. 609):

Construction-related impacts

Construction-related impacts on reptiles due to the use of land and habitat loss in the areas used for construction in the area of the Pig Receiving Station (area of low importance for slow worms, common lizards and grass snakes) are categorised as a localised and permanent loss. During the construction phase, potential exchange relationships between adjacent areas will be interrupted by the areas used for construction. The interruption of exchange relationships is evaluated as localised, medium-term (during construction) and of low impact intensity for reptiles. Since, as a result of clearing the construction site, there will be no suitable habitats for the species occurring in the location, losses of individuals are ruled out. Losses of individuals resulting from construction site traffic or open trenches are classified as localised, medium-term and of medium impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.4, pp. 613-4, Table 6-35). In addition, the erection of amphibian protection fences according to ancillary provision A.3.8.19 during the construction phase almost entirely rules out any losses of individual reptiles. There is assumed to be localised, short- to medium-term impacts with medium impact intensity for the species group due to construction-related air pollutant emissions (cf. application document, Part D1.01, Section 6.2.4.3.4, pp. 613-4, Table 6-35).

Installation-related impacts

The installation-related impacts for reptiles resulting from the use of land on the operating area of the Pig Receiving Station are classified as a localised, permanent loss. The installation-related impacts resulting from barrier, separation and deterrent effects (keeping the operating site of the Pig Receiving Station clear, barrier effect between sub-habitats in the area) are classified as localised, permanent and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.4, pp. 613-4, Table 6-35).

Operation-related impacts

The operation-related impacts depend on the type of work required, but are evaluated in principle as short-term and localised with low impact intensity (medium-value reptile habitats) (cf. application document, Part D1.01, Section 6.2.4.3.4, pp. 613-4, Table 6-35).

Breeding Birds

The following mitigation measures are planned for breeding birds (Section B.4.4.1.9.1):

- PT8 (clearance of construction site prior to breeding season to prevent deaths of and injury to breeding birds),
- PT10 (construction of a fence around the operational area of the Pig Receiving Station and around the areas used during construction),
- PT11 (reduction of light immissions during construction activities and operation),
- PT13 (reduction of sound emissions caused by onshore construction work during the breeding period of birds) and
- PT14 (access road from the car park and site office to the construction area of the Pig Receiving Station).

In addition to these, there is also CEF measure CEF1, which plans the placing of five starling nesting boxes in the vicinity of the project (cf. Section B.4.4.1.9.1). This measure will be undertaken because of the displacement of a starling breeding territory on the site of the planned Pig Receiving Station.
The following impacts are to be expected (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 615):

Construction-related impacts

As a result of the construction-related use of the land, the habitat loss by removing the vegetation and the soil removal in the area of the subsequent operational facility, there will be a short-term to permanent (due to different regeneration times of wood and open-land habitats) and localised loss of high-value to medium-value bird habitats. The interruption of exchange relationships between breeding bird sub-habitats is classified as localised, medium-term and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627, Table 6-39). Ancillary provision A.3.8.21 guarantees that no sand martins are able to populate the excavation pits and piles of soil in the area of the planned Pig Receiving Station and therefore prevents any construction-related hazard to individuals of this species.

The construction-related impacts resulting from sound immissions during the pile driving for the start excavation pits (use of pile-driving equipment for around 30 days in the first year of construction) are short-term, medium-scale and of high impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627, Table 6-39). The construction-related impacts caused by sound immissions from the compressors (pre-commissioning between mid-June and end of November of the second year of construction) are short-term, small-scale and of high impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627, Table 6-39). If this work is carried out during the breeding period in the spring, it will be ensured that a reference level of 47 dB(A) will be maintained within a radius of around 100 m around the site area (Section B.4.4.1.9.1, measure M12 [PT13]). Construction-related impacts resulting from air emissions or the release of other contaminants (SO_2, NO_x, fine particulates, CO_2) in the active areas are partly added to by visual and acoustic disturbances and are classified as medium-scale, short-term and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627, Table 6-39). Construction-related impacts resulting from visual and acoustic disturbances are classified as a localised, medium-term and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627, Table 6-39). It can therefore generally be assumed that the visual and acoustic influence of the construction of the Pig Receiving Station will only have an effect on the breeding birds of the area in the immediate vicinity. During the construction, illumination equipment typical for construction sites will be used, including symmetrical spotlights, balloon luminaires and moisture-proof luminaires. There will also be additional beams of light caused by construction machinery, cars and HGVs. The magnitude of the predicted impacts of the construction site illumination is classified as a localised, medium-term and of low impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627, Table 6-39).

Installation-related impacts

In terms of the installation, the Nord Stream 2 operational area will permanently convert a pine forest into an industrial location, that will be predominantly free of wood, sealed and built over, and the breeding bird population will change

accordingly. The loss of a woodcock and starling territory (valuable species) and of medium- and high-value bird habitats (pine forest and semi-open ruderal stands) as a result of the use of the land for the installation, are evaluated as localised and permanent (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627, Table 6-39).

Operation-related impacts

The extent of the predicted operation-related impacts due to visual and acoustic influences (incl. vehicle traffic to and on the site, light) is categorised as local, permanent and of low impact intensity.

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239) and Section B.4.4.1.9.1.

Onshore mammals incl. bats

The following mitigation measures are planned for the onshore mammals that are present (including the bats) (cf. Section B.4.4.1.9.1):

- PT9 (surveying of woodland and trees in the construction site with regard to the presence of bats before clearing the construction site),
- PT11 (reduction of the light immissions during the construction activities and during operation), and
- PT13 (reduction of sound emissions caused by onshore construction work during the breeding period of bats).

In addition to this, there is ancillary provision A.3.8.20, which plans the monitoring of the suspected territorial trees of the common pipistrelle in the area to the north of the planned Pig Receiving Station for the presence of bats prior to their felling.
The following impacts are to be expected (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 630):

Construction-related impacts

As a result of the construction project and the associated loss of functions of the biotope in the project area, there will be an impairment of hunting and mating territories for the following bat species: common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, common noctule, serotine bat, Natterer's bat, Dauberton's bat and parti-coloured bat. For bats, the construction-related use of the area and the habitat losses in the overall project area are assumed to be localised and permanent impacts with a high impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). Due to the high reproduction rates of small mammals that live underground, any impacts that could negatively affect the population have been ruled out. The deforestation will lead to the bisection of wooded areas in the investigation area, which will cause barriers to dispersion for small mammals that live in woodland, and interrupt the exchange relationships. The exchange relationships, flight corridors or hunting territories of bats may be interrupted in the construction area. This construction-related interruption to the exchange relationships for terrestrial mammals and bats is localised, short-term and of medium impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). Construction-related impacts resulting from losses of

individuals (construction site traffic, open trench traffic, construction activities and impact of the excavation pits as animal traps) are classified as a localised, short-term loss (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). In addition to this, there is ancillary provision A.3.8.20, which plans the monitoring of the suspected territorial tree in the area to the north of the planned Pig Receiving Station for the presence of bats prior to its felling. This will be able to almost entirely rule out the loss of individual bats as a result of the removal of territorial trees. The impacts for terrestrial mammals, and bats in particular, resulting from the construction site illumination are predicted to be medium-term, medium-scale and of medium impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). During the entire construction period, there is expected to be a driving-away of mammals due to the sound emissions (airborne noise) on the construction site and in its vicinity as a result of the construction activities in the project area. As the greatest noise exposure will occur during the rearing season of the young, and roosts and hunting and mating territories will be affected by the localised and short-term impacts, the impact intensity for bats is predicted to be high (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). The impacts on the terrestrial mammals as a result of construction-related sound emissions are restricted to the pile-driving and compressor operation, and are therefore classified as localised and short-term with medium impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). For the impact prediction, it is assumed that other species of mammal will avoid the construction site and its noisy vicinity, so that there will be no significant restrictions of habitat for these species. Construction-related impacts as a result of the release of contaminants (SO_2, NOx, fine particulates, CO_2) are classified as medium-scale and short-term, and the impact intensity as low (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). Within the project area, during the construction phase there may be an impairment of nearby bat roosts and hunting areas as a result of construction noise and light emissions. The evaluations for noise and light emissions are the same as those given previously.

Installation-related impacts

The installation-related use of the area (barrier, separation and scare effect, influence on exchange relationships between bat sub-habitats due to keeping the operational area clear) in the area of the Pig Receiving Station and the ring-road will lead to a localised, permanent loss of bat habitat of high impact intensity (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40).

Operation-related impacts

The operation-related impact factors of vehicle traffic to and on the site (and resulting light emissions), inspection and maintenance work, and noise and light emissions, are evaluated as being localised, short-term to permanent with low to medium impact intensity (low overall) (cf. Application document, Part D1.01, Section 6.2.4.3.6, pp. 637-8, Table 6-40). With respect to other mammals, it should be noted that these are less sensitive than bats to the noise and light emissions resulting from the vehicle transport to the Pig Receiving Station and from the operation of the Pig Receiving Station. Therefore, with regard to the operational-related noise and light emissions, local, short-term impacts of low intensity are to be expected for other mammal species. Inspection and maintenance work will take place on the site of the Pig Receiving Station. The impacts of this are therefore evaluated as localised, short-

term to permanent and with low to medium impact intensity with respect to other mammal species.

The contents of the mitigation measures stated above can be found in the application documents (cf. application document, Part G.01, Section 9.1, pp. 239) and Section B.4.4.1.9.1.

Biological diversity

The impact prediction of the onshore environmental impacts on the protected asset "biological diversity" are based on the comments relating to the protected assets "animals" and "plants" in Section B.4.4.1.3.1.2 (onshore) and the comments in the submitted environmental impact assessment (cf. application document, Part D1.01, Section 6.4, pp. 691). The following can be determined with regard to the issues of biological diversity (cf. application document, Part D1.01, Section 6.4, pp. 695):

Biotope structures and vegetation relationships at the landfall site of the Nord Stream 2 Pipeline will be temporarily and permanent lost as a result of the land uses and changes in the soil behaviours for the construction and operational areas. There are no expected impacts on biotope types protected under section 20 NatSchAG M-V (cf. Section B.4.8.5); only pinewood forest and ruderal stands will be affected. Biotope structures will only experience minor impacts as a result of emissions of air pollutants on areas adjacent to the construction site; the affected locations are mainly categorised as being subjects to an existing eutrophic environmental impact. The investigation area mainly comprises dominant and wide-spread plant species. Over and above this, vascular plant species listed as endangered in the Red List of Mecklenburg – Western Pomerania or as particularly protected under BArtSchV have been detected in the investigation area. These are mainly species that occur in dry, moist and coastal biotopes and also refer to correspondingly designated biotopes with respect to the growth location in the investigation area (cf. application document, Part D1.01, Section 5.5.1.5.1, p. 237). As a value-adding species, sand everlasting (Helichrysum arenarium) could potentially be found, but only in isolation, on the planned construction areas of the landfall site; it is often represented on the other areas of Development Plan No. 1 "Industrie- und Gewerbegebiet Lubminer Heide" (cf. application document, Part D1.01, Section 6.4, p. 695). Sand everlasting occurs in pine forests, on forest edges and tracks (Hensel 2016). However, this plant species was not detected by mapping conducted in the planned construction area of the Pig Receiving Station. An impairment of the sand everlasting population is therefore ruled out. Project-related impacts have no influence on the ecosystem diversity and vegetation relationships of the area. The altered sub-ecosystems continue to be represented to a comparably numerous extent in the area (cf. application document, Part D1.01, Section 6.4, p. 695).

The presence of ground beetles may not experience any construction-/operation- or installation-related impacts due to the crossing of the coastal area by a microtunnel. There will therefore not be any project-related impairment of the ground beetle population and its species diversity. No impacts are expected as a result of the project on the diversity of the ground beetles, because there will not be any disappearance or permanent migration of species. Nor will ecosystem diversity be impaired (cf. application document, Part D1.01, Section 6.4, p. 695).

As a habitat for amphibians, the landfall site comprises an area that only plays a subordinate role for them. As already discussed in Section B.4.4.1.3.1.2, there are no spawning waters in the investigation area. The few sightings of five amphibian species in the investigation area illustrate the low importance of the landfall site for amphibians. With respect to the encountered, strictly protected moor frog species, there is similarly assumed to be no suitable habitat for the species at the landfall site. This is most likely a random migration movement of the moor frog species in the investigation area. The loss of habitat and the separation and barrier effects resulting from the project-related uses of the area will therefore not affect any significant amphibian population (cf. application document, Part F.07, Section 5.3.1, p. 143). In order to prevent the losses of individuals of the strictly protected moor frog species, ancillary provision A.3.8.19 stipulates the construction of an amphibian protection fence at the landfall site during the construction phase. Losses of animals during construction, inspection, repair and security activities can be considered insignificant. The project will affect individuals at most. Localised and temporary air emissions can also lead to injuries to animals in individual cases, whereby an impairment of the surrounding habitat structures that are of low value for amphibians by the emissions is ruled out. No impacts are expected with regard to biological diversity, because there will be no loss of species, for example (cf. application document, Part D1.01, Section 6.4, p. 695).

In the project area and adjacent areas, three reptile species were identified during the investigations conducted for the environmental impact assessment (common lizard, grass snake and slow worm) (cf. application document, Part D1.01, Section 5.5.8.1, p. 388, Table 5-93). The manifold suitable biotopes that alternate on a small scale, such as forest and wooded biotopes, and dry and open land locations provide favourable habitat structures, which are only impaired by the project on a small scale. Losses of individuals due to traffic or construction and later inspection and maintenance work can be ruled out because, as a result of the clearing of the construction site and subsequent operational areas, there will not be any suitable habitats for the species currently present at the location. In addition to this, the amphibian protection fence intended as part of ancillary provision A.3.8.19 will also prevent the migration of reptiles into the construction site area. Barrier and separation effects between the sub-habitats will only occur to a localised extent. Air pollutant, light and noise immissions are regarded as insignificant due to their localised and short-term impacts. No impacts are expected with regard to biological diversity, because there will be no loss of species, for example (cf. application document, Part D1.01, Section 6.4, p. 696).

In the project area and adjacent areas, three reptile species were identified during the investigations conducted for the environmental impact assessment (common lizard, grass snake and slow worm) (cf. application document, Part D1.01, Section 5.5.8.1, p. 388, Table 5-93). The manifold suitable biotopes that alternate on a small scale, such as forest and wooded biotopes, and dry and open land locations provide favourable habitat structures, which are only impaired by the project on a small scale. Losses of individuals due to traffic or construction and later inspection and maintenance work can be ruled out because, as a result of the clearing of the construction site and subsequent operational areas, there will not be any suitable habitats for the species currently present at the location. In addition to this, the amphibian protection fence intended as part of ancillary provision A.3.8.19 will also prevent the migration of reptiles into the construction site area. Barrier and separation effects between the sub-habitats will only occur to a localised extent. Air

pollutant, light and noise immissions are regarded as insignificant due to their localised and short-term impacts. No impacts are expected with regard to biological diversity, because there will be no loss of species, for example (cf. application document, Part D1.01, Section 6.4, p. 696).

Breeding bird species of the bird habitats at the landfall site are affected by construction-related impacts. These breeding birds also include some valuable breeding bird species. On the area of the Pig Receiving Station, there will be permanent loss of habitat for the breeding bird population of a pine forest (bird habitat 3 pine forest, cf. application document, Part D1.01, Section 5.5.11.1, p. 423, Fig. 5-131). On other sub-areas that are to be used temporarily for the construction preparation, the pre-commissioning and the commissioning, there will be a temporary loss of function for the original breeding bird community. In the vicinity of the Pig Receiving Station, there may be disturbances to breeding birds as a result of the construction operation, which are triggered by the noise and light emissions, as well as visually disruptive stimuli (cf. application document, F.07, Section 6.2.2, pp. 273). The implementation of special mitigation measures will sufficiently minimise these high-intensity impacts (light, noise, visual disturbances) on breeding birds (Section B.4.4.1.9.1). Injuries to breeding birds caused by air pollutants cannot be ruled out in the actual construction area, whereby the risk of such cases is very low. Installation-related impairment for the breeding birds with respect to barrier, separation and scare effects is regarded as localised and not very significant. No impacts are expected with regard to the biological diversity of the breeding birds, because there will be no loss of species, for example (cf. application document, Part D1.01, Section 6.4, p. 696).

For bats, the landfall site represents an important habitat, whereby the planned construction and operational areas of the Nord Stream 2 project are classified as sub-habitats. The project-related use of the area may lead to the disturbance of hunting and mating territories of some bat species. The planned construction and operational areas are not of particular importance as roosting locations; there is only suspected to be a common noctule roost in this area. Light emissions, which could even result in the abandonment of roosts, will be sufficiently minimised by appropriate measures (M10, M11, M12 Section B.4.4.1.9.1). The same applies to sound emissions, especially during the significantly more noise-intensive pre-commissioning, which will be significantly reduced with the help of mitigation measures (M12 Section B.4.4.1.9.1). Emissions of air pollutants are classified as “low” due to the spatial and temporal restriction. No impacts are expected with regard to the biological diversity of the bats, because there will be no loss of species, for example (cf. application document, Part D1.01, Section 6.4, p. 696).

Barriers to dispersion and interruptions to exchange relationships for mammals living in wooded areas could occur due to the anticipated construction- and installation-related loads placed on wooded areas. Maximal low impairments of terrestrial mammals are to be expected in the construction area of the Pig Receiving Station due to light and sound emissions. Risks to the populations of small mammals can certainly be ruled out due to their high reproduction rates. For the common otter and other mammal species that are sensitive to disturbances, the construction area, and subsequently the operational area, will play a subordinate role as a habitat, so that measurable impacts can certainly be ruled out here. No impacts are expected with regard to the biological diversity of the mammals, because there will be no loss of species, for example (cf. application document, Part D1.01, Section 6.4, p. 696).

B.4.4.1.4 Soil as a protected asset

When assessing the impact of the project on soil or sediment, special attention must be given to its closeness to nature and its sensitivity to the relevant impact factors in the potentially affected area.

B.4.4.1.4.1 Inventory assessment

B.4.4.1.4.1.1 Offshore

Inventory

Water depth

The route of the Nord Stream 2 Pipeline will run from the border of the 12-nautical mile zone to the Oder river bed (at approximately KP 50.0) over the Odra Bank via several elevated and lowered structures with water depths of approximately 15 to 19 m. On the Oder river bed (at approximately KP 50.0 to KP 60.0), the pipelines will cross an area with a water depth of up to 20 m. Before the route enters the Bay of Greifswald, it will cross the Boddenrandschwelle (at approximately KP 60.0 to KP 70.0), where the water depth is less than 3 m in places. In the Bay of Greifswald area, the Nord Stream 2 Pipeline will run through two hollows with water depths of up to 10 m and an elevated structure between these hollows with a water depth of approximately 5 m. At the landfall point, the pipeline will reach sea level (cf. application document, Part D1.01, Section 5.2.1.1, pp. 128 et seq.).

Sediment conditions

The surface sediment predominant in the Bay of Pomerania is fine to medium sand from a glacial sandur. The sandur is criss-crossed by individual channels whose beds contain glacial sediments (till, sand, and gravel) that form the base of the entire sandur. The relevant area of the Oder river bed consists partly of silt substrate (sediment with a large amount of fine-grain material and a fairly large amount of organic material). In nearshore areas exposed to abrasion, such as the Eastern edge of the Boddenrandschwelle, coarse sediments (gravel, stones, and boulders) are common, some covered by a thin layer of sand. In the flat western part of the Boddenrandschwelle, the seabed exhibits only recent and subrecent sand. The near-surface sediments of the Bay of Greifswald, a lagoonal basin, consist of fine sand, sand, and silt substrate. While the coastal area consists primarily of sand, the substrate grain size generally decreases with increasing water depth, and the silt substrate content increases towards the centre of the bay.

An examination of the sediment conditions in the pipeline route in the Bay of Pomerania and the Bay of Greifswald shows that the Nord Stream 2 route largely crosses areas with fine sand and avoids areas where silty substrates accumulate. In the area around the Boddenrandschwelle the route crosses two smaller areas with coarse sediment (gravel and stones). The areas of the planned interim marine

stockyard in the Bay of Pomerania off Usedom island consist mainly of sandy substrate (cf. application document, Part D1.01, Section 5.2.1.1, pp. 129 et seq.).

In the nearshore area in particular, the sediment surface is exposed to natural transportation processes. As a result, the shores of the Bay of Greifswald are fairly jagged, and the eroding coastline and the landfall zones take various forms (cf. application document, Part D1.01, Section 5.1, p. 123).

Sedimentary load

In order to assess the sedimentary pollutant and nutrient load, chemical sediment surveys were carried out in the areas of the Nord Stream 2 Pipeline and the interim stockyard in 2016 (cf. application document, Part I3.02).

To put the results of the survey into perspective, they are compared with the information in the documents entitled “Gemeinsamen Übergangsbestimmungen zum Umgang mit Baggergut in den Küstengewässern” (Joint Transitional Arrangements for the Handling of Dredged Material in German Federal Coastal Waterways) (GÜBAK, 2009) and “Anforderungen an die stoffliche Verwertung von mineralischen Reststoffen/Abfällen, Technische Regeln, Mitteilung 20 vom 05.11.2004” (Requirements for Recycling Mineral Raw Materials/Waste Materials, Technical Regulations, Notification 20 of 5/11/2004") of the German Regional Waste Institute (LAGA-TR20, 2004).

The GÜBAK guide values were exceeded predominately for heavy metals, especially for arsenic. The value for zinc was the second most exceeded of the GÜBAK Rulebook 1 values, both in surface sediment samples and at deeper levels. The GÜBAK Rulebook 1 values were exceeded to a lesser extent for local levels of cadmium, chromium, copper, nickel, and mercury. However, the GÜBAK guide values refer to concentrations in fine-grain fractions (<20 µm). Because the planned Nord Stream 2 Pipeline and the interim marine stockyard are situated mainly in areas of sandy substrate with a low fine-grain fraction, the concentrations for the total sample for all heavy metals analysed are much lower. This is reflected in the results of the heavy metal assessment in accordance to LAGA-TR20. The concentrations analysed in the total sample were so low that for all examined heavy metals, the concentrations were within the limits of assignment area Z0 (cf. application document, Part D1.01, Section 5.2.1.1, pp. 135 et seq.).

The total organic and organotin material loads were very low. Accordingly, none of the organic contaminant parameters analysed exceeded the GÜBAK Rulebook 1 values, and all parameters analysed in accordance with LAGA-TR20 were within the limits of assignment area Z0.

The eco-toxicity was assessed based on the luminescent bacteria inhibition test, which showed that the sediments in the entire examined pipeline route and at the planned interim stockyard are of no eco-toxilogical concern. At most stations, non-contaminated sediments (GL 1) were present, and in locally restricted areas, non-hazardous contaminated sediments (GL 2) were found.

To determine the nutrient loads, the N and P concentrations in the total samples and in the eluate samples were analysed and classified in accordance with GÜBAK. No nutrients will be examined within the framework of the LAGA analytics. Exceedances

of the GÜBAK guide values occurred only in sediment samples from the Bay of Greifswald in the form of elevated N concentrations in the total samples. The P concentrations in the total samples were below GÜBAK Rulebook 1 and 2 values. The same was true of the N and P concentrations in the eluate. Nutrient analytics thus confirm the known pattern of higher nutrient load in the Bay of Greifswald sediments and a lower load in the outer coast sediments (cf. application document, Part I3.02A, Section 3.6, pp. 40 et seq.).

Assessment

The degree of sediment naturalness along the Nord Stream 2 route is classified as high because the sediments in the observed marine zone have been anthropogenically changed only in the navigation channels and dumping areas; however, the Nord Stream 2 route will not cross these areas (cf. application document, Part D1.01, Section 5.2.2.2, p. 145, pp. 147-149, Table 5-6).

With regard to the habitat potential, the Boddenrandschwelle with its hard substrates (boulder and stone fields) is a relief structure especially worthy of protection because it provides a habitat to communities of special species.

In the Bay of Greifswald area, where a higher proportion of silty/muddy sediment can be found, there is heightened sensitivity to fine-sediment suspension proportions. In the remaining route sections, which predominately run through areas of fine and medium sands, a medium tendency towards suspension is anticipated.

At the interim marine stockyard, soil naturalness is low because parts of the area were used for soil tipping during the construction of the Nord Stream Pipeline. The overall assessment for the soil in the area of the planned interim stockyard is low (cf. application document, Part D1.01, Section 5.2.2.2, p. 145, pp. 147-149, Table 5-6).

B.4.4.1.4.1.2 Onshore

Inventory

The initial substrate for soil formation in the onshore investigation area is characterised predominately by fine to medium sands. The leachate-prone, sandy, low-nutrition areas of the Lubminer Heide are characterized primarily by brown earths to secondary podzols. Due to sedimentary shifts, many of the soils in these area sections are not well developed (regosols). In areas of ground moraine sedimentation, brown earths and luvisols have developed on the nutrient-rich sands and clays. In locations close to groundwater, gley soils, eutric gleysols (humusgley), peat gleysols, and fens have formed. These soils of organic origin are affected to some extent by melioration measures (cf. application document, Part D1.01, Section 5.2.2.2, pp. 139 et seq.).

Greatly anthropogenically modified soils (excavation and filling soils, some of which are fully sealed) can be found in the industrial area south of Lubmin industrial port, in the area of the former Lubmin sewage treatment plant (EWN) and in the area of the pipeline aisle and the noise and visual screening wall (cf. application document, Part D1.01, Section 5.2.2.2, p. 151).

In the northeast of the investigation area, the relief is flat; the adjacent southern part has a low slope and is characterised by dunes. In addition to dune formations, cliffs are a special morphological form within the investigation area. The natural coastal morphology has been greatly anthropogenically modified in the area of Lubmin harbour and the nearby marina.

According to the Untere Bodenschutzbehörde des Landkreises Vorpommern-Greifswald (Regional Soil Protection Agency of the Western Pomeranian-Greifswald Administrative District), there are no known or suspected contaminated sites in the area of the planned natural gas receiving terminal. According to the Landesamt für Zentrale Aufgaben und Technik der Polizei, Brand- und Katastrophenschutz M-V (Mecklenburg-West Pomerania State Police and Emergency Services), there are also no areas known or suspected to be contaminated with unexploded ordnance (cf. application document, Part D1.01, Section 5.2.1.2, pp. 139 et seq.).

Assessment

Special morphogenetic shapes such as dunes and natural coastlines are the result of the landscape formation and often provide special site conditions with respect to habitat potential. They are therefore classified as of high value. With respect to the landscape ecosystem (especially the habitat), peat bogs should also be considered as high value. As a result of melioration measures, parts of the peat bogs are moderately degraded but can still largely fulfil their function in the landscape ecosystem.

Most of the soils in the investigation area have a high to very high degree of naturalness (cf. application document, Part D1.01, Section 5.2.2.2, pp. 153 et seq., Table 5-7). An exception is the areas of Lubmin industrial port, the marina, the Greifswald landfall facility, the EWN site, the pipeline aisle with its noise and visual screening wall, and the former Lubmin sewage treatment plant, due to their high degree of anthropogenic degradation. The soils here are of low value (cf. application document, Part D1.01, Section 5.2.2.2, p. 151).

The bog soils and the largely natural sandy soils (such as dunes and sandy soils under woodlands) are classified as highly sensitive to mechanical pressure because they are easily compacted. In particular, bog soils are highly sensitive to water table drawdown, while soils with sandy or cohesive substrates (loam, marl) are less sensitive depending on their permeability. The largely sandy soils in the investigation area are not very sensitive to pollutant input (contamination) due to their low pollutant retention potential (cf. application document, Part D1.01, Section 5.2.2.1, pp. 143 et seq.).

B.4.4.1.4.2 Environmental impact

B.4.4.1.4.2.1 Offshore

In consideration of the approved soil protection mitigation measures M1 (minimisation of intervention in hard soil biotopes within the Site of Community Interest (SCI)), M2 (minimisation of intervention in soft soil biotopes within SCI) and

M3 (re-establishment of the seabed in trenched areas and at the interim marine stockyard) (cf. Section B.4.4.1.9.1), the following environmental impact is anticipated as a result of the project (cf. application document, Part D1.01, Section 6.2.1.2.1, pp. 466 et seq.):

Construction-related impact

The Nord Stream 2 Pipeline will be laid either on the seabed (in water deeper than 17.5 m) or in dredged pipe trenches that will be backfilled after pipe-laying. In the course of pipe trench dredging, a total sea bed area of 1.4 km² will be removed along a route of approximately 50 km in the 12-nautical mile zone. Part of this soil will be stored temporarily at the marine stockyard and re-used for backfilling the pipe trenches after pipe-lay. The total volume of the excavated material will be 2.5 million m³. It is anticipated that approximately 280,000 m³ will not be suitable for backfilling. Up to 0.5 million m³ will be lost to turbidity. Dredging, pipe-laying and backfilling will cause a local to medium-range disturbance to the seabed, changing the sediment parameters. These changes will be of short to medium duration and low intensity in the anchoring areas and sedimentation zone, of medium intensity in the area around the pipe trench, and of high intensity in the area around the pipeline laid on the seabed. Temporary storage of excavation and backfilling material will lead to a seabed disturbance of medium range, duration, and intensity (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 481, Table 6-7). The pollutant emissions due to construction-related traffic will be low. Turbidity plumes, sediment transportation, and release of nutrients and contaminants caused by construction activities will have a minor impact. Reefs in the area of the anchorage corridor will be bypassed during the planning of the project and therefore unaffected. No measurable impact is anticipated on sandy soils.

Plant-related impact

The plant will cause a minor but permanent change to the sequence of geological layers in areas with both hard and soft sediment as a result of laying pipes in the pipe trenches (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 481, Table 6-7). Where there are sandy soils, the top layer will be restored to its original position with a thickness of at least 30 cm and will be reconstructed in areas of sedimentary residues (reefs) using debris of comparable grain size composition excavated from nearby areas. The two microtunnels, laid at a depth of 6 to 10 m, will also have little impact on the geological makeup. The pipelines laid on the seabed will act as an artificial reef and, at the local level, cause permanent short-range changes of high intensity to the seabed. No impact on the surrounding seabed is anticipated from substances released from the sacrificial anode materials and/or from the coating at the welds between the pipe sections because their concentrations will be very low.

Operation-related impact

Operation-related impact on the temperature conditions caused by gas flow through the pipelines will not exceed the differential value of 2 K within a top layer of 20 cm in the seabed. External inspections, repair work, and free span correction will cause short-term to permanent (in the unlikely case of small-scale free span corrections),

local impact of low to high (in the unlikely case of small-scale free span corrections) intensity (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 481, Table 6-7).

Further details of the content of the previously mentioned mitigation measures are provided in the application document (cf. application document, Part G.01, Section 9.1, pp. 239 ff) and in Section B.4.4.1.9.1.

B.4.4.1.4.2.2 Onshore

In consideration of the approved S1 (protection of the soil against an input of contaminants) and S2 (protection and restoration of the topsoil) soil protection measures, the following environmental impact is anticipated onshore (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 482 et seq.).

Construction-related impact

Construction work in the area of the microtunnels and technology strips/access roads and in construction site facility, storage and assembly areas will lead to functional impairment of local scale and medium to high intensity (depending on soil sensitivity) as a result of topsoil excavation or coverage/compaction of the top soil. Such functional impairment is of medium to permanent duration (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). Soil stripping, application, compaction, and temporary sealing are associated with construction-related land use. As a result, the affected soils are no longer able to fulfil their function, such as serving as a habitat for soil-dwelling organisms and plants, rain water reservoir, contaminant filter for the groundwater or natural history archive, in full or in part. Construction-related land use affects both naturally developed soils (rigosols and brown earths/gleyic brown earths) and anthropogenically preloaded soils with a low degree of naturalness (cf. application document, Part D3.10, Map 1). The dune terrain in the planned construction area is not very pronounced (cf. application document, Part D.01, Section 6.2.1.2.2, p. 484), so no special importance can be assigned to the geomorphological inventory. All temporarily used areas outside of the pig receiving station operating facilities are included in construction-related land use (construction site facility and assembly areas for microtunnel construction; storage and assembly areas south of the pig receiving station). After construction is completed, the plan is to remove temporary facilities and backfill the launch pits for the microtunnels (cf. application document, Part C.01, Section 3.3.11.7, p. 151 and Section 3.4.3, p. 153). The pig receiving station will be connected to the Bay of Greifswald via two parallel microtunnels that are constructed using pipe jacking (cf. application document, Part C.01, Section 3.1.3, p. 57). There will be no open excavation pit and no related above-ground land use in this area.

In the area of the pig receiving station and the southern storage and assembly area, soil stripping and soil application will affect areas with morphogenetic peculiarities (dune terrain), leading to their local and permanent loss. Excavation in the area of the launch pits and of the excavation pits associated with foundation works will cause a permanent functional impairment of naturally developed soils at a local scale of high intensity (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). This affects sandy sites (dunes) of high value.

The intensity of impact from local, short-term water retention measures is low (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). During the construction of the launch pits for the microtunnels and the anchor blocks,

a temporary groundwater table drawdown will be required. This drawdown will be achieved via wells. The following operating times (including lead times) will be in place for water retention: 30 calendar days each for the launch pits for the microtunnels (construction phase, two building structures), 240 calendar days each for the launch pits for the microtunnels (drilling procedure, residual groundwater, two building structures), 30 calendar days each for the anchor blocks (two building structures). The groundwater drawn during the water table drawdown will be discharged into the Lubmin harbour basin via a cased receiving water body (trench 60). The temporary groundwater table drawdown will take place up to maximum a depth of 6.30 m under mean sea level. The area affected by the drawdown up to a depth of 1 m is limited to 40 m around the excavation pits and located entirely within the area established as an industrial area in the development plan no.1 “Industrial and Commercial Park Lubminer Heide”. Only the outer peripheral zone of the maximum depression funnel of 189 m diameter touches areas northwest of the pig receiving station that the development plan designates as coastal protection forest rather than industrial area. The soils affected by the water retention measures towards the northwest are brown earths, gleyic brown earths, and anthropogenically exaggerated soils (cf. application document, Part D3.10, Map 1: Soil). In this area, the water table is at approximately 3 m below ground level (cf. application document, Part I3.08, Document U1-1). It is therefore anticipated that brown earths and anthropogenically exaggerated soil are the only soils to be found in this area. Neither soil is sensitive to short-term water retention measures. The water table drawdown in the affected areas will also be significantly below 1 m (cf. application document, Part I1.05, Annex A, Appendix 2). The temporary impact of the groundwater conditions in the area with a water table drawdown of approximately 1 m will affect naturally developed soils (brown earths and rigosols) as well as anthropogenically preloaded soils with a low degree of naturalness (cf. application document, Part D3.10, Map 1 and application document, Part I1.05, Annex A, Appendix 6, p. 4).

Plant-related impact

The plant-related changes to the naturalness of the soil structure in the microtunnel area and the pig receiving station area are due to replacement of existing sediments with engineering materials. The pipeline-related replacement of the soils will have local, permanent impact of low intensity (usage of sandy sites is already impaired by construction activities) (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). The two parallel microtunnels, constructed using pipe jacking and running between the pig receiving station and the Bay of Greifswald, are approximately 700 m long in total, have an external diameter of 2.5 m, and host one pipeline each. Between the onshore end of the microtunnels and the ground-to-air pipeline transition zone (double arch), the two subterranean pipeline sections are approximately 100 m long (cf. application document, Part C.01, Section 3.1.3, p. 57). The base plates (water-resistant layers of concrete) of the launch pits (15 x 15 m) will also remain in the ground (cf. application document, Part C.01, Section 3.3.11.2, p. 145, Section 3.3.11.7, p. 151 and Section 3.4.3, p. 153).

Plant-related land use is expected to cause local, permanent impact of medium (unsealed facility components) to high (partly sealed surfaces or loss in case of completely sealed surfaces) intensity (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). Plant-related land use will cause loss

or impairment of the soils' storage and regulatory function and of its biotic yield function. Related to the construction of the pig receiving station, an area of 13,981 m² will be fully sealed and an additional area of 1,111 m² partly sealed. Additional areas at the pig receiving station operating facilities totalling 41.479 m² will not be sealed after plant-related land use is completed but will be revegetated with nutrient-poor grassland (cf. application document, Part D1.01, Section 6.2.1.2.2, p. 486).

Operation-related impact

The operation-related emission of nutrients (nitrogen oxides, NO_x) at the pig receiving station facilities and their surroundings to the east into sandy sites that are sensitive to nutrient input has permanent impact but its intensity is assessed as negligible due to existing loads (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). According to 2009 data from the Fachinformationssystem (FIS, Branch Information System) of the Umweltbundesamt (UBA, German Federal Environment Agency) regarding the background presence of nitrogen (http://gis.uba.de/website/depo1/), the existing load in the investigation area is between 10 and 11 kg N/ha*a (reference year is 2009). With regard to a change of the soil structure due to harmful emissions from construction vehicles during servicing and maintenance activities, a short-term, local impact of low intensity is anticipated. During operation-related service measures (maintenance, inspection, and repair work), air pollutants emitted from construction vehicles and equipment and from possible handling losses, leakage, or accidents can cause nutrient and pollutant input into the soil.

Further details of the content of the above-mentioned mitigation measures are provided in the application document (cf. application document, Part G.01, Section 9.1, pp. 239 et seq.) and in Section B.4.4.1.9.1.

B.4.4.1.5 Water as a protected asset

When assessing the impact of the project on surface water and groundwater; their economic meaning in respect to landscape, water balance, and usage; and their closeness to nature, current load situation and sensitivity to the relevant impact factors in the area potentially affected must be taken into account.

B.4.4.1.5.1 Inventory assessment

B.4.4.1.5.1.1 Offshore

Inventory

The offshore part of the planned pipeline route crosses the natural areas of the Bay of Pomerania, the Bay of Greifswald, and the Boddenrandschwelle. The planned interim marine stockyard will be situated in the Bay of Pomerania off to Usedom island.

Bay of Pomerania

The Bay of Pomerania is a shallow-water region in the southwestern Baltic Sea and covers some 8,000 km². The area is bordered to the west by Rügen island, to the southwest by the Boddenrandschwelle of the Bay of Greifswald, and to the south by the Usedom and Wolin islands. Average water depth is 13.2 m. To the north, the underwater relief falls sharply in the direction of the Bornholm and Arkona basins. The 20-m depth limit is assumed as the northern border. The Odra Bank, a large flat sandbank of approximately 1,100 km² with a shallow water depth (8 to 10 m), is situated at the centre of the Bay of Pomerania, which acts as a hydrographic transitional zone between the Oder estuary and the Bornholm and Arkona basins and is affected both by riverine inputs and the oxygen balance of the deeper-lying basins (cf. application document, Part D1.01, Section 5.1, pp. 122 et seq.).

Water exchange with the Baltic Sea (Arkona Sea and Bornholm Sea) surface water is practically unimpeded. The flow velocities are relatively low. In winter, the waters near the Odra Bank are frequently frozen.

According to a study (GLOCKZIN & ZETTLER 2008[81]), the average salinity of the Bay of Pomerania is between 5.7 and 13.8 psu with an average value of 8.67 psu, which is within the environmental impact study specifications. The salinity exhibits no great vertical variability. Throughout the year, the Bay of Pomerania is a vertical homohaline water body. Slight stratification is possible in the transition zone towards the Arkona Basin and in the Oder Bay. This stratification and greater variations of salinity are caused by inflowing saline water from the North Sea (Kattegat) and by precipitation in the Baltic Sea catchment area (cf. application document, Part D1.01, Section 5.3.1.1, pp. 162 et seq.).

The water temperatures exhibit a typical annual cycle with a minimum of 0 to 4°C from February to April and a maximum of 18 to 22°C from July to September. The variations in topsoil and the bottom water temperature are essentially the same. Generally, this is because of the good mixing of the water column in the relatively flat areas of the Bay of Pomerania. However, in summer during periods of low winds, thermal stratification is possible (cf. application document, Part D1.01, Section 5.3.1.1, pp. 162 et seq.).

The long-term LUNG M-V measurements (1975 to 2000) for the Bay of Pomerania show that mean surface water oxygen saturation is 100%. From 2003 to 2006, the saturation values ranged from 85% to 123% (LUNG M-V 2008[82]). However, from 2005 to 2012, strong variations in oxygen saturation (between 0% and 120%) were recorded in the Bay of Pomerania at a water depth of 12 meters using a permanent measuring station at the Odra Bank MARNET station. Based on the results measured at this monitoring station, it is assumed that seasonal hypoxia currently occurs annually below a water depth of 12 meters in the Bay of Pomerania. The deeper the water, the more severe the oxygen consumption (cf. application document, Part D1.01, Section 5.3.1.1, pp. 167 et seq.).

In the northern parts of the Bay of Pomerania, mesotrophic conditions are stable with low nutrient loads throughout the year. Currently, the average annual total N

[81] Glockzin, M., Zettler, M.L. (2008): Spatial macrozoobenthic distribution patterns in relation to major environmental factors- A case study from the Pomeranian Bay (southern Baltic Sea), Journal of Sea Research, Volume 59, Issue 3, 2008, Pages 144-161, ISSN 1385-1101ю

[82] LUNG M-V (Publisher) (2008): Gewässergütebericht Mecklenburg-Vorpommern 2003/2004/2005/2006: Ergebnisse der Güteüberwachung der Fließ-, Stand- und Küstengewässer und des Grundwassers in Mecklenburg-Vorpommern; Güstrow June 2008ю

concentrations in the Bay of Pomerania are between 19 and 24 µmol/l, and the average annual total P concentrations are between 0.69 and 0.97 µmol/l (LUNG M-V 2013[83]). To the south, towards the Odra Bay, the nutrient levels increase due to the input from the Oder river. Especially in the area of the old Oder riverbed (with the Sassnitz gully) and off Ahlbeck-Świnoujście, increased nutrient levels are found in the water. Overall, there is a sharp nutrient gradient in the total N and total P concentrations from the Oder estuary at Świnoujście and the Boddenrandschwelle towards the open Baltic sea (cf. application document, Part D1.01, Section 5.3.1.1, pp. 173 et seq.).

The concentrations of suspended matter in the Bay of Pomerania, especially near shore, are increased primarily by input from rivers and by sediments stirred up due to weather conditions. Strong freshwater run-off from melting snows mean that higher amounts of suspended matter enter the Bay of Pomerania in spring. The dominant easterly winds in spring largely transport suspended matter along the coastline into the Arkona Sea (cf. application document, Part D1.01, Section 5.3.1.1, pp. 176 et seq.).

With regard to the heavy metal pollution, European Community EQS thresholds (EQS directive 2013) were exceeded by lead, mercury and cadmium levels measured within the 12-nautical mile zone of the eastern coastal waters of Western Pomerania from 2008 to 2011. Inputs from rivers are the main contributors to these elevated values. Further seaward, these concentrations are increasingly diluted by uncontaminated seawater (cf. application document, Part D1.01, Section 5.3.1.1, pp. 181 et seq.).

Bay of Greifswald and Boddenrandschwelle

The basin of the Bay of Greifswald covers an area of 510 km² with an average depth of 5.8 m and a maximum depth of 13.6 m. The area is bordered to the north by Rügen island and to the south and west by the mainland. In the east (between Peenemünder Haken and Südperd), it is connected to the Baltic Sea by the Boddenrandschwelle with very shallow water depths (1.5 to 2.5 m in places). The Boddenrandschwelle is crossed by two deep channels (Landtief and Osttief) that are currently used as navigation channels and are partly developed for this purpose. The shores of the Bay of Greifswald are fairly jagged, and the eroding coastline and landfall zones take various forms (cf. application document, Part D1.01, Section 5.1, pp. 123 et seq.),

Large amounts of water are exchanged between the Bay of Greifswald and the Baltic Sea via the Boddenrandschwelle and the Strelasund. This exchange is caused primarily by meteorological factors (wind, air pressure). Westerly weather situations cause low water conditions, while easterly weather situations cause high water conditions. Especially in the nearshore area, the sediment surface is highly exposed to rough seas.

In general, the salinity in the Bay of Greifswald is similar to that of the nearby areas of the Baltic Sea (Bay of Pomerania, 5 to 10 psu). The Bay of Greifswald has an average salinity of approximately 7.5 psu. The salinity in the Bay of Greifswald characteristically has minor spatial and seasonal variations of ±2 psu. Due to its relatively shallow waters, the water body in the Bay of Greifswald is well mixed so

[83] LUNG M-V (Publisher) (2013): Berichte zur Gewässergüte des Landes M-V – Zur Entwicklung und zum Stand der Nährstoffbelastung der Küstengewässer Mecklenburg-Vorpommerns. Güstrow September 2013ю

that no stable haline stratification occurs. In the estuary areas of the Peenestrom, the salinity levels fluctuate strongly. Due to inflowing and outflowing water volumes, the salinity in this area fluctuates between 1 and 8 psu (cf. application document, Part D1.01, Section 5.3.1.1, pp. 164 et seq.).

Water temperatures in the Bay of Greifswald reach a typical annual maximum of approximately 20°C in summer and a minimum of approximately 0°C in winter.

The surface water of the Bay of Greifswald has a long-term average oxygen saturation of approximately 99%. The oxygen saturation in the Bay of Greifswald is dependent on season and weather conditions. Its long-term average value is approximately 10.4 mg/l (LUNG M-V 2008). In the course of the year, there are high oxygen concentrations (approximately 13 mg/l) in spring and low oxygen concentrations (approximately 8 mg/l) in late summer and autumn. Critical oxygen levels (lower than 4 mg/l) rarely occur in relatively shallow, well mixed coastal waters. In the unlikely case that they do occur, they are very short-term and restricted to the local area. During calm weather periods, this can affect protected shallow bays and the areas of the silt basin in the western parts of the Bay of Greifswald (cf. application document, Part D1.01, Section 5.3.1.1, p. 170 et seq.).

The average yearly total N concentration in the Bay of Greifswald ranges from 24 to 43 µmol/l. The total P concentration ranges from 1.42 to 5 µmol/l (LUNG M-V 2013). Lower total P concentrations (0.97 to 1.42 µmol/l) can be found in the area of the Boddenrandschwelle (cf. application document, Part D1.01, Section 5.3.1.1, pp. 174 et seq.).

Assessment

While the Bay of Greifswald is to be classified as a eutrophic body of water, the nutrient ratios in the Bay of Pomerania are eutrophic to mesotrophic. Both the Bay of Pomerania and the Bay of Greifswald have a largely natural water body structure. As a result, both water bodies are of high stock value.

The sensitivity of these water bodies to turbidity is relatively low due to the strong mixing of the two (cf. application document, Part D1.01, Section 5.3.2.2, pp. 189 et seq.).

B.4.4.1.5.1.2 Onshore

Inventory

Surface waters

The surface waters in the onshore investigation area (1,550 m around the project area, cf. application document, Part D1.01, Section 1.4, p. 52) are entirely of anthropogenic origin. These include the Lubmin industrial port, the former inlet channel of the decommissioned Lubmin nuclear power plant, and numerous drainage channels, among them those in the Freesendorfer Wiesen and the Lubminer Heide. There are no surface waters within the immediate project area.

The fortified banks of the Lubmin industrial port and the former inlet channel of the Lubmin nuclear power plant exhibit scarcely any plant life. The largely unsurfaced drainage channels are in large part overgrown with riparian vegetation.

The former inlet channel and the industrial port are directly connected to Peenestrom and the Bay of Greifswald, which are both eutrophicated. It can therefore be assumed that the waters in the former inlet channel and in the industrial port also have a high nutrient load (cf. application document, Part D1.01, Section 5.3.1.2, p. 183).

Groundwater

There are three aquifers present in the investigation area. The uncovered uppermost aquifer is composed of glacio-fluvial and holocene sands and carries unconfined groundwater. The thickness varies between 2 and 10 m. In the area of the Freesendorfer Wiesen, the aquifer is partly covered by thin layers of peat. The second aquifer is covered with till and consists of coarse sands from the melting of the advancing glacier and finer sands deposited during the ice recession. The thickness of this aquifer varies between 5 and 10 m. Again, till is used as an aquitard, restricting the flow of groundwater from one aquifer to another. The third aquifer, of 5 to 10 m thickness, is present only in the eastern part of the investigation area (cf. application document, Part I3.08, Section 4, pp. 7 et seq.).

The water table near the Bay of Greifswald is similar to the water level of the Bay of Greifswald and rises southwards to approximately 5 m above sea level. The groundwater-surface distances vary depending on the relief. In the lowland area north of the outlet canal, the groundwater levels are high (surface distance 0 to less than 2 m); in the area of the Lubmin industrial port and the EWN site, the groundwater levels are 5 to 10 m higher. In the area of the Nord Stream 2 Pipeline, the water level varies between 2.9 m below ground level (near the bay of Greifswald) and 5.0 m below ground level (cf. application document, Part I3.08, Section 4.6, pp. 24 et seq.).

The groundwater flows from south to north towards the Bay of Greifswald. Groundwater formation rate in the investigation area depends on the substrate and the groundwater-surface distance. Groundwater formation at sandy sites far from groundwater occurs at 225 mm per annum, while the formation rate at sandy sites near groundwater and in boggy areas is significantly less (approximately 60 mm per annum) (due to increased evaporation). The groundwater is hydraulically connected to the water of the Baltic Sea. In nearshore areas and the bordering lowlands, the groundwater can be affected by brackish waters (cf. application document, Part D1.01, Section 5.3.1.2, pp. 184 et seq.).

The results of the groundwater analysis performed as part of the site investigation can be considered typical for anthropogenic, geogenic young groundwater unaffected by brackish water. However, at a groundwater measuring point south of the pig receiving station, measured levels of chloride, sulphate, and ammonium exceeded thresholds in accordance with Annex 2 to the Groundwater Ordinance (Grundwasserverordnung, or GrwV). The groundwater analyses show that this is a punctual load which is presumably related to the dismantled sewage treatment plant because the relevant groundwater measuring points are located directly downstream of the former settling pond (cf. application document, Part I1.05, Annex 6, pp. 1 et seq.).

There are no drinking water protection zones located in the investigation area. The nearest drinking water protection zone (Lodmannshagen) is approximately 2 km south of the planned project area (cf. application document, Part D1.01,

Section 5.3.1.2, pp. 184 et seq.). There will be a large-scale water table drawdown in the area of the former nuclear power station site. In the area of the planned project, the impact of the drawdown cannot be discerned with water table contour plans (cf. application document, Part D1.01, Section 5.3.1.2, pp. 184 et seq.).

Assessment

Surface waters

Lubmin industrial port and the former nuclear power station outlet canal are of low value, as they are not very close to nature and their function in the landscape ecosystem is limited. The trenches of the Freesendorfer Wiesen and the Lubminer Heide are not natural waterways; however, they perform a function in the landscape ecosystem due to their natural vegetation cover. They are therefore of medium stock value.

The industrial port and the outlet canal are extremely obstructed. As a result, their sensitivity to structural changes is low. For the trenches, medium sensitivity is anticipated.

Due to existing loads, the sensitivity to contamination is considered to be low for the industrial port and the outlet canal and medium for the trenches (cf. application document, Part D1.01, Section 5.3.2.2, pp. 187 et seq.).

Groundwater

The inventory assessment of the groundwater was based on groundwater formation, the location within the water protection areas, and its importance for the landscape ecosystem (cf. application document, Part D1.01, Section 5.3.2.2, pp. 187 et seq.). In the investigation area, the groundwater formation rate is between >60 mm/a (in boggy areas) and >200 mm/a (at sandy sites that are far from groundwater). This corresponds to medium to high values. There are no drinking water protection zones in the investigation area. The swampy lowland areas are of high importance for the landscape ecosystem. The remaining areas with mineral sandy sites that are far from groundwater are of no great importance to the function of the groundwater for the landscape ecosystem. The stock value of the groundwater is therefore generally considered to be “medium”.

The sensitivity of the groundwater to contamination is assessed as “high” in the areas south of the harbour and the former outlet canal and as “very high” in the area of the Freesendorfer Wiesen because there are only thin and non-cohesive cover layers in some places.

The sensitivity to temporary, quantitative changes (construction-related water table drawdown) is assessed as “low” in areas with high groundwater formation and as “medium” in areas with a medium formation rate due to the short duration (cf. application document, Part D1.01, Section 5.3.2.2, p. 191).

B.4.4.1.5.2 Environmental impact

B.4.4.1.5.2.1 Offshore

In consideration of mitigation measures WA1 (reduction of turbidity plumes caused by the use of mechanical dredgers within the areas of the Bay of Greifswald and the

Boddenrandschwelle) and WA2 (compliance with turbidity limits of 50 mg/l at a distance of 500 m from the source of the suspension, whereby in the short term up to 100 mg/l in addition to the background suspension is possible within SCI in M-V coastal waters and in the interim marine stockyard), the following impact on water is anticipated as a result of the approved project:

Construction-related impact

Construction activities can cause changes to the hydrographical parameters (especially current conditions, salinity, and temperature and oxygen conditions) due to the excavation and backfilling of the pipe trenches and to soil application and soil stripping in the area of the interim marine stockyard. For safety reasons, 90% of the total route of the Nord Stream 2 Pipeline in coastal waters will be laid in an excavated trench that will be backfilled after pipe-laying. The top 50 cm of the excavated material that is suitable for backfilling will be separated by sections of identical substrate properties and will be transported to the interim marine stockyard. After completion of pipe-laying, the temporarily stored seabed material will be backfilled at its original location. The objective of this procedure is to restore the bathymetry of the seabed and the sediment parameters of the bioactive sediment horizon in the area of the pipe trenches and the interim marine stockyard (cf. application document, Part C.01, Section 3.1.1, p. 45 et seq.). The scheduled construction period for dredging, pipe-laying and backfilling in coastal waters is 7.5 months (cf. application document, Part C.01, Section 3.2, p. 77 and Part D1.01, Section 6.2.2.2.1 p. 495). The temporary changes to the bathymetry caused by dredging work can lead to local changes in the current conditions and potentially cause changes in the salinity, temperature and the oxygen levels of the seawater.

As a result of the dredging activities for constructing the pipe trenches, the interim storage of excavated soil and the backfilling of the pipe trenches, sediment disturbance may occur, causing turbidity plumes in the seawater. The extent of the turbidity plumes depends on the grain size and the solubility of the sediment, the loosening process (dredger type), the water depth and the current velocity (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 496). Based on the results of construction monitoring for the Nord Stream Pipeline in 2010, the following predictions regarding the formation of turbidity plumes during the laying of the Nord Stream 2 Pipeline can be made (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 500).

- The turbidity at the extraction tool of the dredging barge will reach peak values of 100 to 150 mg/l, depending on the dredger type.
- The SSCs in the immediate vicinity of the dredging operations will generally fluctuate between 10 and 30 mg/l.
- The SSC in the turbidity plumes away from the dredging barges will generally fluctuate between 10 and 20 mg/l.
- The SSCs at a distance of 500 m from the construction site will not even temporarily exceed the maximum levels naturally reached in the Bay of Greifswald or in the Bay of Pomerania in stormy weather (wind force >4 Bft).
- The turbidity plumes in the Bay of Greifswald will generally extend over a radius of less than 500 m. Turbidity plumes beyond this can be expected only in the area of two short route sections with a silt content of >10%.
- In the Bay of Pomerania, the turbidity plumes have a spread radius of <200 m.

- Most of the suspended material will sediment within 1-2 hours (fine and medium sands). Fine-grain substrate (<20 µm) can also remain in the water column for 1 to 2 days and drift further (this is deducible from the natural retention time of material suspended during strong winds in the Bay of Greifswald). The percentage of such fine-grain substrate in the excavated material is <5% in the Bay of Greifswald and approximately 1% in the Bay of Pomerania.

During construction, dredging activities will cause a temporary re-suspension of sediment and a related potential release of nutrients and contaminants. The nutrient ratios in maritime waters depend on the availability of the plant nutrients phosphorous (P) and nitrogen (N). Most of the nitrogen contained in sediment is in inert (non-reactive) compounds. As a result of various anaerobic and aerobic bacterial metabolic processes, bioavailable nitrogen (N) and ammonium compounds are generally quickly released into free water, where they are re-used in the pelagic primary production. Therefore, it is anticipated that suspension will not cause any relevant discharge of bioavailable nitrogen into the water column (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 504). The bioavailable soluble part of accumulated phosphorous (P) in Western Pomeranian coastal waters is estimated to be 30 to 40%. The phosphate redissolution also occurs naturally in the water body. For a worst-case scenario for the amount of phosphorous remobilised during dredging activities, it has been estimated that the maximum amount of phosphates remobilised due to construction work is less than 5% of the annual input from other sources (internal redissolution, external input from direct dischargers, input from the catchment area and from deposition). In a long-term yearly comparison, the onshore phosphate inputs in the Bay of Greifswald and in the Bay of Pomerania fluctuate by approximately 10 to 20%. The internal redissolution may vary even more. The project-related phosphate redissolution is therefore within the amplitude of the interannual variability of the internal and external inputs (cf. application document, Part D1.01, Section 6.2.2.2.1, pp. 504 et seq.). Chemical sediment investigations along the planned pipe trenches showed a very low concentration of heavy metals. The proven low preload means that redistribution, landfilling and backfilling of dredged material in accordance with GÜBAK and LAGA TR 20 is unconditionally possible. Even in the case of complete redissolution of the heavy metals contained in the dredged material, there would be no increase in the concentration in the free water of the affected water body (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 507). In most of the analysed samples, the concentration of organic pollutants was under the detection limit (cf. application document, Part I3.02A, Section 4, p. 45). There was no relevant existing load. During the construction phase, handling losses, leakages and/or accidents can cause pollutant inputs. Six months after the completion of the construction phase, increased concentrations of long-chain petroleum-derived hydrocarbons (PAK) compared to the values of the baseline surveys in 2006 and 2007 were measured in the Bay of Greifswald during sedimentary chemical investigations of the Nord Stream monitoring (Nord Stream offshore monitoring in 2011 and 2012). Most of the concentrations measured did not exceed GÜBAK guide value 1 (250 mg/kg TM). In the subsequent year, the concentrations were significantly lower. In 2016, the concentrations were under quantification limit (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 508). It cannot be ruled out that these sediment loads are related to the NSP construction activities and were caused by the increased shipping

traffic, construction vehicles/dredgers, and associated fuel and lubricant leakages. Sediment loads imply a preceding emission of long-chain petroleum-derived hydrocarbons (PAK) into the water body.

Within the 12-nautical mile zone in the Bay of Pomerania, the construction-related formation of turbidity plumes of medium-scale expansion, short duration and low to medium intensity due to sediment resuspension during dredging, interim storage of dredged material and the backfilling of the pipe trenches is to be expected. Construction-related impact of increased SSCs caused by the formation of turbidity plumes is within the range of naturally occurring conditions. The project-related release of nutrients, heavy metals and organic pollutants during dredging activities will not be measurable. Due to construction vehicle and equipment related traffic, increased emissions of medium duration, large-scale expansion and low intensity are to be expected (cf. application document, Part D1.01, Section 6.2.2.2.1, pp. 495 et seq.).

Plant-related impact

There will be a plant-related substance release from the anti-corrosion protection of the pipeline (PE-coating and sacrificial anodes). The Nord Stream 2 Pipeline is protected by a 3-layer polyethylene (3LPE) anti-corrosion coating as primary protection and sacrificial anodes as secondary protection (cf. application document, Part D1.01, Section 6.2.2.2.1, pp. 508 et seq.).

During the concrete coating at the factory, the sacrificial anode will be mounted on the pipes and electrically connected to the steel pipe. There will be approximately 1,150 anodes with a maximum total mass of 421 t of aluminium and 25.8 t of zinc present in the route section in coastal waters. The sacrificial anodes are designed to have a service life of 50 years. During this time, up to 50% of the active material can be consumed (cf. application document, Part C.01, Section 2.2.3.3, p. 35). During NSP monitoring in the Baltic Proper, the zinc concentration around the sacrificial anodes in free water was measured. At a distance of 1 to 2 m to the sacrificial anodes, no increase in heavy metal concentrations compared to the reference point was measured (cf. application document, Part D1.01, Section 6.2.2.1, p. 509).

Pipelines that are laid on the seabed rather than buried in trenches use a negligible amount of space and cause only local, small-scale changes in the current conditions. Their impact is therefore of low intensity. The impact of substances released from the sacrificial anode materials and from the coating at the welds between the pipe sections is large-scale, permanent, and of a low intensity (cf. application document, Part D1.01, Section 6.2.2.2.1, pp. 508 et seq.).

Operation-related impact

There may be an operation-related change of the temperature conditions in the water body. During the study on soil temperature (cf. application document, Part I2.02), it was determined how the operation of the Nord Stream 2 Pipeline will influence the temperature of the ambient environment and of the ambient seawater. According to the study, for pipelines laid on the seabed, the temperature difference between the external pipeline wall and the unaffected ambient environment will be 0.4 K in winter and 0.5 K in summer. The temperature difference between the boundary layer of the concrete coating and the ambient water will have no impact on the temperature conditions in the water body.

In the course of service measures, handling losses, leakages and accidents that cause pollutant input into the sea may occur. Unevenness in the topography of areas where the pipeline lies on the seabed can lead to a free span which bears the risk of long-term excessive strain on the pipeline material. If a free-span of the pipeline forms during operation as a result of natural changes in the seabed, the problem can usually be alleviated via rock placement (cf. application document, Part C.01, Section 3.3.8, pp. 134 et seq.). This repair measure leads to the temporary formation of turbidity plumes as a result of possible sediment resuspension and/or local changes in the seabed surface.

Further operation-related impact (external inspections and repairs, free-span correction) leads to turbidity and/or local deposits affecting a small to medium-sized area. This impact is short-term and of low to medium intensity (cf. application document, Part D1.01, Section 6.2.2.2.1, pp. 510 et seq.).

B.4.4.1.5.2.2 Onshore

In consideration of mitigation measure WA3 (protection of the groundwater and surface water against pollution input), the following environmental impact is anticipated as a result of the approved project:

Construction-related impact

Surface waters

During construction, the discharge of groundwater, water from the Bay of Greifswald and water used for pressure-testing the pipework at the pig receiving station can cause pollution input into the surface waters. There is no surface water in the planned construction area; however, a cased drainage channel (trench 60) runs through the area of the pig receiving station towards the Lubmin harbour basin, which is connected to the Bay of Greifswald. It is planned that the groundwater (approximately 180,000 m³) drawn in the course of the temporary water table drawdown during the construction of the launch pits for the microtunnels and the construction of the anchor blocks will be discharged into this drainage channel. Included in the discharge quantity of approximately 180,000 m³ are approximately 5,000 m³ of water from the Bay of Greifswald that is drawn when the product pipes are pulled into the microtunnels following the completion of these tunnels. This leads to an ingress of water from the Bay of Greifswald into the annulus between microtunnel and product pipe and consequently to a flooding of the launch pits with water from the Bay of Greifswald. Additionally, the impermeable launch pits for the microtunnel will hold residual water and surface water (approximately 36,000 m³) that is also to be discharged into trench 60 (cf. application document, Part I1.05, Annex A, Sections 4 and 7, pp. 4 et seq. as well as appendix 1a).

Another discharge into trench 60 is planned after the pressure test of the pipe systems at the pig receiving station is completed. The water used for this test will be taken from the drinking water network (approximately 5,000 m³) and later discharged into trench 60. The inner surfaces of the pipes will not be cleaned with chemical or biological cleaning agents during the construction phase and after completion of the pipeline segments. After the water used for the pressure test has been in the pipe equipment, it may be contaminated with suspended matter (cf. application document, Part I1.05, annex B, Sections 2 and 3, pp. 2 et seq.). The discharge of water from

the construction process into surface water bodies (groundwater drawn during the water table drawdown and drinking water for the pressure test) does not cause any pollution of surface water bodies or groundwater, as the water to be discharged is not polluted. If required, suspended matter will be – within the normal extent – removed from the drained water using sedimentation tanks or filter tanks (WA3) before the water is discharged into the receiving water body.

During the construction phase, handling losses, leakages and/or accidents can cause pollutant inputs into surface water bodies. If water that is supposed to be discharged into ditch 60 is contaminated as a result of handling losses, leaks or accidents, an input of pollutants into Lubmin industrial port and subsequently into the Bay of Greifswald may occur.

Groundwater

During the construction phase, water retention measures can cause a change in the groundwater dynamics and the groundwater quality (load of pollutants). For the construction of the launch pits for the microtunnel and the construction of the anchor blocks, a temporary water table drawdown is required. The water table drawdown will be performed using a well. The following operating times (including lead times) will be in place for water retention: 30 calendar days each for the launch pits for the microtunnels (construction phase, 2 building structures), 240 calendar days each for the launch pits for the microtunnels (drilling procedure, exclusive retention of residual groundwater, 2 building structures), 30 calendar days each for anchor blocks (2 building structures). The temporary water table drawdown will take place up to a depth of 6.30 m under mean sea level. The maximum extent is approximately 189 m around the excavation pit. The area affected by the drawdown up to a depth of 1 m is limited to 40 m around the excavation pits and is located entirely within the area established as industrial area in the development plan no. 1 “Industrial and Commercial Park Lubminer Heide”. Only the outer peripheral zone of the maximum depression funnel of 189 m diameter touches areas northwest of the pig receiving station that the development plan designates as coastal protection forest rather than industrial area. The temporary water table drawdown will cause a local change of the groundwater dynamics (cf. application document, Part I1.05, annex A as well as Part D1.01, Section 6.2.2.2.2, pp. 512 et seq.).

At a groundwater measuring point directly downstream of the former settling pond, raised levels of chloride, sulphates and ammonia have been measured. This is caused by the former sewage treatment plant but represents merely a point source pollution load because no exceedance of the thresholds in accordance with Annex 2 to the Groundwater Ordinance (Grundwasserverordnung, GrwV) were observed at other nearby measuring points. The water retention is almost directly downstream of the affected area. The planned water table drawdown will cause the direction of flow to be marginally deflected to the north-west at a local scale and will increase the groundwater gradient and consequently the current velocity. As the preloaded area is at the southeasterly edge of the depression funnel where the construction-related water table drawdown will hardly be measurable, the increase of the groundwater current velocity will be small. The current velocity in the area of raised concentration levels will be increased from currently approximately 0.16 m/d to 0.7 m/d. Due to the increase of the current velocity associated with the water table drawdown, an enlargement of the area affected by pollutants is anticipated. Given a water retention period between 30 and 120 days (maximum of 4 x 30 days for a sequentially

performed water table drawdown for each of the excavation pits), the affected area will be enlarged by 15 m to 60 m. At the same time, the concentration levels of the substances involved in this process will decrease (cf. application document, Part I1.05, Annex 6).

Construction-related land might cause a temporary reduction in groundwater formation. During the construction phase, construction site facility, storage and assembly areas will be used (cf. application document, Part D1.01, Section 6.2.2.2.2, p. 514). In these fortified, predominantly partly sealed areas, the accruing precipitation water will to a large extent percolate directly or in adjacent areas. After the completion of the construction phase, areas used exclusively for construction will be dismantled and left to regenerate naturally after topsoil application (cf. application document, Part D1.01, Section 6.2.7.2.2, p. 680).

Resulting impact on the groundwater is local, short-term, and of low intensity. The impact of mid-term land use for construction site facility, storage and assembly areas affects a small area and is of low intensity.

Plant-related impact

Groundwater

Plant-related land might cause permanent reduction in groundwater formation. In conjunction with the construction of the pig receiving station, an area of 13,981 m² will be fully sealed and an additional area of 1,111 m² will be partly sealed (cf. application document, Part D1.01, Section 6.2.2.2.2, p. 514). The plan is for the accruing precipitation from the roofs and road surfaces to percolate through infiltration ditches and drainage basins in the area of the pig receiving station (cf. application document, Part H.01, Section 4.4.1, p. 175 and „Molchempfangsstation Lubmin - Ausführungsplanung, GE - Hydraulische Berechnungen für die Schmutz- und Regenwasserableitungen“ (Lubmin pig receiving station - implementation planning, GE - Hydraulic calculations/forecast for sewage and storm water discharge) application document from 24/11/2017).

Construction-related changes to the groundwater formation caused by surfaces partly or completely sealed during the construction of the pig receiving station, including the circular road, are local and permanent. Because a large part of the NSP2 operating site will stay unsealed, the changes will be of low intensity.

Operation-related impact

Operation-related impact on water caused during inspection and maintenance activities or during repair work, the necessity of which is an exception, is local, short-term, and of low intensity. The handling of lubricants and fuels must follow the statutory rules and regulations. During the construction phase and during service measures, handling losses, leakages and accidents that cause pollutant input into the groundwater may occur.

Further details to the content of the previously mentioned mitigation measures are provided in the application document (cf. application document, Part G.01, pp. 239 et seq.).

B.4.4.1.6 Air/Climate as a protected asset

The protected interests to be considered here are the air hygiene and climatic conditions. For the presentation of the climatic impact of the project, the local microclimate or terrain climate is of particular relevance because project macroclimate (large-area) and mesoclimate (regional) impact can be ruled out ahead of time.

B.4.4.1.6.1 Inventory assessment

B.4.4.1.6.1.1 Offshore

Inventory

The coastal climate is primarily influenced by open water surfaces and shore side winds. Due to shore side winds, there is a frequent and brisk exchange of air. The formation of inverted weather conditions with stable temperature stratification is the exception.

It is anticipated that the air pollution over the open water surfaces of the Bay of Greifswald and the Bay of Pomerania is even less than the values measured at the closest onshore monitoring stations in Löcknitz, Rostock-Stuthof, Stralsund-Knieperdamm, Zingst and Garz due to good air mixing and the greater distance to the onshore emitters of air pollution (cf. application document, Part D1.01, Section 5.4.1, pp. 191 et seq.).

Assessment

Due to the particular properties of the Baltic coast climate and the low pollution of the air, the climatic and air hygiene conditions in the areas of the Bay of Greifswald and the Bay of Pomerania are of high value (cf. application document, Part D1.01, Section 5.4.2, pp. 197 et seq.).

B.4.4.1.6.1.2 Onshore

Inventory

The climatic conditions at the onshore landfall site of the pipeline route are subject to the maritime influence of the Baltic Sea. Subdued annual and daily temperature variations, higher humidity and higher wind velocities than in inland areas are characteristic of the coastal climate. The prevailing wind direction in the investigation area is south-west and west. The local climate is significantly influenced by relief, vegetation characteristics and existing development.

The data from air quality monitoring stations Löcknitz, Rostock-Stuthof, Stralsund-Knieperdamm, Zingst and Garz, which are closest to the project area, verify low air pollution in sparsely populated, rural coastal areas of Mecklenburg-Western Pomerania (cf. application document, Part D1.01, Section 5.4.1.2, pp. 195 et seq.). The air quality is preloaded with pollutants from the industrial, commercial and energy site in the Lubminer Heide, and compliance with the relevant environmental protection legislation is assumed due to its relevance for approval. Additionally, the air quality at the landfall site of the pipeline route is positively influenced by the higher coastal wind velocities because this supports the air exchange, and inverted

weather conditions are unlikely. The wind also positively influences the air quality during stable weather conditions in summer via local land- and sea-breeze circulation.

Assessment

With regard to their air hygiene and local climatic compensation function, the forest areas of the Lubminer Heide are of high value as areas of fresh and cold air production. Correspondingly, the forest areas are also highly sensitive to structural changes.

In contrast, the areas of the industrial, commercial and power site in the Lubminer Heide are polluted areas and therefore possess no value-added factors for air quality or climate. The actual project site is within the scope of the approved development plan no.1 “Industrial and Commercial Park Lubminer Heide”.

Generally, the air hygiene and climatic conditions at the landfall site of the pipeline are of high value due to low pollution of the air and the particular properties of the coastal climate (cf. application document, Part D1.01, Section 5.4.2.2, pp. 199 et seq.).

B.4.4.1.6.2 Environmental impact

B.4.4.1.6.2.1 Offshore

Construction-related impact

Construction activities can cause air pollutant emissions that impact the air quality and the local climatic conditions. The deployment of diverse vehicles and construction equipment (e.g. pipe-laying vessels, dredgers, barges, support vessels, survey vessels and safeguarding vessels) during building works for the Nord Stream 2 Pipeline in coastal waters might cause air pollutants to be released. In the offshore air pollutant study “Luftschadstoffstudie Offshore” (cf. application document, Part I2.03), the released emissions in coastal waters caused by the construction of the pig receiving station, the microtunnels and the natural gas receiving terminal (the latter requires a separate planning approval procedure) are also included in the calculation of the offshore emission loads.

The total emissions for the construction corridor in coastal waters (from KP 31 to landfall) during the entire construction period are 185,658 t of CO_2, 113 t of SO_2, 5,094 t of NO_x and 120 t of particulate matter (PM) of grain size <10 µm. The majority of these emissions will be in the area of the Bay of Greifswald and at the North-Eastern Boddenrandschwelle (cf. application document, Part I2.03, Section 9, p. 64). In the section between KP 55 and KP 84 (route section with dredging activities in the Bay of Greifswald and north-east of the Boddenrandschwelle) air pollutant emissions of 113,985 t of CO_2, 69 t of SO_2, 3,107 t of NO_x and 74 t of particulate matter (PM) are anticipated due to extensively employed technology for excavating and backfilling the pipe trenches.

The project-related impact on air quality (here especially CO_2 emissions as a climate relevant gas) generally affects a large area and is short-term (construction phase) and of high intensity (cf. application document, Part D1.01, Section 6.2.3.2.1, pp. 521 et seq.).

Plant-related impact

With regard to plant-related impact, no relevant impact factors were determined (cf. application document, Part D1.01, Section 6.2.3.2.1, p. 524, Table 6-16).

Operation-related impact

During maintenance, inspections and repair work, pollutants can be emitted into the air due to the technology employed (e.g. vessels, construction equipment). However, this will happen to a much lesser extent than during the construction phase. Operation-related impact on the climate/air as a result of external inspections and in the exceptional cases of repair work will have local to medium-scale area of effect and be short-term and of low to medium intensity (cf. application document, Part D1.01, Section 6.2.3.2.1, p. 524, Table 6-16).

B.4.4.1.6.2.2 Onshore

Construction-related impact

There will be a construction-related loss of vegetation that provides an air hygiene, and local climate compensation function. The planned construction- and plant-related land use will affect the forest climatope structure of the Lubminer Heide, which consists of extensive forest lands with a low percentage of open space areas. Climatope structures are areas with similar terrain climatic properties. Typical for forest climatope structures are minor daily variations in temperature and humidity as well as low wind velocities. Furthermore, forest climatope structures are characterized by their function as regions of cold and fresh air production and by their filter function for airborne pollutants. The construction- and plant-related land use for the project will affect a total of approximately 65,365 m² of spruce/deciduous forest land (biotope type WKX) and a total of 14,126 m² of vegetation holdings of open-land biotopes (ruderal meadows and brownfield sites; biotope types RHU, RHK and OBV) (cf. application document, Part G.01, Section 10.2.3, pp. 267 et seq.). The planned areas for deforestation are within the scope of the approved development plan no.1 “Industrial and Commercial Park Lubminer Heide”. After the completion of the construction phase, areas used exclusively for construction will be dismantled and left to regenerate naturally after topsoil application. Because these areas will later be used in accordance with the specifications of the development plan, no provision is made for reforestation (cf. application document, Part D1.01, Section 6.2.7.2.2, p. 680). The climatic compensation function in these areas will be lost.

The air quality and the local climate conditions can be influenced by construction-related air pollutant emissions. Air pollutants are also emitted during the construction of the pig receiving station and of the microtunnels due to the use of various construction equipment and vehicles. The coastal emissions due to offshore activities and the emissions from the construction of the natural gas receiving terminal (the latter requires a separate planning approval procedure) are also included in the calculation of the onshore emission loads (cf. application document, Part I2.04, Section 3, pp. 8 et seq.). For the landfall, construction-related total emissions of 31,742 t of CO_2, 31.2 t of NO_x and 1.8 t of particulate matter (PM) are anticipated. The precommissioning of the pipelines requires the use of a compressor

station during construction. This compressor station also contributes to air pollutant emissions. Further emissions will be produced during the commissioning of the pipeline, provided the pipeline is filled with elemental nitrogen followed by natural gas from the German side. Exhaust emissions will occur at the Lubmin plant site because the filling requires the deployment of several cryopumps, steam boilers, generators and trucks for the delivery of nitrogen. Significant emissions are caused by the deployment of a compressor station during the precommissioning phase of the pipeline. This corresponds to a share of approximately 10% of the total emissions for the project in German territories. In the course of the commissioning of the pipeline, initially air, then nitrogen and eventually a mixture of nitrogen and natural gas is vented into a safe area.

In the context of the above-mentioned air pollution study, the emissions of the airborne pollutants SO_2, NO_x, PM_{10}, $PM_{2.5}$ and the climate-relevant gas CO_2 were measured. Only diesel fuels are used in the onshore construction section, and because diesel fuels do not contain sulphur as a result of legal regulations, no sulphur emissions occur onshore (in contrast to the offshore construction section). During the entire construction period, the total emissions related to the construction of the pig receiving station, including the precommissioning and commissioning of the pipeline, will be 31,742 t of CO_2, 31.2 t of NO_x and 1.8 t of particulate matter (PM) of grain size <10 µm. The majority of these emissions will be during the pre-commissioning (cf. application document, Part I2.04, Section 9, p. 70).

Plant-related impact

The construction of the pig receiving station will cause a plant-related permanent loss of forest that belongs to the forest area of the Lubminer Heide. The loss of the forest changes the ground-level wind and light conditions and increases the bioclimatic air pollution (loss of cold air formation spaces, higher daily variations of climatic parameters). The climatic compensation function in this area will be lost. This is a local and permanent loss of this impact factor (cf. application document, Part D1.01, Section 6.2.3.2.2, p. 530, Table 6-18).

Operation-related impact

Operation activities can cause air pollutant emissions that impact the air quality and the local climatic conditions. During maintenance, inspections and repair work, pollutants can be emitted into the air due to the employed technology (e.g. vehicles, machinery/equipment). However, this will happen to a much lesser extent than during the construction phase.

For special maintenance or operational reasons, a depressurisation of the pipeline may be required. During this process, natural gas up to a minimum pressure is passed on to the gas consumers. When the minimum pressure is reached, the remaining gas is blown out into the atmosphere via the blow-out system at the Lubmin 2 natural gas receiving terminal (cf. application document, Part C.01, Section 4.4.5.7, p. 213). Natural gas is not toxic; however, 98% of natural gas is methane, which is one of the GHGs. However, due to the deployment of welding pigs, an emptying of the pipeline (e.g. during the repair of valves) is often not necessary and therefore unlikely.

As a result of the discharge of gas through the blow-out system (methane) and of external inspections and repair work, including vehicle traffic to and from the site,

operation-related local and short-term impairment caused by emissions of low intensity are anticipated (cf. application document, Part D1.01, Section 6.2.3.2.2, p. 530, Table 6-18).

B.4.4.1.7 Landscape as a protected asset

The term “landscape” as described in sec 2 UVPG refers to the landscape ecosystem as well as to the outer, perceptible phenomenon of nature and landscape – the visual amenity. The significant content-related aspects of the landscape ecosystem are already covered in the context of the considerations regarding the biotic and abiotic protected assets. Here, we will focus on the visual amenity. Attention will be paid not only to the visual perceptibility of the landscape by humans, but also to the senses of hearing and smell, which are also important for the landscape experience.

B.4.4.1.7.1 Inventory assessment

B.4.4.1.7.1.1 Offshore

Inventory

In the offshore section of the pipeline route, the following areas of visual amenity are differentiated:

Bay of Pomerania

Extensive visibility across the water to the horizon is typical for the offshore part of the Bay of Pomerania. Offshore, the east coast of Rügen island and the outer coast of Usedom island are only perceived as lines. In nearshore areas of the pipeline route, there is better visibility to the eastern coast and particularly to the southern coast of Rügen island (coastline of the Mönchgut peninsula between Nordperd and Südperd capes).

The closest distance between the mentioned coastal area and the planned pipeline route, i.e. where the planned project area is visible from land, is 1.6 km, from Südperd cape. The coastal area closest to the interim marine stockyard is situated close to Zinnowitz on Usedom island at a distance of 4.8 km from the pipeline route (cf. application document, Part D1.01, Section 5.6.1, pp. 432 et seq.).

There are no significant existing loads on the areas of visual amenity. The use of the maritime waters by shipping is a typical aspect of the Baltic Sea cultural and economic region.

Bay of Greifswald

Significant characteristic landscape elements in the area of the Bay of Greifswald are the water areas and the fringe effect between land and sea through the diverse bays on the coastline.

Viewed from the north, existing loads on the areas of visual amenity are caused by the decommissioned Lubmin nuclear power plant complex and by the pier structure of Lubmin industrial port.

Assessment

Both the Bay of Pomerania and the Bay of Greifswald exhibit typical characteristics of coastal waters (predominance of natural water areas, extensive and appealing visibility). Both water bodies are therefore very important for visual amenity.

Due to the excellent visibility, both landscapes are very sensitive to visual disturbances (cf. application document, Part D1.01, Section 5.6.1, p. 439).

B.4.4.1.7.1.2 Onshore

Inventory

In accordance with the statewide analysis and assessment of landscape potentials in Mecklenburg-Western Pomerania (Landesweiten Analyse und Bewertung der Landschaftspotentiale in M-V (LAUN M-V 1996[84]), the surroundings of the onshore project site are divided into two areas of visual amenity:

Lubminer Heide

The Lubminer Heide area of visual amenity is a largely natural, shallow-walled ground moraine landscape with sand deposits dominated by a pine forest predominantly of younger age. Due to its location on the Bay of Greifswald, the area is influenced by the coastline formation. The forest is situated in a dune area with gently rolling landscape topography (cf. application document, Part D1.01, Section 5.6.1, p. 436).

In this landscape zone, existing loads are primarily caused by the large former nuclear power plant complex in Lubmin, the former outlet canal, Lubmin industrial port and additional industrial plants, e.g. the Greifswald landfall facility and Deutsche Ölwerke Lubmin GmbH. Numerous high-voltage lines and aisles for the OPAL and NEL natural gas pipelines also cause an anthropogenic degradation of this subsection of the Lubminer Heide. The forest area is partly claimed by the legally binding development plan no.1 “Industrial and Commercial Park Lubminer Heide” and also includes the actual project site. In Lubmin itself and in the adjacent forest and beach area to the northeast, the impact of the industrial and commercial park is mitigated by an existing noise and visual screening wall (cf. application document, Part D1.01, Section 5.6.1, p. 436).

Struck und Freesendorfer Wiesen

To the north, the Lubminer Heide is adjacent to the Struck und Freesendorfer Wiesen area of visual amenity. The landscape is dominated by extensive flat salt marshes that are criss-crossed by several trenches. At its southern and northern border, the area of visual amenity is structured by small forest lands, and at its centre is the water area of Freesendorfer lake. Due to its flat relief and the predominant absence of shrubs, the visibility of this landscape zone is extensive (cf. application document, Part D1.01, Section 5.6.1, p. 435).

[84] LAUN M-V (1996): Landesweite Analyse und Bewertung der Landschaftspotentiale in Mecklenburg-Vorpommern. Landesamt für Umwelt und Natur Mecklenburg-Vorpommern.

Existing loads are caused by the adjacent large complex of the former nuclear power plant in Lubmin, the Lubmin industrial and commercial park with the Greifswald landfall facility, the industrial port and Deutsche Ölwerke Lubmin GmbH. The chimneys of the former nuclear power plant and the stacks at the landfall facility Greifswald are especially visible from a great distance (cf. application document, Part D1.01, Section 5.6.1, p. 435).

Assessment

Lubminer Heide

The forest areas of the Lubminer Heide are of great aesthetic importance, especially due to their natural, unspoilt vegetation close to the coastline, their structured dune terrain and their shielding effect towards the industrial, commercial and energy site.

With increasing proximity to the industrial and commercial park, the shielding effect of the forest decreases, which is why a medium sensitivity of the forest areas to visual disturbances of the landscape experience is anticipated.

Struck und Freesendorfer Wiesen

The “Struck und Freesendorfer Wiesen” area of visual amenity is of high aesthetic importance especially due its extensive, charming expanse and the tranquillity that this largely unfragmented landscape transmits.

Due to the high visibility of this landscape zone, the sensitivity to visual disturbances is very high (cf. application document, Part D1.01, Section 5.6.2, pp. 439 et seq.).

B.4.4.1.7.2 Environmental impact

B.4.4.1.7.2.1 Offshore

There is no plant-related impact on the offshore landscape because the pipeline is laid on or trenched into the seabed.

Construction-related impact

There will be construction-related changes in the visual amenity of the landscape caused by disruptive visual, acoustic and olfactory stimuli. The use of vehicles and machinery for the pipe trench excavation, material transport, pipe-laying and backfilling of trenches (including backhoe dredgers, trailing suction hopper dredgers, bucket ladder dredgers, pipe-laying vessels, barges, anchor handling tugs, pipe carriers, multi-purpose vessels) will cause visual disturbances to scenery surrounding or adjacent to the pipeline route and the routes for material transport and not in perspective shadow. Vehicles and machinery in themselves as well as the light emissions and airborne noise and air emissions that are caused by the use of these vehicles and machines influence the perception of the landscape.

Due to the high visibility of the Bay of Greifswald and Bay of Pomerania sceneries, it is anticipated that larger vessels and the greater construction-related ship density will be clearly visible at a distance of approximately 5 km. Within this radius, there will also be onshore sites, e.g. the coastline of Mönchgut peninsula on Rügen island (area between Thiessow and Göhren) and the southern coastline of the Bay of

Greifswald (area around Lubmin), from where the construction activities can be viewed.

Within a radius of 3 km around offshore construction sites, a short-term impact affecting a medium-sized area is anticipated. With regard to the offshore pipeline-laying activities in the 12-nautical mile zone, construction-related impact of high intensity on the visual amenity within a radius of approximately 3 km around the construction site is anticipated. Thus, the affected landscape is situated south of the Mönchgut peninsula in the area of Klein Zicker and Thiessow and at the Lubmin 2 landfall zone (coastal section westwards of the port entrance towards Lubmin). At a distance of approximately 5 km, medium-intensity impact on the visual amenity is possible (south of the Mönchgut peninsula in the area of Göhren). Regarding the construction-related traffic, the routes to be assessed are the main routes along the pipeline route (linked to Lubmin port) and the routes from Sassnitz-Mukran and to the offshore interim stockyard off Usedom island (from the Bay of Greifswald via Osttief deep channel and from the northern part of the pipeline route along the route eastwards of Greifswalder Oie). In this context, the scenery-related attractions are confined to the water areas in the immediate vicinity of the routes.

Plant-related impact

There are no known relevant plant-related impact factors for this protected asset.

Operation-related impact

Operation-related service measures (maintenance, inspection and repair work) can cause construction-related changes in the visual amenity of the landscape due to disruptive visual, acoustic and olfactory stimuli. Pigs are used for the internal inspection and maintenance of the pipelines at regular intervals of three to eight years. The pigs pass through the pipeline and in the process record the condition of the pipeline and perform cleaning procedures if necessary (cf. application document, Part C.01, Section 4.4.3.1, p. 198). This procedure will not cause any impact on the visual amenity. During the inspections, there will be negligible impact on the environment because the vessel used for check-ups will contribute to the shipping traffic that impairs the visual amenity. Maintenance activities are required only as an exception. Their impact with regard to visual impairment, noise, and contaminant emissions can be compared to the impact of the construction phase; however, it is short-term of low to medium intensity and affects a small area.

B.4.4.1.7.2.2 Onshore

In consideration of approved mitigation measure PT11 (reduction of the light emission during construction and operation), the following project-related environmental impact is anticipated onshore (cf. application document, Part D1.01, Section 6.2.5.2.2, pp. 646 et seq.):

Construction and plant-related impact

There will be construction-related changes in the visual amenity caused by land use and consequential loss of structural elements impacting the visual amenity. In the Lubminer Heide area of visual amenity, the construction- and plant-related land use for the project will affect a total of approximately 65,365 m² of spruce/deciduous

forest land (biotope type WKX) and a total of 14,126 m² of vegetation holdings for open-land biotopes (ruderal meadows and brownfield sites; biotope types RHU, RHK and OBV) (cf. application document, Part G.01, Section 10.2.3, pp. 267-268). Due to their characteristics and their shielding effect forest lands are of high value for the visual amenity. The planned areas for deforestation are within the scope of the approved development plan no.1 “Industrial and Commercial Park Lubminer Heide”. After the completion of the construction phase, areas used exclusively for construction will be dismantled and left to regenerate naturally after topsoil application. Because these areas will later be used in accordance with the specifications of the development plan, no provision is made for reforestation (cf. application document, Part D1.01, Section 6.2.7.2.2, p. 680). The area to the north of the pig receiving station (microtunnel) will not be reforested, which means that the structures that influence the visual amenity (forest) will be permanently lost. This will be associated with a functional impairment (quality degradation) of the visual amenity. Due to the very small area affected by the impairments in the area of perspective shadows (noise and visual screening wall), the impact on the visual amenity is assessed as “low”. The forest and succession areas that will be permanently lost in the area of the pig receiving station due to building development are associated with a quality degradation of the visual amenity. The loss is assessed as “medium”. Remote impact from structural losses on adjacent areas of visual amenity is reduced by the preservation of forest edge structures and the use of an existing noise and visual screening wall. Given this context, structural losses may be assessed as “low”.

There will be plant-related changes to the visual amenity of the landscape caused by visual disruptive stimuli (introduction of structures into the landscape). At the area of the pig receiving station, several physical structures will be constructed. These include new operations and workshop buildings, enclosure of the terminal area with outer and inner fences (height: approximately 3.10 m), the construction of a transformer station and of a diesel-emergency power generator, private traffic facilities (streets, roads, 12 car parking spaces) and other building structures such as bar grate platforms used as operating and maintenance platforms, pig traps, safety shut-off valves and a blow-out system (cf. application document, Part I1.04 and Part D1.01, Section 6.2.5.2.2, p. 649). Due to the reshaping of areas of the visual amenity by visual overlay with structural elements of the pig receiving station, currently undeveloped, wooded and unsealed areas in the Lubminer Heide will be lost. The perceptibility of the extremely valuable and highly sensitive areas of visual amenity Struck und Freesendorfer Wiesen and Bay of Greifswald will be impaired by the introduction of technogenic elements. The construction of plants and facilities will lead to a technical superimposition of the currently predominately wooded project area and consequently to a change in landscape appearance. Vertical structures in particular can create a large long-distance effect. Within the pig receiving station, this applies to the blow-out system (30 m in height) (cf. application document, Part G.01, Section 8.1.4.3, p. 171). The reshaping of the Lubminer Heide area can be considered permanent, of medium-scale expansion and generally as medium impact. Due to the impaired visibility, the effects on other areas of visual amenity can be considered negligible.

During the construction phase, there will be changes in the visual amenity of the landscape caused by disruptive visual, acoustic and olfactory stimuli. The deployment of construction vehicles and equipment/machinery for construction activities will cause a limited visual change of the landscape zone in the areas with

no perspective shadows adjacent to the project area. Vehicles and machinery in themselves and the emissions (particularly light and dust) caused by their use influence the perception of the landscape. Additionally, construction-related sound, air pollutant and odour emissions might impair the landscape experience.

Operation-related impact

Plant operation and service measures (maintenance, inspection and repair work) can cause changes in the visual amenity of the landscape due to disruptive visual, acoustic and olfactory stimuli. An operation-related impairment of the landscape appearance can be caused by the lighting of the pig receiving station. Under normal operating conditions, there will be no sound emissions caused by the pig receiving station (cf. application document, Part I2.08A, Section 4.1, pp. 5 et seq.). The operation-related traffic to and from the site is of small scale because the operating stations of the plant are not occupied by personnel during normal operation (cf. application document, Part C.01, Section 2.2.5, p. 41). During service measures, construction vehicles and equipment can cause visual disturbances as well as air pollutant and sound emissions that might result in a temporary impairment of the visual amenity.

The preservation of vegetation at the edge of the project area and the noise and visual screening wall can mitigate the impairment. For that reason, and in consideration of the existing load, the impact on Lubminer Heide are minor. Due to the impaired visibility, the effects on other areas of visual amenity can be considered negligible.

B.4.4.1.8 Cultural heritage and other tangible assets

Cultural heritage and other protected assets are listed in sec. 2 para. 1 no. 3 old version UVPG as independent protected assets. As a result, plans for culturally important monuments or archaeological objects, ensembles of buildings, townscapes, cultural landscapes or elements of cultural landscapes such as other monuments or tangible assets with existing sensitivity towards the impact factors of the project, must be taken into account when assessing the environmental impact of the project.

B.4.4.1.8.1 Inventory assessment

B.4.4.1.8.1.1 Offshore

Inventory

Cultural heritage

Based on information from the Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern (State Bureau for Culture and Preservation of Ancient Monuments and Artefacts of Mecklenburg-Western Pomerania) and the Bundesamt für Seeschifffahrt und Hydrologie (German Federal Maritime and Hydrographic Agency) (cf. application document, Part I1.03, Section 8.1, p. 118), and based on the evaluation of geophysical surveys (particularly side-scan sonar surveys) and video recordings along the planned pipeline route, a series of buried monuments and other

underwater objects have been already identified in the immediate vicinity of the planned pipe-laying trenches and the anchor corridor (cf. application document, Part D1.01, Section 5.8.1 p. 454).

One of the known buried monuments is a part of the historical Swedish shipwreck barrier from the Great Northern War (1700 - 1721) situated in the area south-east of Rügen Island in the area of the Thiessower Haken and the Boddenrandschwelle. The Swedish navy constructed these shipwreck barriers as protection against encroachment by Danish warships into the strategically important Bay of Greifswald. For this purpose, several requisitioned trade and fishing vessels were scuttled. The various wreck sites are distributed over an area of 1.5 km. Prior to the construction of the Nord Stream route, wreckage of a ship at one shipwreck barrier site was raised under the direction of the State Bureau for Culture and Preservation of Ancient Monuments and Artefacts of Mecklenburg-Western Pomerania. During this process, a 60-m-wide corridor for the laying process was created. In the area of the Boddenrandschwelle, the planned Nord Stream 2 route will run at a distance of approximately 100 m parallel to the Nord Stream Pipeline (cf. application document, Part D1.01, Section 3.2.5 p. 114).

In the further course of the Nord Stream 2 route through the Bay of Greifswald, separate wreck sites have been identified that are in the area of the planned construction activities (cf. application document, Part D1.01, Section 5.8.1 pp. 454 et seq.).

Other tangible assets

Several navigational marks (buoys and beacons) for the navigation channels and controllers are present as tangible assets in the offshore section of the pipeline route. Trans-regionally significant maritime routes in the Bay of Pomerania are the main shipping routes towards Świnoujście, the Świnoujście-Ystad shipping corridors (South Sweden) and a west-east route south of the Adlergrund, including the corridors to Sassnitz/Mukran and to the Landtief (cf. application document, Part D1.01, Section 3.2.3 pp. 107 et seq.). The Nord Stream 2 route crosses the following main routes with a high ship density in the area of the Bay of Pomerania:

- The pipeline crosses the Adlergrund traffic separation area at a length of 9.5 km (KP 0.000 to KP 9.535).
- The pipeline crosses Shipping Lane No. 20 Ystad-Świnoujście at a length of 2.2 km (KP 27.645 to KP 29.892).
- The pipeline crosses the shipping lane towards the Świnoujście approach at KP 47.500.

Important areas for shipping within the Bay of Greifswald are the Osttief, Tonnenbankrinne, Landtief buoyed fairways as well as the entry into the Strelasund. The Nord Stream 2 route crosses the Bay of Greifswald at the following shipping channels and approaches (cf. application document, Part D1.01, Section 3.2.3 p. 108):

- The pipeline crosses the seaward approach to the Landtief shipping lane at a length of 0.8 km and then runs parallel to the approach and the actual shipping lane at a length of 12.5 km (KP 58.316, KP 58.773 to KP 71.294).

- The pipeline crosses the junction of the Landtief shipping lane into the Schumachergrund and Böttchergrund shipping lanes and into the shipping lane towards Vilm at a length of 0.7 km (KP 71.294 to KP 72.008).
- The pipeline crosses the junction of the Neptungrund shipping lane into the Ariadnegrund and Elsagrund shipping lanes at a length of 0.8 km (KP 77.028 to KP 77.860).
- The pipeline crosses the shipping lane towards Lubmin harbour at a length of 0.9 km (KP 79.625 to KP 80.487).

Larger transhipment ports in the vicinity of the construction project are the ports of Wolgast and Greifswald-Ladebow. Additional large ports are the ports of Mukran, Sassnitz and Stralsund and the port of Świnoujście in Poland (outside of the 12-nautical mile zone of Germany). In addition, there are the recently extended ports of Vierow and the industrial port at the industrial, commercial and power site in the Lubminer Heide. The roadsteads closest to the Nord Stream 2 route are situated east of Rügen island in the catchment area of the ports of Sassnitz and Mukran. In 2004, there were 77 marinas with 5,150 berths in total in the water sport areas at the Bay of Greifswald and the Peenestrom/Achterwasser. Shipyards are found in the water sports centre in Greifswald and Wolgast and in Lauterbach on Rügen island and in Stralsund. The maintenance of the approaches and the shipping lanes in the investigation area forms an essential basis for the mentioned ports, roads and shipyards (cf. application document, Part D1.01, Section 3.2.3, pp. 107 et seq.).

Traditionally, the fishing grounds of the Bay of Greifswald and the outer coasts of Mecklenburg-Western Pomerania are of particular importance to fishery. While the outer coast and the marine areas are dominated by trawling, gillnets are predominately used for fishery in the Bay of Greifswald due to its shallower waters. The main target species are herring, cod and flounder. The catch is mostly herring with a main catch season in spring (March to May). From 2012 to 2014, the above-mentioned fish species accounted for 95% of the reported catch. The remainder consisted largely of the eel, plaice and turbot target species, but also of salmonid species and freshwater species like perch and pike-perch (cf. application document, Part D1.01, Section 3.2.1 pp. 92 et seq.).

The Bay of Greifswald contains important spawning areas for a variety of fish species but is of inter-regional importance for spring-spawning herring. The Bay of Greifswald is the main spawning area for herring stock from Kattegat, the northern Skagerrak, Mecklenburg Bay and east of Rügen island. The flat, structurally rich peripheral regions of the Bay of Greifswald that are abundant in macrophytes are especially popular spawning areas. During current fishing activities in the area of the Lubmin landing point, herring fry was very prevalent. The Lubmin area has a high hydrodynamic exposition, and as a result, the macrophyte stock is much lower in this area than in other areas of the Bay of Greifswald. Important herring spawning areas are further to the west (Gahlkow) or further to the east (Freesendorfer Haken) of Lubmin. The Lubmin 2 landfall point therefore is of less importance for the herring spawning area. Based on the fishing results, it can be assumed that this area is used as a nursery area for herring (cf. application document, Part D1.01, Section 5.5.4.2, p. 309).

In this region, the culturally important “traditional fishing” is practised mainly by family-run businesses with small floats. Traditional fishery is an important economic

factor for Mecklenburg-Western Pomerania, especially with respect to tourism, because it contributes to maintaining the maritime character of the coastal communities (direct sales of fish at the home ports) but also from the perspective of the fish processing industry. The fishing grounds of the Bay of Greifswald and the outer coasts of Mecklenburg-Western Pomerania make an essential contribution to ensuring the livelihood of the small-scale fisheries sector (cf. application document, Part D1.01, Section 5.8.1, pp. 454 et seq.).

The Landtief restricted area is adjacent to the Nord Stream 2 route and relevant to the raw materials industry. It is located to the east of Lobbe at approximately 0.3 km distance from the route. It is a prospective area for gravel and sand dredging for commercial use as approved in accordance with Section 8 of the German Federal Mining Act (BbergG). Additionally, the Prorer Wiek priority area is situated northeast of Nordperd cape, also at approximately 0.3 km distance from the route. The priority area is intended for sediment extraction for coastal protection measures of the federal state of Mecklenburg-Western Pomerania. Currently, there is no master or main operating plan, but only an approval for Prorer Wiek priority area in accordance with Section 8 of the German Federal Mining Act (BbergG). The latter approval also applies to Usedom authorised field for the commercial securing of raw materials. This authorised field is situated at approximately 100 m distance from the planned interim marine stockyard. Located at a distance of approximately 200 m from the planned interim marine stockyard is the Trassenheide approved field for the exploration of sand in accordance with Section 7 of the German Federal Mining Act (BbergG) (cf. application document, Part D2.01, Environmental Impact Study, Map 3: Marine Use and Infrastructure). For the Trassenheide approved field, an exploratory operations plan has been approved. Also affected by the route is the Oderbank KW approved field for the exploration of hydrocarbons in accordance with Section 7 of the German Federal Mining Act (BbergG). This approved field stretches from Lubmin pass Usedom island in a northeasterly direction towards the Bay of Pomerania.

The section from KP 50.703 to KP 51.203 crosses the route of the Nord Stream 2 Pipeline, the approved route for six 3-phase submarine power cables systems operated by 50Hertz Offshore GmbH, two of which are already implemented (see Section B.4.4.2.9). Among other purposes, these six submarine cables are intended to connect the "Arkona Basin Southeast" and "Viking" offshore wind farms to the mainland. In areas where submarine cables are already in position, the pipeline will be laid on the seabed. In areas where the three remaining submarine cables are to be laid, the Nord Stream 2 Pipeline will be covered with 1.0 m of soil in order to allow for a subsequent crossing of the pipeline by the cables (cf. application document, Part D1.01, Section 3.2.5, p. 113).

The planned NSP2 pipeline route will run largely parallel northwest of the existing NSP pipeline. In the Boddenrandschwelle area and to the north-east of it, this is the closest distance between the two pipeline routes and is approximately 100 m.

During monitoring of military and civilian aircraft movements, flights with an altitude below 8 km are controlled at take-off and landing and must state the flight destination and origin. There are no air routes, in the sense of defined flight routes, in Germany. In visual flight, a minimum flight altitude of 500 ft (150 m) over open country applies, and obstacles must be given a minimum clearance of 150 m. For flights with visual flight rules, obstacles must be taken into account during flight preparation. In view of the minimum statutory altitude, no relevant touch points between the planned

construction project and aviation are apparent (cf. application document, Part D1.01, Section 3.2.2, p. 105).

From the borders of the 12-nautical mile zone to KP 49.815, the Nord Stream 2 Pipeline runs through military training grounds. It is the “Pomeranian Bight” Marine (navy) artillery practice range and the “ED-D 47” Luftwaffe (air force) gunnery practice and exercise area. The Bundeswehr (German army) stated in its letter to the regulatory authorities that the “Pomeranian Bight” Marine (navy) artillery practice range was indispensable for the German Navy's training operations. Further restrictions that exceed the current restrictions due to the commissioning of the first two Nord Stream pipelines and have more than negligible impact on military use, are not considered acceptable in view of the security situation and the defence capability of the allies. Seen from an internal perspective of the Bundeswehr, artillery training operations with large-calibre munitions in the pipeline area would require significantly more restrictive safety measures. From the German Navy’s point of view, a moderate widening of the existing pipeline corridor would not significantly increase the existing limitations. In this respect, the limitations caused by the Nord Stream 2 Pipeline running parallel to the Nord Stream Pipeline at a maximum distance of 2 nautical miles in the “Pomeranian Bight” artillery practice range is only just acceptable (cf. application document, Part D1.01, Section 3.2.8, pp. 118 et seq.).

Assessment

Cultural heritage

The historical Swedish shipwreck barrier is an important archaeological source for shipbuilding and shipping and is therefore an archaeological monument of great cultural importance. This is also true of the other existing archaeological monuments in the area of the route and in the anchor corridor. Correspondingly, a high sensitivity to the loss of the archive function for cultural history is assumed (cf. application document, Part D1.01, Section 5.8.2, p. 456).

Other tangible assets

For shipping, the maintenance of the approaches and the shipping lanes and routes are of paramount importance. There is great sensitivity to permanent loss of functionality of the existing maritime routes.

Fishing is a traditional utility of high cultural importance. Therefore, there is great sensitivity to the impairment of the spawning grounds or the catch areas. This applies especially to small businesses.

For the areas relevant to the raw materials industry in the close vicinity of the construction project, there is currently still no exploration, master or main operating plan and consequently no sensitivity to project-related impact. An exception to this is the "Trassenheide" approved field. An exploratory operations plan has been approved for it. The "Trassenheide" approved field is a tangible asset of low importance; extraction activities will not be carried out on this approved field.

The cable and pipeline routes are of great importance as tangible assets and are highly sensitive to loss of functionality.

B.4.4.1.8.1.2 Onshore

Inventory

Cultural heritage

According to the Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern (State Bureau for Culture and Preservation of Ancient Monuments and Artefacts of Mecklenburg-Western Pomerania), there are no architectural monuments at the onshore landfall site for the Nord Stream 2 Pipeline, nor are there any buried monuments or suspected monument sites known to date (cf. application document, Part D1.01, Section 5.8.1, p. 456).

Other tangible assets

Starting at the coastline the planned onshore pipeline route will run within two trenchless microtunnels underneath the beach, the dune belt, the dune forest, and various onshore infrastructure facilities, like a road, railway tracks, OPAL and NEL natural gas pipelines and several other supply lines. During the planning and the construction phase, the required vertical distances between the lines/pipelines to be crossed and the Nord Stream 2 Pipeline will be taken into account (cf. application document, Part D1.01, Section 3.2.5, p. 114). The planned pig receiving station is situated in woodland and ruderal sites which are already fully claimed by the legally binding development plan No 1 “Industrie- und Gewerbegebiet Lubminer Heide” (Lubminer Heide industrial and commercial park) (cf. application document, Part D1.01, Section 5.8.1, p. 456).

Assessment

Forestry areas, supply lines and traffic routes are considered tangible assets of high importance and of high sensitivity to loss of functionality (cf. application document, Part D1.01, Section 5.8.2, p. 457).

B.4.4.1.8.2 Environmental impact

B.4.4.1.8.2.1 Offshore

In consideration of approved mitigation measure KuS1 (coordination of measures with the Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern [State Bureau for Culture and Preservation of Ancient Monuments and Artefacts of Mecklenburg-Western Pomerania]), the following project-related environmental impact is anticipated offshore:

Construction-related impact

Construction-related land use can result in loss or damage of cultural heritage objects. Along the Nord Stream 2 route, several buried monuments have already been found, e.g. the historical Swedish shipwreck barrier in the area of the Boddenrandschwelle and individual shipwreck sites in the Bay of Greifswald (see Section B.4.4.1.8.1).

Loss/damage of other tangible assets due to construction-related land use or operation-related service measures

The shortest distance between the predominately parallel routes of the Nord Stream 2 Pipeline and the Nord Stream Pipeline will be in the area of the

Boddenrandschwelle. Here the distance will be only approximately 100 m. Furthermore, the planned Nord Stream 2 Pipeline will cross the approved route of six 3-phase submarine power cables system operated by 50Hertz. Construction activities or service measures could potentially damage the mentioned cables. During building activities, additional, currently unknown objects pertinent to monument conservation may be found in the seabed and potentially be destroyed or damaged.

Other uses or tangible assets might be impaired due to the construction-related land use. During the building phase for the Nord Stream 2 Pipeline, temporary usage restrictions for shipping traffic and fishery might occur due to the imposition of safety zones around dredging and pipe-laying activities in order to avoid any danger to maritime traffic. Unauthorised ship traffic, including fishing vessels, will not be permitted to enter this safety zone (cf. application document, Part D1.10, Section 6.2.7.2.1, p. 676). In general, safety zones encompass only the immediate area where the construction vehicles are operating. The radius of the safety zone around the laying barge of the second generation (from the Bay of Greifswald to the location where the pipes are placed – offshore of the Boddenrandschwelle) will be approximately 1,000 m, whereas the radius of the safety zone around laying barges of the third or fourth generation will be at least approximately 2,000 m (cf. application document, Part D1.01 Section 6.2.6.2.1, p. 662).

There is no master or main operating plan yet for any of the areas in the vicinity of the planned pipeline or of the interim marine stockyard that are relevant to the raw materials industry (see Section B.4.4.1.8.1). Therefore, relevant conflicts over utilization with construction-related impact from the Nord Stream 2 Pipeline can be ruled out. The "Trassenheide" approved field is situated at a distance of approximately 200 m from the planned interim marine stockyard for the Nord Stream 2 project. Only construction-related impact factors (turbidity, sedimentation, construction traffic) in connection with the Nord Stream 2 project apply to this approved field. However, these factors do not result in any relevant impairment of the exploring activities in this field. The impairment of the Oderbank KW approved field for the exploration of hydrocarbons by the construction-related land use will be negligible.
Relevant touch points between the planned project and aviation are not anticipated if the designated minimum flight altitude is maintained.
The planned pipeline will cross the “Pomeranian Bight” Marine (navy) artillery practice range and the “ED-D 47” Luftwaffe (air force) gunnery practice and exercise area. No significant conflicts with military concerns are anticipated (see Section B.4.8.19).

Plant-related impact

Other uses or tangible assets might be impaired due to the plant-related land use. There might be a plant-related anchor restriction for shipping and fishery. In order to protect the pipeline, a prohibited anchoring zone will be set up with a width of 200 m on both sides of the pipeline route. There will be almost no limitations to fishing activities along the pipeline. Only in rock placement areas and in areas of free spans is trawling to be avoided, as the trawl nets can get stuck. This would not be of any danger to the pipeline itself; however, it poses a risk for fishery, as part of the trawl net could be damaged, torn or lost (cf. application document, Part C.01, Section 5.3.2, p. 226).

No impact is anticipated on traditional fishing with gillnets, longlines, or fykes because this kind of fishery will be allowed in the direct vicinity of the pipeline route (cf. application document, Part D1.01, Section 6.2.7.2.1, p. 677).

The impairment of the "Oderbank KW new" approved field for the exploration of hydrocarbons by the plant-related land use will also be negligible, as only a small portion of the approved field will no longer be available for the exploration of hydrocarbon after the construction of the Nord Stream 2 Pipeline is completed. Additionally, there is no current operation plan for the exploration, so no exploration can be performed.

Operation-related impact

During service measures, additional, currently unknown objects pertinent to monument conservation may be found in the seabed and potentially be destroyed or damaged due to construction work related to these service measures.

B.4.4.1.8.2.2 Onshore

In consideration of approved mitigation measure KuS2 (mitigation of impairments/losses due to archaeological prospects) the following project-related environmental impact is anticipated onshore:

Construction-related impact

The construction-related land might lead to loss or damage of cultural heritage and tangible assets. However, in the onshore area of the planned construction, no buried monuments or suspected monument sites are known to date. It is possible that, during construction activities or service measures, objects pertinent to monument conservation may be found in the ground and be lost or damaged.

The route of the Nord Stream 2 Pipeline will run within microtunnels underneath the onshore coastal protection forest, various supply lines, a road, and railway tracks. Construction-related structural changes or destruction of cultural heritage and tangible assets during the construction of the microtunnels is not anticipated, as an underpass of the gas pipelines and supply lines, the road and railway tracks at sufficient depth has already been taken into account during the planning phase. There will be construction-related land use of woodland. For the Nord Stream 2 project, a total of 8.2968 ha of woodland will be used in accordance with sec. 2 LWaldG (Forest Act of the State of Mecklenburg-Western Pomerania). 1.7197 ha of these used woodlands will be unstocked forest land. The affected forest land is predominately spruce/deciduous forest. The planned areas for deforestation or for reuse/forest conversion are within the scope of approved development plan No 1 “Industrie- und Gewerbegebiet Lubminer Heide” (Lubminer Heide industrial and commercial park). After the completion of the construction phase, areas used exclusively for construction will be dismantled and left to regenerate naturally after topsoil application. Because these areas will later be used in accordance with the specifications of the development plan, no provision is made for reforestation (cf. application document, Part D1.01, Section 6.2.7.2.2, pp. 679 et seq.). The magnitude of the impact at high impairment intensity (loss) is assessed as permanent and of local scale.

Construction-related land use can cause functional impairment of the forest lands. At the border of the area for the construction site setup and the storage and assembly areas, trees that are to be preserved might be damaged. Traffic movements near the tree root system can result in soil compaction, thus a reduction in water and nutrient uptake can result. Collision damage to the trunk and crown areas of the trees caused by construction vehicles and machinery is also possible. Protective measure S4 (construction-related wood protective measures) will lead to a mitigation of possible impairments for grove stands (spruce forest) of great value directly adjacent to the construction site.

Construction-related air pollutant emissions can cause a functional impairment of the forest lands. The deployment of vessels, construction equipment, vehicles, pumps and other units during building work might cause various air pollutants to be released. They will disperse within the atmosphere onshore as well as offshore. Air pollutant emissions will also be released during precommissioning and commissioning of the pipeline (cf. application document, Part I2.04, Section 1, pp. 2 et seq.). With regard to the protection of forests, sulphur dioxide (SO_2) and nitrogen dioxide (NO_2) are particularly relevant. S and N inputs from the air contribute to the acidification and eutrophication of ecosystems, which in the long term may lead to nutrient imbalances in soil, poor plant growth and a loss of biological diversity. As the affected spruce forest is not particularly sensitive to nutrient input, no significant impairment due to nutrient input is anticipated.

Only diesel fuels are used in the onshore construction section, and because diesel fuels do not contain sulphur as a result of legal regulations, no sulphur emissions occur – in contrast to the offshore construction section. Emissions in the nearshore area of the offshore construction sections are included in the onshore propagation calculation. The maximum SO_2 emissions occur on the offshore route section and amount to 4 µg/m³ in the annual average (cf. application document, Part I2.04, Section 9, pp. 70 et seq.). The offshore SO_2 emissions of the pipe-laying fleet are also not able to affect onshore tangible assets because the emissions will not reach land (cf. application document, Part I2.03, Section 8.1, pp. 39-41, Figures 5, 6, 7).

With regard to nitrogen oxides, the highest emission loads in the first construction year will occur in the immediate vicinity of the start excavation pit for the microtunnel and in the area of the AWTIs near landfall. In the second construction year, the highest load will be in the vicinity of precommissioning and commissioning areas, where the temporary compressor station will be constructed (cf. application document, Part I2.04, Section 8.2, p. 43). The maximum NO_2 emissions in the forest areas directly adjacent to the project and specified in approved development plan No 1 “Industrie- und Gewerbegebiet Lubminer Heide” (Lubminer Heide industrial and commercial park) amount to 20 µg/m³ in the annual average (cf. application document, Part I2.04, Section 8.2, Figure 9, p. 45).

Forest areas can be impaired by leakages or accident-related pollutant inputs during the construction phase. Soil contamination may occur from lubricants and fuels through handling losses or accidents during the construction phase. This may cause further contamination to the adjacent forest areas.

Construction-related water retention measures may cause functional impairment of the forest areas. A temporary water table drawdown is required for the construction of the launch pit for the microtunnels as well as for the construction of the excavation pits for the anchor blocks. The water table drawdown will be performed using wells.

The following operating times (including lead times) will be in place: 30 calendar days each for the launch pits for the microtunnels (construction phase, 2 building structures), 240 calendar days each for the launch pits for the microtunnels (drilling procedure, residual groundwater, 2 building structures), 30 calendar days each for anchor blocks (2 building structures). The maximum depth for the temporary water table drawdown will be 6.30 m under mean sea level. The maximum extent is approximately 189 m around the excavation pit. The drawdown will affect an area of 40 m radius around the excavation pits to a depth of 1 m. This is located within the area established as the industrial zone in development plan no.1 “Industrial and Commercial Park Lubminer Heide”. The groundwater from the drawdown will be discharged into the Lubmin harbour basin via a receiving water body (trench 60) that runs through the area of the pig receiving station (cf. application document, Part I1.05 as well as Part D1.01, Section 6.2.7.2.2). The temporary water table drawdown will cause a local change to the groundwater dynamics. According to development plan no.1 “Industrial and Commercial Park Lubminer Heide”, potential impacts of groundwater retention on trees worth preserving in the coastal protection forest only occur in the outer peripheral zone of the drawdown cone.

Plant-related impact

According to the landscape conservation and management plan submitted to the planning approval authority, wooded areas of approximately 50,497 m² in total and situated in the forest area of the Lubminer Heide may be permanently lost as a result of the structural facilities of the Nord Stream 2 Pipeline (cf. application document, Part G.01, Section 8.1.5.3.1, p. 202, Table 8-59). The losses are within the stipulations of development plan no.1 “Industrial and Commercial Park Lubminer Heide”. Due to the extent of the additional forest areas adjacent to the Lubminer Heide, the impairment is classified as “medium” and the magnitude of the impact is assessed as permanent and of a local scale (cf. application document, Part D1.01, Section 6.2.7.2.2, p. 202, Table 6-81 et seq.).

Operation-related impact

Construction activities related to service measures may lead to loss or damage of additional tangible assets. The construction-related risk of impairment to ground monuments due to servicing and maintenance activities is very low because these activities are rarely required and if at all, they will be carried out in soil layers already affected by construction-related land use (cf. application document, Part D1.01, Section 6.2.7.2.2, p. 202, Table 682).

B.4.4.1.9 Description of measures for the prevention and mitigation or compensation of significant impacts on the protected assets in accordance with the second sentence of Section 2 (1) UVPG, including replacement measures

B.4.4.1.9.1 Mitigation measures

In accordance with Section 13 (1) BNatSchG (German Federal Nature Conservation Act), significant damage to nature and landscape must be avoided by the party responsible as a matter of priority. Purpose of the following protective measures (S), design measures (G) and early offset compensatory measures (CEF wildlife

protection measures) as defined in the landscape conservation and management plan for the route sections in coastal waters and the Lubmin landfall area (cf. application document, Part G.01, Section 9, pp. 238 et seq.) as well as mitigation measures for offshore and onshore areas defined in the environmental impact study (EIS) (cf. application document, Part D1.01, Sections 7.1 and 7.2) is the significant reduction of the intervention. These measures form the basis for the assessment of the environmental impacts within the meaning of Section 12 UVPG (see Section B.4.4.2).

- **M1: Minimisation of the area of intervention in hard soil biotopes within the Site of Community Interest (SCI)**

  Reefs subject to biotope protection according to Section 30 BNatSchG (German Federal Nature Conservation Act) on the eastern flank of the Boddenrandschwelle (NOG, NOR biotope types) within the “Greifswald Boddenrandschwelle and parts of the Bay of Pomerania” site of community interest (below a water depth of 10 m) will be bypassed. The reef areas subject to biotope protection according to Section 30 BNatSchG (German Federal Nature Conservation Act) on the Boddenrandschwelle (NOG, NOR biotope types) and in the adjacent area of the south western pipeline route (NIG, NIR biotope types) within the “Bay of Greifswald and parts of the Strelasund and Northern cape of Usedom” site of community interest, will be crossed via the shortest possible route.

  To reduce the area of intervention within the SCI, both pipelines will be laid in the same trench with a minimum bottom width.

  The cover depth of the pipelines in the trenches will be reduced to the required minimum in order to keep the trench width and the volume of dredged material as low as possible. If for technical safety reasons the pipeline must be trenched but not covered, the pipeline will still be additionally covered with 50 cm of soil in areas with a “flush-to-seabed” requirement in accordance with DNV-GL (2016b). This is to meet the “2 K criterion requirements and to enable restoration of the affected seabed conditions.

  To minimise the impacted area of intervention, the trench profile will be constructed with a steep and stable slope incline of 1:2.5 (H:L).

  Within the “Greifswald Boddenrandschwelle and parts of the Bay of Pomerania” (DE1749-302) and the “Bay of Greifswald, parts of the Strelasund and Northern cape of Usedom” (DE1747-301) sites of community interest, horizontal dredging tolerances will be avoided using optimised dredging techniques.

  (This corresponds to measure BO1 or PT3 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.].)

- **M2: Minimisation of the area of intervention in soft soil biotopes within the Bay of Greifswald**

  Soft soil biotopes (NOB/NIB, NIF biotope types) listed as habitat types 1110 and 1160 in the “Bay of Greifswald, parts of the Strelasund and Northern cape of Usedom” (DE1747-301) site of community interest and subject to biotope protection according to Section 30 BNatSchG (German Federal Nature Conservation Act) will be crossed via the shortest possible route.

To reduce the area of intervention within the SCI, both pipelines will be laid in the same trench with a minimum bottom width.

The cover depth of the pipelines in the trenches must be reduced to the required minimum in order to keep the trench width and the volume of dredged material as low as possible. For areas with a “flush-to-seabed” requirement please see the previous section relating to the M1 mitigation measures.

The trench profile will be defined in accordance with the requirements for the local soil conditions. In order to reduce the impacted area of intervention, a profile with a slope angle as steep as possible, guaranteeing a reasonable stability during the construction phase and backfilling of the trenches, will be selected. For the construction of a stable slope, a slope inclination of 1:2.5 (H:L) is required.

Within the “Greifswald Boddenrandschwelle and parts of the Bay of Pomerania” (DE1749-302) and the “Bay of Greifswald, parts of the Strelasund and Northern cape of Usedom” (DE1747-301) sites of community interest, horizontal dredging tolerances will be avoided using optimised dredging techniques.

(This corresponds to measure BO2 or PT4 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.].)

- **M3: Re-establishment of the seabed in trenched areas and at the interim marine stockyard**

The sequence of work activities and pipelaying must be staggered in such a way that the pipe trenches remain open only for the shortest timespan required for the pipelay process.

The material excavated from the pipe trenches must be reused for backfilling unless it is unsuitable for this purpose.

After the completion of the construction work at the pipe trenches and at the interim marine stockyard, the bathymetry of the seabed as well as the sediment parameters in the area of the bioactive sediment horizon (the top 30 cm) of all original biotopes (soft soil or hard substrate) must be restored in line with their nature (tolerances: pipe trenches +30 cm, interim stockyard ±50 cm).

During the backfilling process the substrate properties of the existing seabed (topsoil) will be restored to the best possible match. In order to achieve this, the pipeline route will be divided into sections where the topsoil has almost identical qualities, as analysed during the route exploration. Relevant for the section structure are the substrate properties of the topsoil in relation to the macrozoobenthos, i.e. essentially the grain size distribution. In order to keep at least the top 30 cm of the backfilled material in line with this stipulation, the topmost 50 cm of the excavated soil must be stored and then re-applied in sections so that the topsoil is restored to its original condition.

In the reef areas (habitat type 1170) within the SCI, the reef structures must be restored by extensively spreading stones with a grain size of 63 to 200 mm onto the seabed after the backfilling is completed. The degree of hard substrate covering the seabed has been determined pre-emptively on the basis of the exploration results and a professional nature conservation survey of the seabed. The restoration is performed in line with this degree of coverage. The

local natural till must be replaced with imported autochthonous till of a similar quality. In total, a usable hard surface area of approximately 60,000 m² must be restored.

(This corresponds to measure BO3 or PT7 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.].)

- **M4: Reduction of turbidity plumes due to the deployment of mechanical dredgers within the FFH areas**

  During the trench digging operations within the Bay of Greifswald and the Boddenrandschwelle – and therefore also within the "Bay of Greifswald, parts of the Strelasund and Northern cape of Usedom" (DE1747-301) and the "Greifswald Boddenrandschwelle and parts of the Bay of Pomerania" (DE1749-302) sites of community interest – the deployment of mechanical dredgers is intended to reduce the sediment spill and spread.

  (This corresponds to measure WA1 or PT5 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.].)

- **M5: Compliance with turbidity limits of 50 mg/l at a distance of 500 m from the source of the suspension, whereby in the short term up to 100 mg/l in addition to the background suspension could be possible within SCI in coastal waters M-V as well as in the interim marine stockyard**

  Within the Coastal waters M-V SCI ("Bay of Greifswald, parts of the Strelasund and Northern cape of Usedom" [DE1747-301] and "Greifswald Boddenrandschwelle and parts of the Bay of Pomerania" [DE1749-302]) as well as at the interim stockyard, a maximum suspension load of 50 mg/l additional to the background turbidity at 500 m distance from the suspension source must be ensured, whereby short-term (for a maximum of 6 hours) under temporary and extreme sea conditions, suspension loads of up to 100 mg/l are also permissible in this impact zone.

  During the construction phase compliance with the turbidity limits must be monitored and documented in real-time. In case the thresholds are exceeded, measures to reduce the excavation capacity must be taken on-site. In case of exceedance, a management plan must be set-up as part of the concept for the transport of the excavated material.

  (This corresponds to measure WA2 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.].))

- **M6: Construction time constraints in the middle of May until the end of December in the Bay of Greifswald as well as in the south west of the Bay of Pomerania**

  Offshore construction activities in the offshore areas between KP 53 and the landfall site, i.e. particularly on the Boddenrandschwelle and in the Bay of Greifswald, are restricted to the period 15/05 to 31/12 (herring spawning season and sea duck resting activity).

  (This corresponds to measure PT1 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.] as well as to measure AFB VM1 in the

technical paper on the law on the conservation of species [cf. application document, Part F.07, Section 4, p. 36].)

- **M7: Construction time constraints in the Bay of Pomerania from KP 53**

  Offshore dredging operations and pipelaying in the Bay of Pomerania in the area between KP 17 and KP 53 are restricted to the period 01/09 to 31/12 (resting activity).

  Offshore dredging operations and pipelaying in the Bay of Pomerania in the area between KP 0 and KP 17 (German EEZ Border) are restricted to the period 15/05 to 31/12 (resting activity). Additionally, offshore stationary operations (construction of AWTI, Above Water Tie-In BOT) in the area between KP 10 and KP 17 are restricted to the period 15/05 to 31/10 (resting activity).

  (This corresponds to measure PT2 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.] as well as to measure AFB VM2 in the technical paper on the law on the conservation of species [cf. application document, Part F.07, Section 4, p. 36].)

- **M8: Reduction of the light immission during offshore construction activities.**

  Light immissions from offshore construction activities outside the traffic separation scheme must be reduced in such a way that exclusive light sources required for the actual construction activities directly and for occupational safety are used.

  (This corresponds to measure PT6 of the EIS [cf. application document, Part D1.01, Section 7.1, pp. 746 et seq.].)

- **M9: Building site clearance prior to the breeding season in order to prevent killing and injury of breeding birds**

  The preparation of the construction site for the pig receiving station, construction site facility areas, part of the ring road, including the building site clearance (woodland removal and removal of the vegetation cover) is restricted to the period 01.11 to 31.03 (see M10). Immediately after the completion of the preparation activities the actual construction activities must commence in order to ensure the continuous deterrence of breeding birds.

  The construction site clearance and the temporary or permanent claim of potential breeding sites will take place before the start of the breeding season so that the areas will no longer be available to the birds and potential death or injuries to birds are avoided.

  (This corresponds to measure PT8 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.] as well as to measure AFB VM4 in the technical paper on the law on the conservation of species [cf. application document, Part F.07, Section 4, p. 37].)

- **M10: Survey on shrubs and trees at the building site regarding the occurrence of bats prior to the building site clearance**

Prior to the construction site clearance, a survey of the shrubs and trees in the construction site with regard to their usage as winter quarters for bats must be carried out in order to avoid any bat fatalities. In case hibernating bats are found, the specific trees will be left untouched until the bats have left their winter quarters in the next spring. Evidence must be provided by a bat expert.

(This corresponds to measure PT9 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.] as well as to measure AFB VM7 in the technical paper on the law on the conservation of species [cf. application document, Part F.07, Section 4, p. 38].)

- **M11: Reducing the light immission during construction and operation**

  At the pig receiving station, a reduction of the light immission at night must be ensured by proper planning of the terminal's lighting system. This will be accomplished through:

  – using lighting in a construction work-oriented way (turning off or greatly reduced at idle times) that allows for lighting required for occupational safety,

  – using non-glare luminaires,

  – using a layout and mounting height of the spotlights adjustable to the current activity and the occupied area; complying with a maximum light height of 10 m over terrain level,

  – adjusting construction site spotlights and lighting in an averted direction from the storage facility area,

  – selecting appropriate types of floodlight (symmetrical, asymmetrical floodlights),

  – minimising the upward light ratio by limiting the angle of the spotlights to a maximum of 40°.

  Additionally, the tree population outside of the ring road and the construction site facility areas must be left untouched because they reduce the light immissions particularly in the northern, eastern and western directions.

  (This corresponds to measure PT11 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.] as well as to measure AFB VM3 in the technical paper on the law on the conservation of species [cf. application document, Part F.07, Section 4, pp. 36 f].)

- **M12: Reduction of noise emission from onshore construction work during the breeding period of birds and bats**

  Noise intensive onshore construction work, like pile driving or compressor operation, should be avoided primarily during the breeding season of birds and bats in the period 01.04 to 15.07.

  In case these activities are absolutely necessary between 01.04 and 15.07, noise dampening measures must be implemented to guarantee that the immission values will not exceed 47 dB(A) at a distance of approximately 100 m from the construction site.

(This corresponds to measure PT13 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.] as well as to measure AFB VM5 in the technical paper on the law on the conservation of species [cf. application document, Part F.07, Section 4, p. 37].)

- **M13: Access route from the parking area and office building to the construction site of the pig receiving station**

  Access from the planned location of the car park and from the office buildings south of the Deutsche Ölwerke Lubmin GmbH to the northern entrance of the building site for the pig receiving station must be prohibited. Therefore, the route must be blocked off for car traffic at two points.

  The alternative route will run from the office building and the car park into an aisle of the southerly adjoining forest. South of the forest area the aisle will lead into a gravel track and from there the route will run in a west-south west direction to the construction site. The route must be signposted. These preventative measures must be managed and overseen by the ecological construction supervision.

  (This corresponds to measure PT14 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.] as well as to measure AFB VM6 in the technical paper on the law on the conservation of species [cf. application document, Part F.07, Section 4, pp. 37 f].)

- **S1: Protection of the soil, groundwater and surface water against pollution input**

  Solely construction site areas and construction site facility areas defined in the planning document must be used for the storage of construction material and as car parks for the construction vehicles. During the refuelling of construction vehicles handling losses must be prevented using appropriate measures.

  The water from the water retention measures needs to be cleared of suspended matter using sedimentation tanks or filter tanks prior to the discharge into the nearby receiving water body of the EWN Entsorgungswerk für Nuklearanlagen GmbH (trench 60). The sedimentation tanks are equipped with straw bales allowing a filtering of turbid materials to take place.

  In the case of ground contamination, immediate measures to eliminate the risk must be taken (binding agents, prevention of the further pollutant dispersion). The ecological construction supervision and, where applicable, the relevant lower water authority (Untere Wasserbehörde) must be informed.

  (This corresponds to measures BO4 and WA3 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.].)

- **S2: Protection and restoration of the topsoil**

  To mitigate the changes to the naturally developed soils, topsoil and subsoil need to be removed separately. The topsoil must be properly disposed of.

  In case of landfill, preventive groundwater and soil protection concerns in accordance with LAGA 20 must be taken into account.

Only the areas used during construction must be recultivated after use. This includes removing partly sealed surfaces (e.g. gravel surfaces), loosening of the soil and covering of the topsoil.

The application of top soil in recultivated areas and on unsealed areas at the pig receiving station must take place under arid soil conditions (soil humidity in accordance with the manual of soil mapping KA5, 1 to 3) in order to minimise microstructure damages.

For the application of top soil, a substrate suitable for the location (sand) is required, except where that conflicts with the technical requirements.

The recultivated areas will not be sown, but left to natural succession. Unsealed areas at the pig receiving station will be sown with sandy grasslands of regional origin.

(This corresponds to measure BO5 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.].)

- **S3: Erection of a fence around the operation site of the pig receiving station and around the areas used during construction**

  A fence with bar grate elements must be erected around the operational site of the pig receiving station and areas used for construction. Additionally, areas used during construction for the launch pit for the microtunnels need to be completely screened from view by the fence. The aim of this measure is to shield and protect adjacent biotope structures and habitats of different species.

  These preventative measures must be managed and overseen by the ecological construction supervision.

  (This corresponds to measure PT10 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.].)

- **S4: Construction-related wood protective measures according to DIN 18920**

  Prior to the construction activities, woodland of conservation importance will be protected in accordance with DIN 18920. It is anticipated that high value woodland areas (pine forest) adjacent to the construction site will be cordoned off with a protective fence (see measure S3). All other adjacent biotopes will be closed off with barrier tape.

  For protection against mechanical damage (e.g. bruising and stripping of bark, wood and roots, damage to the crown) by vehicles, construction machinery and other construction processes, individual trees in the construction area will be fenced in. The fence will enclose the entire root area. The root area comprises the ground area under the crown of the tree plus an additional area of 1.5 m in all directions. If the root area cannot be secured for reasons of space, the trunk must be encased in padded planks. The protective guards must be installed without damaging the trees and must not touch the root lugs. The crown must be protected against damage by equipment and vehicles and if necessary branches may be properly tied back or trimmed off. The root area must be cushioned with a pressure distributing layer (permeable to water, e.g. using

excavator mats) as a protection against loads. The excavator mats must not touch the root lugs.

(This corresponds to measure PT12 of the EIS [cf. application document, Part D1.01, Section 7.2, pp. 752 et seq.].)

- **G1: Implementation of the specifications of development plan no.1 "Industrial and Commercial Park Lubminer Heide" to plant trees for greenspace replacement of parking spaces**

  In accordance with the provisions of the development plan, for each of the 5 car parking spaces a site-appropriate native standard deciduous tree with a large crown and a minimum trunk circumference of 18/20 cm, three times grafted and with tree basket root ball netting must be planted. An area of at least 7 m² is required around the trees and shall be planted with soil-covering plants. The types of plants and their plantation qualities are listed in the development plan.

  At the premises of the Nord Stream 2 AG, 12 car parking places are planned. Accordingly, three trees of the described quality will be planted. The location for the new trees will be determined during the implementation planning.

- **CEF1: Establishing surrogate and evasion habitats for starlings**

  The loss of breeding grounds for starlings shall be compensated through the provision of starling nest boxes (made from wood and concrete) in the spatial-functional context of the project with a ratio of 1:5 (loss:replacement). In consultation with the local nature conservation authorities (UNB) of Western Pomerania-Greifswald the nest boxes must be maintained for a period of 10 years and cleaned every year.

- **CEF2: Establishing alternative refuges for soprano pipistrelle (Pipistrellus pygmaeus) and common pipistrelle (Pipistrellus pipistrellus)**

  To compensate for the loss of two mating quarters of the soprano pipistrelle and one mating quarter of the soprano pipistrelle, artificial replacement quarters (round bat boxes for breeding and as daytime quarters for soprano or common pipistrelles) must be provided with a ratio of 1:3 (loss:replacement).

For community and public health as a protected asset the following mitigation measures are defined in the EIS (cf. application document, Part D1.01, Section 7.1, p. 752 and Section 7.2, p. 756):

- **ME1: Compliance with the legal requirements to mitigate potential impacts from offshore immissions (coastal waters M-V)**

  The noise immissions caused by dredgers, pipe-laying vessels and associated supply and carrier vessels must not exceed the guide values of the Allgemeine Verwaltungsvorschrift zum Schutz gegen Baulärm (AVV Baulärm, general administrative specification for protection against noise from construction sites) from 19/08/1970 at the nearby residential buildings and tourist accommodations of the Lubmin seaside resorts and the municipality of Thiessow.

  For the light immissions please see M8.

- **ME2: Avoidance or mitigation due to compliance with the prevailing provisions concerning the prevention of immissions**

  The prevention or mitigation of light, noise and pollution immissions a.o. will be assured by compliance with the prevailing provisions.

  For the commissioning of equipment and temporary facilities, exceedance of the allowed noise immission values must be avoided. If required, appropriate mitigation measures must be implemented.

  The exposure to light due to light trespass and psychological glare effect for the adjacent towns (Lubmin, Wusterhusen and Spandowerhagen) is below the guide values for night hours. Compliance with the guide values for exposure to light caused by the upward light ratio must be achieved through proper planning of the lighting system and application of modern non-glare luminaires. It has to be ensured that the light spectrum corresponds to the occupational safety requirements.

  The nitrogen study (cf. Application document, Part I2.12) for the operation of the blow-out during the commissioning of the Nord Stream 2 Pipelines provides worst case analyses of the oxygen saturation at higher altitudes. In the worst case, a significant reduction in oxygen saturation to values between 18% and 19% in volume will only be achieved at the effective source height of 29 m ± 3 m. At 10 m distance from the source the oxygen saturation will be above 19% by volume. During commissioning, the projection surface below this area has to be cordoned off or monitored within a safety zone of 20 m radius around the blow-out.

For cultural heritage as a protected asset and other tangible assets, the following mitigation measures are defined in the EIS (cf. application document, Part D1.01, Section 7.1, p. 752 and Section 7.2, p. 757):

- **KuS1: Coordination of measures with the State Bureau for Culture and Preservation of Ancient Monuments and Artefacts of Mecklenburg-Western Pomerania**

  In order to avoid impairment of marine cultural heritage (ground monuments, wrecks) in the vicinity of the route and in the anchor corridor, a new concept with the required avoidance measures must be established and agreed upon with the relevant state office for culture and preservation of ancient monuments and artefacts. The concept must be taken into consideration during construction.

  In case currently unknown objects pertinent to monument conservation are found on the seabed during offshore construction work, the relevant authorities must be informed without undue delay. Additionally, a chance finds procedure defined in close collaboration with the state office needs to be implemented.

- **KuS2: Mitigation of impairments/losses due to archaeological prospects**

  Apparent soil colourations or archaeological finds (fragments of pottery etc.) detected during construction activities must be reported to the lower heritage

conservation authorities without undue delay so that necessary steps to safeguard these finds can be taken.

B.4.4.1.9.2 Replacement measures

For significant adverse environmental impact on singular tangible assets within the meaning of the UVPG, compensatory measures are considered. Offset measures in accordance with the intervention regulations of Section 15§ BNatSchG (German Federal Nature Conservation Act) will be provided firstly by setting up an eco-account suitable for the compensation for interventions in the offshore area of the Nord Stream 2 project (see Section B.4.8.4.4.2).

Secondly, offset measures in accordance with the intervention regulations of Section 15§ BNatSchG (German Federal Nature Conservation Act) will be provided by first afforestation or by allocation of areas for first afforestation from the pooled space defined in the development plan of the EWN GmbH that are intended for the compensation for intervention in the onshore area of the Nord Stream 2 project (see Section B.4.8.4.4.2). Accordingly, offset measures will be provided partly of similar value but not of similar nature with the result that real compensation in accordance with the UVPG will not be provided for all protected assets. With regard to all protected assets within the meaning of the UVPG it can be assumed, that the intended measures in accordance with ÖkoKtoVO M-V and the first afforestation or pooled space of the EWN GmbH respectively will restore functions to some extent not only of similar value but also of similar nature.

B.4.4.2 Assessment of the environmental impact of the project (Section 12 UVPG)

The assessment required by Section 12 of the UVPG (old version) serves to aid the decision preparation within the framework of the permitting process. The assessment will be made as part of the review process separately from the other non-environment related approval prerequisites. A weighting against non-environment related concern will not be carried out at this stage. The assessment of the environmental impact is based on the interpretation and application of the environment related factual details of the relevant special laws on to the merits of the case.

The assessments of any adverse environmental impact in accordance with Section 12 UVPG (old version) for each protected environmental asset affected by the project are described below. This takes account of the mitigation, offset, replacement, protection, prevention and CEF measures defined in the landscape conservation and management plan.

<u>Offshore</u>

In the EIS (cf. application document, Part D.01), impacts on the protected assets have been assessed based on the importance of the respective affected protected asset and its sensitivity to the relevant impact factors. For the assessment the following criteria have been taken into consideration: spatial extent, duration and frequency as well as impact intensity. Based on the combination of assessment criteria a conclusive overall assessment of the structural and functional changes has

been conducted. The magnitude of the structural and functional changes shows to what extent the construction-, plant- or operation-related changes due to the project may result in an impairment or destruction of certain important functions of the area (cf. application document, Part D1.01, Section 6.1, pp. 458 et seq.). The magnitude of the structural and functional changes has been assessed on the basis of a five-tier scale as “very low”, “low”, “medium”, “high” and “very high”. Structural and functional changes assessed on a tier higher than “low” are considered as a significant adverse environmental impact within the meaning of the UVPG. From a technical point of view this assessment is seen as a reasonable method by the planning approval authority. The impact rankings of the structural and functional changes with regards to the respective protected assets have been reviewed by the planning approval authority.

Onshore

In the EIS, the relevant onshore impacts of the Nord Stream 2 project have been assessed based on their determined impact intensity. For this purpose, the importance of the inventory, the sensitivity of the protected assets and the impact intensity has been evaluated. The ranking of the impairment intensity of the structural and functional changes (low, medium, high, very high) is based on the combination of the three aforementioned criteria (cf. application document, Part D1.01, Section 6.1, pp. 458 et seq.). As a further step, the impacts of the respective impact factors have been evaluated in consideration of the overall duration and spatial extent of the impacts. Eventually, the combination of impairment intensity, duration and spatial extent will lead to an overall assessment as “low”, “medium”, “high” or “very high”. An impact with an overall assessment on a tier higher than “low” is considered a significant adverse environmental impact within the meaning of the UVPG. From a technical point of view this assessment is also seen as a reasonable method by the planning approval authority. The ranking of the overall assessment of the impacts with regards to the respective protected assets have been reviewed by the planning approval authority.

B.4.4.2.1 Community and public health as a protected asset

B.4.4.2.1.1 Offshore

The explanations provided for the assessment of the visual impact of the construction activities during the pipelaying process in the Bay of Greifswald and in coastal waters as “medium” are plausible (cf. application document, Part D1.01, Section 6.2.6.2.1, pp. 655 et seq.). Therefore, an adverse environmental impact on community and public health is anticipated. This also applies to light effects at night within an impact area of 500 m around dredging barges as well as for noise emissions during the pipelaying process when several devices (in particular backhoe dredgers) are deployed simultaneously despite the utility provider’s obligation to comply with the AVV Baulärm regulations (general administrative specification for protection against noise from construction sites) (see also ME1, Section B.4.4.1.9.1). Additional mitigation measures regarding noise emissions as well as light effects and visual impact are not required due to the short-term duration of these impacts (cf. application document, Part D1.01, Section 6.2.6.4, p. 671).

Furthermore, no significant construction-related environmental impact is deducible.

Plausibly, there are no plant-related impacts of the Nord Stream 2 Pipeline on community and public health (cf. application document, Part D1.01, Section 6.2.6.4, p. 671). The mostly trenched Nord Stream 2 Pipeline does not cause any significant adverse environmental impact on community and public health.

The operation-related impacts (visual disturbance, noise emissions, pollutant emissions) as a result of possible free span corrections and external inspections (repair work if necessary) are plausibly, assessed as “low” due to their local spatial extent, their short-term duration and their low intensity. Therefore, no significant adverse environmental impact is deducible (cf. application document, Part D1.01, Section 6.2.6.4, p. 671).

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact offshore on community and public health. Nevertheless, this is justifiable because the legal requirements with regard to community and public health are complied with offshore and the impact –to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it cannot be tolerated in view of the purpose and the importance of the project (see Section B.4.1).

B.4.4.2.1.2 Onshore

All impact factors and their resulting impact on community and public health onshore are all individually assessed as “low” (cf. application document, Part D1.01, Section 6.5.3, p. 724, Table 6--57). Therefore, no significant adverse environmental impact is deducible.

Conclusion

No significant adverse environmental impact on community and public health is caused onshore by the Nord Stream 2 project.

B.4.4.2.2 Animals, plants and biodiversity as a protected asset

B.4.4.2.2.1 Offshore

<u>Marine Biotopes</u>

The assessment of the construction-related smothering (change of the benthic communities, adaptation of singular species to the changed substrate conditions) caused by and related to the dredging and backfilling of sediment or the placing of the pipelines onto the seabed respectively and the consequential disturbance of the geological makeup with the respective biotope structures (loss of inventory) as well as by the interim storage of sediment in the temporary marine stockyard, as significant adverse environmental impact is plausible. Additional construction-related impacts (like loss of inventory, smothering due to the sweeping of anchor chains across the seabed, impairment due to shading and sedimentation due to re-suspension as well as sedimentation of silty and organic matter, formation of turbidity plumes, release of nutrients and pollutants) have been plausibly assessed as “low” with respect to structural and functional changes. Therefore, no significant adverse

environmental impact is deducible (cf. application document, Part D1.01, Section 6.2.4.2.1, p. 540, Table 6-21).

Due to a sectioned pipelaying process on the seabed an artificial hard substrate will be permanently available to be inhabited. This plant-related impact will cause a significant adverse environmental impact; however, this will affect only short route sections within the 12-nautical mile zone. The release of substances from the sacrificial anode materials and from the coating at the welds between the pipe sections will cause only a minor impact because the concentration of these substances is low. Therefore, no significant adverse environmental impact is deducible.

There are no operation-related impact factors that could cause significant adverse environmental impacts.

Macrophytes

Plausibly, for macrophytes, only construction-related impacts assessed as of low structural and functional impairment are anticipated (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 548, Table 6-22). Therefore, no significant construction-related adverse environmental impact is deducible for this subordinate protected asset. The occurrence of macrophytes (red algae, ceramium spec.) along the Nord Stream 2 route is limited, in particular on the hard substrates in the area of the Boddenrandschwelle and in the adjacent area towards the north (north east of Nordperd cape) (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 547). In these areas, macrophyte stocks will be eliminated due to construction activities. The recuperation or recolonisation of macrophytes can occur immediately on identical substrates after the sediments in the construction site are restored. The affected reefs will be restored with appropriate matter of equal value. The monitoring of the Nord Stream Pipeline showed that the recolonisation of the reefs with macrophytes occurred within a year and was completed within three years after the pipelaying (cf. application document, Part I3.04, Section 4.2.6.2, pp. 60 and 111). At the landfall site, spermatophytes (seed-bearing plants) grow in water depths of up to 1 m with low coverage rates (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 547). The plants growing at a water depth of 1 m will be crossed via microtunnels; therefore, no loss of plants is anticipated. Thus, the construction of the exit pit and the Above-Water-Tie-In at the offshore exit of the microtunnels will not cause a loss of spermatophytes at a water depth of 2 m. The construction activities will start with the excavation of the AWTI pit at the offshore end of the microtunnel at a water depth of 2 m. In general, mitigation measures PT3 (minimisation of the area of intervention in hard soil biotopes within the Site of Community Interest [SCI] in coastal waters M-V) and PT4 (Minimisation of the area of intervention in soft soil biotopes within the Bay of Greifswald in coastal waters M-V) (see Section B.4.4.1.9.1) will mitigate the environmental impact in a way that sparse occurrences of macrophyte stocks will be affected by construction-related use only to a minimal extent. Thus, under consideration of the mitigation measures, the assessment of the impacts of construction-related stock losses with a later resettlement of macrophytes as of local scale, medium duration and medium intensity is plausible. The following impact factors – resuspension of sediment, formation of turbidity plumes, release of nutrients and pollutants, increase or decrease of sedimentation – will lead to an impairment by shading and sedimentation of macrophytes. With regard to the formation of turbidity plumes it must be noted, that turbidity plumes will form during dredging and backfilling

activities particularly in those areas along the route section in the Bay of Greifswald where silty sediments are excavated. This is caused by the fact that fine-grain components of the sediment in particular are prone to suspension. In contrast, the route crosses areas with a higher percentage of silt in sediment only at a few intersections (cf. application document, Part D2.05). Due to the distance of these areas to the habitats of macrophytes it can be concluded that the turbidity will be of lesser importance for macrophytes, in particular when taking into account the natural turbidity or the average suspended load in the Bay of Greifswald of 40 mg/l. At high winds turbidity by suspended matter can be as high as 60 mg/l, whereas the turbidity can last up to 1 or 2 days before the suspended matter is sedimented again (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 500). It can be assumed that the macrophyte population is adapted to these kind of turbidity events and can tolerate such short-term conditions. The turbidity survey for the construction of the Nord Stream 2 Pipeline concludes that the concentration of the turbidity at a distance of 500 m from the construction activities will be approximately 30 mg/l and, therefore, will be below the regularly occurring turbidity (cf. application document, Part I3.06, Section 5, p. 19). The sedimentation in the area relevant to macrophytes at 25 g/m² will result in a thin layer (cf. application document, Part I3.06, Section 5, p. 19) that will not affect the macrophytes. The release of nutrients from the sediment due to re-suspension relates primarily to phosphate (P). However, the project-related phosphate redissolution is within the interannual variability of the internal and external inputs (cf. application document, Part D1.01, Section 6.2.2.2.2, p. 543). A significant increase in bloom of pelagic algae and a related light deficiency due to the Nord Stream 2 project is not anticipated. In the EIS, the impact of the impairment due to shading and sedimentation has therefore been generally assessed as medium-scale, short-term and of low intensity. Plausibly, the change in morphology/sediment structure does not cause any significant adverse environmental impact on macrophytes as a subordinate protected asset. In accordance with mitigation measure PT7 (see Section B.4.4.1.9.1) a restoration of the seabed in the trenched areas is intended. This also includes a restoration of the affected reefs which are of particular importance to macrophytes. As the sediment is untouched at the landfall site at a water depth of 1 m (where the macrophyte population occurs) due to the underground crossing using microtunnels, no significant environmental impact caused by this impact factor is anticipated.

The plant-related impacts also will cause only minor structural and functional impairment, therefore, no significant adverse environmental impact on macrophytes is deducible (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 548, Table 6-22).

Operation-related impact factors of the Nord Stream 2 project (impacts on the temperature conditions in sediment that affect macrophytes and external inspections, repair work and free span correction) also have no significant adverse environmental impact on macrophytes. The statements in the EIS regarding these operation-related impacts are plausible and justify the specified assessment (cf. application document, Part D1.01, Section 6.2.4.2.2, p. 544 et seq.).

Macrozoobenthos

During the construction-related dredging activities and the interim storage of the excavated material part of the macrozoobenthos population will be lost. This is assessed as a significant environmental impact (cf. application document, Part D1.01, Section 6.2.4.2.3, pp. 558 et seq., Table 6-23). Taking into account the

high intensity and the subsequent regeneration period, the assessment of this impact as a significant structural and functional impairment is plausible. Additionally, the construction-related land use and the temporary change of habitat (temporary stock loss and subsequent regeneration) will cause a significant adverse environmental impact (cf. application document, Part D1.01, Section 6.2.4.2.3, pp. 558 et seq., Table 6-23). Considering the medium-term duration and the medium intensity of these impacts, the assessment is justified. Further construction-related impact factors, like the formation of turbidity plumes and sedimentation, as well as the laying of the pipeline onto the seabed, will not cause any significant adverse environmental impact (cf. application document, Part D1.01, Section 6.2.4.2.3, pp. 558 et seq., Table 6-23).

The plant-related land use and the permanent change of habitat in sections where the pipeline will be installed on the seabed (short sections within the 12-nautical mile zone, permanent change of the local benthic colonisation structure) will cause a significant adverse environmental impact on the macrozoobenthos (cf. application document, Part D1.01, Section 6.2.4.2.3, pp. 558 et seq., Table 6-23). Considering the permanent duration and the high intensity of these impacts, the assessment is plausible.

Plausibly, the release of substances from the sacrificial anode material will not cause any significant adverse environmental impact. As laid out in Section B.4.4.1.5.2.1 on macrophytes, the main release of substances from the sacrificial anodes in the form of aluminium and zinc will not cause any significant adverse environmental impact.

The temperature of the pipelines, inspection and maintenance tasks as well as free span correction are operation-related impact factors that also do not cause any significant adverse environmental impact.

Fish and cyclostomes

There will be no significant construction-related adverse environmental impact on fish and cyclostomes. Impact factors connected to construction-related land use and the temporary change of habitat due to increased shipping traffic, noise emissions (underwater sound), dredging and interim storage of the excavated material, laying of the pipeline onto the seabed as well as formation of turbidity plumes and sedimentation will each cause only minor structural and functional changes (cf. application document, Part D1.01, Section 6.2.4.2.4, pp. 571 et seq., Table 6-25).

The introduction of hard substrate in sandy marine areas will cause a loss of habitat to some fish species. For sections where the pipeline will be installed on the seabed (short sections in the 12-nautical mile zone), a local, permanent loss of habitat of medium intensity is anticipated as a result of the plant-related area use and the permanent habitat change. Considering the magnitude of these impacts, a significant adverse environmental impact on fish and cyclostomes can be deduced (cf. application document, Part D1.01, Section 6.2.4.2.4, pp. 571 et seq., Table 6-25). The release of substances from the sacrificial anode material will lead only to minor plant-related structural and functional changes and thus, will not cause any significant adverse environmental impact.

The operation-related inspection and maintenance activities as well as free span correction are not anticipated to cause any significant adverse environmental impact

on fish and cyclostomes as only minor project-related impacts have been determined for this impact factor.

Resting birds

For all relevant construction- and/or operation-related impact factors to be included in the impact prediction (the existing monitoring results showed no plant-related impacts on resting birds), minor impacts have been determined which is plausible (cf. application document, Part D1.01, Section 6.2.4.2.5, pp. 580 et seq., Table 6-28). Considering the mitigation measures (PT1, PT2 and the construction time constraints established therein as well as PT6), it can be deduced that there will not be any significant adverse environmental impact on resting birds as a subordinate protected asset.

Marine mammals

Overall, the construction-related impacts due to noise emissions from construction equipment and vehicles are assessed as “low” with regard to the structural and functional changes. Visual disturbances caused by construction equipment and vehicles also will cause only minor structural and functional changes (cf. application document, Part D1.01, Section 6.2.4.2.6, pp. 589 et seq., Table 6-31). Therefore, there will not be any significant adverse environmental impact on marine mammals as a subordinate protected asset.

There are no relevant plant-related impact factors for marine mammals (cf. application document, Part D1.01, Section 6.2.4.2.5, pp. 580 et seq., Table 6-28).

The operation-related impact factors will cause only minor impacts and thus, no significant adverse environmental impact can be deduced (cf. application document, Part D1.01, Section 6.2.4.2.5, pp. 580 et seq., Table 6-28).

Biological diversity

Genetic diversity

With regard to the assessment of the environmental impact of the Nord Stream 2 project on the marine flora and fauna, please see Sections B.4.4.2.2.1 and B.4.6. A project-related impairment of the genotypes of domesticated animals or cultivated plants can be ruled out because these do not occur in the offshore investigation area and therefore, cannot be affected by the environmental impact of the project. A project-related loss or a significant change/decrease of the genotypes of single species of wild flora and fauna cannot be ruled out. A significant decrease of the genetic resources is not anticipated.

Species diversity

With regard to the assessment of the environmental impact of the Nord Stream 2 project on the marine flora and fauna, please see Sections B.4.4.2.2.1 and B.4.6. Direct or indirect project-related losses or relevant decreases of fauna or flora species and, subsequently, a decrease in species diversity can be ruled out. A complete loss or a significant decrease in population and, subsequently, an impact of the species diversity can be ruled out.

Ecosystem diversity

There will be no project-related impact on the ecosystem diversity caused by serious damage to or a complete loss of ecosystems as well as their typical structures and processes (please see the explanation regarding the impacts on terrestrial biotope types as well as on flora and fauna in Section B.4.4.1.3.2.1 in connection with B.4.4.2.2.1 and B.4.6). Though plant-related superimposing or transformation of marine biotope types may occur offshore in sections where the Nord Stream 2 Pipeline is laid on top of the seabed, these impacts are only small scale and will not cause any loss of ecosystem diversity. Related to the Nord Stream 2 project, no significant impairment of the typical structures and processes of ecosystems is anticipated. Also, no significant adverse impact on the use of the ecosystem, e.g. for fishery or shipping, is anticipated (see Sections B.4.8.11, B.4.8.18).

In summary, in consideration of the aforementioned mitigation measures (Section B.4.4.1.9.1), it can be concluded that neither a loss nor a significant decrease of populations in the marine environment is anticipated in view of the predicted impacts. Also, there are no concerns regarding any significant impairment of the genetic resources or of the ecosystem diversity in the marine environment. It should be noted that the majority of impacts of the project are construction-related and only few permanent impacts will occur. Offshore, there are no project-related changes to the biological diversity anticipated. The offshore project-related impact on the biological diversity is generally assessed as insignificant.

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact offshore on animals, plants and biodiversity. Nevertheless, this is justifiable because the legal requirements with regard to animals, plants and biodiversity are complied with offshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1).

B.4.4.2.2.2 Onshore

Biotope types/plants

Biotope types

In accordance with the high overall assessment in the impact prediction, it can be deduced, that the construction-related loss and the impairment of soils, soil compaction, change of soil properties due to technology strips/access roads, construction site facility areas etc. as well as the related loss of biotopes in pine/deciduous forest of high value at dry to dewier locations will lead to a significant adverse environmental impact on biotope types and plants. This also applies to the construction-related land use, the loss of habitat due to the removal of vegetation and topsoil in the area of the future operation facility (habitat loss in pine/deciduous forest of high value at dry to dewier locations).

In-line with the high overall assessment, the plant-related land use and the resulting loss of habitat in pine/deciduous forest of high value at dry to dewier locations will also lead to a significant adverse environmental impact.

Furthermore, in line with the low overall assessment for construction-related, plant-related and operation-related impacts, no significant adverse environmental impact on biotope types/habitats is anticipated (cf. application document, Part D1.01, Section 6.2.4.3.1, pp. 597 et seq., Table 6-32).

Plants

Due to the avoidance of the use of dry, wet and coastal biotopes, the unavoidable removal of vegetation causing a significant adverse environmental impact will not affect any known biospheres of endangered and/or particularly protected vascular plant species. The construction- and operation-related emissions as well as the construction-related groundwater retention will cause no significant adverse environmental impact due to their low impact intensity.

Ground beetles on the beach

Overall, the construction- and operation-related impacts are each to be assessed as "low" (cf. application document, Part D1.01, Section 6.2.4.3.2, p. 603, Table 6-33). Therefore, no significant adverse environmental impact on ground beetles on the beach is anticipated.

Amphibians

Lubmin 2 landfall point covers an area that is a habitat of minor importance for amphibians (low-value amphibian habitats). In the overall assessment the anticipated construction-related losses of individual amphibians due to construction site traffic and open pits are assessed as "low" (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 607 et seq., Table 6-34). Additionally, possible losses of individual amphibians are mitigated by collateral clause A.3.8.19 that stipulates the construction of protective fences for amphibians. All further construction-related impacts as well as plant- and operation-related impacts on amphibians are also assessed as "low" (cf. application document, Part D1.01, Section 6.2.4.3.3, pp. 607 et seq., Table 6-34). Therefore, no significant adverse environmental impact is deducible for amphibians as subordinate protected assets.

Reptiles

In the EIS, predominantly a low overall assessment with regard to reptiles is deduced (cf. application document, Part D1.01, Section 6.2.4.3.4, pp. 613 et seq., Table 6-35). Therefore, no significant adverse environmental impact is deducible. Exclusively in the case of construction- or plant-related land use (causing a loss of habitat or sealing of surfaces in reptile habitats of medium value), a medium overall assessment can be deduced (cf. application document, Part D1.01, Section 6.2.4.3.4, pp. 613 et seq., Table 6-35). Therefore, no significant adverse environmental impact is deducible from these two impact factors.

Breeding birds

The bird habitats in the vicinity of the project site are intensively used by several breeding bird species, including some valuable breeding bird species. In the vicinity of the project site only a few breeding pairs will be affected. The land use related to the pig receiving station will cause a loss of habitat for breeding birds typical for pine forests, including two valuable species. Medium construction-related impacts are anticipated for the following impact factors: land use, habitat loss due to the removal of vegetation and topsoil in the area of the future operation facility and in temporarily

used areas and associated loss of bird habitats of medium to high value as well as noise emissions during pile driving (microtunnel) and the associated disturbance to breeding (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627 et seq., Table 6-39). Therefore, a significant adverse environmental impact is deducible from these impact factors. The plant-related loss of bird habitats of medium to high value (pine forest, semi-open ruderal meadows) due to land use as well as barrier, separation and scare effect, is assessed as medium in the overall assessment (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627 et seq., Table 6-39). Therefore, a significant adverse environmental impact is deducible from these impact factors. In consideration of the mitigation measures and the CEF measures and in accordance with the magnitude of the impacts with regard to impact intensity, duration and spatial extent, all further construction-, plant- and operation-related impacts are assessed as “low” in the overall assessment for the breeding bird species group (cf. application document, Part D1.01, Section 6.2.4.3.5, pp. 627 et seq., Table 6-39). Therefore, no significant adverse environmental impact is deducible from these impact factors.

Terrestrial mammals, including bats

For the particularly sensitive Eurasian otter (Lutra lutra) and other mammal species the investigation area is of minor importance as a habitat.

Construction-related disturbances due to the interruption of exchange relations between sub-habitats during the construction phase and the loss of individual mammals due to construction traffic and open pits are each assessed as “low” pursuant to their impact magnitude (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637 et seq., Table 6-40). Therefore, no significant adverse environmental impact is deducible from these impact factors. Medium impacts are anticipated for the remaining construction-related impact factors (land use, loss of habitat due to the removal of vegetation and topsoil in the area of the future operation facility and in temporarily used areas, construction lighting, noise emissions) and the associated loss of reproduction, feeding and resting places or disturbance and deterrence of breeding (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637 et seq., Table 6-40). Therefore, a significant adverse environmental impact is deducible from these impact factors.

The plant-related land use (barrier, separation and scare effect, impact on exchange relations between sub-habitats for bats due to keeping areas free for the operating site) and the associated loss of bat habitat in the area of the pig receiving station and the ring road are assessed as medium impact factors (cf. application document, Part D1.01, Section 6.2.4.3.6, p. 637, Table 6-40). Therefore, a significant adverse environmental impact is deducible from these impact factors.

Considering the magnitude of the operation-related impacts (impairment of the bat habitats), they are assessed as “low” (cf. application document, Part D1.01, Section 6.2.4.3.6, pp. 637 et seq., Table 6-40). Therefore, no significant adverse environmental impact is deducible from these impact factors.

Biological diversity

Genetic diversity

With regard to the assessment of the environmental impact of the Nord Stream 2 project on the onshore flora and fauna, please see Sections B.4.4.2.2.2 and B.4.6. A

project-related impairment of the genotypes of domesticated animals or cultivated plants can be ruled out because these do not occur in the onshore investigation area and thus cannot be affected by the environmental impact of the project. A project-related loss or a significant change/decrease of the genotypes of single species of wild flora and fauna cannot be ruled out. A significant decrease of the genetic resources is not anticipated.

Species diversity

With regard to the assessment of the environmental impact of the Nord Stream 2 project on the onshore flora and fauna, please see Sections B.4.4.2.2.2 and B.4.6. Direct or indirect project-related losses or relevant decreases of fauna or flora species and, subsequently, a decrease in species diversity can be ruled out. A complete loss or a significant decrease in population and, subsequently, an impact of the species diversity can be ruled out.

Ecosystem diversity

There will be no project-related impact on the ecosystem diversity caused by serious damage to or a complete loss of ecosystems as well as their typical structures and processes (please see the explanation regarding the impacts on terrestrial biotope types as well as on flora and fauna in Section B.4.4.1.3.2.2 in connection with B.4.4.2.2.2 and B.4.6). Though plant-related superimposing or transformation of the biotope type WKX in pine/deciduous forest of high value at dry to dewier locations covering an area of 50,497 m² will occur due to the construction of the pig receiving station, these impacts are only small-scale and will not cause any loss of ecosystem diversity. Related to the Nord Stream 2 project, no significant impairment of the typical structures and processes of ecosystems is anticipated. Also, no significant adverse impact on the use of the ecosystem, e.g. forestry, is anticipated because the construction of the onshore facilities of the Nord Stream 2 project will take place in an area within the scope of the approved development plan, namely development plan no.1 “Industrial and Commercial Park Lubminer Heide” (see Section B.4.8.10).

In summary, in consideration of the aforementioned mitigation measures (see Section B.4.4.1.9.1), it can be concluded that neither a loss nor a significant decrease of populations in the terrestrial environment is anticipated in view of the predicted impacts. Also, there are no concerns regarding any significant impairment of the genetic resources or of the ecosystem diversity in the terrestrial environment. It should be noted that the majority of impacts of the project are construction-related and only few permanent impacts will occur. Onshore, there are no project-related changes to the biological diversity anticipated. The onshore project-related impacts on the biological diversity are generally assessed as insignificant.

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact onshore on animals, plants and biodiversity. Nevertheless, this is justifiable because the legal requirements with regard to animals, plants and biodiversity are complied with onshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1).

B.4.4.2.3 Soil as a protected asset

In accordance with article 1 of the German Federal Soil Protection Law (Bundes-Bodenschutzgesetz - BBodSchG) from 17/03/1998 (BGBl. I, p. 502) as last amended by the ordinance dated 31/08/2015 (BGBl. I, p. 1474), it is the purpose of this law to sustainably ensure or restore the functions of the soil. For this purpose, adverse soil alterations must be avoided; the soil and existing loads as well as any related pollution of water bodies must be restored and measures must be implemented to avoid adverse impacts on the soil. In case of impact on the soil, impairments of the natural function of the soil as well as of its function as an archive for natural and cultural history must be avoided as much as possible.

B.4.4.2.3.1 Offshore

The installation of the pipelines on the seabed, the dredging and backfilling of the pipe trenches and the dumping of the excavated material at the interim stockyard will cause a construction-related low to medium functional impairment of the seabed and a change in the sediment parameters each leading to significant adverse environmental impacts. These impacts cannot be avoided despite the implementation of stipulated mitigation measures (BO1, BO2 and BO3) and a route optimisation. Considering the aforementioned mitigation measures and generally due to the deployment of up-to-date equipment and procedures, possible additional construction-related impacts on soil will not reach the significance threshold (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 478).

Construction-related impacts at the base of the pipe trench as a result of the pipelaying and the embedding of the pipelines in supplied gravel do not cause any impairment of the functionality of the seabed and are therefore assessed as “not significant” (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 481, Table 6-7). The change in the flow regime for sections where the pipeline will be installed on the seabed and the release or spill of substances from the sacrificial anode material as well as from the coating at the welds between the pipe sections into the sediment are plausibly assessed as minor structural and functional changes (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 481, Table 6-7). Therefore, the assessment that these impact factors will not cause any significant adverse environmental impact on soil is plausible. The impacts caused by the land use at pipeline sections where the pipeline will be installed on the seabed are assessed as a significant adverse environmental impact (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 481, Table 6-7); however, this impact factor will affect only short sections (approximately 3.5 km) within the 12-nautical mile zone.

The EIS statements regarding the operation-related impacts are also plausible. No significant operation-related adverse environmental impact on soil is anticipated (cf. application document, Part D1.01, Section 6.2.1.2.1, p. 481).

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact offshore on soil. Nevertheless, this is justifiable because the legal requirements with regard to soil are complied with offshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1). In view of the above, and because there will be no improper land use, the project will not conflict offshore with any of the aforementioned objectives for soil as a protected asset.

B.4.4.2.3.2 Onshore

Medium to high construction-related functional impairment and losses are anticipated in the EIS for soil as a protected asset, caused by construction activities in the construction area, construction site facility area etc. and associated impairments of the functions of the soil in the construction area (pig receiving station, ring road, construction site facility, storage and assembly areas), caused by excavation in the area of the launch pits and of the excavation pits associated with foundation works as well as caused by the removal and application of topsoil in areas with morphogenetic peculiarities (dune terrain) (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). Therefore, a construction-related significant adverse environmental impact on soil is deducible from these impact factors. Even though the implementation of mitigation measure S2 (a.o. removal of sealing, soil loosening and revegetation of areas used during construction) (see Section B.4.4.1.9.1) will result in a mitigation of the impairments caused by removal and application of topsoil, soil compaction and sealing in the areas used during the construction phase, the remaining functional impairment will be significant (cf. application document, Part G.01, Section 8.1.1.3, pp. 124 et seq.).

The impacts on soil caused by the construction-related groundwater retention measures are plausibly assessed as “low” (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). Due to the short duration of the groundwater retention measures and the low sensitivity of sand areas further away from groundwater this construction related impact is assessed as “low” in the overall assessment, and therefore, is considered “non-significant”. No groundwater-dependant soil and biotope types can be found on the soils affected by the project (rigosols, brown earths, anthropogenically exaggerated soil). After completion of the construction activities the groundwater table will quickly return to its original level. Significant impairments of the storage and regulatory function as well as of the biotic yield function of the soils as a result of the water table drawdown are therefore not anticipated.

The assessment of the plant-related impacts is also plausible. The functional impairment and the loss of the soil function on unsealed, partly sealed and completely sealed surfaces may cause a significant adverse environmental impact (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). The soil formation in these areas is disturbed or impaired and subsequently, the soils are only capable of functioning to a limited extent.

The operation-related emissions of nutrients and pollutants caused by construction vehicles during inspection and maintenance activities will not result in any significant adverse environmental impact on soil. Overall, the emission of nutrients caused by the operation of the Nord Stream 2 Pipeline as well as the pollutant emissions caused by construction vehicles during inspection and maintenance activities are assessed as “low” (cf. application document, Part D1.01, Section 6.2.1.2.2, pp. 489 et seq., Table 6-9). The operation of the Nord Stream 2 Pipeline or the pig receiving station respectively will only result in negligible emissions of nutrients because there are no major combustion plants planned to be constructed in this area. During maintenance, inspection and repair work, considerably less amounts of air pollutants will be emitted than during the construction phase because fewer vehicles and machinery/equipment will be deployed. As a result, the duration and the spatial extent of the impacts is generally significantly lower and thus the impacts on soil can be assessed as “negligible”.

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact onshore on soil. Nevertheless, this is justifiable because the legal requirements with regard to soil are complied with onshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1). In view of the above, and because there will be no improper land use, the project will not conflict onshore with any of the aforementioned objectives for soil as a protected asset.

B.4.4.2.4 Water as a protected asset

The purpose of the German federal Law on the management of water resources (Wasserhaushaltsgesetz, WHG), is to employ sustainable water management in order to protect the water bodies as a part of the ecosystem, as livelihood for humans, as a habitat for fauna and flora and as a usable asset (cf. Section 1 of the WHG). In accordance with Section 5 (1) of the WHG, during measures which could impact a water body each individual shall exercise all necessary care, (1) to avoid an adverse change of the water body's properties, (2) to ensure an economical use of the scarce resource of water, (3) to maintain the capability of the water economy and (4) to avoid an expansion or acceleration of the water flow. The environmental quality standards for soil are stipulated in the EU Water Framework Directive. In accordance with the integration of the EU Water Framework Directive into national legislation and with Sections 27 and 44 of the WHG, in so far as they are not classified as artificial or heavily modified, "surface waters shall be managed in such a way as to prevent deterioration of their ecological status and their chemical status and to preserve or achieve good ecological status and good chemical status." In the report to the inventory for the Warnow/Peene river basin district, the coastal waters to be considered were classified as "not been significantly altered", so that the environmental target of a "good status" is considered as being achieved. An updated management plan for this river basin district that includes the Bay of Greifswald and the adjacent coast waters, is available (LUNG M-V, 2015). For the Bay of Greifswald, a mesotrophic to slightly eutrophic water body with predominately macrophytes and good visibility (visibility depth) is stipulated as a development target. Surface waters and groundwater are connected. Surface waters shall be managed in such a way as to prevent deterioration of their quantitative status and their chemical status, to reverse any significant and sustained upward trend in the concentration of any pollutant resulting from the impact of human activity; [and] to maintain or achieve a good quantitative status and a good chemical status" (Section 47 of the WHG).

B.4.4.2.4.1 Offshore

The construction-related impacts on water caused by construction activities and construction traffic are assessed plausibly as "very low" to "low" (cf. application document, Part D1.01, Section 6.2.2.2.1, pp. 511 et seq., Table 6-13).

The area of the trenches that exists during the construction phase (until the backfilling) is so small compared to the affected marine waters of the Bay of Greifswald and the southern part of the Bay of Pomerania that a certain impact on hydrographical conditions can only be measured locally (most likely in the area of the Boddenrandschwelle), if at all. As the original bathymetric conditions will largely be

restored after the substrate-specific backfilling of the trenches (see Mitigation measure M3 in Section B.4.4.1.9) or will revert back to their original levels within a short to medium amount of time, there will be no permanent significant changes of the hydrographical parameters (water exchange, salinity, temperature and oxygen condition). In the area of the interim marine stockyard, the landfill will normally not exceed a height of 4 m. Generally, a free water depth of 7.5 m must remain above the landfill (cf. application document, Part C.01, Section 3.3.3.3, p. 97). Because the bathymetry is also restored in the area of the interim marine stockyard with a precision of ±0.5 m after the completion of the pipelaying process and because the results of the monitoring of the Nord Stream Pipeline in 2012 and the survey in 2016 showed that the levelling of the seabed to the original conditions due to water current and waves occurred within a period of five years (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 495), permanent changes to the local pattern of water currents can be ruled out in the area of the interim marine stockyard, too.

The construction-related turbidity due to the release of suspended matter from sediment as a result of the pipe trench excavation, dumping of excavated material and backfilling of trenches is also to be considered “low”. During dredging activities for the pipe trench excavation, the dumping of excavated material at the interim marine stockyard and the subsequent backfilling of trenches, temporary particle suspension will occur. Different to the dredging work during the construction of the Nord Stream Pipeline, the trench for the Nord Stream 2 Pipeline in the Bay of Greifswald will be excavated using backhoe dredgers rather than trailing suction hopper dredgers (see Measure M4 in Section B.4.4.1.9). The objective of this procedure is to reduce the suspension of excavated material for NSP2 by up to 50% compared to NSP (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 503). At the same time a restriction of the suspension load to 50 mg/l additional to the background turbidity at 500 m distance from the suspension source will be pursued within the Site of Community Interest [SCI] and at the interim marine stockyard, whereby short-term (for a maximum of 6 hours) and under extreme sea conditions, suspension loads of up to 100 mg/l are also permissible in this impact zone (see Measure M5 in Section B.4.4.1.9). Cohesive excavation material, unsuitable for backfilling the trench for reasons of turbidity formation, dredging techniques and positional stability of the pipeline, will not be temporarily stored at the interim marine stockyard but rather will be transported directly to an appropriate onshore tipping area where it is recycled or permanently dumped (cf. application document, Part C.01, Section 3.1.1, p. 46 as well as collateral clause A.3.6.2).

The intensity of the construction-related particle suspension can be reduced to a sufficient level by implementing mitigation measures M4 and M5 as well as collateral clause A.3.6.2. During the construction monitoring for the Nord Stream Pipeline it has been verified that the limitation of the suspension load pursued by implementing measure M5 can be achieved (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 499 et seq.). The compliance with the pursued maximum turbidity levels and the separation of the dredged material at the interim stockyard will be monitored by the ecological construction supervision (cf. collateral clause A.3.8.6). Therefore, no significant impairments of the maritime waters due to turbidity plumes are anticipated.

With regard to structural and functional changes, the construction-related release of nutrients and contaminants due to the re-suspension of sediments as a result of the pipe trench excavation, dumping of excavated material and backfilling of trenches is

plausibly assessed as “very low”. The release of nutrients due to the re-suspension of sediment during the construction phase will not lead to a significant increase of the pelagic primary production, provided measure M4 (reduction of turbidity plumes due to the deployment of backhoe dredgers within the Bay of Greifswald, see Section B.4.4.1.9) is implemented. Even during dredging procedures using trailing suction hopper dredgers, namely during the laying of the Nord Stream Pipeline, the project-related redissolution has been within the amplitude of the interannual variability of the internal and external inputs. Additionally, excavated matter with organic constituents of more than 3% by weight will not be re-introduced into the water body in order to avoid a temporary eutrophication of marine waters. For that reason, the excavated matter is not temporarily stored in the interim stockyard but transported directly to an appropriate onshore tipping area (cf. application document, Part C.01, Section 3.1.1, p. 46 et seq. as well as collateral clause A.3.6.2). A significant construction-related eutrophication of the Bay of Greifswald and the Bay of Pomerania is not anticipated. Considering the low existing load of the sediment, a measurable increase in the concentration of heavy metals and organic pollutants in marine waters due to the construction-related re-suspension of sediment is not anticipated.

The assessment of the structural and functional changes due to the input of pollutants as a result of handling losses, leakages and/or accidents during the construction phase as “low” is plausible. In accordance with collateral clause A.3.6.15, the environmental authority must be informed without delay about accidents with substances hazardous to water, so that appropriate measures can be imposed. Within the framework of the ecological construction supervision (cf. measure S1 as well as collateral clause A.3.8.6) loss adjustment measures required under certain conditions are stipulated and the implementation of these measures is monitored, in order to sufficiently reduce the risk of water pollution.

Plant-related changes to the current conditions caused by the pipeline being installed on the seabed and by the plant-related substance release from the anti-corrosion protection of the pipeline (PE-coating and sacrificial anodes) are also plausibly assessed as “very low” or “low” respectively in the EIS (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 511 et seq., Table 6-13). The installation of the pipeline on the seabed will be a permanent linear obstacle to the natural flow regime near the seabed. However, with regard to the hydrographical parameters (e.g. salinity, temperature, oxygen level, turbidity and nutrient levels), this will not result in any significant impacts. The local changes to the flow regime will not cause any significant changes to the water exchange processes in the Bay of Pomerania. The assessment of the structural and functional changes due to the use of cubic space and the changes in the current conditions in sections where the pipeline is installed on the seabed as “very low” or “low” is plausible.

The substance inputs from the anti-corrosion protection of the pipeline (PE-coating and sacrificial anodes) are permanent; however, their concentrations are so low that no significant impairment of the water body is anticipated. The impacts of the release of substances from the sacrificial anode materials and from the coating at the welds between the pipe sections are low, particularly due to the effects of dispersion and dilution.

Operation-related changes to the temperature conditions in water bodies and operation-related changes to the water body properties due to service measures (maintenance, inspection and repair work), including free span correction will lead to

no changes or only minor structural and functional changes with regard to water. For pipelines installed on the seabed the operation-related temperature difference between the external pipeline wall and the unaffected ambient environment will be low at 0.4 K in winter and 0.5 K in summer (cf. application document, Part I2.02, Section 4, p. 7). Significant changes of the water temperature can therefore be ruled out.

Possible operation-related impacts due to the temperature differences between the boundary layer of the concrete coating and the ambient water as well as a result of external inspections or possible repair work will be assessed as “low” if they do occur.

In accordance with collateral clause A.3.6.15, the environmental authority must be informed without delay about accidents with substances hazardous to water, so that appropriate measures can be imposed. Within the framework of the ecological construction supervision (cf. protection measure S1 as well as collateral clause A.3.8.6) loss adjustment measures required under certain conditions are stipulated and the implementation of these measures is monitored, in order to sufficiently reduce the risk of water pollution.

Experiences from NSP so far show no occurrence of any unacceptably large free spans that had to be compensated by rock placement (cf. application document, Part D1.01, Section 6.2.2.2.1, p. 510). In case free span correction is required, the resulting impacts due to turbidity plumes are short-term and the changes to the seabed are limited to a local extent. Therefore, no significant impairments are anticipated.

Conclusion

Offshore, no significant construction-, plant- and/or operation-related adverse environmental impact on water is anticipated. Offshore, there is also no likelihood of adverse changes to the water body properties.

Considering the hydrographical parameters, dependant sensitivity of the affected marine waters to the impact factors of the project, the intensity, duration and extent of the intervention works as well as the mitigation measures (WA1 and WA2), no project-related risk of an adverse change to the hydromorphological and physical-chemical quality components of the ecological status and of the substances of the chemical status of the Bay of Greifswald and the Bay of Pomerania is anticipated. Thus, the targets of the Water Framework Directive are not endangered by the project.

B.4.4.2.4.2 Onshore

It has been plausibly deduced in the EIS that no overall assessment will reach or exceed a medium magnitude. Therefore, no significant adverse environmental impact on water onshore is deducible (cf. application document, Part D1.01, Section 6.2.2.2.2, p. 517, Table 6-14 as well as collateral clause A.3.6).

Surface waters

The potential pollution input into surface waters caused by the discharge of groundwater, water from the Bay of Greifswald and water used for pressure testing the pipework at the pig receiving station during the construction phase is considered

to be a local, short-term impact of low intensity and is therefore associated with a low overall assessment (cf. application document, Part D1.01, Section 6.2.2.2.2, p. 514). Changes in the quality of the groundwater pumped to the surface and to be discharged into Lubmin industrial port via trench 60 can occur due to an existing small-scale load that has been detected at a groundwater measuring point immediately downstream of the former settling pond (chloride, sulphate and ammonium values exceeded the threshold stipulated in Annex 2 to the German Groundwater Ordinance [Grundwasserverordnung, GrwV])). The temporary groundwater retention will only locally expand (approximately 15 to 60 m) the area loaded with existing pollution from the former sewage treatment plant while at the same time diluting the pollutant concentration in the groundwater. It is not anticipated that this existing load will cause a significant change in the composition of the pumped groundwater and subsequently of the surface waters connected via trench 60 because the percentage of the area with increased loads will be less than 10% of the watershed (cf. application document, Part I1.05, Annex 6).

The risk of suspended matter input into the Bay of Greifswald caused by the discharge of groundwater, water from the Bay of Greifswald and water used for pressure testing the pipework at the pig receiving station during the construction phase (trench 60) will be sufficiently mitigated by implementing measure S1 (see Section B.4.4.1.9) that stipulates the cleansing of water using sedimentation tanks equipped with straw bales. A significant impairment of the water quality at Lubmin industrial port and subsequently of the Bay of Greifswald is not anticipated.

The potential pollution input into surface waters caused by construction-related handling losses, leakages and/or accidents is also negligible. The risk of water pollution caused by construction-related handling losses, leakages and/or accidents will be mitigated by collateral clause A.3.6.10 of this Plan Approval Decision that stipulates suitable clean-up measures to be implemented before the discharge into trench 60. Therefore, a significant impairment of Lubmin industrial port and the Bay of Greifswald is not anticipated.

Groundwater

Changes in the groundwater dynamics and groundwater quality (pollution load) caused by groundwater retention measures during the construction phase as well as changes to the groundwater formation and the groundwater availability due to construction-related land use are considered to be “low” in the overall assessment (cf. application document, Part D1.01, Section 6.2.2.2.2, p. 517, Table 6-14). No groundwater-dependant biotopes are affected by the temporary changes to the groundwater-surface distances. The pine/deciduous forest land at sandy sites in the outer peripheral zone of the water table drawdown cone has a low sensitivity to water table drawdown. After completion of the construction activities the groundwater table will quickly return to its original level. A significant impairment of the groundwater regime with regard to its importance for groundwater-dependant biotopes can be ruled out.

The temporary groundwater retention will only locally expand (approximately 15 to 60 m) the area loaded with existing pollution from the former sewage treatment plant while at the same time diluting the pollutant concentration in the groundwater. Furthermore, the investigation area is of no importance for the drinking water production. Therefore, no significant impairment is anticipated.

On these fortified, predominantly partly sealed areas the accruing precipitation will to a large extent percolate directly or in adjacent areas. Therefore, no significant reduction in the groundwater formation is anticipated. No significant changes to the groundwater availability are anticipated.

Overall, the changes of the groundwater formation and the groundwater availability due to plant-related land use, will cause only minor impacts on water as a protected asset. It is planned that the accruing precipitation from the roofs and road surfaces at the pig receiving station will percolate through infiltration ditches and drainage basins in the area of the pig receiving station (cf. application document, Part H.01, Section 4.4.1, p. 175 as well as collateral clause A.3.6.13). This will sufficiently mitigate the risk of a permanent reduction in groundwater formation. A significant change of the groundwater availability can be ruled out.

The overall assessment of the local, short-term impacts of low intensity due to potential contamination of the groundwater as a result of handling losses, leakages and/or accidents during the construction phase or during operation-related service measures (maintenance, inspection and/or repair work) as “low” is plausible. The risk of a potential contamination of the groundwater as a result of construction- or operation-related handling losses, leakages and/or accidents is low. Additionally, within the framework of the ecological construction supervision (cf. collateral clause A.3.8.6) and as a result of the protection measure, loss adjustment measures required under certain conditions are stipulated and the implementation of these measures is monitored, so that no significant impairments of the groundwater are anticipated.

Conclusion

Onshore, the Nord Stream 2 project will not cause any significant adverse environmental impact on water. On land, there is no likelihood of adverse changes to the water body properties. Considering the intensity, duration and spatial extent of the impact as well as mitigation measure WA3, project-related changes of the quantitative status and the chemical status of the surfaces waters and the groundwater are also not anticipated. Thus, the targets of the Water Framework Directive are not endangered by the project.

B.4.4.2.5 Landscape as a protected asset

B.4.4.2.5.1 Offshore

Potential construction related impairment of the visual amenity offshore are assessed as medium for the following impact factors: visual disturbance, noise emissions and pollutant emissions associated with the construction operations and traffic in a radius of approximately 3 km around the offshore construction sites (cf. application document, Part D1.01, Section 6.2.5.2.1, p. 646, Table 6-41). Therefore, in coastal waters, these impact factors may cause a significant adverse environmental impact on the considered protected asset. Further construction-related impacts and the operations-related impacts will be short-term and overall of low intensity, causing no significant adverse environmental impact.

The construction-related changes to the visual amenity of the landscape due to visual, acoustic and olfactory disruptive stimuli in a radius of approximately 3 km

around the offshore construction site are anticipated to lead to medium structural and functional changes. The impact on areas at a distance of more than 3 km to the offshore construction site will only be “low” with regard to structural and functional changes. Therefore, no significant adverse environmental impact on the landscape is anticipated in these areas. The visual long-distance effect caused by offshore construction vehicles and machinery, in particular caused by pipe-laying vessels due to their striking size and appearance, will be clearly visible in the onshore coastal areas in the vicinity of the construction site (distance <3 km to the offshore construction sites, particularly to those close to Thiessow and Lubmin). Therefore, this impact is assessed to be of high intensity. The offshore construction activities will take place between May and December. However, work will not be carried out simultaneously along the entire route. Due to separate construction phases (e.g. excavation, pipelaying, backfilling), each of the various route sections will only be affected by the construction activities from a few days up to a few weeks. As a result, observers will notice changes to the visual amenity of the landscape in these coastal areas only for very short periods of time. Significant visual impacts to the visual amenity are therefore not anticipated. In the area of the interim marine stockyard near Usedom island the huge pipe-laying vessel will not be deployed. Additionally, the distance between the construction site and the nearby coastline close to Zinnowitz is greater (>3 km) than the distance between the pipeline route and Thiessow or Lubmin respectively so that no significant impact on the visual amenity on the landscape caused by visual disturbances is anticipated.

As a result of implementing collateral clause A.3.3.9 and the recommendations based on the light immission assessments (e.g. minimising the upward light ratio by limiting the angle of the spotlights to a maximum of 40°, using non-glare luminaires, using asymmetrical LED floodlights) (cf. application document, Part I2.09, pp. 39 et seq.) as well as mitigation measures M8 and ME2 (see Section B.4.4.1.9), construction-related light emissions will be reduced to a negligible level.

The noise study regarding the construction noise offshore (cf. application document, Part I2.06) concludes that during daytime the immission guide values of the AVV-Baulärm (general administrative specification for protection against noise from construction sites) will not be exceeded at relevant immission locations within the impact area of the construction activities (towns of Lubmin and Rügen/Thiessow as well as Lubmin Marina). Furthermore, the calculations show that the immission guide values at night may be exceeded in case convoys of backhoe dredgers and pipelay vessels are used concurrently or even in case of each type of convoy being used on its own. Noise reduction can be achieved by keeping a minimum distance to protection areas during nightly work activities (cf. application document, Part I2.06, Section 6.2.2, pp. 17 et seq. as well as collateral clause A.3.3.6). The noise-related impacts on the scenic experience can be reduced by implementing mitigation measures ME1 and ME2 (see Section B.4.4.1.9) as well as by complying with collateral clauses A.3.3.1, A.3.3.2, A.3.3.4, A.3.3.6 as well as A.3.3.7 and A.3.3.9 (compliance with the AVV Baulärm regulations [general administrative specification for protection against noise from construction sites] and the 32. BImSchV [32nd ordinance for the implementation of the German Federal Immission Protection Act] as well as verifiable implementation of noise protection measures to ensure the compliance with immission values stipulated in the noise impact assessment, monitored by the ecological construction supervision.

As the results of the air pollutant study show that the legal immission thresholds for SO_2, NO_2, PM_{10} and $PM_{2.5}$ are not exceeded at any of the offshore areas affected by construction activities (cf. application document, Part I2.03, Section 9, pp. 64 et seq.), no significant impairment to the landscape perception as a result of construction-related exhaust emissions is anticipated.

Plant-related impact factors for landscape/visual amenity as a protected asset are not significant because the pipelines are generally underneath the surface level of the water, and additionally, the pipelines are predominately trenched in sediment within the 12-nautical mile zone.

Plausibly, the operations-related impacts are assessed as short-term and generally as “low”. Therefore, there are no significant adverse environmental impacts (cf. application document, Part D1.01, Section 6.2.5.2.1, p. 646, Table 6-41).

Operation-related alterations in the visual amenity of the landscape due to visual, acoustic and olfactory disruptive stimuli caused by service measures (maintenance, inspection and repair work) are exclusively short-term impacts of small to medium spatial extent and of low to medium intensity. During external inspections, remotely operated underwater vehicles (ROV) will be deployed via a parent vessel (cf. application document, Part C.01, Section 4.1.2.3, p. 165). The related impacts on the visual amenity will be negligible because the vessel used for check-ups will integrate into the existing shipping traffic. Repair works required in exceptional cases, e.g. in order to correct free spans or due to other damage to the pipeline, will be carried out at a point source. It is anticipated that the intensity of the associated impacts will not be higher than that of impacts during the construction phase. Provided that the repair work is carried out in accordance with existing immission protection provisions (cf. collateral clauses A.3.3.1, A.3.3.2, A.3.3.4 and A.3.3.9), significant impairment of the visual amenity of the landscape can be ruled out.

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact on the offshore landscape. Nevertheless, this is justifiable because the legal requirements with regard to landscape are complied with offshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1).

B.4.4.2.5.2 Onshore

The magnitude of the construction-related impacts caused by the removal of structural elements affecting the visual amenity (forest) and the resulting functional impairment of the visual amenity (loss of structural elements impacting the visual amenity) in construction site facility and storage areas (microtunnels); in the storage and assembly area as well as at the construction offices south-east of the pig receiving station is assessed as “medium”. Therefore, a significant adverse environmental impact can be deduced (cf. application document, Part D1.01, Section 6.2.5.2.2, pp. 651 et seq., Table 6-42).

Even though the construction-related changes to the landscape amenity caused by land use (loss of structural elements impacting the visual amenity) are only of local extent, they are permanent and of medium intensity. As these impacts are assessed as “medium” on a general level, a significant impairment of the Lubminer Heide area

of visual amenity is anticipated. The vegetation holdings affected by the project are within the scope of the approved development plan no.1 “Industrial and Commercial Park Lubminer Heide” where these areas are declared as industrial zones. This area of visual amenity is already affected by the adjacent area with pre-existing industrial and commercial use. However, the forest lands between the industrial and commercial park and the town of Lubmin will remain unchanged. Also, the coastal protection forest between the industrial and commercial park and the beach at the Bay of Greifswald will not be affected, so that the continuous shielding effect of the forest will be ensured.

The overall value assessment of the impacts as “low” and resulting conclusion that no significant construction-related changes to the amenity of the landscape caused by visual, acoustic and olfactory disruptive stimuli are anticipated, is plausible (cf. application document, Part D1.01, Section 6.2.5.2.2, p. 651 et seq., Table 6-42). The visual long-distance effect of construction vehicles and machinery/equipment is restricted by the surrounding forest and the existing noise and visual screening wall located to the north west of the project area. Therefore, the construction site is generally only visible from areas within the scope of the approved development plan no.1 “Industrial and Commercial Park Lubminer Heide”. As projected in the EIS, no significant adverse impact on the visual amenity is anticipated.

Construction-related light emissions can be reduced to a negligible level by implementing collateral clause A.3.3.9 as well as mitigation measures M11 and ME2 (see Section B.4.4.1.9), that also include recommendations based on the light immission assessments (cf. application document, Part I2.10). A significant impairment of the landscape amenity caused by construction-related dust generation can be avoided by complying with collateral clause A.3.3.5 (deployment of appropriate measures like humidification, cleaning or fortification to avoid or minimise dust emissions).

The Construction Noise Onshore and Pre-commissioning Onshore noise studies (cf. application document, Part I2.07, Parts 1 and 2) conclude that the immission guide values of the AVV-Baulärm (general administrative specification for protection against noise from construction sites) will not be exceeded at relevant immission locations within the impact area of the construction activities (towns of Lubmin and Lubmin Marina) if the compressor units used during the pre-commissioning will not exceed a sound power level of ≤104 dB(A). Collateral clause A.3.3.6 ensures compliance of the relevant immission guide values. When implementing mitigation measure ME2 (see Section B.4.4.1.9) and complying with collateral clauses A.3.3.1, A.3.3.2, A.3.3.4 as well as A.3.3.7 (compliance with the AVV Baulärm regulations [general administrative specification for protection against noise from construction sites] and the 32. BImSchV [32nd ordinance for the implementation of the German Federal Immission Protection Act] as well as monitoring the implementation within the framework of the ecological construction supervision, no significant impairments to the scenic experience caused by noise immissions are anticipated.

As the results of the air pollutant study show that the legal immission thresholds for SO_2, NO_2, PM_{10} and $PM_{2.5}$ are not exceeded in any residential or tourist area outside of the facility or construction area (cf. application document, Part I2.04, Section 9, pp. 70 et seq.), no significant impairment to the landscape perception as a result of construction-related exhaust emissions is anticipated.

The plant-related impacts of the two impact factors building development (functional impairment due to loss of structural elements impacting the visual amenity: forest, woodland) and introduction of permanent foreign objects (reshaping/superimposing of areas of visual amenity by visual overlay with structural elements of the project) are assessed as “medium”. Therefore, a significant adverse environmental impact can be deduced. This relates particularly to the 30 m high blow-out with a visual working zone radius of 384 m (in accordance with the “Notes on Intervention Management and compensation planning for wind farms, antenna masts and comparable vertical structures” (“Hinweise zur Eingriffsbewertung und Kompensationsplanung für Windkraftanlagen, Antennenträger und vergleichbare Vertikalstrukturen”) (published by the State Office for the Environment, Environmental Protection and Geology (Landesamt für Umwelt, Naturschutz und Geologie) of Mecklenburg-West Pomerania in 2006). Consequently, the impacts of the blow-out are restricted to the Lubminer Heide area of visual amenity (cf. application document, Part G.01, Section 8.1.4.3, p. 171). The reshaping in the area of the Lubminer Heide (III 7-9, lower transparency) can therefore be plausibly assessed as permanent, medium-scale and overall as “medium”.

The overall assessment for the remaining construction- or plant-related impacts is “low” which is plausible. Therefore, no further construction- or plant-related, significant adverse environmental impacts are anticipated. The constructional elements of the pig receiving station will lead to a reshaping or superimposing of the areas of visual amenity, particularly with vertical elements. Overall, the plant-related changes to the visual amenity of the landscape caused by visual disruptive stimuli (introduction of structure into the landscape) are plausibly assessed as “low” in the EIS.

The creative stipulations of the development plan will be complied with by implementing measure G1 (see Section B.4.4.1.9.1). With this measure an appropriate planting of trees will take place in the area of the car parking places.

Overall, the changes to the visual amenity of the landscape due to visual, acoustic and olfactory disruptive stimuli as a result of plant operations and/or service measures (maintenance, inspection and repair work) are plausibly assessed as “low”. Considering the existing loads, operation-related impacts (impairment of the visual amenity of the landscape) are plausibly assessed as “low”. No significant adverse environmental impact is deducible from this impact factor. Operation-related light emissions as a result of the lighting at the pig receiving station will be reduced to a negligible level by implementing collateral clause A.3.3.9 as well as mitigation measures M11 and ME2 (see Section B.4.4.1.9). Under normal operating conditions, there will be no sound emissions caused by the pig receiving station (cf. application document, Part I2.08A, Section 4.1, pp. 5 et seq.). The operation-related vehicle traffic is so low that the connected emissions may be disregarded.

During service measures, no significant impairment of the amenity of the landscape as a result of visual disturbances or air pollutant and sound emissions is anticipated. This is due to the fact that even in a case where repair work is required, no higher impacts than during the construction phase of the plant are expected and that this repair work would be carried out in the area of the pig receiving station. Provided that the repair work is carried out in accordance with existing immission protection provisions (cf. collateral clauses A.3.3.1, A.3.3.2, A.3.3.4 and A.3.3.9), significant impairment of the visual amenity of the landscape can be ruled out.

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact on the onshore landscape. Nevertheless, this is justifiable because the legal requirements with regard to the landscape are complied with onshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1).

B.4.4.2.6 Air/Climate as a protected asset

In accordance with Section 1 (3) (4) of the BNatSchG (German Federal Nature Conservation Act), the natural assets of air and climate must be protected by implementing Nature Conservation and Landscape Management measures. This applies in particular to areas with beneficial air hygienic or climatic effects like fresh and cold air production areas or air exchange tracts. The purpose of the German Federal Emission Control Act (Bundes-Immissionsschutzgesetz, BImSchG) is to protect people, animals and plants, soil, water and the atmosphere as well as cultural assets and other tangible assets from an adverse environmental impact (immissions) and to prevent the occurrence of adverse environmental impacts. The legal requirements are laid out in Section 22 of the BImSchG. The specific environmental targets are defined for example in the implementing provisions to the BImSchG and in the German air pollution control regulation titled “Technical Instructions on Air Quality Control” (Technische Anleitung zur Reinhaltung der Luft, TA Luft).

B.4.4.2.6.1 Offshore

The assessment of the construction-related air pollutant emissions (including those due to traffic) within the 12-nautical mile zone as “significant” in view of their predicted intensity and extent is plausible (cf. application document, Part D1.01, Section 6.2.3.2.1, p. 524, Table 6-16). The results of the air pollution study (cf. application document, Part I2.03) showed that the maximum SO_2 immissions in the immediate vicinity of the pipeline route will be less than 2 µg/m³ in the annual average. The annual average for the immission of SO_2 will therefore be far below the applicable immission threshold for the protection of vegetation or the ecosystems (20 µg/m³ of SO_2) as stipulated in the 39th BImSchV and the TA Luft. Additionally, even in the immediate vicinity of the pipeline route, the thresholds for the protection of human health (both the long-term value stipulated in the TA Luft and the short-term value stipulated in the TA Luft as well as in the 39th BImSchV) will not be exceeded (cf. application document, Part I2.03, Section 8.1, pp. 38 et seq.). With regard to NO_2, the threshold (40 µg/m³) for the protection of human health will neither be reached nor exceeded in the annual average in the immediate vicinity of the construction areas along the route. In the first construction year, the NO_2 immissions are anticipated to be 11 µg/m³ in annual average in the residential areas on the east coast of Rügen island. In the second and third construction years the loads will still be significantly lower. The NO_2 short-term threshold for the protection of human health is 200 µg/m³ hourly average with 18 permissible exceedances in the calendar year. This short-term value will only be exceeded in subsections of the

route and this exceedance will be limited to the actual construction site where occupational protection rules apply rather than legal immission control requirements. Under adverse weather conditions, higher hourly averages might also occur in the eastern part of Rügen island in residential areas close to the route during singular peak hours, however, no exceedance of the thresholds of 200 µg/m³ NO_2 is anticipated ((cf. application document, Part I2.03, Section 8.2, pp. 42 et seq.). In the first construction year, the concentration for PM_{10} at the construction site will increase only slightly from an existing load of 16 µg/m³ to a maximum of 17 µg/m³. For the subsequent years, no noteworthy increase in the loads is anticipated. Therefore, the concentrations in all investigation areas will be well below the threshold of 40 µg/m³ in the annual average. The permissible short-term values for PM_{10} (35 daily average values of more than 50 µg/m³) were not reached. Also, the maximum values for $PM_{2.5}$ of just below 13 µg/m³ in the named areas remained well below the threshold of 25 µg/m³. The construction-related additional amount of dust contributing to the total dust concentration is well below the threshold of 0.35 g/(m²*d) (cf. application document, Part I2.03, Section 9, p. 65).

The concentrations in all offshore areas affected by construction activities are therefore well below the legal immission thresholds (cf. application document, Part I2.03, Section 9, pp. 64 et seq.). Overall, the impacts of all construction-related air pollution emissions are considered to be significant due to their large spatial extent and their local high intensity.

A significant change of the local climate conditions as a result of the CO_2 emission is not anticipated because the emissions are limited to the construction phase.

No plant-related impacts offshore on air and climate are anticipated. Neither the trenched pipelines nor the pipeline running on the seabed will cause a plant-related adverse impairment of this protected asset.

The impacts on air quality and local climate conditions as a result of operation-related air pollution emissions during external inspections or repair work are assessed to cause a minor structural and functional impairment. This assessment is plausible (cf. application document, Part D1.01, Section 6.2.3.2.1, p. 524, Table 6-16). During maintenance, inspection and repair work, considerably less amounts of air pollutants will be emitted than during the construction phase because fewer vehicles and machinery/equipment will be deployed. As a result, the duration and the spatial extent of the impacts is generally significantly lower and thus the impacts on air and climate can be assessed as “negligible”.

Conclusion

It can therefore not be ruled out, that the project may have a significant construction-related environmental impact offshore on air and climate. Nevertheless, this is justifiable because the legal requirements with regard to air and climate are complied with offshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1).

B.4.4.2.6.2 Onshore

The required removal of forest at the construction facility and storage area for the microtunnels, at the pig receiving station as well as on storage and assembly areas

will lead to partial loss of an area with climate meliorating functionality. This will affect valuable forest climatope structures of medium sensitivity in the Lubminer Heide. In view of the permanent losses, it is anticipated that this impact factor will cause significant adverse environmental impacts on air and climate (cf. application document, Part D1.01, Section 6.2.3.2.2, p. 529, Table 6-18). The vegetation holdings affected by the project are within the scope of the approved development plan no.1 “Industrial and Commercial Park Lubminer Heide” where these areas are declared as industrial zones. However, the forest lands between the industrial and commercial park and the town of Lubmin will remain unchanged. Also, the coastal protection forest between the industrial and commercial park and the beach at the Bay of Greifswald will not be affected, so that the continuous local-climatic compensation function of the forest will be ensured. The outlet canal of the former nuclear power station and the industrial port act as an air flow channel. However, their function is not affected by the project. Though the spatial extent of the impact is small due to its distance from the forest, it will cause a complete and permanent loss of valuable forest climate structures. Therefore, significant adverse impacts on air and climate are anticipated.

The assessment of the impairment of air quality and local climate conditions as a result of construction-related air pollution emissions as “low” is plausible. Based on the construction-related total immission loads for the airborne pollutants SO_2, NO_2, PM_{10} and $PM_{2.5}$ determined within the framework of the air pollution study (cf. application document, Part I2.04) no large-scale change in air quality within the investigation area can be deduced. The maximum SO_2 emissions occur on the offshore route section and amount to 4 µg/m³ in the annual average. The annual average for the immission of SO_2 will therefore be far below the applicable immission threshold for the protection of vegetation or the ecosystems (20 µg/m³ of SO_2) as stipulated in the 39th BImSchV and the TA Luft. There will be no project-related increase of the existing load of 1 µg/m³ in residential areas. With regard to NO_2, the threshold (40 µg/m³ in the annual average) for the protection of human health will only be exceeded locally at the construction site. In this area the higher thresholds for occupational health and safety apply. Immissions outside of the construction sites, particularly in surrounding residential and commercially used areas will remain well below the threshold of 40 µg/m³ in the annual average. Exceedances of the hourly average of 200 µg/m³ NO_2 are almost exclusively confined to the immediate vicinity of the construction site areas. Slight, small-scale exceedances are possible on adjacent roads.

PM_{10} immissions on adjacent company premises (max. 18 µg/m³ in the annual average) are also well below the threshold of 40 µg/m³. In the adjacent residential areas, the existing load of 16 µg/m³ will not be notably increased. The immissions in the vicinity of the project site will be well below the short-term threshold of 35 exceedance days of 50 µg/m³. Also, the maximum values for $PM_{2.5}$ of 13 µg/m³ in the named areas will remain well below the threshold of 25 µg/m³ in the annual average stipulated in the 39th BImSchV. The construction-related additional amount of dust contributing to the total dust concentration (<0.03 g/(m²*d) is infinitesimal compared to the threshold of 0.35 g/(m²*d).

The concentrations in all residential or tourist areas outside of the facility or construction area are therefore well below the legal immission thresholds (cf. application document, Part I2.04, Section 9, pp. 70 et seq.). A significant change of the local climate conditions as a result of the CO_2 emission is not anticipated

because the emissions are limited to the construction phase. As the impact on air and climate is anticipated to be small-scale, short-term and of low intensity overall the impact is considered “low”. Therefore, no significant construction-related air quality impairment through pollution emissions is anticipated.

The building development at the pig receiving station area, including the ring road, will lead to plant-related partial loss of area with climate meliorating functionality. This also will affect valuable forest climatope structures of medium sensitivity in the Lubminer Heide. In view of the permanent losses, a significant adverse environmental impact on climate and air is anticipated.

Overall, the impairment of air quality and local climate conditions as a result of operation-related air pollution emissions is plausibly assessed as “low”. During maintenance, inspection and repair work, considerably less amounts of air pollutants will be emitted than during the construction phase because fewer vehicles and machinery/equipment will be deployed. As a result, the duration and the spatial extent of the impacts is generally significantly lower and thus the impacts on air and climate can be assessed as “negligible”. As an emptying of the pipeline for maintenance or operational reasons is highly unlikely and the associated blow-out of methane is only short-term, no significant adverse environmental impact is anticipated. In summary, operation-related impacts are anticipated to be local, short-term and of low impact.

Conclusion

Therefore, it cannot be ruled out, that the project may have a significant construction-related environmental impact onshore on air and climate. Nevertheless, this is justifiable because the legal requirements with regard to air and climate are complied with onshore and the impact – to the extent that it is possible and reasonable – is avoided and hence ultimately not so severe that it could not be tolerated in view of the purpose and the importance of the project (see Section B.4.1).

B.4.4.2.7 Cultural heritage and other protected assets

B.4.4.2.7.1 Seaward side

The construction-related loss or damage to known cultural assets, in particular the shipwreck barrier from 1715, caused by land use has not been classified in the present Environmental Impact Assessment with regard to structural and functional impairment (see application document Part D1.01, Chapter 6.2.7.2.1, p. 678 et seq., Tab. 6-47). For this reason, a verbal, argument-based dispute is therefore being conducted at this point by the planning approval authority. It is planned to map the location of cultural heritage sites on the seabed on the basis of a contract between the project sponsor and the Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern, to determine project-specific effects and to define measures to reduce certain impacts (e.g. by defining exclusion zones for anchors). The protection, recovery and documentation of the archaeological monuments in the scope of the construction measures should also be subject to contractual regulations between the project promoter and the Landesamt für Kultur und Denkmalpflege Mecklenburg-Vorpommern (see application document part D1.01, chapter 6.2.7.2.1, p. 676). If the aforementioned contract is concluded and the KuS1 measure (cf. Section B.4.4.1.9.1) and the ancillary provisions on the protection of historical monuments

(cf. Section A.3.5) are complied with, it must be assumed that the protection of the known archaeological monuments is sufficiently guaranteed. Consequently, there are no significant adverse environmental impacts from the impact of the loss or damage to known cultural assets caused by construction.
If objects that are relevant in terms of historical monument protection and that were previously unknown during construction work are discovered in the seabed, the provisions of Section 11 DSchG M-V must be observed (cf. measure KuS1, Section B.4.4.1.9.1 as well as ancillary provisions, Section A.3.5.2). Considerable effects on previously unknown cultural assets can thus be avoided.
The loss of or damage to other material goods resulting from the use of the land, or operational maintenance measures, must be ruled out on the seaward side, or classified as having a negligible adverse impact on the environment. The risk of damage to intersecting or close-by pipeline routes has been taken into account in the technical planning of Nord Stream 2. For example, the Nord Stream 2 pipeline is to be laid in a trench with a 1 m overlap in the area of the crossing with the planned but not yet completed submarine cables, so that the future submarine cables can be laid over the pipeline (see application document Part C.01, Chapter 2.2.3.4, p. 38). The crossing of the submarine cables of the VT 50Hertz by the construction of the Nord Stream 2 pipeline is regulated by the ancillary provisions in Section A.3.10. It is also intended to determine the position and design of the cable crossings in a crossover agreement to be concluded between Nord Stream 2 AG as the pipeline operator and 50Hertz as the submarine cable operator (see application document, Part C.01, Chapter 2.1.5.1, p. 17). This ensures that potential damage to crossing cables is avoided.

Impairment of other uses due to use of space during the construction period must be excluded on the seaward side, or classified as a non-substantial adverse environmental impact. Shipping and fishing restrictions are limited in time and space. The Greifswalder Bodden in particular is an important fishing area for the traditionally practised gillnet fishing, which is affected by the dredging and laying work as well as the associated shipping activities. Action M6 (see Section B.4.4.1.9.1) restricts the construction period in the Greifswald Bodden and south west of the Pomeranian Bay from mid-May to the end of December, so that the construction-related disruption to traditional fishing activities is limited to a period of 7.5 months. In addition, the subsidiary provisions A.3.2.2 and A.3.2.3 ensure that fishing activities are influenced as little as possible by the construction of the Nord Stream 2 pipeline. Since the main target species, the herring, is mainly caught between March and May during the spring, there is no significant time overlap with the planned construction measures. The transport journeys between the pipeline route and the marine interim storage facility will be carried out along fixed routes and coordinated in advance with the fishing companies (see application document part D1.01, chapter 6.2.7.2.1, p. 677). Fish stocks themselves are not significantly impaired by the construction activity (see section B.4.4.4.2.2). For traditional inshore fishing, the use of space during the construction period does not give rise to any significant conflicts of use due to its spatial and temporal limitations (cf. Section B.4.8.11). The interests of shipping are also not affected (see Section B.4.8.18).
Mining of raw materials is not significantly impaired (cf. Section B.4.4.1.8.2.1 and B.4.8.15).
National defence issues are also not significantly affected (see Section B.4.8.19).

The impairment of other uses due to spatial use and accidents (especially flushing of the pipeline) can be assessed as "low". In order to avoid endangering trawling in the area of rock placement and free sagging of the pipeline, Nord Stream 2 AG intends to inform the relevant professional groups about possible dangers through information events. In addition, Nord Stream 2 AG recognises and monitors any critical flushing that may occur through regular inspections and will take appropriate measures to counteract it. (cf. application document part C.01, chapter 5.3.2, p. 226) There are therefore no significant conflicts of use for the fishery (see section B.4.8.11). The no-anchoring zone does not affect the interests of fishing and shipping in any relevant way, since it is only a small-scale impact (see Sections B.4.8.11 and B.4.8.18).

If operational inspections and repair work or correction of unsupported areas reveal previously unknown objects in the seabed that are relevant for the protection of historical monuments, the provisions of Section 11 DSchG M-V (cf. measure KuS1, Section B.4.4.1.9.1 as well as ancillary provisions, Section A.3.5.2) must be observed. Considerable effects on previously unknown cultural assets can thus be avoided. Mechanical damage to cultural objects caused by operations is therefore considered improbable. Material goods will also be taken into account when planning inspections and repair work and corrections of unsupported areas. This means that there are only minor structural and functional impairments due to operational effects.

Conclusion

It cannot therefore be ruled out that the project will have a significant adverse environmental impact with regard to cultural and other tangible assets on the seaward side, although this is justifiable because the statutory requirements are also met with regard to cultural and other tangible assets on the seaward side, the effects are avoided to the extent that this is reasonable, and are therefore ultimately not so serious that they could not be deemed acceptable within the scope and significance of the project (cf Section B.4.1).

B.4.4.2.7.2 Shore side

The loss / damage of previously unknown archaeological monuments due to land use during the construction period has not been assessed in this environmental impact study. However, this impact should not be considered as a significant adverse environmental impact. If objects that are relevant in terms of historical monument protection that were previously unknown during construction work are discovered, the provisions of Section 11 DSchG M-V must be observed (cf. measure KuS2, Section B.4.4.1.9.1 as well as ancillary provisions, Section A.3.5.2). Considerable effects on cultural assets can thus be sufficiently avoided.
The impact of the loss or damage to other tangible assets (except for forest land) caused by land used during the construction period or as part of maintenance measures should not be regarded as significant (see application document, Part D1.01, Section 6.2.7.2.2, p. 683, Tab. 6-48). Construction-related damage to other material goods is not to be expected, since the necessary safety distances to crossing infrastructure facilities, or to the roots of existing woodland were already taken into account in the planning phase. For example, the Nord Stream 2 pipeline will use trenchless technology to cross areas of shallow water and dunes, the restocked coastal protection forest and various supply pipelines, a road and a

railway track via two parallel micro-tunnels before reaching the pig receiving terminal. The construction of these two adjacent microtunnels is carried out by pipe jacking. In the area of the microtunnels, the covering is approx. 4.5 m to 10 m. This covering results from the requirements of tunnel construction and from the requirement that underpassing of the infrastructure and the coastal forest must be ensured at a sufficient depth (cf. application document, Part C.01, Chapter 3.1.3, p. 57).
For the loss of forest areas in the course of the removal of vegetation in the construction sector as well as on the storage and assembly areas, the measure of the effects with a high degree of impairment must be assessed as permanent, local and thus high overall. This results in a considerable adverse environmental impact on protected cultural and other tangible assets. The forestry law compensation requirement for the loss of a total of 8.2968 hectares of forest land within the scope of Section 2 LWaldG (of which 1.7197 hectares are unwooded areas) within the scope of the B-Plan No. 1 "Lubminer Heide Industrial and Commercial Park" was determined in agreement with the Jägerhof Forestry Office and Landesforst MV in accordance with the stipulations of the B-Plan. Afterwards, a compensation requirement for wooded areas of 1: 3 and for non-wooded areas of 1: 1 have been considered. Accordingly, a compensation requirement of 21.4512 ha is initially required under forestry law. Since a succession area share of 30% is provided in the measure areas of the B-plan (according to measure sheet 1E of the B-plan justification) for nature conservation reasons, but the compensation under forestry law is usually not made by succession areas but by afforestation, an additional supplement of 30% is applied in addition to the previously determined compensation requirement under forestry law. This results in a total compensation requirement of 27.8862 ha (cf. application document, part G. 01, chapter 10.3.2, p. 273). Thus, the necessary afforestation measures meet the requirements of nature conservation (30% share of succession areas) and at the same time take into account the forestry requirements (cf. explanatory statement on plan no. 1 "Lubminer Heide industrial and commercial area", March 2004, p. 51).

According to the statement of Landesforst M-V dated 31.05.2017, the previously described “forest conversion from the existing B-Plan area pool can currently be fully compensated for. From the B-Plan area pool for alternative afforestations, which has already been implemented, there is currently an overcompensation in the amount of 34.39 ha (nature conservation overcompensation corresponds to approx. 31.90 ha) in relation to the forest conversion measures already allocated.”
The project promoter was obliged to undertake a compensation of 30.6573 hectares under forestry law (cf. ancillary provision A.3.8.8). Under the above-mentioned conditions, it can be assumed that the loss of forest areas due to construction and plants will be fully compensated for.
It is not possible to predict the functional impairment of forest areas adjacent to the construction site as a result of construction-related land use. Damage to trees at the edges of construction site equipment, storage and assembly areas must be avoided by means of suitable perimeter fencing during the construction period and targeted tree protection measures in accordance with DIN 18920 (see measures S3 and S4, Section B.4.4.1.9.1). The implementation of the above-mentioned tree protection measures must be monitored by the ecological construction management (see ancillary provision A.3.8.2). Under the above-mentioned conditions, no functional impairments are to be expected for the forest areas to be preserved as a result of construction-related land use.

The functional impairment of forest areas caused by the introduction of pollutants and nutrients during the construction period is to be classified as "low" in the overall assessment (see application document, Part D1.01, Chapter 6.2.7.2.2, p. 683, Tab. 6-48). A considerable functional impairment of forest areas due to construction-related air pollutant emissions is not to be expected since, according to the results of the air pollutant study (see application document, part I2.04), the results are well below the limit of the annual average emissions limit for sulphur dioxide of 20 µg/m³ for the airborne pollutant test according to 39. BImSchV and TI Air for the protection of vegetation. The maximum SO_2 emissions are located in the seaward side pipeline area off the coast and amount to an annual average of 4 µg/m³.
With regard to nitrogen dioxide emissions, maximum annual average NO_2 emissions of 20 µg/m³ were predicted in the forest areas directly adjacent to the project area and set out in plan B No. 1 "Lubminer Heide industrial and commercial area". This value is below the limit value for protecting vegetation of 30 µg/m³ in the annual average according to TI Air. Even in view of the fact that these air pollutant inputs are limited in terms of construction time and that the forest stands pronounced in the examination area are not particularly sensitive to nutrient input (pine forest with nitrophilous soil vegetation), it can be assumed that no significant functional impairment will occur.
A functional impairment of forest areas due to leaks or accidental contamination during construction activities must also be excluded. Observance of measure S1 (cf. Section B.4.4.1.9.1), which provides for the use of binding agents and immediate information on ecological monitoring of construction in the event of possible soil contamination, as well as the use of vehicles and machines that comply with the state of the art, will sufficiently reduce the risk of a functional impairment of forest areas due to pollutant contamination.
The functional impairments of forest areas due to water management measures during the construction period have been plausibly classified in an overall assessment as "low" (cf. application document, Part D1.01, Chapter 6.2.7.2.2, p. 683, Tab. 6-48). The mixed pine forest stands on sandy sites on the outer edge of the ground water lowering funnel show a low susceptibility to groundwater lowering. After completion of the construction work, the groundwater level will very quickly return to its original level. It can therefore be assumed that the planned water retention measures will not cause significant impairment to forest areas.

Considering measure S1 (cf. Section B.4.4.1.9.1), according to which the groundwater being pumped has suspended matter removed before it is discharged into the receiving watercourse, considerable impairment of forest stands via the waterway can also be ruled out.

An reasonable average assessment was carried out for the plant-related land use and the resulting loss of forest areas. A significant adverse effect on the environment results from this aspect. As there are large forested areas of the Lubminer Heath present in the surrounding area, the intensity of the disturbance can be reasonably assessed as "medium" (cf. application document, part D1.01, chapter 6.2.7.2.2, p. 681). Taking into account the local/small-scale extent, but the permanent impact of the subsequent use of forest areas, this has a significant adverse environmental impact on the protected cultural and other tangible assets.

Nor can it be assumed that other material goods will be damaged as part of operational maintenance measures, since the necessary safety distances between

the facilities of the Nord Stream 2 construction project and other material goods have already been taken into account in the planning. In addition, due to operational reasons, no significant negative environmental impacts are to be expected on the land side, as was already the case for the effects on previously unknown archaeological monuments during the construction period. In the case of maintenance and repair work, the provisions of Section 11 DSchG M-V for previously unknown listed sites must also be observed. The measure KuS2 (section B.4.4.1.1.9.1) provided for in the planning documents and the ancillary provision A.3.5.2, guarantee sufficient consideration of cultural assets that may be affected.

Conclusion

It cannot therefore be ruled out that the project will have a significant adverse environmental impact with regard to cultural and other tangible assets on the shore side, although this is justifiable because the statutory requirements are also met with regard to cultural and other tangible assets on the shore side, the effects are avoided to the extent that this is reasonable, and are therefore ultimately not so serious that they could not be deemed acceptable within the scope and significance of the project (cf Section B.4. 1).

B.4.4.2.8 Interactions

Ecosystemic interactions as a complex set of interactions of the environment include all functional and structural relationships between the individual protected assets in accordance with Section 2 UVPG (German Environmental Impact Assessment Act) within the area to be considered. The interactions to be included are usually recorded through the analysis of the individual protected assets. Effects on the structure of interactions can be significant shifts in effects and secondary effects between and within different environmental media, which can add, reinforce, enhance, but also reduce or cancel out each other's effects. The specific interactions between the protected assets were considered in the impact assessments for the protected assets. In the present case, the relationships between soil, water, habitat types, habitats and human landscape and recreation are of particular relevance. As outlined in the Environmental Impact Assessment for the sea and land area (see application document, part D1.01, section 6.3, p. 685), interactions do not have any additional or major effects that go beyond those derived from the individual protected assets. Consequently, there will be no significant additional adverse environmental impacts.

B.4.4.2.9 Interaction with other existing or authorised projects and activities

The EIA takes into account various planning, plans, projects and intentions which, in combination with the project considered here, could be give rise to significant adverse environmental impacts on protected assets (cf. application document, part D1.01, chapter 6.5, p. 697). The following projects were included in the in-depth examination of the interaction on the basis of a preliminary examination of possible projects:

- Establishment and operation of 6 AC systems for grid connection of the offshore wind farm clusters "Westlich Adlergrund" and "Arkona See" (see application document, part D1.01, chapter 6.5.2, p. 699)
- Nord Stream Pipeline: Construction has already been completed, and when operational activities for the Nord Stream pipeline come together during the Nord Stream 2 pipeline construction phase, interaction is possible. As a result of the installation, the emissions from the sacrificial anodes interact for the length of the pipeline (see application document, part D1.01, chapter 6.5.2, p. 703).
- Lubmin 2 natural gas receiving station (planning approval procedure GASCADE, cf. application document, part D1.01, Chap. 1.2.2, p. 39)
- European gas connection pipeline EUGAL (planning approval procedure GASCADE, see application document, part D1.01, Chap. 1.2.2, p. 44)

This selection in the result of the audit is reasonable as far as the planning approval authority is concerned. The other projects mentioned in chapter 6.5.1 of the EIA were obviously not to be considered in detail due to the lack of a possible interaction.

B.4.4.2.9.1 Seaward side

B.4.4.2.9.1.1 Installation and operation of 6 AC systems for the grid connection of the offshore wind farm clusters "Westlich Adlergrund" and "Arkona See".

The project Cluster Westlich Adlergrund (CWA) serves the offshore grid connection of wind farms in the Westlich Adlergrund Cluster, north east of Rügen. Up to 6 cables are to be laid here in the future, from the landing at Lubmin through the Greifswalder Bodden, the 12 nautical mile zone and the EEZ to the transformer platforms in the respective wind farms of the "Westlich Adlergrund" and "Arkona-See" clusters. As a first step, three cables will be laid to connect the wind farms "Arkona Basin Southeast" and "Viking" to the grid.

The entire project is divided into three separate and already planned planning segments. These are the land route, sea route and Exclusive Economic Zone (EEZ) sections. In view of the interaction with the Nord Stream 2 route in the 12 nautical mile zone, the sea route will be considered below; plan approval decision was granted for this on 9 July 2015 by the Ministry of Energy, Infrastructure and Regional Development Mecklenburg-Western Pomerania.

The project's sea route runs in the Greifswalder Bodden to a length of approx. 12 km within the reservation area for pipelines (LEP 2016) east of the Nord Stream pipeline. The cable distance in the Greifswalder Bodden section is 50 m or100 m. The covering is generally at least 1.55 m. In the case of the crossing of shipping channels, the covering height reaches 3.5 m to 4.0 m below the current sea bed.

Contrary to the original schedule, 50Hertz has not only changed the schedule, but also the laying sequence and initially only laid two cables (281, 282) in Greifswalder Bodden by the end of 2017. According to the 2018 implementation status announced in the statement from 50Hertz Transmission GmbH dated 30.05.2017, the laying of a

further cable (OST-1-3, Cable 261) is planned. Agreement between 50 Hertz and NSP2 on the crossover of submarine cables and pipeline also indicated that this is expected to take place in the first half of 2018, i. e. before and thus below the Nord Stream 2 pipeline planned to be laid in this area during the period from August to December 2018. On the other hand, the three other submarine cable systems not currently planned are only to be laid after the NSP2 pipeline has been laid and are therefore to be laid above the pipeline that has already been laid. According to the Demand Development Planning (O-NEP 2025), which is confirmed by the information provided by 50Hertz, 50Hertz intends to install only one more submarine cable system in 2018. The chronological staggering of the implementation of the 50Hertz grid connection systems can be illustrated in two variants as follows (see Nord Stream 2, statement on the FFH (Flora Fauna Habitat) compatibility study following the hearing procedure of 15 November 2017):

- 2 cables in 2017,1 cable in 2018, 2019, 2020 and 2021 or
- 2 cables in 2017,1 cable in 2018, 2 cables in 2019, 1 cable in 2020

This time frame for laying the cable systems was confirmed by the responsible planning approval authority, the Ministry of Energy, Infrastructure and Regional Development of Mecklenburg-Western Pomerania, in a letter dated 29 November 2017.

Based on the time sequence described above, the three submarine cable systems installed before the pipeline was laid are to be crossed by the Nord Stream 2 pipeline (the pipeline is laid on the seabed) (see application document, Part C.01, Chapter 3.1.7, p. 66). In the subsequent section of the three submarine cable systems to be implemented after the pipeline has been laid, the pipeline will be laid with a ground cover of 1.0 m in order to allow the pipeline to be crossed by three submarine cable systems to be installed after the Nord Stream 2 pipeline has been laid (see application document, Part C.01, Chapter 3.1.7, p. 67). Since the pipeline must be buried in the area of submarine cables that are installed after the pipeline has been laid, and each submarine cable to be installed after the pipeline has been laid must be provided with a rock placement in the intersection area, the trench length of the pipeline and the number of rock placements to be taken into account are reduced. The fewer submarine cables installed prior to pipe laying, the longer the two trenches in the intersection area and the more stone placements have to be produced during the subsequent cable installation. Therefore, the worst-case scenario is scenario is laying 2 cables before the pipeline is installed and 4 cables after, i. e. four rock placements will be necessary (area: 3,920 m², volume: 3,360 m³) (cf. application document, part D1.01, chapter 6.5.2, p. 699).

Based on the above illustrations, the construction of the Nord Stream 2 pipeline route and the laying of the cables connecting the offshore wind farm clusters "Westlich Adlergrund" and "Arkona See" in the Greifswalder Bodden region and the mouth of the bay may overlap in terms of time. This combination of events can lead to significant adverse environmental impacts resulting from the use of habitat types, the development of turbidity plumes and disruptive effects on animals. In the assessment of a possible interaction, the same impact factors will be analysed below as in the assessment of the significant adverse environmental impacts of the Nord Stream 2 pipeline. The effective factors taken into account are therefore the required

temporary land use, as well as material and non-material impacts during construction and operation, if they are likely to have a detrimental effect on habitats or species (see application document, part D1.01, chapter 6.5.2, p. 701).

Land take

As far as land take is concerned, both projects assume that marine biotope types will be affected. Both projects envisage backfilling the trenches with autochthonous material. Since the effects on the water depth are very similar, a similar regeneration process of the affected sea bed can be assumed. The Nord Stream Pipeline Monitoring was able to demonstrate that within two to four years there was a regeneration of the benthic population and that there were no restrictions on the function and features of the communities (see application document, chapter 4.1.6, p. 57, chapter 4.2.6, p. 110). After three years, the affected areas are once again completely available as feeding grounds for e.g. fish-eating birds or benthophagous sea ducks.
In summary, it should be noted that if the Nord Stream 2 pipeline and submarine cables are built at the same time, this will lead to a larger temporary impairment of the benthos due to construction. Since the benthos community will regenerate again within two to four years after the restoration of the abiotic site conditions, there will be no significant adverse environmental impacts for the benthos (see application document, part D1.01, chapter 6.5.2, p. 701).

Turbidity plumes

Concerning the formation of turbidity plumes, the simultaneous implementation of the construction work on the seaward side in 2018 at worst results in an increase of up to 50% in the total amount of sediment resuspended by dredging work. Since no macrophytes colonise the course of both routes, their effects on them are furthermore excluded. According to the location of the cable routes and the Nord Stream 2 pipeline route, the increased disturbance effects on benthos, fish, birds and marine mammals are concentrated in the eastern part of the Bodden between Landtief and the industrial port of Lubmin by turbidity plumes from both projects, so that the temporarily impaired area within the Greifswald Bodden and the Pomeranian Bay will nevertheless only increase slightly (cf. Application document, part D1.01, chapter 6.5.2, p. 701).
Turbidity monitoring showed that, compared to the Nord Stream 2 pipeline, Nord Stream's pipelines laid in the same manner were able to demonstrate that turbidity plumes arising during the installation had a maximum extension of 200 m in Pomeranian Bay and up to 500 m in the Greifswald Bodden (Nord Stream Monitoring Turbidity Plumes 2010, p. 43 et seq.). The cables for the network connection are also laid or flushed in a trench, so a similar turbidity behaviour can be assumed. Due to the fact that turbidity is limited to a few months on the one hand and occurs locally and is of medium intensity on the other hand, this combination does not result in any significant adverse environmental impacts (see application document, part D1.01, chapter 6.5.2, p. 702).

Remobilization of phosphate from sediment

Simultaneous construction work on the seaward side could also lead to an increase of up to 50% in the total amount of remobilised phosphate in worst case conditions with regard to the remobilization of phosphate from the sediment. The forecast for the worst case scenario for the entire Nord Stream 2 project is a redissolving of up to 15 t phosphate (see application document, part D1.01, chapter 6.2.2.2.1, p. 504). This amount would correspond to an increase of up to 5% (400 t/a, cf. application document, part D1.01, Chap. 6.2.2.2.1, p. 504) in the mean annual phosphate input / internal natural release. From this point of view, it cannot be assumed that the added accumulation of phosphate resulting from dredging fine sand with low organic content could have a measurable effect on the primary production of phytoplankton within the Greifswald Bodden. Therefore, there are no significant adverse environmental impacts resulting from the combined action (see application document, part D1.01, chapter 6.5.2, p. 702).

Sound emissions from ships and visual disturbances

The maximum disturbance effect around a building site ship for disturbance-sensitive species of resting birds (sea divers, sea ducks) is around three kilometres (cf. application document, F.07, chapter 6.1.2.5, p. 172). For fish and marine mammals, the disturbance is less (cf. application document, part D1.01, chapter 6.5.2, p. 702). The simultaneous operation of the construction site fleets for the Nord Stream 2 installation and the power cable connection results in an increased area of disturbance. However, this is limited in time for each area because the laying fleets move on the water. In addition, it is to be assumed that the affected species can be avoided, as there are sufficient and undisturbed areas in the immediate vicinity for food to be found by resting birds or as a feeding and transit area for marine mammals. Fish in the immediate vicinity of the vessels are displaced for the duration of their presence and then return to the previously disturbed areas. In addition, no construction work takes place in the sea area before 15 May of a construction year (exclusion period), so that the herring remains undisturbed during its spawning period. Due to the fact that interfering effects are limited to a few months on the one hand and occur locally and of medium intensity on the other hand, this combination does not result in any significant adverse environmental impacts (see application document, part D1.01, chapter 6.5.2, p. 702).

The Nord Stream 2 pipeline project and the project to install and operate 6 AC systems (220 kV) to connect the offshore wind farm clusters "Westlich Adlergrund" and "Arkona-See" (50Hertz) to the grid will therefore not lead to any significant adverse environmental impacts in the sea area.

B.4.4.2.9.1.2 Nord Stream Pipeline:

The operational effects resulting from external inspections and repair work and, if necessary, correction of the free sagging of the Nord Stream pipeline could cause the environmental impacts of both projects to interact during the Nord Stream 2 pipeline construction phase. This applies mainly to impacts from turbidity as well as optical and acoustic disturbances of disturbance-sensitive animal species caused by

shipping traffic. The effects are local, short-term and low-intensity, which means that the construction-related effects of the Nord Stream 2 pipeline can only be amplified to a limited extent. In addition, corrections of free sagging on the Nord Stream pipeline have not been made since commissioning and are therefore unlikely to occur in conjunction with the effects of the construction of the Nord Stream 2 pipeline. There are therefore no significant adverse environmental impacts resulting from the interaction (see application document, part D1.01, Chap. 6.5.2, p. 703).

The Nord Stream pipeline is equipped with a similar passive corrosion protection system as the Nord Stream 2 pipeline. As a result, emissions from the sacrificial anodes in conjunction with the Nord Stream pipeline, which has already been laid, will be additive. The amount of metal potentially dissipated in solution is roughly doubled with the implementation of the project considered here (cf. application document, part D1.01, Chap. 6.5.2, p. 703). The sacrificial anodes are designed to have a service life of 50 years. During this time, up to 50% of the active material can be consumed. For the pipeline sections laid in the seabed, which is predominantly the case in the 12 nautical mile zone, it can be assumed that some of the quantity of dissolving metal will accumulate on site in the seabed. The impacts are local, long-term and also of low intensity, which does not result in any significant adverse environmental impacts (cf. application document, part D1.01, Chap. 6.5.2, p. 703).

In the case of the Nord Stream 2 and Nord Stream Pipeline projects, the possibility of significant adverse environmental impacts occurring in the sea area can thus be excluded.

Conclusion

It should be noted that the assessments of environmental impacts do not change as a result of the inclusion of the above-mentioned projects, i.e. do not (further) intensify to such an extent that a combination of the environmental impacts assessed as negligible would be considered significant.

B.4.4.2.9.2 Shore side

For the land area, a study is being carried out with the interacting projects of the natural gas receiving station Lubmin 2 (EST Lubmin 2) and the European gas connection pipeline EUGAL. A description of these planned projects is given in Chapter 1.2.2 of the Environmental Impact Assessment (see application document, Part D1.01, Chapter 1.2.2, p. 39) and in Sections B.1.3 and B.4.2.1 of this plan approval decision. Plans for the Lubmin 2 natural gas receiving station and the EUGAL project are also currently within the planning approval process according to EnWG, and the competent authority is also the Stralsund mining authority. The construction periods of the aforementioned projects are expected to be in 2018 and 2019.

On the basis of the environmental impact study (cf. application document, part D1.01, chapter 6.5.3, p. 704) and the impact factors considered on the basis of the current planning status for the Lubmin 2 natural gas receiving station and the EUGAL project, the impact assessment of the impacts related to the protected assets has shown that significant adverse environmental impacts, taking into

account prevention and mitigation measures in the context of the above-mentioned projects in the land area, can only be ascertained with regard to the protected assets including animals, plants and biodiversity (cf. application document, part D1.01, chapter 6.5.3, p. 717, Tab. 6-55). The cumulative effects of land use, the removal of forest, scrub and herbaceous vegetation from the above-mentioned projects and the removal of forest, scrub and herbaceous vegetation from the construction site and the removal of topsoil for the above-mentioned projects, together with the EUGAL project, will lead to the spatial extension of the loss of animals and reproduction sites, and reproductive and developmental stages for breeding bird species increasing from "small-scale" to "medium-scale". Application document, part D1.01, chapter 6.5.3, p. 717, tab. 6-55). This greater extent of the above-mentioned impact results in an average overall assessment. As a result, the accumulation of the effects of the Nord Stream 2 and EUGAL projects has resulted in an additional significant adverse environmental impact on the fauna, flora and biodiversity, which is assessed and compensated for in their own permission procedures.
For all other impacts on the protected assets, the accumulation of the land-based factors will not lead to the significance threshold being exceeded any further by an impact from the Nord Stream 2 project.

Conclusion

Compensation in accordance with the intervention regulation of Section 15 BNatschG is made here by means of initial afforestation or the allocation of initial afforestation areas from the B-Plan area pool of the EWN, which are intended to compensate for the intervention in terrestrial biotopes (see Section B.4.8.4.4.1). Accordingly, compensation is partly equivalent and not identical, so that real compensation is not provided for all protected assets in the sense of the UVPG. With regard to the protected assets of animals, plants and biodiversity, it can be assumed that the functions of the B-Plan area pool of the EWN (see Section B.4.8.4.4.1) will in any case be partially restored in the same way and not only in an equivalent manner, as a result of the planned initial afforestation or the allocation of initial reforestation areas from the B-Plan area pool of the EWN (see Section B.4.8.4.4.1).
It cannot therefore be ruled out that the project will have a significant adverse environmental impact in relation to the protected assets of land-based fauna, flora and biodiversity, taking into account the accumulation of projects, although this is justifiable, because the legal requirements are also met on land with regard to the protected assets of fauna, flora and biodiversity, the impacts are avoided to the extent that they are reasonable and are therefore not as serious, such that they could not be accepted in terms of the purpose and scope of the project (see Section B.4.1).

B.4.4.3 General and site-related preliminary examinations of the individual case within the framework of the determination of the EIA obligation pursuant to Section 7 UVPG (in conjunction with Section 9 (1) sentence 1 No. 2, (4) UVPG)

As part of the planning approval procedure for the project in question, the project promoter submitted a supplementary volume “Ergänzungsband: Konkretisierungen” (Supplementary Volume: Further Specifications) to the planning approval authority on 2 November 2017. This 1st amendment of the plan contains a fundamentally

revised and updated concept for the compensation of interference in nature and the landscape within the meaning of Sections 13 of BNatSchG. The compensation measures presented contain several individual measures. There is an obligation to carry out a general or site-specific environmental impact assessment (preliminary environmental impact assessment) for the measures listed below (see Sections B.4.4.3.1 to B.4.4.3.6). The preliminary EIA assessment is carried out here as a precautionary measure, irrespective of whether or not the respective (partial) measure is ultimately planned.

B.4.4.3.1 Production of trench closures to restore the natural flooding dynamics of the island Schadefähre

The compensation measure originally planned for the island of Schadefähre aims at restoring a natural flood regime, ending the drainage effect of the former network of melioration ditches by constructing trench closures and thus stopping the peat mineralisation and the resulting discharge of nutrients into Peenestrom and subsequently also into the Greifswald Bodden. At the same time, the reedbed vegetation is to be converted back into sedge reeds by means of a permanent preservation system, or where these are already present, they should be continued. Since sedge reeds serve as a breeding habitat for various species of endangered meadow birds (snipe, redshank, reed warbler, etc.), the reintroduction of these breeding bird species is a further aim of the measure.
Part of the compensation measure for the island is the restoration of the island's natural flooding dynamics by ending the drainage effect of the island's trench system with trench closures and stopping peat mineralisation. For this purpose, 13 trenches will be (partially) closed by closures with existing peat up to the topsoil, so that the flood water of the Peene and the precipitation water are retained in the area for a longer period of time. The water levels then sink more slowly. It is possible that areas of open water may be formed. The trenches are to be filled with slightly permeable peat. The degraded topsoil layer must be removed to fill the trenches. there is sufficient peat in the area for transport routes to be kept to a minimum. Before beginning to refill the trenches, the trench sections intended for this purpose must be mown and any sludge deposits present in the area of the trench must be removed.
The manufacture of trench closures is a new project within the meaning of Section 7 in conjunction with Section 7. Section 2 Paragraph 4 sentence 1 no. 1 lit. c UPVG, since the manufacture of trench closures is a measure affecting nature and the landscape without altering or extending the implementation of such a measure (cf. Section 2 Paragraph 4 sentence 1 no. 2 lit. c UVPG). The compensation measure “Insel Schadefähre” (Schadefähre Island) was already included in the application documents for the Nord Stream 2 project planning approval under energy law (see application document, part G. 01, chapter 11.2.4.4). However, the compensation measure originally envisaged did not go beyond a preparatory planning stage in terms of content, nor were action sheets for it submitted.
In accordance with No. 13.18.2 of Annex 1 to the UVPG, a site-specific preliminary examination of the individual case is to be carried out in accordance with Section 7 Paragraph 2 UVPG for the production of trench closures as a means of waterway development in the WHG. In accordance with No. 13.18.2 of Annex 1 to the UVPG, expansion measures within the meaning of the WHG that are not covered by Nos. 13.1 to 13.17 of Appendix 1 to the UVPG, require a site-specific preliminary examination of the individual case, if it concerns a near-natural development of

streams, ditches, retention basins and ponds, small-scale near-natural reshaping, such as the removal of stream and trench piping, the laying of road ditches in the built-up area and their small-scale piping or the implementation of gravel ditches. The trench filling measure using the materials available on site can be seen as a near-natural construction of trenches.
According to the legal definition of Section 67 Paragraph 2 sentence 1 WHG, a watercourse development in the sense of the Federal Water Resources Act (WHG) is the creation, disposal and substantial transformation of a watercourse or its banks. A watercourse development does not exist if a watercourse is only created for a limited period of time and the water regime is not significantly affected as a result (Section 67 Paragraph 2 sentence 2 WHG). Dams and embankments that influence the flow of flood water, as well as coastal protection structures, are equivalent to the development of watercourses (Section 67 Paragraph 2 sentence 3 WHG). Trench filling is a waterway construction in the sense of Section 67 Paragraph 2 sentence 1 WHG. A waterway construction is therefore any measure that aims to change the state of the watercourse by way of water management, or to change the state of a watercourse including its banks in a way that is important for the water balance or in any other way (Spieth, in: Giesberts/Reinhardt, BeckOK Umweltrecht, 44. Edition, Status: 01.08.2017, Section 67 WHG, recital 8). An essential transformation is always a given if a structural measure affects the state of the body of water in a way that is important for the water balance (water level, water discharge), the water management, the ecology of the body of water or in any other respect (VGH Hessen, Urt. v. 01.09.1998,7 UE 2170/95, juris recital 36). Since the backfilling of the 13 trenches is intended to affect the water level on the island of Schadefähre in such a way that the flood water will flow more slowly and the water level on the island will therefore be increased over a longer period of time, thus restoring the natural flooding dynamics, the filling of the trenches will have an impact on the water balance in the form of water drainage.

B.4.4.3.1.1 Data basis

The following documents form the basis of the site-specific preliminary examination of the individual case to determine whether or not there is a duty to carry out an environmental impact assessment (EIA):

- Complete application documents for the entire Nord Stream 2 project,
- Application documentation, supplementary volume: Specification, Document 2 - Compensation measure for the island of Schadefähre, with information according to Annex 2 of the UVPG on the characteristics of the project and the location as well as on the possible significant environmental impacts of the project (see Section 7 Paragraph 4 UVPG),
- Application documentation, supplementary volume: Specification, document 6 - Compilation of the instruction sheets,
- Opinions of the competent authorities and associations regarding the 1st revision to plans.

B.4.4.3.1.2 Decision on the EIA obligation of the project

For the above-mentioned project, the planning approval authority establishes ex officio that there is no obligation to carry out an environmental impact assessment in accordance with Section 5 (1) sentence 1, sentence 2 No. 3 UVPG.
The decision that it is not necessary to carry out an environmental impact assessment shall be made known to the public in accordance with Section 5 Paragraph 2 UVPG specifying the essential reasons for the non-existence of the EIA obligation with reference to the respective relevant criteria in Annex 3 to the UVPG and specifying which characteristics of the project or site or which precautions are relevant for this assessment, by way of the usual local announcement of a plan approval decision by the local planning authorities (Section 74 Paragraph 4 of the Administrative Procedure Act Mecklenburg-Western Pomerania (VwVfG M-V)) or otherwise made public (Section 74 Paragraph 5 VwVfG M-V).
Pursuant to Section 5 Paragraph 3 sentence 1 UVPG, the statement cannot be independently challenged.

B.4.4.3.1.3 Reasons for the decision

The decision derives from the expert assessment of the above documents, which were examined with regard to the criteria for the preliminary examination of the individual case in accordance with Annex 3 to the UVPG. In order to make the decision comprehensible and transparent, the essential characteristics of the project and its location, the nature and characteristics of possible significant adverse environmental impacts of the project and the arrangements envisaged by the promoter, which obviously exclude such effects, are summarised below.

B.4.4.3.1.3.1 Resilience of the protected assets (protection criteria)

In the case of the project to produce the trench closures, there are special local conditions, measured against the protection criteria listed in No. 2.3 of Annex 3 to the UVPG, since the Natura 2000 sites "Peeneunterlauf, Peenestrom, Achterwasser und Kleines Haff" (DE2049-302) and "Peenetallandschaft" (DE2147-401) (No. 2.3.1 of Annex 3 to the UVPG), the nature reserve "Unteres Peenetal" (Peenetalmoor) (No. 2.3.2 of Annex 3 to the UVPG), the landscape conservation area "Unteres Peenetal und Peene-Haff" Vorpommern-Greifswald (No. L67a) (No. 2.3.4 of Annex 3 to the UVPG) and the biotope "Schadefähre, NSG" Unteres Peenetal" (OVP10283) (No. 2.3.7 of Annex 3 to the UVPG), which is legally protected in accordance with Section 30 BNatSchG, will be affected in a relevant manner.

Criteria	No	Yes	Information on the criteria (Type and scope)
Sites of community importance and bird sanctuaries in accordance with Section 32 BNatSchG, Section 21 NatSchAG M-V (also impairments which can have an external impact on the area)		x	The production of the trench closures is planned in the Site of Community Importance (SCI) "Peeneunterlauf, Peenestrom, Achterwasser und Kleines Haff" (DE2049-302) and in the European Bird Sanctuary "Peenetallandschaft" (DE2147-401). The protection objectives of the

Criteria	No	Yes	Information on the criteria (Type and scope)
			aforementioned Natura 2000 sites are not affected by the project. Impairment that may be caused by noise emissions during the construction of trench closures is ruled out for the protected bird species by means of prevention and mitigation measures as well as a construction period regulation (construction work only outside the breeding periods of the target bird species).
Nature conservation areas in accordance with Section 23 BNatSchG including regulations under state law	x		The project area is located in the "Unteres Peenetal" (Peenetalmoor) nature conservation area. The conservation objectives of the nature conservation area are not affected.
National parks and national natural monuments in accordance with Section 24 BNatSchG including regulations under state law	x		-
Biosphere reserves and landscape protection areas in accordance with Sections 25, 26 BNatSchG	x		The project is located in the "Unteres Peenetal and Peene-Haff" (Vorpommern-Greifswald) landscape protection area no. L67a. The conservation objectives of the "Unteres Peenetal and Peene-Haff" landscape protection area are not affected.
Natural monuments in accordance with Section 28 BNatSchG	x		-
Protected landscape components, including avenues, in accordance with Section 29 BNatSchG	x		-
Legally protected biotopes according to Section 30 BNatSchG		x	The project is located in the legally protected biotope Schadefähre, "Unteres Peenetal" nature conservation area (OVP10283). Natural and unspoilt stream and river sections are protected, including riverbank vegetation, reeds and reed beds; areas of sedimentation of standing bodies of water and bodden waters with areas of sediment. The protection objectives of the legally protected biotopes are not affected. In addition, the biotope properties are

Criteria	No	Yes	Information on the criteria (Type and scope)
			also improved. The Schadefähre biotope is supported by removing or reducing the drainage effect of the trench system.
Water protection areas in accordance with Section 51 WHG, mineral spring protection areas in accordance with Section 53 (4) WHG, risk areas in accordance with Section 73 (1) WHG as well as flood areas in accordance with Section 76 WHG including regulations under regional law	x		-
Areas where the environmental quality standards laid down in European Union legislation have already been exceeded	x		-
Areas with a high population density, especially central places in terms of population density. Section2 (2) No. 2 ROG including provisions under regional law	x		-
Monuments, groups of monuments, landmarks or areas listed in official lists or maps which have been classified as archaeologically significant landscapes by the national authority designated by the federal states, including regulations under national law.	x		-

B.4.4.3.1.3.2 Assessment of significant adverse environmental impacts

The above examination revealed special local conditions (Section 7 Paragraph 2 sentence 3 UVPG). Taking into account the criteria listed in Annex 3 of the UVPG, the examination carried out on the basis of the criteria stated in Annex 3 to the UVPG has shown that the construction of the trench closures cannot have any significant adverse environmental effects which affect the special sensitivity or the protection objectives of the aforementioned Natura 2000 sites or the legally protected biotope and which would have to be taken into account when deciding on the approval of the project (Section 7 (2), sentence 5,6 UVPG).

B.4.4.3.1.3.2.1 Characteristics of the project

Federal State:	Mecklenburg-Western Pomerania
District/Office:	Vorpommern-Greifswald / Anklam-Land

Community:	Bargischow
Utilisation:	Island of Schadefähre, area 89.6 ha
Scope:	13 trench plugs

Criteria	No	Yes	Clarifications
Size and design of the entire project	x		13 sites on the island if Schadefähre will be filled at the respective outlet points of the northern trenches to Peenestrom with soil. In this way, the retention of flood water and rainwater can be achieved on the island of Schadefähre. Larger areas of the island will be submerged and this will also have a longer-lasting impact on water levels in the central and northern part of the island. In addition, irrigation of the ditches that have not yet silted up will also be effected in the event of flooding. The filling is to be carried out by means of low permeable peat. For this purpose, material from the removal of the degraded topsoil layer is used.
Interaction with other existing or authorised projects and activities	x		There is no interaction with other existing or authorised projects and activities.
Use of natural resources, in particular land, soil, water, animals, plants and biodiversity	x		Area: The modification or expansion of site areas is only carried out selectively on the existing trench system. Soil: It is foreseeable that there will be no sealing or large-scale relocation of soil at the respective project sites. If necessary, individual floor slabs and associated small-scale soil compaction and relocation work may have to be carried out on necessary ditch crossings. Water: No construction-related water retention measures are required for closing the trenches. Impairment during construction due to the introduction of pollutants into the groundwater is ruled out by means of standard prevention and mitigation measures. Fauna and Flora: Biotope structures close to nature are not utilised at the project location. Only the access routes will be temporarily influenced. No FFH species groups are significantly affected according to Annex II of the Habitats Directive. The

Criteria	No	Yes	Clarifications
			habitats of the otter, beaver and the potential habitats of the Desmoulin's whorl snail and narrow-mouthed whorl snail are affected only insignificantly locally and for construction reasons, as they are only very small-scale and of very short duration. The trench closures potentially benefit the meadow wading birds, but do not impair them under any circumstances. Impairments due to noise emissions during construction are excluded by means of standard prevention and mitigation measures as well as regulation of construction time (production of trench closures outside breeding periods for the target bird species) for the protected bird species. Impairment of the landscape and the scenery due to local and temporary effects of hydraulic engineering measures (closure of trenches) must be excluded. <u>Biological Diversity:</u> Since only a small area is affected and the implementation of the project only lasts a short time, there is no impact on biodiversity.
Waste generation in the sense of Section 3 Paragraph 1,8 KrWG	x		The waste arising from the operation of construction machinery and vehicles is to be collected and sent for professional disposal. The corresponding legal regulations are to be observed.
Environmental pollution and nuisances	x		Only local and construction effects due to the trench closures are to be expected. The soil material in the vicinity of the project is used. The guideline values of AVV Construction Noise Control Regulations are complied with.
Risks of incidents, accidents and disasters related to the project including incidents, accidents and disasters which, according to scientific evidence, are caused by climate change, in particular with regard to:	x		The planned construction measures are to employ common building methods which are carried out using state of the art techniques. The risk of accidents is therefore low. The risk of pollutants escaping into the aquatic environment is also estimated to be low. If the safety regulations are complied with, an increased risk of

Criteria	No	Yes	Clarifications
• Materials and technologies used • The susceptibility of the project to accidents as defined in Section 2 No. 7 of the Accident Regulations, in particular due to its completion within the an appropriate safety distance to operating areas as defined in Section 3 Paragraph 5a BImSchG.			accidents can be ruled out. As a result, the production of the trench closures and the associated rewetting of the island of Schadefähre will have no impact on climate change in the adjacent sense, and since the measures will be carried out only where rewetting is to be achieved i.e. locally, on a small scale and selectively on the island.
Risks to human health, e. g. from contamination of water or air pollution	x		The closure of trenches and the associated rewetting do not pose any project-related risks to human health, as these only have the effect of keeping rainwater and flood water of the Peene in the area for a greater period of time. The project will have a positive impact on the hydrology/water quality of the island.

B.4.4.3.1.3.2.2 Location of the project

The assessment of the ecological sensitivity of the areas which may be affected by the project includes, in addition to the following utilisation and quality criteria, the protection criteria described above (Subclause 2.3.1) in accordance with No. 2.3 of Annex 3 to the UVPG.

B.4.4.3.1.3.2.2.1 Usage criteria

The project is located on the island of Schadefähre. The effects are limited in their locality and specifically to the 13 (partially) closed trenches. Areas which are currently fallow and partially wetted are used. The project concerns habitats for otters and beavers as well as potential habitats for the Desmoulin's whorl snail and narrow-mouthed whorl snail.
The construction schedule is adapted to the hydrological situation of the island of Schadefähre. Residential areas or areas under development are not affected by the project and its hydrological effects. Areas of particular importance for recreational use or tourism as well as areas used for the agricultural, forestry and fishing industries, including supplying them and disposing of waste from them, are not affected.
Cumulative effects with other existing or authorised projects and activities are excluded.

B.4.4.3.1.3.2.2.2 Quality criteria

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
Area	x		This this is selective use of the area at the 13 trenches to be filled.
Soil, in particular soils with special functions for the natural environment (e.g. soils with special site characteristics, with a cultural/natural-historical significance, raised bogs, old forest sites), sensitivity to soil erosion and material contamination of the soil.	x		The project will affect soils with strong characteristics of flooding moors (deep moorland sites with a groundwater corridor spacing of predominantly less than 0.5 m); there are bog soils on the entire island, mineral soil is not present. As a result of improvement measures during the GDR period, peat mineralization began. Regeneration of the soil is ensured, as the moorland soil remains directly on site and the trench closures are produced with existing peat up to ground level. The location and dimensions of the peat digging areas depend on the location of the installation sites; transport routes are thus kept to a minimum.
Landscape	x		The landscape at the project site, and thus the island of Schadefähre, has a strong flooding moor character (deep moorland sites with a ground water surface distance of predominantly less than 0.5 m); the entire island is covered with bog soils, mineral soil is not present. As a result of improvement measures during the GDR period, peat mineralization began. After the abandonment of use around 1980, the existing meadow biotopes became reeded and lost their biodiversity. In the north-east of the island there are clear depressions of approx. 250 m² due to peat cutting.

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
Water, including groundwater	x		Water: Regular flooding of the island leads to a constant input of nutrients and brackish water. The water level on the island is generally influenced by flood events. The continuous level of the island of Schadefähre lies at the water level 5+ at the limit of 4+. Drainage of the island has led to the formation of a topsoil horizon with unfavourable physical properties, including reduced water storage capacity and water permeability. In the north-east of the island there are clear depressions of approx. 250 m² due to peat cutting. The water level on the island of Schadefähre is generally influenced by flood events. Without the water supply from floods, the water level on the island falls relatively quickly. WFD-relevant waters are not present on the island itself. The planned trench closures reduce the diffuse nutrient load and thus support the objectives of the WFD for the Peene (UNPE-0100) and Peenestrom (WP_16) bodies of water.
Fauna, flora and biodiversity	x		At present, the biotope types reed and sedge beds (VRP, VRL) and large sedge reed beds (VGR) can be found on the island of Schadefähre. Species habitats for otters and beavers (species listed in Annex II of the Habitats Directive) are present on the island and may be affected by local construction. Potential habitats of the Desmoulin's whorl snail and narrow-mouthed whorl snail (Annex II FFH-RL) are present at the project site. Meadow wading birds are present on the island, the target species aquatic warbler and rails are not found on the island.
Other natural resources	x		-

B.4.4.3.1.3.2.3 Nature and characteristics of the possible effects

In the following, the possible significant environmental impacts on the listed protected assets are roughly described on the basis of the nature and characteristics of the project, and the significance of the adverse effects on the environment is assessed using criterion 3 to the UVPG, Annex 3.

B.4.4.3.1.3.2.3.1 People, including human health

No effects due to hydrological changes; no adverse effects due to noise (compliance with the guide values of the AVV Baulärm [German Construction Noise Ordinance]); no traffic restrictions; the protected assets are not otherwise affected.

➔No negative environmental impact

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.3.2.3.2 Fauna, flora and biodiversity

Temporary, local impact on near-natural biotope structures on the access route; temporary, local effects on species and biocommunities limited to the existing spectrum of species at the construction sites on the respective trench; regeneration given that moorland soil material remains directly on the site; no negative impact on species listed in Annex II of the Habitats Directive and protected bird species; no impairment of Natura 2000 conservation objectives; and the nature reserve and the protected landscape area; compatibility with the protection goals of legally protected biotopes; no project-related impacts on biodiversity

➔Project impacts on species and biocommunities are limited to specific areas and sites; no significant adverse environmental impacts on animals and plants; improvement of the biotope characteristics of legally protected biotopes; no impact on biodiversity.

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5,6 UVPG

B.4.4.3.1.3.2.3.3 Area

Only selective modification/extension of the existing trench systems

➔Extremely slight, selective change; no negative effects known

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.3.2.3.4 Ground

No sealing; no large-area soil relocation; temporary, local, construction period effects; if necessary, isolated small-scale soil compaction and relocation at

necessary ditch crossings; impact on moor soils; use of moor-protecting technology limits impacts to a minimum; positive effects on moorland bodies by reducing peat degradation.

➔Local soil movements during the construction phase; material remains on site; use of peat-friendly technology; overall positive effects on soil due to the project

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.3.2.3.5 Water

Temporary, local, construction period effects; no significant project effects under adherence to prevention/mitigation measures such as consideration of the seasonal hydrological situation on the island of Schadefähre; positive effect on water quality as a whole, by reducing the discharge of nutrients from the peat layer.

➔No water retention measures due to construction; harmful substances can be introduced into groundwater during construction, but prevention and mitigation measures are envisaged; positive effect on water quality

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.3.2.3.6 Air / Climate

Temporary, local, construction period effects due to pollutant emissions from individual construction vehicles; use of low-emission construction vehicles; no impact on the climate

➔Temporary, local, insignificant emissions of pollutants from individual construction vehicles during the construction period; use of low-emission construction vehicles

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.3.2.3.7 Landscape

No effects on the landscape and scenery

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.3.2.3.8 Cultural heritage and other material goods

No known concern

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.3.2.3.9 Interaction between the aforementioned protected assets

In the previous analysis of the individual protected assets and the assessment of the effects of the project with regard to the protected asset, the expected and decision-relevant effects were recorded. Interactions between the individual protected assets including soil, fauna, flora and water are intended as a positive effect of the measure in terms of nutrient reduction and rewetting.

➔No negative environmental impact due to interactions

Conclusion: No significant adverse environmental impacts within the sense of Section 7 Paragraph 2 sentence 5, 6 UVPG

B.4.4.3.1.4 Summary

The nature and extent of the project-related effects on the protected assets cannot be assessed as significant in the present documents, in particular with regard to the geographical area concerned, the population concerned, the severity and complexity, the likelihood, duration, frequency, reversibility and the interaction of the impacts with the impacts of other existing or authorised projects, as well as mitigation measures. The impacts do not have a cross-border character.
Taking into account the criteria listed in Annex 3 to the UVPG, the project does not have any significant adverse environmental impacts which affect the special sensitivity or the protection objectives of the area and which would have to be taken into account in the approval decision in accordance with Section 25 (2) UVPG (Section 7 (2) Sentence 5,6 UVPG). There is no requirement to carry out an environmental impact assessment for the project.

B.4.4.3.2 Integration of an additional filtration in the Bergen wastewater treatment plant

The "Measure for nutrient reduction in the small Jasmunder Bodden including integration of additional filtration in the wastewater treatment plant Bergen" (compensation measure E5) is part of the "Measures to improve the ecological status of the small Jasmunder Bodden (Rügen)" (compensation measures E3 to E5, E1m), with establishing an extensive, nutrient depletion pasture management on the available grassland biotopes in the rewetted Ossen lowland for the purpose of keeping open and developing species rich eutrophic wetlands and wet meadows with temporary influence of salt water on fens, a conversion of arable land with a land value of <<50 into permanent grassland biotopes achieved to a limited extent for the purpose of improving the feasibility of a year-round pasture concept (pasture grazing with cattle and horses) and a voluntary additional filtration of nutrients in the wastewater treatment plant Bergen, east of the Ossen lowland in the small Jasmunder Bodden. The aim of the overall measures is to increase the biodiversity of grassland vegetation by grazing, hoof impact loading and seed transport, to increase the occurrence of submersed macrophytes and the diversity of aquatic animal species (fish, invertebrates), to improve breeding and resting habitats of waterfowl species, and to reduce the discharge of nutrients into the Great Jasmunder Bodden / Westrügenschen Bodden.

No environmental impact assessment has so far been carried out for the existing wastewater treatment plant in Bergen. According to the project sponsor concept, the existing wastewater treatment plant is to be extended by integrating an additional filtration system. From a structural point of view, this extension is to be carried out in such a way that an existing decommissioned clarification tank is demolished and additional plant components (filling station, methanol tank, precipitant tank, dosing pump equipment, DL/E station, flushing water pumping station with filter, inlet / outlet shaft) and supply and discharge pipes are installed on the vacated area. For this purpose, the project sponsor has concluded a planning and construction agreement with the operator of the plant (Zweckverband Wasserersorung und Abwasserbehandlung Rügen - ZWAR (Rügen Joint Body for Water Supply and Wastewater Treatment)) (agreement of 15.12./18.12.2017). According to the above agreement, the project sponsor is to act as the client in consultation with the ZWAR. The aforementioned construction measures require a building permit from the responsible building authority (Section 59 Paragraph 1 LBauO M-V) in accordance with the regional building regulations as a modification / extension to an existing building structure. No such building permit has been granted at present. In addition, for the intended establishment of the additional purification stage as an additional reduction for the purpose of nutrient reduction in the waters used, the modification of the permit granted under water law for the existing plant is required (Section 8 WHG). This change in the permit granted under water law was granted to the ZWAR as operator of the plant by the lower water authority on 18 December 2017.
Pursuant to Section 9 Paragraph 2 sentence 1 no. 2 UVPG, the proposed amendment is subject to a preliminary environmental impact assessment. Pursuant to point 13.1.2 of Annex 1 to the UVPG, a general preliminary examination of the individual case is to be conducted pursuant to Section 7 Paragraph 1 UVPG (in conjunction with Section 9 para 2 sentence 1 no. 2, para 4 UVPG) for the construction and operation of a wastewater treatment plant designed for organically contaminated wastewater of 600 kg / d to less than 9,000 kg / d biochemical oxygen demand in five days (raw) or inorganic polluted wastewater from 900 m^3 to less than 4,500 m^3 of wastewater in two hours (excluding cooling water). The authority responsible for carrying out the preliminary EIA review is the authority that decides on the approval of the project in question. Such a preliminary EIA examination was therefore carried out by the competent regional water authority in the course of the water licensing procedure. The assessment by the water authority showed that no significant adverse environmental impacts were to be expected from the project. An EIA is therefore not necessary. As the Stralsund Mining Authority, as the planning approval authority, has no responsibility for the approval of the construction, modification and operation of the waste water treatment plant in question, the Stralsund Mining Authority therefore has no obligation to carry out a preliminary EIA examination in this respect. Since the project sponsor of the planning approval authority in its supplementary volume: Specification has submitted information to the UVPG in accordance with Annex 2 which allows for a preliminary examination, the planning approval authority has assumed by way of a legal subordination a precautionary obligation to carry out a preliminary EIA examination. This precautionary preliminary EIA examination has revealed the following:

B.4.4.3.2.1 Data basis

The following documents form the basis of the general preliminary examination of the individual case to determine whether or not there is a duty to carry out an environmental impact assessment (EIA):

- Complete application documents for the entire Nord Stream 2 project,
- Application documentation, supplementary volume: Specifications, document 3 - Measures to improve the ecological status of the Little Jasmund Bodden (Rügen), with information in accordance with Annex 2 to the UVPG on the characteristics of the project and the site as well as on the possible significant environmental impacts of the project (cf. Section 9 Paragraph 2 Clause 1 No. 2, Paragraph 4 in conjunction with Section 7 Paragraph 4 UVPG),
- Application documentation, supplementary volume: Specification, document 6 - Compilation of the instruction sheets,
- Opinions of the competent authorities and associations regarding the 1st revision to plans,
- 1st amendment to the permit under water law WE 04/KA/03/99 of 17.02.2015 issued by the administrative district of Vorpommern Rügen on 18.12.2017.

B.4.4.3.2.2 Decision on the EIA obligation of the project

For the above-mentioned project, the planning approval authority establishes ex officio that there is no obligation to carry out an environmental impact assessment in accordance with Section 5 (1) sentence 1, sentence 2 No. 3 UVPG. The determination of non-existence of the obligation to carry out an environmental impact assessment shall be made known to the public in accordance with Section 5 Paragraph 2 UVPG specifying the essential reasons for the non-existence of the EIA obligation with reference to the respective relevant criteria in Annex 3 to the UVPG and specifying which characteristics of the project or site or which precautions are relevant for this assessment, by way of the usual local announcement on the interpretation of a copy of the plan approval decision (Section 74 Paragraph 1 of the German Stock Corporation Act). 4 VwVfG M-V) or public (Section 74 Paragraph 5 VwVfG M-V).
Pursuant to Section 5 Paragraph 3 sentence 1 UVPG, the statement cannot be independently challenged.

B.4.4.3.2.3 Reasons for the decision

The decision derives from the expert assessment of the above documents, which were examined with regard to the criteria for the preliminary examination of the individual case in accordance with Annex 3 to the UVPG. In order to make the decision comprehensible and transparent, the essential characteristics of the project and its location, the nature and characteristics of possible significant adverse environmental impacts of the change and the arrangements envisaged by the promoter, which obviously exclude such effects, are summarised below.

B.4.4.3.2.3.1 Characteristics of the project

Federal State:	Mecklenburg-Western Pomerania

District/Office:	Vorpommern-Rügen / Bergen auf Rügen
Community:	City of Bergen auf Rügen
Utilisation:	Land on the site of the existing wastewater treatment plant in Bergen
Scope:	Designed for a population of 92,000 The population-specific load according to ATV-DVWK-A 198 is 60 g BOD5/d (E*d) Designed for a load of 5,520 kg BOD_5/d (E*d)
Design flow rate:	700 m^3/h (= 1,400 m^3/2h)

Criteria	No	Yes	Clarifications
Size and design of the entire project and, where relevant, demolition work	x		The wastewater treatment plant Bergen is operated by the Zweckverband Wasserversorgung und Abwasserbehandlung Rügen (ZWAR) and is located outside the closed development east of the city in the district of Bergen Wilhelmshöh. The Bergen wastewater treatment plant is designed for the targeted elimination of phosphorus and nitrogen nutrients and complies with the state of the art in terms of statutory discharge requirements. However, the wastewater treatment plant nevertheless emits a not insignificant nutrient load through the treated wastewater into the receiving watercourse "Kleiner Jasmunder Bodden". In order to relieve the receiving water, the wastewater treatment plant is equipped with an additional purification stage for further nutrient elimination. The presented feasibility study (Dr. Born, Dr. Ermel GmbH 2017a) shows that a downstream additional filtration via a continuous filter is the preferred method for further nutrient elimination at the Bergen wastewater treatment plant. For the downstream denitrification, new plant components as well as supply and discharge pipes must be erected or laid on the site of the wastewater treatment plant. In the run-up to the planned construction

Criteria	No	Yes	Clarifications
			work, a decommissioned purification tank with an area of approx. 1,075 m² will be unsealed. At this location, the plant sections will subsequently be erected on an area of approx. 450 m². Small-scale relocations of soil are to be carried out for the installation of supply and discharge pipes. Changes in plant capacity are excluded due to the project. The planned measures are intended to reduce the nutrient content in the effluent water of the wastewater treatment plant as far as possible (approximately 16.3 t of nitrogen per year and 500 kg of phosphorus per year) by optimising existing plant components and by means of downstream denitrification.
Interaction with other existing or authorised projects and activities	x		There is no interaction with other existing or authorised projects and activities.
Use of natural resources, in particular land, soil, water, animals, plants and biodiversity	x		Area: Modification and expansion of plant components are carried out exclusively on the existing wastewater treatment plant site. Soil: The new plant sections with a total area of approx. 450 m² will be erected in the area of a decommissioned purification tank, which will be dismantled on an area of 1,075 m². The new plant components are thus to be manufactured exclusively on ground that was previously sealed. There is no new sealing of ground without preloading. Rather, an unsealing area of approx. 625 m² remains. Small-scale relocations of soil from anthropogenic soils are to be carried out on the site of the wastewater treatment plant to lay the supply and discharge pipes. Water: The measure serves to sustainably improve the water quality of the Greifswald Bodden by reducing nutrient loads from the wastewater treatment plant

Criteria	No	Yes	Clarifications
			effluent. The Bergen wastewater treatment plant discharges the treated wastewater into the Kleine Jasmunder Bodden (WP_14). A project-related increase in the discharge quantities is excluded. Rather, it can be assumed that the quality of the treated wastewater will improve significantly with regard to the parameters COD, BOD_5, nitrogen, ammonium-nitrogen and phosphorus. If necessary, short-term construction-related dewatering measures may be necessary for the foundation of the new plant sections. Impairment during construction due to the introduction of pollutants into the groundwater is ruled out by means of customary prevention and mitigation measures. <u>Fauna and Flora:</u> The planned measures will be carried out exclusively in the area of anthropogenic pre-contaminated areas. Biotope structures close to nature are not utilised. To the south of the planned measure, a hedge plantation is located at the perimeter fence of the waste water treatment plant area, which has breeding bird habitats. If the implementation of prevention and mitigation measures is guaranteed, significant impairments to the breeding bird species due to construction time disturbances can be excluded, especially during the demolition of the decommissioned sedimentation tank. Other species are not affected. Impairment of the landscape and scenery is not to be expected due to the classification of the measures in the area of the existing wastewater treatment plant. The primary objective of the

Criteria	No	Yes	Clarifications
			measure is to improve the water quality in the Greifswalder Bodden by reducing nutrient inputs via the water discharged from the wastewater treatment plant. The improvement of the water quality has a positive effect on the development of marine habitats in the Greifswalder Bodden. This results in equally positive effects on the GGB "Greifswalder Bodden, parts of Strelasund and Nordspitze Usedom" (DE1747-301). Biological Diversity: Due to the small scale of the project and the pre-loading at the wastewater treatment plant site, there are no effects on biodiversity.
Waste generation in the sense of Section 3 Paragraph 1, 8 KrWG	x		The waste arising from the operation of construction machinery and vehicles is to be collected and sent for professional disposal. The corresponding legal regulations are to be observed.
Environmental pollution and nuisances	x		The impacts caused by the project are only to be expected during the construction phase of the new plant components. The impacts are limited to the site of the wastewater treatment plant itself and its immediate surroundings. The guideline values of AVV Construction Noise Control Regulations are to be complied with. Compared to existing wastewater treatment plants, there will be no increase in operational noise, light and odour emissions.
Risks of incidents, accidents and disasters related to the project, including incidents, accidents and disasters which, according to scientific evidence, are caused by climate change, in particular with regard to: • Materials and technologies used • The susceptibility of the project to accidents as	x		The planned construction measures are to employ common building methods which are carried out using state of the art techniques. The risk of accidents is therefore low. The risk of pollutants escaping into the aquatic environment is also estimated to be low. If the safety regulations are complied with, an increased risk of accidents can be ruled out. Climate change related impacts of

Criteria	No	Yes	Clarifications
defined in Section 2 No. 7 of the Accident Regulations, in particular due to its completion within an appropriate safety distance to operating areas as defined in Section 3 Paragraph 5a BImSchG.			the project in the adjacent sense are excluded.
Risks to human health, e. g. from contamination of water or air pollution			The modification of the project does not pose any hazards to human health due to plant or operational reasons. The installation of additional denitrification reduces the nutrient load in the wastewater treatment plant effluent. Construction-related impairments caused by harmful substances entering the groundwater are minimised by means of prevention or mitigation measures. Noise and air pollution during the construction phase do not have any effect due to the preloading.

B.4.4.3.2.3.2 Location of the project

B.4.4.3.2.3.2.1 Usage criteria

The modified project is located at the site of the Bergen wastewater treatment plant, through which it is also characterised. The wastewater treatment plant Bergen is located in a separate location outside any self-contained housing developments. Residential areas and buildings are not affected by the modified project and the hydrological effects. Forest stands border to the north and west of the wastewater treatment plant site, but the project will not affect them. Rural and arable land can be found to the south and east of the wastewater treatment plant. Areas of particular importance for recreational use or tourism as well as areas used for the agricultural, forestry and fishing industries, including supplying them and disposing of waste from them, are not affected. The existing site of the wastewater treatment plant will not be extended.
In the vicinity of the modified project, no other plants are known to have an impact on the site of the Bergen wastewater treatment plant. Preloading from other systems also does not exist. Cumulative effects of the amended project "Wastewater Treatment Plant Bergen" with other projects are therefore not apparent.

B.4.4.3.2.3.2.2 Quality criteria

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
Area	x		There is no land use that extends beyond the existing and used area of the Bergen wastewater treatment plant.
Soil, in particular soils with special functions for the natural environment (e.g. soils with special site characteristics, with a cultural/natural-historical significance, raised bogs, old forest sites), sensitivity to soil erosion and material contamination of the soil.	x		Only anthropogenic pre-existing soils are affected by the project, which are predominantly impermeable soils. Soils of particular importance for nature conservation or particularly endangered, as well as priority or precautionary areas for the extraction of raw materials, are neither influenced nor impaired.
Landscape	x		At the project's location, the landscape is characterised by the existing plant stock of the wastewater treatment plant.
Water, including groundwater	x		Water: The closest water body of special importance is the "Kleine Jasmunder Bodden" (WP_14), which lies at a distance of approx. 1,750 m to the east of the modified project. The trench with the Water and Soil Association (WBV) code Z46 is located about 70 m south of the wastewater treatment plant. The small water bodies in Tetel are located east of the project at a minimum distance of 800 m from the project. Running waters, water protection areas or catchment areas of these waters are neither adversely affected nor impaired. The modified project will have a positive effect on the Kleiner Jasmunder Bodden as a result of the reduction of nutrient input (nitrogen and phosphorus). Ground water: The wastewater treatment plant is located in the area of the "Mittelrügen" groundwater body (WP_KO_9). Groundwater recharge is already reduced in the current state due to the existing

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
			impermeable surface on the waste water treatment plant site. Areas with a high potential for groundwater pollution are neither affected nor impaired.
Fauna, flora and biodiversity	x		At the southern perimeter fence of the wastewater treatment plant there is a protected hedgerow biotope, which includes breeding habitats for birds. The building site area and its surroundings can potentially be hunting habitat of bats. The waste water treatment plant location is characterised by the existing plant stock and impermeable paths. Permeable areas have low quality grasslands in terms of nature conservation.
Other natural resources	x		Due to the existing wastewater treatment plant, air quality is already polluted on a small scale.

B.4.4.3.2.3.2.3 Protection criteria

Criteria	No	Yes	Information on the criteria (Type and scope)
Sites of community importance and bird sanctuaries in accordance with Section 32 BNatSchG, Section 21 NatSchAG M-V (also impairments which can have an external impact on the area)	x		The Bergen wastewater treatment plant is located outside Natura 2000 sites. The FFH area "Kleiner Jasmunder Bodden mit Halbinseln und Schmaler Heide" (DE1547-303) and the EU bird sanctuary "Binnenbodden von Rügen" (DE1446-401) are located at a distance of approx. 1,450 m east of the wastewater treatment plant. The project will have operational effects on the Little Jasmund Bodden. However, since this is a reduction of the nutrient load (nitrogen and phosphorus), the operational effects are only positive. Damage to the protected areas caused by factors such as noise and air pollutants during the

Criteria	No	Yes	Information on the criteria (Type and scope)
			construction phase are ruled out due to the previous pollution at the wastewater treatment plant site, as well as due to the fact that these effects occur exclusively locally and temporarily, and due to the considerable distance to the aforementioned protected areas.
Nature conservation areas in accordance with Section 23 BNatSchG including regulations under state law	x		The nature reserve "Insel Pulitz" (NSG) is located at a distance of approx. 2,500 m in the Kleine Jasmunder Bodden. The nature reserve will not be affected by factors such as noise and air pollutants during the construction phase. Operational factors reach the nature reserve. Since this is also a matter of reducing the nutrient load (nitrogen and phosphorus), these have a positive effect on the bodies of water in the nature reserve in the Kleiner Jasmunder Bodden.
National parks and national nature monuments in accordance with Section 24 BNatSchG including regulations under state law	x		-
Biosphere reserves and landscape protection areas in accordance with Sections 25, 26 BNatSchG	x		The wastewater treatment plant is located within the landscape conservation area (LSG081)"Ostrügen" with a total area of 30,600 ha. Since the planned measure will be carried out on the site of the existing wastewater treatment plant, there will be no conflicts with the protected area ordinance for the Landscape Conservation Area "Ostrügen" (no project-related impairment of the Landscape Conservation Area and no restriction of the protected area objectives). The biosphere reserve "Südost-Rügen" is located about 5 km south of the wastewater treatment plant and is not impacted by the project.
Natural monuments in	x		-

Criteria	No	Yes	Information on the criteria (Type and scope)
accordance with Section 28 BNatSchG			
Protected landscape components, including avenues, in accordance with Section 29 BNatSchG	x		-
Legally protected biotopes according to Section 30 BNatSchG	x		In the southern area of the wastewater treatment plant site, a hedgerow structure is located on a length of 250 m and a width of at least 5 m, which has been planted as a privacy screen and is subject to statutory biotope protection in its form. The operational reduction of the nutrient load (nitrogen and phosphorus) in the effluent water from the wastewater treatment plant has positive effects on the legally protected marine biotopes in the Kleiner Jasmunder Bodden.
Water protection areas in accordance with Section 51 WHG, mineral spring protection areas in accordance with Section 53 Paragraph 4 WHG, risk areas in accordance with Section 73 Paragraph 1 WHG as well as flood areas in accordance with Section 76 WHG including regulations under regional law	x		-
Areas where the environmental quality standards laid down in European Union legislation have already been exceeded	x		-
Areas with a high population density, especially central places in terms of population density. 2 Paragraph 2 No. 2 ROG including provisions under regional law	x		-
Monuments, groups of monuments, landmarks or areas listed in official lists or maps which have been classified as archaeologically significant landscapes by the national authority designated by the federal states, including regulations under national law.	x		-

B.4.4.3.2.3.3 Nature and characteristics of the possible effects

In the following, the possible significant adverse environmental impacts of the modification of the project on the listed protected property based on the nature and characteristics of the project are described roughly and the significance of the adverse effects on the environment are assessed using the criteria set out in Annex 3 to the UVPG.

B.4.4.3.2.3.3.1 People, including human health

No effects due to hydrological changes; no operational increase in noise, light and odour emissions; no unreasonable building-related noise emissions due to compliance with the guideline values for AVV building noise; no traffic restrictions; protected property not affected in other respects

➔No negative environmental impact

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.2 Fauna, flora and biodiversity

Sealing and overprinting of low-grade, anthropogenically precontaminated areas; large-scale unsealing of a disused clarifier; impairment of potential nesting sites in the hedge in the southern part of the wastewater treatment plant due to construction noise and visual effects are minimised by prevention and mitigation measures;

➔permanent unsealing of a decommissioned sedimentation tank for the construction of new plant components to minimise land use and sealing by alteration; permanent small-area compaction and sealing of low-value residential grassland/low-value biotopes; the effects of the project are locally limited to the location of the modified project; possible impairment of nesting sites in the hedge structure during the construction period due to noise and visual effects can be reduced or even avoided. No adverse effects on faunistic functions as no habitats with habitat suitability for the species are affected (no killing, injury, significant disturbance or destruction of breeding and resting places for the bats); no killing, injury or significant disturbance of breeding birds); no project-related effects on LRT in accordance with Annex I Habitats Directive, species in accordance with Annex II Habitats Directive or species in accordance with the EU Birds Directive; no significant impairment of the protection and conservation objectives of the FFH area and the European Bird Sanctuary.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.3 Area

Surface sealing of approx. 1,075 m2; surface sealing of approx. 400 m^2; relocation of approx. 50 m^2 of soil

➔permanent positive effect due to unsealing within the scope of the change; minor sealing and relocation; overall minimisation of land consumption through unsealing and new sealing

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.4 Ground

Small-scale permanent stressing of preloaded soils without special site-specific properties; unsealing of a decommissioned sedimentation tank for the construction of new plant components; not affected by near-natural and sensitive soils; not affected by soils of cultural-historical importance or with archival function or rare soils.

➔Low impact on contaminated soils; surface sealing

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.5 Water

Exclusively temporary, local effects during the construction phase; no significant project effects if planned prevention and mitigation measures are adhered to, such as refuelling of construction vehicles on sealed surfaces; minimising the nutrient load in the wastewater treatment plant effluent leads to positive effects on the water quality of the Kleiner Jasmunder Bodden

➔Pollutant input is possible during the construction phase; if necessary, groundwater retention during the construction phase; both are only temporary and local; prevention and mitigation measures are available; permanent and significant minimisation of nutrient load in the effluent of the wastewater treatment plant.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.6 Air / Climate

Exclusively temporary, local, insignificant construction period effects at the contaminated wastewater treatment plant site

➔Temporary, local, insignificant emissions of pollutants from individual construction vehicles at the pre-contaminated wastewater treatment plant site during the construction period

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.7 Landscape

Construction of the new plant for downstream denitrification on the site of the existing wastewater treatment plant in Bergen after unsealing a decommissioned clarification tank in the context of the existing plants.

➔New construction of new plant sections on the site of the existing wastewater treatment plant in Bergen after dismantling of decommissioned clarification basins without affecting the landscape or scenery.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.8 Cultural heritage and other material goods

No known concern
Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.3.3.9 Interaction between the aforementioned protected assets

In the previous analysis of the individual protected assets and the assessment of the effects of the altered project with regard to the protected assets, the expected and decision-relevant effects were recorded. Interactions between the protected assets including area, soil (used by plant) and water (reduction of nutrient load) are intended as a positive effect of the measure.

➔No negative environmental impact due to interactions

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.2.4 Summary

The nature and extent of the project-related effects on the protected assets cannot be assessed as significant in the present documents, in particular with regard to the geographical area concerned, the population concerned, the severity and complexity, the likelihood, duration, frequency, reversibility and the interaction of the impacts with the impacts of other existing or authorised projects, as well as mitigation measures. The impacts do not have a cross-border character.
Taking into account the criteria listed in Annex 3 to the UVPG, the amendment cannot cause any significant adverse environmental impacts (Section 9 Paragraph 2 Clause 1 No. 2 UVPG). There is no requirement to carry out an environmental impact assessment for the proposed amendment.

B.4.4.3.3 Integration of additional filtration in the Göhren wastewater treatment plant

The “Measure for nutrient reduction in the Lobber See and in the Greifswalder Bodden including the integration of the additional filtration into the Göhren wastewater treatment plant” (compensation measure E11) and the measure at the Lobbe pumping station (see below, section B.4.4.3.4) are part of the “Measures to

improve the water balance in the lowlands of Lobber See and reduction of nutrient discharge in the Greifswalder Bodden" (compensation measures E7 to E11), with which the water balance in the lowlands on Lobber See are controlled by a seasonal control of the flood water levels, without permanent lowering of the groundwater level at a new pumping station to be built at Lobbe with a near-surface water level in winter (suppression of peat mineralization) and a flood water level of -0.3 to 0.5 m to maintain conditions that continue to allow extensive, nature conservation grassland management in the summer months (May-October). In order to be improved, the grassland scenery is rounded off by conversion of arable land with a land value of <<50 into permanent pasture biotopes for the purpose of improved pasture management (adapted grazing density, securing a feed supply sufficient for a six month grazing period), providing ecological, nature conservation grassland management for the purpose of the conservation and development of species-rich meadows and wetland biotopes are to be continued and expanded and a voluntary additional filtration of nutrients in the wastewater treatment plant Göhren, which drains west over the Großen Lobber See in the Greifswalder Bodden. The aim of the overall measure is to preserve biodiversity in grassland vegetation by grazing, hoof impact and seed transport, to increase the diversity of aquatic animal species in the Lobber See (fish, invertebrates), to improve the breeding and resting habitats of waterfowl species (grebes, greylag geese, swans) and to reduce nutrient discharge into the Greifswalder Bodden.
No environmental impact assessment has so far been carried out for the existing wastewater treatment plant in Göhren. According to the project sponsor concept, the existing wastewater treatment plant is to be extended by integrating an additional filtration system. This expansion is to be carried out in such a way that additional plant components (filling station, methanol tank, metering pump equipment, DL/E station, rinsing water and feed pump station with filter, discharge measuring shaft) as well as inlet/outlet pipes are installed on free surfaces. For this purpose, the project sponsor has concluded a planning and construction agreement with the operator of the plant (Zweckverband Wasserersorung und Abwasserbehandlung Rügen - ZWAR) (agreement of 15.12./18.12.2017). According to the above agreement, the project sponsor is to act as the client in consultation with the ZWAR. The aforementioned construction measures require a building permit from the responsible building authority (Section 59 Paragraph 1 LBauO M-V) in accordance with the regional building regulations as a modification / extension of an existing building structure. No such building permit has been granted at present. In addition, for the intended establishment of the additional purification stage as an additional reduction for the purpose of nutrient reduction in the waters used, the modification of the permit granted under water law for the existing plant is required (Section 8 WHG). This change in the permit granted under water law was granted to the ZWAR as operator of the plant by the lower water authority on 19/12/2017.
Pursuant to Section 9 Paragraph 2 sentence 1 no. 2 UVPG UVP, the proposed amendment is subject to a preliminary environmental impact assessment. Pursuant to point 13.1.2 of Annex 1 to the UVPG, a general preliminary examination of the individual case is to be conducted pursuant to Section 7 Paragraph 1 UVPG (in conjunction with Section 9 para 2 sentence 1 no. 2, para 4 UVPG) for the construction and operation of a wastewater treatment plant designed for organically contaminated wastewater of 600 kg / d to less than 9,000 kg / d biochemical oxygen demand in five days (raw) or inorganic polluted waste water from 900 m^3 to less than 4,500 m^3 of wastewater in two hours (excluding cooling water). The authority responsible for carrying out the preliminary EIA review is the authority that decides

on the approval of the project in question. Such a preliminary EIA examination was therefore carried out by the competent regional water authority in the course of the water licensing procedure. The assessment by the water authority showed that no significant adverse environmental impacts were to be expected from the project. An EIA is therefore not necessary. As the Stralsund Mining Authority, as the planning approval authority, has no responsibility for the approval of the construction, modification and operation of the waste water treatment plant in question, the Stralsund Mining Authority therefore has no obligation to carry out a preliminary EIA examination in this respect. Since the project sponsor of the planning approval authority in its supplementary volume: Specification has submitted information to the UVPG in accordance with Annex 2 which allows for a preliminary examination, the planning approval authority has assumed by way of a legal subordination a precautionary obligation to carry out a preliminary EIA examination. This precautionary preliminary EIA examination has revealed the following:

B.4.4.3.3.1 Data basis

The following documents form the basis of the general preliminary examination of the individual case to determine whether or not there is a duty to carry out an environmental impact assessment (EIA):

- Complete application documents for the entire Nord Stream 2 project,
- Application documentation, supplementary volume: Specifications, document 4 - Measures to improve the water balance in the lowlands of the Lobber See and reduction of nutrient discharge in the Greifswalder Bodden, with information in accordance with Annex 2 to the UVPG on the characteristics of the project and the site as well as on the possible significant environmental impacts of the project (cf. Section 9 Paragraph 2 Clause 1 No. 2, Paragraph 4 in conjunction with Section 7 Paragraph 4 UVPG),
- Application documentation, supplementary volume: Specification, document 6 - Compilation of the instruction sheets,
- Opinions of the competent authorities and associations regarding the 1st revision to plans,
- 6th amendment to the permit under water law WE 14/KA/02/99 of 17.02.1999 issued by the administrative district of Vorpommern Rügen on 19.12.2017.

B.4.4.3.3.2 Decision on the EIA obligation of the project

For the above-mentioned project, the planning approval authority establishes ex officio that there is no obligation to carry out an environmental impact assessment in accordance with Section 5 (1) sentence 1, sentence 2 No. 3 UVPG.
The decision that it is not necessary to carry out an environmental impact assessment shall be made known to the public in accordance with Section 5 Paragraph 2 UVPG specifying the essential reasons for the non-existence of the EIA obligation with reference to the respective relevant criteria in Annex 3 to the UVPG and specifying which characteristics of the project or site or which precautions are relevant for this assessment, by way of the usual local announcement of a plan approval decision by the local planning authorities (Section 74 Paragraph 4 of the

Administrative Procedure Act Mecklenburg-Western Pomerania (VwVfG M-V)) or otherwise made public (Section 74 Paragraph 5 VwVfG M-V).
Pursuant to Section 5 Paragraph 3 sentence 1 UVPG, the statement cannot be independently challenged.

B.4.4.3.3.3 Reasons for the decision

The decision derives from the expert assessment of the above documents, which were examined with regard to the criteria for the preliminary examination of the individual case in accordance with Annex 3 to the UVPG. In order to make the decision comprehensible and transparent, the essential characteristics of the project and its location, the nature and characteristics of possible significant adverse environmental impacts of the change and the arrangements envisaged by the promoter, which obviously exclude such effects, are summarised below.

B.4.4.3.3.3.1 Characteristics of the project

Federal State:	Mecklenburg-Western Pomerania
District/Office:	Vorpommern-Rügen / Mönchgut-Granitz
Community:	Ostseebad Göhren, Middelhagen
Utilisation:	Area on the site of the existing wastewater treatment plant in Göhren
Scope:	Designed for a population of 30,000 The population-specific load according to ATV-DVWK-A 198 is 60 g BOD_5/d (E*d) Designed for a load of 1,800 kg BOD_5/d (E*d)
Design flow rate:	450 m^3/h

Criteria	No	Yes	Clarifications
Size and design of the entire project and, where relevant, demolition work	x		The wastewater treatment plant Göhren is operated by the Zweckverband Wasserversorgung und Abwasserbehandlung Rügen (ZWAR) and is located outside the closed development south of Göhren on the island of Rügen. The Göhren wastewater treatment plant is designed for the targeted elimination of nutrients phosphorus and nitrogen and complies with the state of the art in terms of statutory discharge requirements. The wastewater treatment plant nevertheless emits a not insignificant nutrient load through the treated wastewater into the Großen Lobber See and subsequently into the Greifswalder Bodden. In order to relieve the

Criteria	No	Yes	Clarifications
			receiving water, the wastewater treatment plant is to be equipped with an additional purification stage for further nutrient elimination. The presented feasibility study (Dr. Born, Dr. Ermel GmbH 2017) shows that a downstream additional filtration via a continuous filter is the preferred method for further nutrient elimination at the Göhren wastewater treatment plant. For the downstream denitrification, plant sections with a footprint of approx. 250 m² are to be erected on the site of the wastewater treatment plant. Small-scale relocations of soil are to be carried out for the installation of supply and discharge pipes. Changes in plant capacity are excluded due to the project. The planned measures are intended to reduce the nutrient content in the effluent water of the wastewater treatment plant as far as possible (approximately 3.1 t of nitrogen each year and 220 kg of phosphorus each year) by optimising existing plant components and by means of downstream denitrification.
Interaction with other existing or authorised projects and activities	x		There is no interaction with other existing or authorised projects and activities.
Use of natural resources, in particular land, soil, water, animals, plants and biodiversity	x		Area: Modification and expansion of plant components are carried out exclusively on the existing wastewater treatment plant site. About 250 m² of new space will be used. Soil: For the construction of the plant for downstream denitrification, soil is to be sealed on an area of approx. 250 m². Furthermore, small-scale relocations of around 50 m^2 are to be carried out in the course of laying the supply and discharge pipes. Water: The measure serves to sustainably improve the water

Criteria	No	Yes	Clarifications
			quality of the Greifswald Bodden by reducing nutrient loads from the wastewater treatment plant effluent. The Göhren wastewater treatment plant discharges the treated wastewater into the "Greifswalder Bodden" coastal body of water (WP_13). A project-related increase of the discharge quantities is excluded. Rather, it can be assumed that the quality of the treated wastewater will improve significantly with regard to the parameters COD, BOD_5, nitrogen, ammonium-nitrogen and phosphorus. If necessary, short-term construction-related dewatering measures may be necessary for the foundation of the new plant sections. Impairment during construction due to the introduction of pollutants into the groundwater is ruled out by means of prevention and mitigation measures. Fauna and Flora: The planned measures will be carried out exclusively in the area of biotopes contaminated with anthropogenic substances, which are characterised by intensively cultivated urban grasslands. Biotope structures close to nature are not utilised. The wastewater treatment plant area is surrounded by shrub structures as privacy screens, which shelter breeding bird habitats. There is no direct intervention in woodland biotopes. Due to the preloading at the wastewater treatment plant site, it is assumed that construction-related disturbances at the wastewater treatment plant will be tolerated. Other species groups are not affected. Impairment of the landscape and scenery is not to be expected due to the classification of the measures in the area of the existing wastewater

Criteria	No	Yes	Clarifications
			treatment plant. The primary objective of the measure is to improve the water quality in the Großen Lobber See by reducing nutrient inputs via the water discharged from the wastewater treatment plant. The improvement of the water quality has a positive effect on the development of marine habitats in the Greifswalder Bodden and the Großen Lobber See. This results in equally positive effects on the SCI "Greifswalder Bodden, parts of Strelasund and Nordspitze Usedom" (DE1747-301). Biological Diversity: Due to the small scale of the project and the pre-loading at the wastewater treatment plant site, there are no effects on biodiversity.
Generation of waste in accordance with Section 3 Paragraph 1, 8 KrWG (Closed Substance Cycle Act)	x		The waste arising from the operation of construction machinery and vehicles is to be collected and sent for professional disposal. The corresponding legal regulations are to be observed.
Environmental pollution and nuisances	x		The impacts caused by the project are only to be expected during the construction phase of the new plant components. The impacts are limited to the site of the wastewater treatment plant itself and its immediate surroundings. The guideline values of AVV Construction Noise Control Regulations are to be complied with. Compared to existing wastewater treatment plants, there will be no increase in operational noise, light and odour emissions.
Risks of incidents, accidents and disasters related to the project, including incidents, accidents and disasters which, according to scientific evidence, are caused by climate change, in particular with regard to: • Materials and technologies	x		The planned construction measures are to employ common building methods which are carried out according to the state of the art. The risk of accidents is therefore low. The risk of pollutants escaping into the aquatic environment is also estimated to be low. If the safety regulations are complied with, an

Criteria	No	Yes	Clarifications
used • The susceptibility of the project to accidents as defined in Section 2 No. 7 of the Accident Regulations, in particular due to its completion within the an appropriate safety distance to operating areas as defined in Section 3 Paragraph 5a BImSchG.			increased risk of accidents can be ruled out. Climate change related impacts of the project in the adjacent sense are excluded.
Risks to human health, e. g. from contamination of water or air pollution	x		The modification of the project does not pose any hazards to human health due to plant or operational reasons. The installation of additional denitrification reduces the nutrient load in the waste water treatment plant effluent. Construction-related impairments caused by harmful substances entering the groundwater are minimised by means of prevention and mitigation measures. Noise and air pollution during the construction phase do not have any effect due to the preloading.

B.4.4.3.3.3.2 Location of the project

B.4.4.3.3.3.2.1 Usage criteria

The modified project is located at the site of the Göhren wastewater treatment plant, through which it is also characterised. The Göhren wastewater treatment plant is located in a separate location outside any self-contained housing developments. Residential areas and buildings are not affected by the modified project and the hydrological effects. Areas of particular importance for recreational use or tourism as well as agricultural, forestry and fisheries use or supply and disposal are not affected. The existing site of the wastewater treatment plant will not be extended.
In the vicinity of the modified project, no other plants are known to have an impact on the site of the Göhren wastewater treatment plant. Preloading from other systems also does not exist. Cumulative effects of the amended project "Göhren Wastewater Treatment Plant" with other projects are therefore not apparent.

B.4.4.3.3.3.2.2 Quality criteria

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
Area	x		There is no land use that extends beyond the existing and used area of the Göhren wastewater treatment plant.
Soil, in particular soils with special functions for the natural environment (e.g. soils with special site characteristics, with a cultural/natural-historical significance, raised bogs, old forest sites), sensitivity to soil erosion and material contamination of the soil.	x		Only anthropogenic pre-existing soils are affected by the project, which are predominantly impermeable soils. Soils of particular importance for nature conservation or particularly endangered, as well as priority or precautionary areas for the extraction of raw materials, are neither influenced nor impaired.
Landscape	x		At the project's location, the landscape is characterised by the existing plant stock of the wastewater treatment plant.
Water, including groundwater	x		Water: The nearest open water bodies are the former maturation ponds of the wastewater treatment plant, which are about 40 m away from the modified project. The Große Lobber See is located about 1,500 m south west of the wastewater treatment plant, while Hagensche Wiek in Greifswalder Bodden is located about 2,300 m south west of the wastewater treatment plant. The Baltic Sea is located about 100 m east of the wastewater treatment plant. The wastewater treatment plant effluent is discharged via the receiving water in the Großen Lobber See and subsequently in the Greifswalder Bodden. A negative influence or impairment of flowing waters, water protection areas, catchment areas and the like is excluded. The amended project has a positive effect on the Großen Lobber See and Greifswalder Bodden as a result of the reduction of nutrient input into these waters. Ground water: The wastewater treatment plant is located in the

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
			area of the groundwater body "Rügen-Nordost" (WP_KO_10). Groundwater recharge is already reduced in the current state due to the existing impermeable surface on the waste water treatment plant site. This is further reduced at certain points by means of new sealing of small surface areas. Areas with a high potential for groundwater pollution are neither affected nor impaired.
Fauna, flora and biodiversity	x		The waste water treatment plant location itself is characterised by the existing plant stock and impermeable paths. The existing permeable areas have low quality grasslands in terms of nature conservation. The wastewater treatment plant is surrounded by trees and shrubs as privacy screen, representing habitats for breeding birds. The building site area and its surroundings can potentially be hunting habitat of bats. The area of the wastewater treatment plant can be crossed in times of amphibian migratory activity due to the proximity of the ponds.
Other natural resources	x		Due to the existing wastewater treatment plant, air quality is already polluted on a small scale.

B.4.4.3.3.3.2.3 Protection criteria

Criteria	No	Yes	Information on the criteria (Type and scope)
Sites of community importance and bird sanctuaries in accordance with Section 32 BNatSchG, Section 21 NatSchAG M-V (also impairments which can have an external impact on the area)	x		The Göhren wastewater treatment plant is located outside Natura 2000 sites. The wastewater treatment plant drains water via the Großen Lobber See in the Greifswalder Bodden in the Greifswalder Bodden FFH area (DE1747-301). The distance to this FFH area is approx. 65 m.

Criteria	No	Yes	Information on the criteria (Type and scope)
			Approximately 400 m of the FFH area "Küstenlandschaft Südost-Rügen" (DE1648-302) is crossed. The wastewater treatment plant itself is located about 300 m to the east of the FFH area "Küstenlandschaft Südostrügen" (DE1648-302). The “Greifswalder Boddenrandschwelle und Teile der Pommerschen Bucht” (Greifswalder Boddenrand threshold and parts of the Pomeranian Bight) (DE1749-302) are located at a distance of about 100 m east of the wastewater treatment plant. The "Greifswalder Bodden und südlicher Strelasund” (Greifswalder Bodden and southern Strelasund) (DE1747-402) EU bird sanctuary extends south west of the wastewater treatment plant. The distance to the wastewater treatment plant is at least 65 m. The project will have operational effects on the Großen Lobber See and Greifswalder Bodden. However, since this is a reduction of the nutrient load, the operational effects are only positive in nature. Damage to the protected areas as a result of construction and installation-related factors are excluded due to the previous pollution at the wastewater treatment plant site, as well as due to the fact that these only occur locally and temporarily, and in some cases at a not insignificant distance to the aforementioned protected areas.
Nature conservation areas in accordance with Section 23 BNatSchG including regulations under state law	x		-
National parks and national nature monuments in accordance with Section 24 BNatSchG including regulations under state	x		-

Criteria	No	Yes	Information on the criteria (Type and scope)
law			
Biosphere reserves and landscape protection areas in accordance with Sections 25, 26 BNatSchG	x		The wastewater treatment plant is located within the landscape conservation area (LSG084) and the biosphere reserve of the same name, the "Biosphere Reserve Südost-Rügen", which has a total area of 30,600 ha. Since the planned measure will be carried out on the site of the existing wastewater treatment plant, there are no conflicts with the protected area ordinance of the Landscape Conservation Area and the biosphere reserve.
Natural monuments in accordance with Section 28 BNatSchG	x		-
Protected landscape components, including avenues, in accordance with Section 29 BNatSchG	x		-
Legally protected biotopes according to Section 30 BNatSchG	x		The Göhren wastewater treatment plant is surrounded by shrub structures, which have been planted as privacy screens and may be subject to statutory biotope protection. The reduction of the nutrient load in the effluent water of the wastewater treatment plant for operational reasons will have positive effects on protected marine biotopes in the Greifswalder Bodden.
Water protection areas in accordance with Section 51 WHG, mineral spring protection areas in accordance with Section 53 Paragraph 4 WHG, risk areas in accordance with Section 73 Paragraph 1 WHG as well as flood areas in accordance with Section 76 WHG including regulations under regional law	x		-
Areas where the environmental quality standards laid down in European Union legislation have already been exceeded	x		-
Areas with a high population density, in particular central	x		-

Criteria	No	Yes	Information on the criteria (Type and scope)
places within the meaning of Section 2 Paragraph 2 No. 2 ROG, including regulations under regional law			
Monuments, groups of monuments, landmarks or areas listed in official lists or maps which have been classified as archaeologically significant landscapes by the national authority designated by the federal states, including regulations under national law.	x		-

B.4.4.3.3.3.3 Nature and characteristics of the possible effects

In the following, the possible significant adverse environmental impacts of the modification on the listed protected property on the basis of the nature and characteristics of the project are described roughly and the significance of the adverse effects on the environment are assessed using the criteria set out in Annex 3 to the UVPG.

B.4.4.3.3.3.3.1 People, including human health

No effects due to hydrological changes; no impairment due to noise, light or odour emissions; compliance with the guideline values of AVV Baulärm (German Construction Noise Ordinance); no traffic restrictions; protected assets not affected in other respects

➔No negative environmental impact

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.2 Fauna, flora and biodiversity

Sealing and imprinting of low-value, anthropogenically contaminated biotopes (settlement grassland); no intervention in privacy protection vegetation around the wastewater treatment plant; no impact on breeding habitats in woodland structures during construction due to the occurrence of species which are typical of the area with high tolerance thresholds for noise and visual impacts on preloaded wastewater treatment plant sites.

➔The imprinting and sealing of low-grade, already anthropogenic biotopes; limitation of project impacts on existing wastewater treatment plant site; at the most constructional impairment of breeding habits in woody biotopes on pre-loaded wastewater treatment plant property due to visual impact and noise; no project-related effects on LRT according to Annex I FFH Directive, species

according to Annex II FFH-RL or VRL-relevant species; no significant impairment of the protective purpose and conservation objectives of the FFH areas and the bird sanctuary; killing, injury, significant disturbance or destruction of breeding sites and resting places for bats and breeding birds is excluded, disturbance of breeding birds can be avoided in any case by undertaking building measures outside the breeding season; killing and injury to amphibians is precluded by prevention measures (creation and maintenance of an amphibian fence) if construction works take place during migratory activity; significant disruption and destruction of reproductive and resting places of amphibians is excluded

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.3 Area

No land use beyond existing and used wastewater treatment plant property; surface sealing there approximately 250 m^2 for the plant; relocation of approximately 50 m^2 of soil

➔Minor sealing and relocation to already used wastewater treatment plant property

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.4 Ground

Surface sealing of approx. 250 m^2; relocation of approx. 50 m^2 of soil; small-scale permanent exposure to soils already contaminated by existing wastewater treatment plant without special site-specific characteristics; no impact on near-natural or sensitive soils; no impact on soils of cultural-historical importance; no impact on soils with archive function or rare soils.

➔Small-scale surface sealing on pre-loaded soil without special site-specific properties; small-area soil relocation

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.5 Water

Exclusively temporary, local effects during the construction phase; no significant project effects due to planned prevention and mitigation measures, such as refuelling of construction vehicles on sealed surfaces; minimising the nutrient load in the effluent of the wastewater treatment plant leads to positive effects on the water quality of the Großen Lobber See and the Greifswalder Bodden

➔Pollutant input is possible during the construction phase; if necessary, groundwater retention during the construction phase; both are only temporary and local; prevention and mitigation measures are available; permanent and

significant minimisation of nutrient load in the effluent of the wastewater treatment plant.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.6 Air / Climate

Only temporary, local, insignificant emissions of pollutants from individual construction vehicles at the pre-contaminated wastewater treatment plant site during the construction period

➔Temporary, local, insignificant emissions of pollutants from individual construction vehicles

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.7 Landscape

Construction of the new plant for downstream denitrification on the site of the existing wastewater treatment plant in Göhren in the context of the existing plants.

➔New construction of new plant sections on the site of existing wastewater treatment plant Göhren without any impact on the landscape or scenery

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.8 Cultural heritage and other material goods

No known concern
Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.3.3.9 Interactions between the aforementioned protected assets

In the previous analysis of the individual protected assets and the assessment of the effects of the altered project with regard to the protected assets, the expected and decision-relevant effects were recorded. Interactions between the protected assets including area, soil (sealing, relocation) and water (reduction of nutrient load) are intended as a positive effect of the measure.

➔No negative environmental impact due to interactions

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.3.4 Summary

The nature and extent of the project-related effects on the protected assets cannot be assessed as significant in the present documents, in particular with regard to the geographical area concerned, the population concerned, the severity and complexity, the likelihood, duration, frequency, reversibility and the interaction of the impacts with the impacts of other existing or authorised projects, as well as prevention and mitigation measures. The impacts do not have a cross-border character.
Taking into account the criteria listed in Annex 3 to the UVPG, the amendment cannot cause any significant adverse environmental impacts (Section 9 Paragraph 2 Clause 1 No. 2 UVPG). There is no requirement to carry out an environmental impact assessment for the proposed amendment.

B.4.4.3.4 Hydraulic engineering measures, including "replacement new construction" of the Lobbe pumping station, new weir construction

The planned individual measures at the Lobbe pumping station are part of the "Measures to improve the water balance in the lowlands of the Lobbe See and to reduce nutrient input into the Greifswalder Bodden" (compensation measures E7 to E11). Due to seasonal control of the surface water levels at the planned, newly built Lobbe pumping station with near-surface water level in winter (suppression of the peat mineralisation) and a surface water level of -0.3 to 0.5 m to maintain conditions that will enable extensive grassland management in line with nature conservation requirements in the summer period (May to October), the water balance in the lowlands of the Lobbe See is to be improved. An an adaptation of the water levels in the investigated area are planned (see Section B.4.4.3.4.3.1) through a number of hydraulic engineering measures with the objectives of setting optimal summer water levels for extensive management (= 0.30 to 0.50 m ground clearance), the prevention of negative effects due to a rise in water level on neighbouring areas and the securing of sufficient receiving water conditions for all flowing drainage systems by means of the following measures: including a replacement new building being erected for the Lobbe pumping station and altering of the switch-on and switch-off locations. The wind power plant at the present pumping station will be preserved. In addition, the intention is to replace the spillover at the Lobber See by a new weir construction with storage targets of: 0.25 m AMSL (height above mean sea level) for winter and -0.05 m AMSL for summer.
The planned hydraulic engineering measures are uniformly a modification project within the meaning of Section 9 in conjunction with Section 9. Section 2 Paragraph 4 sentence 1 No. 2 UVPG, as the existing Lobbe pumping station will be retained. A new pumping station will be built on the existing site, which will take over the functions of the old pumping station in an optimised form. The spillover at the Lobber See is replaced by a new weir construction.
No environmental impact assessment has so far been carried out for the existing pumping station at Lobbe. The planned hydraulic engineering measures at the existing Lobbe pumping station ("replacement new construction") are subject to preliminary environmental impact assessment in accordance with section 9 (2) sentence 1 no. 2 of the EIA. In accordance with No. 13.18.1 of Annex 1 to the UVPG, a general preliminary examination of the individual case in accordance with Section 7 Paragraph 1 UVPG (in conjunction with Section 9 Paragraph 2 sentence 1 no. 2, Paragraph 4 UVPG) is to be carried out for expansion measures in

accordance with the WHG that are not covered by Nos. 13.1 to 13.17 or by No. 13.18.2. The measures described above cannot be subsumed under the measures specified in Nos. 13.1 to 13.17 of Annex 1 to the UVPG. Number 13.18.2 of Annex 1 to the UVPG provides for a site-specific preliminary examination of the individual case for the near-natural development of streams, ditches, retention basins and ponds, small-scale near-natural remodelling such as the removal of stream and ditch piping, the laying of road ditches in the built-up area and their small-scale piping as well as the implementation of gravel banks in watercourses. The measures planned by the project promoter are not one of the above-mentioned measures, in particular not a "near-natural extension" within the meaning of No. 13.18.2 of Annex 1 to the UVPG.
According to the legal definition of Section 67 Paragraph 2 sentence 1 WHG, a watercourse development in the sense of the WGH is the creation, disposal and substantial transformation of a watercourse or its banks. A watercourse development does not exist if a watercourse is only created for a limited period of time and the water regime is not significantly affected as a result (Section 67 Paragraph 2 sentence 2 WHG). Dams and embankments that influence the flow of flood water, as well as buildings for coastal protection, are equivalent to the development of watercourses (Section 67 Paragraph 2 sentence 3 UVPG). A watercourse development is therefore any measure that aims to change the body of water through water management, or to change the state of a watercourse including its banks in a way that is important for the water balance or in any other way (Spieth, in: Giesberts/Reinhardt, BeckOK Umweltrecht, 44. Edition, Status: 01.08.2017, Section 67 WHG, recital 8). An essential transformation is always a given if a structural measure affects the state of the body of water in a way that is important for the water balance (water level, water discharge), the water management, the ecology of the body of water or in any other respect (VGH Hessen, Urt. v. 01.09.1998,7 UE 2170/95, juris recital 36). The hydraulic engineering measures envisaged in detail (new construction of the Lobbe pumping station, construction of a new weir, new construction or reversal of the upstream trench of the Lobbe sewerage system, adaptation of the overflow of the hospital drainage system, closure of the trench and production of the drainage system and, if necessary, adaptation of the drain of the Göhren wastewater treatment plant, if necessary, adaptation of drainage systems, see the following section B.4.3.4.4.3.3.1) have a significant effect on the water level of the affected waters and are therefore to be qualified as watercourse development within the meaning of Section 67 Paragraph 2 sentence 1 WHG. There is an obligation to carry out a general preliminary examination of the individual case in accordance with No. 13.18.1 of Annex 1 to the UVPG in conjunction with. Section 9 (2) sentence 1 no. 2, (4) in conjunction Section 7 (1) UVPG.

B.4.4.3.4.1 Data basis

The following documents form the basis of the general preliminary examination of the individual case to determine whether or not there is a duty to carry out an environmental impact assessment (EIA):

- Complete application documents for the entire Nord Stream 2 project,
- Application documentation, supplementary volume: Specifications, document 4 - Measures to improve the water balance in the lowlands of the Lobber See and reduction of nutrient discharge in the Greifswalder Bodden, with information in

accordance with Annex 2 to the UVPG on the characteristics of the project and the site as well as on the possible significant environmental impacts of the project (cf. Section 9 Paragraph 2 sentence 1 No. 2, Paragraph 4 in conjunction with Section 7 Paragraph 4 UVPG),

- Application documentation, supplementary volume: Specification, document 6 - Compilation of the instruction sheets,
- Opinions of the competent authorities and associations regarding the 1st revision to plans.

B.4.4.3.4.2 Decision on the EIA obligation of the project

For the above-mentioned project, the planning approval authority establishes ex officio that there is no obligation to carry out an environmental impact assessment in accordance with Section 5 (1) sentence 1, sentence 2 No. 3 UVPG.

The determination of non-existence of the obligation to carry out an environmental impact assessment shall be made known to the public in accordance with Section 5 Paragraph 2 UVPG specifying the essential reasons for the non-existence of the EIA obligation with reference to the respective relevant criteria in Annex 3 to the UVPG and specifying which characteristics of the project or site or which precautions are relevant for this assessment, by way of the usual local announcement of a plan approval decision by the local planning authorities (Section 74 Paragraph 1 of the German Stock Corporation Act). 4 VwVfG M-V) or otherwise made public (Section 74 Paragraph 5 VwVfG M-V).
Pursuant to Section 5 Paragraph 3 sentence 1 UVPG, the statement cannot be independently challenged.

B.4.4.3.4.3 Reasons for the decision

The decision derives from the expert assessment of the above documents, which were examined with regard to the criteria for the preliminary examination of the individual case in accordance with Annex 3 to the UVPG. In order to make the decision comprehensible and transparent, the essential characteristics of the project and its location, the nature and characteristics of possible significant adverse environmental impacts of the change and the arrangements envisaged by the promoter, which obviously exclude such effects, are summarised below.

B.4.4.3.4.3.1 Characteristics of the project

Federal State:	Mecklenburg-Western Pomerania
District/Office:	Vorpommern-Rügen / Mönchgut-Granitz
Community:	Göhren, Middelhagen
Individual measures:	Replacement of the Lobbe pumping station and modification of the switch-on and switch-off locations: Winter: Off: -0.45 m AMSL, On: -0.15 m AMSL,

	Summer: Off: -0.75 m AMSL, On: -0.45 m AMSL, Purpose: Optimisation of water levels in the pumping station polder (MWWi = -0.30 m AMSL, MWSo = -0.60 m AMSL) The control of the pumping station remains variable.
	The replacement of the spillover at the Lobber See by a new weir construction with the following storage targets: Winter: +0.25 m AMSL, Summer: -0.05 m AMSL, Purpose: Optimisation of water levels in the sub-basin of the Lobber See (MWWi = +0.25 m AMSL, MWSo = -0.05 m AMSL) The control of the weir is variable.
	New construction or flow reversal of the trench of the Lobbe drainage system and connection underneath the new weir at the Lobber See Purpose: Securing the drainage of the village of Lobbe
	Adjustment overflow of the clinic drainage system Purpose: Connection of the soakaway system to the trench network for controlled drainage of precipitation water in the event of heavy rainfall events due to the reduction of the soakaway performance at higher groundwater table depths.
	Trench closure and dewatering Purpose: Local optimisation of water levels
	Examination, if necessary, adaptation of the effluent of the wastewater treatment plant Göhren Purpose: Securing of the receiving water flow (possible duct opening) for the wastewater treatment plant from the street outlet
	Inspection, if necessary, adjustment of drainage pipes Purpose: Securing of the receiving water flow (possible duct opening) for drainage collectors

Criteria	No	Yes	Clarifications
Size and design of the entire project and, where relevant, demolition work	x		As a result of the modelling of the water level elevation in the Lobber See flats (including the polder areas), it will be necessary to restore and adapt the functionality of the Lobbe pumping station (capacity as well as activation and deactivation elements) and to vary the regulation at the point of the spillover (replacement by adjustable weir). Since the modelling is based on data from the digital terrain model (DGM1), site and water level measurements have to be carried out on site to provide further

Criteria	No	Yes	Clarifications
			detailed designs and measurements of the project. In principle, the accompanying hydraulic engineering measures are as described above. These hydraulic engineering accompanying measures serve to achieve the goal of improving the water balance in the Lobber See flats without affecting the adjacent agricultural, settlement and traffic areas. The old pumping station remains intact; therefore, demolition work does not need to take place.
Interaction with other existing or authorised projects and activities	x		The current management of the areas in the lowlands will be maintained.
Use of natural resources, in particular land, soil, water, animals, plants and biodiversity	x		Area: There will be no change to or extension of the site area, so that there will be no land use beyond the area already used. Soil: It is foreseeable that there will be no large-scale sealing or relocation of soil at the respective sites. The new building will be erected on the site previously used as the company premises. Local ground movements during construction due to soil exchange or relocation are possible. Water: If necessary, short-term construction-related dewatering measures may be necessary for the foundations of the new plant sections. Impairment during construction due to the introduction of pollutants into the groundwater is ruled out by means of customary prevention and mitigation measures. All in all, the natural water balance in the Lobber See lowlands is improved by the possibility of variable control of the water management systems and the possibility of reacting to extreme events (heavy rainfall, flooding). Fauna and Flora: The planned measures are to be implemented on the sites of the existing buildings,

Criteria	No	Yes	Clarifications
			and natural biotope structures are not used. No species groups are affected at the sites. Impairment of the landscape and scenery is not to be expected due to the classification of the measures on the terrain. Biodiversity: Due to the small scale of the project and the pre-loading at the sites, there are no effects on the biodiversity.
Generation of waste in accordance with Section 3 Paragraph 1, 8 KrWG (Closed Substance Cycle Act)	x		The waste arising from the operation of construction machinery and vehicles is to be collected and sent for professional disposal. The corresponding legal regulations are to be observed.
Environmental pollution and nuisances	x		The impacts caused by the project are only to be expected during the construction phase of the replacement (new) structures. The effects are limited to the current building sites or the company premises used. The guideline values of AVV Construction Noise Control Regulations are to be complied with. Compared to existing operation of the structures, there will be no increase in operational noise, light and odour emissions.
Risks of incidents, accidents and disasters related to the project, including incidents, accidents and disasters which, according to scientific evidence, are caused by climate change, in particular with regard to: • Materials and technologies used • The susceptibility of the project to accidents as defined in Section 2 No. 7 of the Accident Regulations, in particular due to its completion within the an appropriate safety distance to operating areas as	x		The planned construction measures are to employ common building methods which are carried out using state of the art techniques. The risk of accidents is therefore low. The risk of pollutants escaping into the aquatic environment is also estimated to be low. If the safety regulations are complied with, any increased risk of accidents can be ruled out. Climate change related impacts of the project in the adjacent sense are excluded.

Criteria	No	Yes	Clarifications
defined in Section 3 Paragraph 5a BImSchG.			
Risks to human health, e.g. from contamination of water or air pollution	x		The project does not pose any hazards to human health due to plant or operational reasons.

B.4.4.3.4.3.2 Location of the project

B.4.4.3.4.3.2.1 Usage criteria

The replacement new buildings are also located on plant areas currently used for water management purposes. Residential areas and buildings are not affected by the modified project and the hydrological effects. Areas of particular importance for recreational use or tourism as well as areas used for the agricultural, forestry and fishing industries, including supplying them and disposing of waste from them, are not affected. The project sites already in use will not be extended beyond the area already used for this purpose.
In the vicinity of the project, no other facilities are known to have an impact on the project's location. Preloading from other systems also does not exist. Cumulative effects of the project with other projects are therefore not apparent. The current management of the areas will be maintained.

B.4.4.3.4.3.2.2 Quality criteria

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
Area	x		The replacement new buildings will be erected on the areas already used for water management at the sites currently in use. There is no land use that extends beyond the existing premises.
Soil, in particular soils with special functions for the natural environment (e.g. soils with special site characteristics, with a cultural/natural-historical significance, raised bogs, old forest sites), sensitivity to soil erosion and material contamination of the soil.	x		Soils of particular importance for nature conservation or particularly endangered, as well as priority or precautionary areas for the extraction of raw materials, are neither influenced nor impaired.
Landscape	x		At the project's location, the landscape is characterised by the existing plant stock of the waterworks structure.
Water, including groundwater	x		Water: The closest open body of water is the Großen Lobber See, which lies about 150 m east of the

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
			spillover and about 250 m south-east of the pumping station. Hagensche Wiek, located in the Greifswalder Bodden, is located at a distance of about 150 m west of the pumping station and about 310 m west of the spillover. A negative influence on the existing trench system of the lowlands of the Lobber See, such as the trench from the Großen Lobber See and the trench from Middelhagen, is excluded. Water protection areas or catchment areas are neither adversely affected nor impaired. The project will have a positive impact on the Großen Lobber See by raising water levels, as the open water surface of the lake will be increased. The seasonal reactivation of the Kleinen Lobber See also has a positive effect; here too, the open water surface of the lake is increased. <u>Ground water:</u> Groundwater is neither negatively affected nor impaired.
Fauna, flora and biodiversity	x		Potential habitat structures for amphibians and reptiles may exist at the Lobbe pumping station site. Construction-related effects are possible, but are negligible when taking into account prevention and mitigation measures (amphibian fence).
Other natural resources	x		-

B.4.4.3.4.3.2.3 Protection criteria

Criteria	No	Yes	Information on the criteria (Type and scope)
Sites of community importance and bird sanctuaries in accordance with Section 32 BNatSchG, Section 21 NatSchAG	x		The replacement structures to be newly constructed are located outside areas of community importance.

Criteria	No	Yes	Information on the criteria (Type and scope)
M-V (also impairments which can have an external impact on the area)			However, the new replacement buildings are located in the EU bird sanctuary "Greifswalder Bodden and southern Strelasund" (DE1747-402). The bird sanctuary is not affected by the project.
Nature conservation areas in accordance with Section 23 BNatSchG including regulations under state law	x		-
National parks and national natural monuments in accordance with Section 24 BNatSchG including regulations under state law	x		-
Biosphere reserves and landscape protection areas in accordance with Sections 25, 26 BNatSchG	x		The individual structures are located within the landscape conservation area (LSG084) and the biosphere reserve of the same name, the "Southeast Rügen Biosphere Reserve", which has a total area of 30,600 ha. Since the planned accompanying hydraulic engineering measures will be carried out on the areas of the sites already in use, there are no conflicts with the protected area ordinance of the LSG and the biosphere reserve.
Natural monuments in accordance with Section 28 BNatSchG	x		-
Protected landscape components, including avenues, in accordance with Section 29 BNatSchG	x		-
Legally protected biotopes according to Section 30 BNatSchG	x		The location of the pumping station is not within legally protected biotopes and does not affect them. The location of the spillover (water legal permit from 2008) is within the legally protected biotope "wetland biotope". The compensation required as a result of this has already been made in the water law approval procedure for the original plant, on whose premises the new project will also be erected.
Water protection areas in accordance with Section 51 WHG, mineral spring protection	x		-

Criteria	No	Yes	Information on the criteria (Type and scope)
areas in accordance with Section 53 Paragraph 4 WHG, risk areas in accordance with Section 73 Paragraph 1 WHG as well as flood areas in accordance with Section 76 WHG including regulations under regional law			
Areas where the environmental quality standards laid down in European Union legislation have already been exceeded	x		-
Areas with a high population density, in particular central locations within the meaning of Section 2 Paragraph 2 No. 2 ROG, including regulations under regional law	x		-
Monuments, groups of monuments, landmarks or areas listed in official lists or maps which have been classified as archaeologically significant landscapes by the national authority designated by the federal states, including regulations under national law.	x		The monument "Windschöpfwerk Lobbe" (list number 004211 according to LK VR) at the location of the replacement pumping station Lobbe will not be affected in the sense of the DSchG.

B.4.4.3.4.3.3 Nature and characteristics of the possible effects

In the following, the possible significant adverse environmental impacts of the modification on the listed protected assets on the basis of the nature and characteristics of the project are described roughly and the significance of the adverse effects on the environment are assessed using the criteria set out in Annex 3 to the UVPG.

B.4.4.3.4.3.3.1 People, including human health

No impairment due to noise, light or odour emissions; compliance with the guideline values of AVV Baulärm (German Construction Noise Ordinance); no traffic restrictions; protected assets are also not affected in other respects

➔No negative environmental impact

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.2 Fauna, flora and biodiversity

Only temporary, local effects on amphibians during construction are possible; killing or injury of amphibians are excluded by prevention and mitigation measures (amphibian fence); no significant disturbance or destruction of breeding or resting places.

➔Local limitation of the effects on building sites; no significant impact on amphibians due to prevention and mitigation measures.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.3 Area

No land use beyond the company premises already in use

➔Use of space only on used company premises; no change or expansion of site areas

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.4 Ground

Only temporary, local effects during the construction period (soil movements) are possible; no impact on near-natural or sensitive soils ; no impact on soils with cultural-historical significance; no impact on soils with archive function or rare soils

➔Temporary, local effects during construction on soils without special location characteristics; local soil movements during construction time (soil exchange, soil relocation)

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.5 Water

Only temporary, local effects during the construction period are possible; no significant effects due to prevention and mitigation measures; improvement of the natural water balance in the Lobber See flats through variable control of the water management facilities; possibility to react to extreme events such as heavy rainfall, floods; no damaging changes in bodies of water in accordance with Section 3 No. 10 WHG

➔Possibility of input of pollutants during the construction phase if necessary; groundwater retention during the construction phase if necessary; no significant project effects due to prevention and mitigation measures.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.6 Air / Climate

Only temporary, local, not significant effects by individual construction vehicles possible

➔Temporary, local, insignificant emissions of pollutants from individual construction vehicles

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.7 Landscape

No effects on landscape or scenery due to (new) replacement structures at already used plant locations

➔No negative environmental impact

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.8 Cultural heritage and other material goods

No adverse effects on the historical monument "Schöpfwerk Lobbe", because preservation is ensured

➔No negative environmental impact

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.3.3.9 Interactions between the aforementioned protected assets

In the previous analysis of the individual protected assets and the assessment of the effects of the altered project with regard to the protected assets, the expected and decision-relevant effects were recorded. Interactions between the protected assets are not apparent.

➔No negative environmental impact due to interactions

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.4.4 Summary

The nature and extent of the project-related effects on the protected assets cannot be assessed as significant in these documents, in particular with regard to the geographical area concerned, the population concerned, the severity and complexity, the likelihood, duration, frequency, reversibility and the interaction of the impacts with the impacts of other existing or authorised projects, as well as mitigation measures. The impacts do not have a cross-border character.

Taking into account the criteria listed in Annex 3 to the UVPG, the amendment cannot cause any significant adverse environmental impacts (Section 9 Paragraph 2 Clause 1 No. 2 UVPG). There is no requirement to carry out an environmental impact assessment for the proposed amendment.

B.4.4.3.5 Integration of additional filtration in the Greifswald-Ladebow wastewater treatment plant

The "Action for nutrient reduction in Greifswalder Bodden through integration of additional filtration in the Greifswald-Ladebow wastewater treatment plant" (compensation measure E1) is, together with the "Action for nutrient reduction in Greifswalder Bodden through integration of additional filtration in the Stralsund wastewater treatment plant" (compensation measure E2) (see section B.4.4.3.6 below) is an integral part of the "Measures for the reduction of nutrient discharges from the wastewater treatment plants Greifswald-Ladebow and Stralsund", with which the nutrient emissions of the aforementioned wastewater treatment plants are to be reduced by optimising the existing plant and the installation of downstream additional denitrification. The effluents of both wastewater treatment plants flow via Strelasund and Danish Wiek into the Greifswalder Bodden. The above-mentioned measures are intended to achieve a sustainable improvement in water quality and marine habitats in the Greifswalder Bodden.
No environmental impact assessment has so far been carried out for the existing wastewater treatment plant Greifswald-Ladebow. According to the project sponsor concept, the existing wastewater treatment plant is to be extended by integrating an additional filtration system. This expansion is to be carried out in such a way that the existing denitrification plants and problem water treatment will be optimised and additional plant components for residual denitrification (dispensing plant, denitrification filter, switchgear, optionally A-carbon adsorption, measuring points) and feeding/discharging pipelines will be built on the existing free area. For this purpose, the project sponsor has concluded an agreement with the operator of the plant (Wastewater Plant Greifswald, own plant operation of the University and Hanseatic City of Greifswald) on the additional reduction of nutrients and pollutants (agreement dated 25 January 2017). According to the above-mentioned agreement, the project sponsor is to act as the client in consultation with the Greifswald treatment works. The aforementioned construction measures require a building permit from the responsible building authority (Section 59 Paragraph 1 LBauO M-V) in accordance with the regional building regulations as a modification / extension to an existing building structure. No such building permit has been granted at present. In addition, for the intended establishment of the additional purification stage as an additional reduction for the purpose of nutrient reduction in the affected bodies of waters, the modification of the permit granted under water law for the existing plant is required (Section 8 WHG). This change in the water-legal permit was granted by the lower water authority on 21.12.2017 to the University and Hanseatic City of Greifswald as operator of the plant.
Pursuant to Section 9 Paragraph 2 sentence 1 no. 2 UVPG UVP, the proposed amendment is subject to a preliminary environmental impact assessment. Pursuant to point 13.1.2 of Annex 1 to the UVPG, a general preliminary examination of the individual case pursuant to Section 7 Paragraph 1 UVPG (in conjunction with Section 9 para 2 sentence 1 no. 2, para 4 UVPG) is to be conducted for the construction and operation of a wastewater treatment plant designed for organically contaminated

wastewater of 600 kg / d to less than 9,000 kg / d biochemical oxygen demand in five days (raw) or inorganic polluted waste water from 900 m^3 to less than 4,500 m^3 of wastewater in two hours (excluding cooling water). The authority responsible for carrying out the preliminary EIA review is the authority that decides on the approval of the project in question. Such a preliminary EIA examination was therefore carried out by the competent regional water authority in the course of the water licensing procedure. The assessment by the water authority showed that no significant adverse environmental impacts were to be expected from the project. An EIA is therefore not necessary. As the Stralsund Mining Authority, as the planning approval authority, has no responsibility for the approval of the construction, modification and operation of the wastewater treatment plant in question, the Stralsund Mining Authority therefore has no obligation to carry out a preliminary EIA examination in this respect. Since the project sponsor of the planning approval authority in its supplementary specification volume has submitted information to the UVPG in accordance with Annex 2 which allows for a preliminary examination, the planning approval authority has assumed by way of a legal subordination a precautionary obligation to carry out a preliminary EIA examination. This precautionary preliminary EIA examination has revealed the following:

B.4.4.3.5.1 Data basis

The following documents form the basis of the general preliminary examination of the individual case to determine whether or not there is a duty to carry out an environmental impact assessment (EIA):

- Complete application documents for the entire Nord Stream 2 project,
- Application documentation, supplementary volume: Specifications, document 5 - Measures for the reduction of nutrient discharges from the wastewater treatment plants Greifswald-Ladebow and Stralsund with information in accordance with Annex 2 to the UVPG on the characteristics of the project and the site as well as on the possible significant environmental impacts of the project (cf. Section 9 Paragraph 2 Clause 1 No. 2, Paragraph 4 in conjunction with Section 7 Paragraph 4 UVPG),
- Application documentation, supplementary volume: Specification, document 6 - Compilation of the instruction sheets,
- Opinions of the competent authorities and associations regarding the 1st revision to plans,
- 4th amendment of the permit pursuant to Section 8 WHG for discharging mechanically and biologically treated wastewater from the wastewater treatment plant Greifswald into the "Greifswalder Bodden" of the State Office for Agriculture and Environment of Western Pomerania dated 21.12.2017 (cf: 2012/356/9655/E8/4.Ä).

B.4.4.3.5.2 Decision on the EIA obligation of the project

For the above-mentioned project, the planning approval authority establishes ex officio that there is no obligation to carry out an environmental impact assessment in accordance with Section 5 (1) sentence 1, sentence 2 No. 3 UVPG.

The decision that it is not necessary to carry out an environmental impact assessment shall be made known to the public in accordance with Section 5 Paragraph 2 UVPG specifying the essential reasons for the non-existence of the EIA obligation with reference to the respective relevant criteria in Annex 3 to the UVPG and specifying which characteristics of the project or site or which precautions are relevant for this assessment, by way of the usual local announcement of a plan approval decision by the local planning authorities (Section 74 Paragraph 4 of the Administrative Procedure Act Mecklenburg-Western Pomerania (VwVfG M-V)) or otherwise made public (Section 74 Paragraph 5 VwVfG M-V).
Pursuant to Section 5 Paragraph 3 sentence 1 UVPG, the statement cannot be independently challenged.

B.4.4.3.5.3 Reasons for the decision

The decision derives from the expert assessment of the above documents, which were examined with regard to the criteria for the preliminary examination of the individual case in accordance with Annex 3 to the UVPG. In order to make the decision comprehensible and transparent, the essential characteristics of the project and its location, the nature and characteristics of possible significant adverse environmental impacts of the change and the arrangements envisaged by the promoter, which obviously exclude such effects, are summarised below.

B.4.4.3.5.3.1 Characteristics of the project

Federal State:	Mecklenburg-Western Pomerania
District:	Vorpommern-Greifswald
Community:	Hanseatic city of Greifswald
Scope:	Designed for a population of 96,000 The population-specific load according to ATV-DVWK-A 198 is 60 g BOD_5/d (E*d) Designed for a load of 5,760 kg BOD_5/d (E*d)
Design flow rate:	800 m^3/h

Criteria	No	Yes	Clarifications
Size and design of the entire project and, where relevant, demolition work	x		The Greifswald-Ladebow wastewater treatment plant is located in the Ladebow district of the Hanseatic city of Greifswald outside the enclosed development north of the Ladebow district. The Greifswald-Ladebow wastewater treatment plant was commissioned in 1994 and has a capacity of 96,000 inhabitants. The site of the wastewater treatment plant is owned by the Hanseatic city of Greifswald.

Criteria	No	Yes	Clarifications
			The presented feasibility study (ehp Umweltplanung GmbH 2017a) shows that the control value for nitrogen is largely exhausted. With values of approx. 0.3 mg/l, phosphorus is generally significantly lower than the control value. The nitrogen effluent load consists mainly of nitrate, but there are some ammonium levels above 1 mg/l. It can be seen that the plant has only small reserves with regard to nitrification. The planned measures are intended to reduce the nutrient content in the effluent water of the wastewater treatment plant as far as possible by optimising existing plant components and by means of downstream denitrification. As measures to increase the elimination of nitrogen, the optimisation of turbid water treatment (problem water treatment) for the treatment of the total amount of highly contaminated wastewater from sludge treatment (reduction of backload), the optimisation of the I&C technology of the activated sludge plant to improve nitrification and measures for the removal of nitrate by downstream denitrification are planned. The optimisation measures are to be carried out on the existing stock. For the downstream denitrification, new plant components as well as supply and discharge pipes must be erected or laid on the site of the wastewater treatment plant. For this purpose, an area of approx. 300 m² is required for the construction of the plant for downstream denitrification plus approx. 50 m² of temporary area utilisation for the laying of the supply and discharge pipes. The planned construction period is expected to be 1.5 years. Changes in plant capacity are

Criteria	No	Yes	Clarifications
			excluded due to the project.
Interaction with other existing or authorised projects and activities	x		There is no interaction with other existing or authorised projects and activities.
Use of natural resources, in particular land, soil, water, animals, plants and biodiversity	x		Area: Modification and expansion of plant components are carried out exclusively on the existing wastewater treatment plant site. For the denitrification plant, an area of about 300 m² will be used on the site, as well as a further 50 m2 for the laying of pipelines. Soil: For the construction of the plant for downstream denitrification, soil is to be sealed on an area of about 300 m². In addition, small-scale relocations of the soil are carried out in the course of laying the supply and discharge pipes (approx. 50 m^2). The surroundings of the site at the Greifswald-Ladebow wastewater treatment plant show numerous dikes and dams; the soils are therefore preloaded by anthropogenic impression. Water: The measure serves to sustainably improve the water quality of the Greifswald Bodden by reducing nutrient loads from the wastewater treatment plant effluent. A project-related increase in the discharge quantities is excluded. It can be assumed that the quality of the treated wastewater will improve significantly with regard to the parameters COD, BOD_5, nitrogen, ammonium-nitrogen and phosphorus. If necessary, short-term construction-related dewatering measures may be necessary for the foundation of the new plant sections. Impairment during construction due to the introduction of pollutants into the groundwater is ruled out by means of prevention and mitigation measures. Fauna and Flora: The planned measures involve local interventions

Criteria	No	Yes	Clarifications
			in soil and biotopes at the site of the wastewater treatment plant in Greifswald-Ladebow. In the implementation of prevention and mitigation measures, such as the exclusion of nocturnal construction work or the erection of a visual screen to the building site during the construction period, significant impairments of the breeding birds and amphibians species groups are excluded. If no construction work is carried out at night, impairments of migratory activities of the otter are excluded. Other species are not affected. The existing trees and shrubs in the vicinity of the plant with suitability as breeding sites for breeding birds, which at the same time – as well as the hedge to the east of the wastewater treatment plant fence – are suitable as frost-free winter quarters for amphibians, and the associated possible significant effects on breeding birds and amphibians during the construction period are excluded by appropriate prevention and mitigation measures. Impairment of the landscape and scenery is not to be expected due to the classification of the measures in the area of the existing wastewater treatment plant. The primary objective of the measure is to improve the water quality in the Greifswalder Bodden by reducing nutrient inputs via the water discharged from the wastewater treatment plant. The improvement of the water quality has a positive effect on the development of marine habitats in the Greifswalder Bodden. This results in equally positive effects on the GGB "Greifswalder Bodden, parts of Strelasund and Nordspitze Usedom" (DE1747-301). Due to noise and visual impacts during the construction period,

Criteria	No	Yes	Clarifications
			which are to be seen in the context of the preloading caused by the existing operation of the wastewater treatment plant, small-scale disturbances of the adjacent EU bird sanctuary "Greifswalder Bodden und südlicher Strelasund" (DE1747-402) can occur, which are reduced by prevention and mitigation measures. Biological Diversity: Due to the small scale of the project and the pre-loading at the wastewater treatment plant site, there are no effects on biodiversity.
Waste generation in the sense of Section 3 Paragraph 1, 8 KrWG	x		The waste arising from the operation of construction machinery and vehicles is to be collected and sent for professional disposal. The corresponding legal regulations are to be observed.
Environmental pollution and nuisances	x		The impacts caused by the project are only to be expected during the construction phase of the new plant components. The impacts are limited to the site of the wastewater treatment plant itself and its immediate surroundings. The guideline values of AVV Construction Noise Control Regulations are to be complied with. Compared to existing wastewater treatment plants, there will be no increase in operational noise, light and odour emissions.
Risks of incidents, accidents and disasters related to the project, including incidents, accidents and disasters which, according to scientific evidence, are caused by climate change, in particular with regard to: • Materials and technologies used • The susceptibility of the project to accidents as defined in Section 2 No. 7 of the Accident Regulations, in particular due to its	x		The planned construction measures are to employ common building methods which are carried out using state of the art techniques. The risk of accidents is therefore low. The risk of pollutants escaping into the aquatic environment is also estimated to be low. If the safety regulations are complied with, an increased risk of accidents can be ruled out. Climate change related impacts of the project in the adjacent sense are excluded.

Criteria	No	Yes	Clarifications
completion within the an appropriate safety distance to operating areas as defined in Section 3 Paragraph 5a BImSchG.			
Risks to human health, e. g. from contamination of water or air pollution	x		The modification of the project does not pose any hazards to human health due to plant or operational reasons. The installation of additional denitrification reduces the nutrient load in the wastewater treatment plant effluent. Construction-related impairments caused by harmful substances entering the groundwater are minimised by means of prevention and mitigation measures. Noise and air pollution during the construction phase do not have any effect due to the preloading.

B.4.4.3.5.3.2 Location of the project

B.4.4.3.5.3.2.1 Usage criteria

The modified project is located at the site of the Greifswald-Ladebow wastewater treatment plant, which it is also characterised by its plant stock. The Greifswald Ladeow wastewater treatment plant is located in an isolated location outside built-up residential areas and is surrounded by near-natural biotope structures. Residential areas and buildings are not affected by the modified project and the hydrological effects. Areas of particular importance for recreational use or tourism as well as areas used for the agricultural, forestry and fishing industries, including supplying them and disposing of waste from them, are not affected. The existing site of the Greifswald-Ladebow wastewater treatment plant will not be extended.
In the vicinity of the modified project, no other plants are known to have an impact on the site of the Greifswald-Ladebow wastewater treatment plant. Preloading from other systems also does not exist. Cumulative effects of the amended project "Wastewater Treatment Plant Greifswald-Ladebow" with other projects are therefore not apparent.

B.4.4.3.5.3.2.2 Quality criteria

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
Area	x		The planned optimisation measures are to be carried out on the existing stock. There is no land use that

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
			extends beyond the existing and used area of the Greifswald-Ladebow wastewater treatment plant. On the site, an area of approx. 300 m² will be used for the construction of the plant for subsequent denitrification plus about 50 m² of temporary space for laying the supply and discharge pipes.
Soil, in particular soils with special functions for the natural environment (e.g. soils with special site characteristics, with a cultural/natural-historical significance, raised bogs, old forest sites), sensitivity to soil erosion and material contamination of the soil.	x		The project will result in new soil sealings on the site of the wastewater treatment plant on pre-loaded soils on the aforementioned scale. Soils of particular importance for nature conservation or particularly endangered, as well as priority or precautionary areas for the extraction of raw materials, are neither influenced nor impaired.
Landscape	x		At the project's location, the landscape is characterised by the existing plant stock of the wastewater treatment plant.
Water, including groundwater	x		Water: The closest open body of water is the Dänische Wiek with direct connection to the Greifswalder Bodden, which is located about 350 m east of the project. Small watercourses are located north of the wastewater treatment plant at a distance of at least 100 m from the project and west of the wastewater treatment plant at a distance of about 160 m from the project. A negative influence or impairment of flowing waters, water protection areas, catchment areas and the like is excluded. The amended project has a positive effect on the Dänische Wiek and Greifswalder Bodden as a result of the reduction of nutrient input into these waters (probably about 21 t/a nitrogen; 0.5 t/a phosphorus). Ground water: The Greifswald-Ladebow wastewater treatment

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
			plant is located in the "Ryck/Ziesebach" groundwater body (WP_KO_5). The wastewater treatment plant discharges the treated wastewater into the coastal body of water "Greifswalder Bodden" (WP_13). Groundwater recharge is already reduced in the actual state due to the existing impermeable surface on the wastewater treatment plant site. This is further reduced at certain points by means of new sealing of small surface areas. Areas with a high potential for groundwater pollution are neither affected nor impaired.
Fauna, flora and biodiversity	x		The wastewater treatment plant location itself is characterised by the existing plant stock and impermeable paths. The existing permeable areas have low quality grasslands in terms of nature conservation. Outside the perimeter fencing of the wastewater treatment plant, there are mainly ruderal areas with interspersed woody plants. At the eastern fence of the wastewater treatment plant there is a protected hedgerow biotope, which was planted in autumn 2017 and does not presently represent a breeding habitat for birds.
Other natural resources	x		Due to the existing wastewater treatment plant, air quality is already polluted on a small scale.

B.4.4.3.5.3.2.3 Protection criteria

Criteria	No	Yes	Information on the criteria (Type and scope)
Sites of community importance and bird sanctuaries in accordance with Section 32 BNatSchG, Section 21 NatSchAG M-V (also impairments which can	x		The Greifswald-Ladebow wastewater treatment plant is located outside Natura 2000 sites. The Dänische Wiek, part of the Greifswalder Bodden FFH-area,

Criteria	No	Yes	Information on the criteria (Type and scope)
have an external impact on the area)			parts of the Strelasund and the northern tip of Usedom (DE1747-301), is situated at a distance of about 350 m east of the wastewater treatment plant. The project will have operational effects on the Dänische Wiek and Greifswalder Bodden. However, since this is a reduction of the nutrient load, the operational effects on the previously mentioned areas are only positive in nature. The EU bird sanctuary "Greifswalder Bodden und südlicher Strelasund" (Greifswalder Bodden and southern Strelasund) (DE1747-402) borders the north of the Greifswald-Ladebow wastewater treatment plant. Project impairments of the protected areas due to construction period factors such as noise and air pollutants are excluded due to the previous pollution at the wastewater treatment plant location, as well as due to the fact that these occur exclusively locally and temporarily, as well as due to the distance to the protected area.
Nature conservation areas in accordance with Section 23 BNatSchG including regulations under state law	x		The Ladebower Moor nature reserve borders directly to the west of the Greifswald-Ladebow wastewater treatment plant. The aim of the protection status as of 24.11.1997 is to preserve a coastal, strongly peaty marsh with adjacent dry locations. The current state of the area is considered to be good after drainage ditches were closed in 1993. Project impairments of the protected areas due to construction period factors such as noise and air pollutants are excluded due to the previous pollution at the wastewater treatment plant location, as well as due to the fact that these occur exclusively locally and temporarily.
National parks and national	x		-

Criteria	No	Yes	Information on the criteria (Type and scope)
natural monuments in accordance with Section 24 BNatSchG including regulations under state law			
Biosphere reserves and landscape protection areas in accordance with Sections 25, 26 BNatSchG	x		The "Greifswalder Bodden" landscape conservation area (LSG142), which has a total area of 56,522 ha, is located at a distance of about 350 m east of the wastewater treatment plant. The Southeast Rügen Biosphere Reserve is located about 21.5 km northeast of the wastewater treatment plant site. Construction and installation-related factors do not reach the protected areas. The operational reduction of the nutrient load in the effluent water of the wastewater treatment plant has positive effects on the marine components of the protected areas.
Natural monuments in accordance with Section 28 BNatSchG	x		-
Protected landscape components, including avenues, in accordance with Section 29 BNatSchG	x		-
Legally protected biotopes according to Section 30 BNatSchG	x		To the east of the fenced-in wastewater treatment plant site in Greifswald-Ladebow there is a hedgerow structure made of indigenous trees and shrubs (hawthorn, dogwood, elderberry, field maple) on a length of 120 m and a width of 5 m, which is subject to statutory biotope protection. Prevention and mitigation measures (possibly necessary compensation of hedgerow losses due to the planting of new hedgerow structures) prevent an impairment of the protected biotope. The reduction of the nutrient load in the effluent water of the wastewater treatment plant for operational reasons will result in positive effects on protected marine biotopes in the Greifswalder Bodden.

Criteria	No	Yes	Information on the criteria (Type and scope)
Water protection areas in accordance with Section 51 WHG, mineral spring protection areas in accordance with Section 53 Paragraph 4 WHG, risk areas in accordance with Section 73 Paragraph 1 WHG as well as flood areas in accordance with Section 76 WHG including regulations under regional law	x		-
Areas where the environmental quality standards laid down in European Union legislation have already been exceeded	x		-
Areas with a high population density, in particular central places within the meaning of Section 2 Paragraph 2 No. 2 ROG, including regulations under regional law	x		-
Monuments, groups of monuments, landmarks or areas listed in official lists or maps which have been classified as archaeologically significant landscapes by the national authority designated by the federal states, including regulations under national law.	x		-

B.4.4.3.5.3.3 Nature and characteristics of the possible effects

In the following, the possible significant adverse environmental impacts of the modification of the project on the listed protected assets on the basis of the nature and characteristics of the project are described roughly and the significance of the adverse effects on the environment are assessed using the criteria set out in Annex 3 to the UVPG.

B.4.4.3.5.3.3.1 People, including human health

No effects due to hydrological changes; no additional impairments due to noise, light or odour emissions; compliance with the guideline values of AVV Baulärm (German Construction Noise Ordinance); no traffic restrictions; protected assets are also not affected in other respects

➔No negative environmental impact

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.2 Fauna, flora and biodiversity

Sealing and overprinting of biotope types with general significance are significant impairments of the efficiency of the natural environment according to Sections 14, 15 BNatSchG; compensation through compensation measures; significant damage to species groups of breeding birds and amphibians will be excluded by prevention and mitigation measures, such as avoiding damage to the hedgerow structure east of the treatment plant site and the installation of a temporary fence to shield visual disturbances in the surrounding open landscape, in particular to the north in the direction of the adjoining LSG and the construction site and maintenance of an amphibious fence in the period of migration activities; exclusion of nocturnal construction activities excludes disturbances of migratory activity of the otter; no concern of other species groups

➔Overstamping and sealing of ruderal corridors as biotope types of general importance for nature conservation is compensated for by compensation measures; impairment of protected hedgerow structure at the eastern edge of the wastewater treatment plant is excluded by means of prevention and mitigation measures; significant impairment of breeding birds and amphibians is excluded by means of prevention and mitigation measures.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.3 Area

No land use beyond existing and used wastewater treatment plant property; surface sealing there approx. 300 m^2; relocation of approx. 50 m^2 of soil; areas foreseen in the interior area for building planning purposes

➔Minor new land use on already used wastewater treatment plant property

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.4 Ground

Small-scale, permanent exposure to contaminated soils without special site characteristics (area sealing 300 m^2, relocation approx. 50 m^2); no impact on near-natural or sensitive soils; no impact on soils of cultural-historical importance; no impact on soils with archive function or rare soils

➔Small-scale surface sealing on pre-loaded soil without special site-specific properties; small-area soil relocation

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.5 Water

Exclusively temporary, local effects during the construction period; no significant project effects if planned prevention and mitigation measures are adhered to, such as refuelling of construction vehicles on sealed surfaces, use of preloaded/sealed surfaces for construction equipment and material storage; minimisation of nutrient load in the effluent treatment plant produces positive effects on the water quality of the Greifswald Bodden region.

➔Pollutant input is possible during the construction phase; if necessary, groundwater retention during the construction phase; both are only temporary and local; prevention and mitigation measures are available; permanent and significant minimisation of nutrient load in the effluent of the wastewater treatment plant.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.6 Air / Climate

Only temporary, local, insignificant emissions of pollutants from individual construction vehicles at the pre-contaminated wastewater treatment plant site during the construction period

➔Temporary, local, insignificant emissions of pollutants from individual construction vehicles

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.7 Landscape

Construction of the new plant for downstream denitrification on the site of the existing wastewater treatment plant in Greifswald-Ladebow in the context of the existing plants.

➔New construction of new plant sections on the site of existing wastewater treatment plant Greifswald-Ladebow without any impact on the landscape or scenery

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.8 Cultural heritage and other material goods

No known concern

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.3.3.9 Interactions between the aforementioned protected assets

In the previous analysis of the individual protected assets and the assessment of the effects of the altered project with regard to the protected assets, the expected and decision-relevant effects were recorded. Interactions between the objects of protection including area, soil (sealing, relocation) and water (reduction of nutrient load) are intended as a positive effect of the measure.

➔No negative environmental impact due to interactions

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.5.4 Summary

The nature and extent of the project-related effects on the protected assets cannot be assessed as significant in these documents, in particular with regard to the geographical area concerned, the population concerned, the severity and complexity, the likelihood, duration, frequency, reversibility and the interaction of the impacts with the impacts of other existing or authorised projects, as well as mitigation measures. The impacts do not have a cross-border character.
Taking into account the criteria listed in Annex 3 to the UVPG, the amendment cannot cause any significant adverse environmental impacts (Section 9 Paragraph 2 Clause 1 No. 2 UVPG). There is no requirement to carry out an environmental impact assessment for the proposed amendment.

B.4.4.3.6 Integration of additional filtration in the Stralsund wastewater treatment plant

The "Measure for nutrient reduction in the Greifswalder Bodden through integration of additional filtration in the Stralsund wastewater treatment plant" (compensation measure E2) is part of the presented "Measures for reducing nutrient inputs from the Greifswald-Ladebow and Stralsund wastewater treatment plants".
No environmental impact assessment has so far been carried out for the existing wastewater treatment plant in Stralsund. According to the project sponsor's concept, the existing wastewater treatment plant is to be extended by integrating an additional filtration system.
This expansion is to be carried out in such a way that the existing denitrification plants as well as mixing and equalisation basins are optimised and, from a structural point of view, additional plant components for residual denitrification (dosing plant, denitrification filter, switchgear, optional A-carbon adsorption, measuring points) and turbid water treatment (sedimentation, deammonification, nitration, blower, switchgear) are to be installed on the existing free area, as well as supply/discharge pipelines. For this purpose, the project sponsor has concluded a planning and construction agreement with the operator of the plant (Hansestadt Stralsund) (agreement dated 15.12/19.12.2017). According to the aforementioned agreement, the project sponsor is to act as the building owner in consultation with the Hanseatic City of Stralsund. The aforementioned construction measures require a building permit from the competent building authority (Section 59 Paragraph 1 LBauO M-V) to amend / extend an existing building structure. No such building permit has been granted at present. In addition, for the intended establishment of the additional

purification stage as an additional reduction for the purpose of nutrient reduction in the waters used, the modification of the permit granted under water law for the existing plant is required (Section 8 WHG). This change in the water-legal permit was granted by the lower water authority on 21.12.2017 to the Hanseatic City of Stralsund as operator of the plant.
Pursuant to Section 9 Paragraph 2 sentence 1 no. 2 UVPG UVP, the proposed amendment is subject to a preliminary environmental impact assessment. Pursuant to point 13.1.2 of Annex 1 to the UVPG, a general preliminary examination of the individual case is to be conducted pursuant to Section 7 Paragraph 1 UVPG (in conjunction with Section 9 para 2 sentence 1 no. 2, para 4 UVPG) for the construction and operation of a wastewater treatment plant designed for organically contaminated wastewater of 600 kg / d to less than 9,000 kg / d biochemical oxygen demand in five days (raw) or inorganic polluted waste water from 900 m^3 to less than 4,500 m^3 of wastewater in two hours (excluding cooling water). The authority responsible for carrying out the preliminary EIA review is the authority that decides on the approval of the project in question. Such a preliminary EIA examination was therefore carried out by the competent regional water authority in the course of the water licensing procedure. The assessment by the water authority showed that no significant adverse environmental impacts were to be expected from the project. An EIA is therefore not necessary. As the Stralsund Mining Authority, as the planning approval authority, has no responsibility for the approval of the construction, modification and operation of the waste water treatment plant in question, the Stralsund Mining Authority therefore has no obligation to carry out a preliminary EIA examination in this respect. Since the project sponsor of the planning approval authority in its supplementary specification volume has submitted information to the UVPG in accordance with Annex 2 which allows for a preliminary examination, the planning approval authority has assumed by way of a legal subordination a precautionary obligation to carry out a preliminary EIA examination. This precautionary preliminary EIA examination has revealed the following:

B.4.4.3.6.1 Data basis

The following documents form the basis of the general preliminary examination of the individual case to determine whether or not there is a duty to carry out an environmental impact assessment (EIA):

- Complete application documents for the entire Nord Stream 2 project,
- Application documentation, supplementary volume: Specifications, document 5 - Measures for the reduction of nutrient discharges from the wastewater treatment plants Greifswald-Ladebow and Stralsund with information in accordance with Annex 2 to the UVPG on the characteristics of the project and the site as well as on the possible significant environmental impacts of the project (cf. Section 9 Paragraph 2 Clause 1 No. 2, Paragraph 4 in conjunction with Section 7 Paragraph 4 UVPG),
- Application documentation, supplementary volume: Specification, document 6 - Compilation of the instruction sheets,
- Opinions of the competent authorities and associations regarding the 1st revision to plans,
- 2nd revision the permit pursuant to Section 8 WHG for discharging mechanically and biologically treated wastewater from the wastewater

treatment plant Stralsund into the "Strelasund" of the State Office for Agriculture and Environment of Western Pomerania from 21.12.2017 (cf: 2012/045-2/9655/E8/2.Ä).

B.4.4.3.6.2 Decision on the EIA obligation of the project

For the above-mentioned project, the planning approval authority establishes ex officio that there is no obligation to carry out an environmental impact assessment in accordance with Section 5 (1) sentence 1, sentence 2 No. 3 UVPG.
The decision that it is not necessary to carry out an environmental impact assessment shall be made known to the public in accordance with Section 5 Paragraph 2 UVPG specifying the essential reasons for the non-existence of the EIA obligation with reference to the respective relevant criteria in Annex 3 to the UVPG and specifying which characteristics of the project or site or which precautions are relevant for this assessment, by way of the usual local announcement of a plan approval decision by the local planning authorities (Section 74 Paragraph 4 of the Administrative Procedure Act Mecklenburg-Western Pomerania (VwVfG M-V)) or otherwise made public (Section 74 Paragraph 5 VwVfG M-V).
Pursuant to Section 5 Paragraph 3 sentence 1 UVPG, the statement cannot be independently challenged.

B.4.4.3.6.3 Reasons for the decision

The decision derives from the expert assessment of the above documents, which were examined with regard to the criteria for the preliminary examination of the individual case in accordance with Annex 3 to the UVPG. In order to make the decision comprehensible and transparent, the essential characteristics of the project and its location, the nature and characteristics of possible significant adverse environmental impacts of the change and the arrangements envisaged by the promoter, which obviously exclude such effects, are summarised below.

B.4.4.3.6.3.1 Characteristics of the project

Federal State:	Mecklenburg-Western Pomerania
District:	Vorpommern-Rügen
Community:	Hanseatic city of Stralsund
Scope:	Designed for a population of 120,000 The population-specific load according to ATV-DVWK-A 198 is 60 g BOD_5/(E*d) Designed for a load of 7,200 kg BOD_5/d (E*d)
Design flow rate:	800 m^3/h

Criteria	No	Yes	Clarifications
Size and design of the entire project and, where relevant, demolition work	x		The Stralsund wastewater treatment plant in the district of Franken Mitte, which has been in operation since 1993, is designed for a capacity of 120,000 inhabitants. The operating

Criteria	No	Yes	Clarifications
			permit is issued for 85,000 inhabitants and the actual load has been increasing since 2016. The site is owned by REWA GmbH. The supply to the wastewater treatment plant is approx. 11,200 m³/d in dry weather and up to 40,000 m³/d in rainy weather. The wastewater treatment plant is currently working at full capacity. The Stralsund wastewater treatment plant is already designed to reduce the nitrogen and phosphorus nutrients and meets the legal requirements with regard to the state of the art. However, the plant continues to emit a nutrient load into the Strelasund / Greifswalder Bodden, the reduction potential of which was tested in a concept study (EHP UMWELTPLANUNG GMBH 2017B). With regard to the purification performance, the control value of 18 mg/l for nitrogen is sometimes used to a relatively high degree; phosphorus, with values of approx. 0.6 mg/l, is generally significantly lower than the monitoring value. The nitrogen load consists mainly of nitrate, but there are some ammonium levels up to 10 mg/l. It can be seen that the nitrification capacity of the plant is to some degree limited. The planned measures are intended to reduce the nutrient content in the effluent water of the wastewater treatment plant as far as possible by optimising existing plant components and by means of downstream denitrification. As measures to increase the elimination of nitrogen, the optimisation of turbid water treatment (problem water treatment) for the treatment of the total amount of highly contaminated wastewater from sludge treatment (reduction of backload), the optimisation of the

Criteria	No	Yes	Clarifications
			I&C technology of the activated sludge plant to improve nitrification and measures for the removal of nitrate by downstream denitrification are planned. The optimisation measures are to be carried out on the existing stock. For the downstream denitrification, new plant components as well as supply and discharge pipes must be erected or laid on the site of the wastewater treatment plant. For this purpose, an area of approx. 500 m² is required for the construction of the plants for downstream denitrification and turbid water treatment, plus approx. 70 m² of temporary area utilisation for the laying of the supply and discharge pipes. The planned construction period is expected to be 1.5 years. Changes in plant capacity are excluded due to the project.
Interaction with other existing or authorised projects and activities	x		There is no interaction with other existing or authorised projects and activities.
Use of natural resources, in particular land, soil, water, animals, plants and biodiversity	x		Area: Modification and expansion of plant components are carried out exclusively on the existing wastewater treatment plant site. For the denitrification plant, an area of about 500 m² will be used on the site, as well as a further approx. 70 m2 for the laying of pipelines. Soil: For the construction of the plant for downstream denitrification, soil is to be sealed on an area of approx. 250 m². In addition, small-scale relocations of the soil are carried out in the course of laying the supply and discharge pipes (approx. 70 m^2). Water: The measure serves to sustainably improve the water quality of the Greifswald Bodden by reducing nutrient loads from the wastewater treatment plant effluent. A project-related increase in the discharge quantities is excluded.

Criteria	No	Yes	Clarifications
			Rather, it can be assumed that the quality of the treated wastewater will improve significantly with regard to the parameters COD, BOD_5, nitrogen, ammonium-nitrogen and phosphorus. If necessary, short-term construction-related dewatering measures may be necessary for the foundation of the new plant sections. Impairment during construction due to the introduction of pollutants into the groundwater is ruled out by means of prevention and mitigation measures. <u>Fauna and Flora:</u> The planned measures involve local interventions in soil and biotopes at the site of the wastewater treatment plant in Stralsund. Biotopes of the settlement grasslands as well as individual young trees and small-scale individual areas of hedging are affected. Impairment of the landscape is not to be expected due to the classification of the measures in the area of the existing wastewater treatment plant. The primary objective of the measure is to improve the water quality in the Greifswalder Bodden by reducing nutrient inputs via the water discharged from the wastewater treatment plant. The improvement of the water quality has a positive effect on the development of marine habitats in the Greifswalder Bodden. <u>Biodiversity:</u> The small-scale project at the pre-polluted wastewater treatment plant site is not likely to have an impact on biodiversity.
Waste generation in the sense of Section 3 Paragraph 1, 8 KrWG	x		The waste arising from the operation of construction machinery and vehicles is to be collected and sent for professional disposal. The corresponding legal regulations are to be observed.
Environmental pollution and	x		The impacts caused by the project

Criteria	No	Yes	Clarifications
nuisances			are only to be expected during the construction phase of the new plant components. The impacts are limited to the site of the wastewater treatment plant itself and its immediate surroundings. The guideline values of AVV Construction Noise Control Regulations are to be complied with. Compared to existing wastewater treatment plants, there will be no increase in operational noise, light and odour emissions.
Risks of incidents, accidents and disasters related to the project, including incidents, accidents and disasters which, according to scientific evidence, are caused by climate change, in particular with regard to: • Materials and technologies used • The susceptibility of the project to accidents as defined in Section 2 No. 7 of the Accident Regulations, in particular due to its completion within the an appropriate safety distance to operating areas as defined in Section 3 Paragraph 5a BImSchG.	x		The planned construction measures are to employ common building methods which are carried out using state of the art techniques. The risk of accidents is therefore not increased. The risk of pollutants escaping into the aquatic environment is also low. If the safety regulations are complied with, an increased risk of accidents can be ruled out. Climate change related impacts of the project in the adjacent sense are excluded.
Risks to human health, e.g. from contamination of water or air pollution	x		The modification of the project does not pose any hazards to human health due to plant or operational reasons. The installation of additional denitrification reduces the nutrient load in the wastewater treatment plant effluent. Construction-related impairments caused by harmful substances entering the groundwater are minimised by means of prevention and mitigation measures. Noise and air pollution during the construction phase do not have any effect due to the preloading.

B.4.4.3.6.3.2 Location of the project

B.4.4.3.6.3.2.1 Usage criteria

The modified project is located at the Stralsund wastewater treatment plant in Stralsund (OT Franken Mitte), which is also the site of a large number of plants. Furthermore, sealed paths and open spaces with settlement grasslands as well as individual settlement shrubs have a distinctive effect. There are other commercially used sites outside the perimeter fencing of the wastewater treatment plant. Residential areas will not be affected by the modified project and the hydrological effects. Areas of particular importance for recreational use or tourism as well as areas used for the agricultural, forestry and fishing industries, including supplying them and disposing of waste from them, are not affected. The existing site of the Stralsund wastewater treatment plant will not be extended.
In the vicinity of the modified project, no other plants are known to have an impact on the site of the Stralsund wastewater treatment plant. Preloading from other systems also does not exist. Cumulative effects of the amended project "Wastewater Treatment Plant Stralsund" with other projects are therefore not apparent.

B.4.4.3.6.3.2.2 Quality criteria

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
Area	x		The planned optimisation measures will be carried out in the existing facilities; there will be no land use that extends beyond the existing and used premises of the Stralsund wastewater treatment plant. On the site, an area of approx. 500 m² will be used for the construction of the plants for downstream denitrification and turbid water treatment, plus approx. 70 m² of temporary space for laying the supply and discharge pipes.
Soil, in particular soils with special functions for the natural environment (e.g. soils with special site characteristics, with a cultural/natural-historical significance, raised bogs, old forest sites), sensitivity to soil erosion and material contamination of the soil.	x		The amended project will result in new soil sealing on the site of the wastewater treatment plant. Soils of particular importance for nature conservation or particularly endangered, as well as priority or precautionary areas for the extraction of raw materials, are neither influenced nor impaired.
Landscape	x		At the project's location, the landscape is characterised by the existing stock of wastewater treatment plants as well as by the

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
			other commercial uses existing there.
Water, including groundwater	x		Water: The closest open body of water is the coastal water body "Strelasund" (WP_12), which is about 414 m away from the Stralsund wastewater treatment plant. Hohe Graben is about 645 m away, the Franken ponds are located about 911 m away from the wastewater treatment plant. A negative influence or impairment of flowing waters, water protection areas, catchment areas and the like is excluded. The amended project has a positive effect on Strelasund and Greifswalder Bodden as a result of the reduction of nutrient input into these waters (probably about 31 t/a nitrogen; 1.9 t/a phosphorus). Ground water: The wastewater treatment plant is located in the area of the groundwater body "Stralsund" (WP_KO_4). Groundwater recharge is already reduced in the current state due to the existing impermeable surface on the waste water treatment plant site. This is further reduced at certain points by means of new sealing of small surface areas. Areas with a high potential for groundwater pollution are neither affected nor impaired.
Fauna, flora and biodiversity	x		The wastewater treatment plant location itself is characterised by the existing plant stock and impermeable paths. The existing unsealed areas have low-value grasslands as well as individual areas of trees and shrubs. There are other commercially used sites outside the perimeter fencing of the wastewater treatment plant. To the north are the abandoned areas of the former sugar factory with a succession of trees and

The richness, availability, quality and regenerative capacity of the natural resources of the area and its subsoil	No	Yes	Clarifications
			extensive blackberry bushes. The area may serve as a hunting grounds, but not as a habitat for bats; the existing bushes can potentially serve as a habitat for bush breeders.
Other natural resources	x		Any influencing or impairment of important areas for air quality and climate control is excluded. The modified project is located at a commercial site. Due to the existing wastewater treatment plant, air quality is already polluted on a small scale.

B.4.4.3.6.3.2.3 Protection criteria

Criteria	No	Yes	Information on the criteria (Type and scope)
Sites of community importance and bird sanctuaries in accordance with Section 32 BNatSchG, Section 21 NatSchAG M-V (also impairments which can have an external impact on the area)	x		The Stralsund wastewater treatment plant is located outside Natura 2000 sites. The EU bird sanctuary "Greifswalder Bodden and southern Strelasund" (DE1747-402) is located at a distance of about 700 m east of the wastewater treatment plant. The distance to the Greifswalder Bodden FFH area, parts of the Strelasund and the northern tip of Usedom (DE1747-301) is approx. 2.6 km. The project will have operational effects on the FFH area, which will be achieved by reducing the nutrient load, which will have positive effects on Strelasund and Greifswalder Bodden. Project impairments of the protected areas due to construction period factors such as noise and air pollutants are excluded due to the previous pollution at the wastewater treatment plant location, as well as due to the fact that these occur exclusively locally and temporarily, as well as due to the (sometimes

Criteria	No	Yes	Information on the criteria (Type and scope)
			considerable) distance to the protected area.
Nature conservation areas in accordance with Section 23 BNatSchG including regulations under state law	x		-
National parks and national natural monuments in accordance with Section 24 BNatSchG including regulations under state law	x		-
Biosphere reserves and landscape protection areas in accordance with Sections 25, 26 BNatSchG	x		The project area is located outside landscape conservation areas and biosphere reserves. The "Mittlerer Strelasund" landscape conservation area (LSG 61) with a total area of 1,400 ha is located at a distance of approx. 2.5 km east of the wastewater treatment plant. Approximately 900 m northwest of the wastewater treatment plant is the LSG "Stadtteiche und Grünanlagen von Stralsund" (City ponds and green areas of Stralsund). Construction and installation-related factors do not reach the protected areas. The operational reduction of the nutrient load in the effluent water of the wastewater treatment plant has positive effects on the marine components of the protected areas.
Natural monuments in accordance with Section 28 BNatSchG	x		-
Protected landscape components, including avenues, in accordance with Section 29 BNatSchG	x		-
Legally protected biotopes according to Section 30 BNatSchG	x		To the west and north of the final sedimentation basin, the wastewater treatment plant in Stralsund is lined with a partly interrupted tree hedge (BHB) consisting of sycamore, birch and willow on a total length of approx. 260 m. This biotope is classified as near-natural field hedges and is

Criteria	No	Yes	Information on the criteria (Type and scope)
			subject to statutory biotope protection. Due to the nature of the project, there will be no intervention in the tree hedge, as the plants for residual nitrification and turbid water treatment as well as the supply and discharge pipes will be built outside legally protected biotopes, so that impairments of even these biotopes are excluded. The Greifswalder Bodden, which is legally protected as "Bodden waters with sedimentation zones" and into which the treated wastewater is discharged via the Strelasund, is exclusively positively influenced by the reduction of nutrient inputs.
Water protection areas in accordance with Section 51 WHG, mineral spring protection areas in accordance with Section 53 Paragraph 4 WHG, risk areas in accordance with Section 73 Paragraph 1 WHG as well as flood areas in accordance with Section 76 WHG including regulations under regional law	x		-
Areas where the environmental quality standards laid down in European Union legislation have already been exceeded	x		-
Areas with a high population density, in particular central places within the meaning of Section 2 Paragraph 2 No. 2 ROG, including regulations under regional law	x		-
Monuments, groups of monuments, landmarks or areas listed in official lists or maps which have been classified as archaeologically significant landscapes by the national authority designated by the federal states, including regulations under national law.	x		-

B.4.4.3.6.3.3 Nature and characteristics of the possible effects

In the following, the possible significant adverse environmental impacts of the modification of the project on the listed protected asset on the basis of the nature and characteristics of the project are described roughly and the significance of the adverse effects on the environment are assessed using the criteria set out in Annex 3 to the UVPG.

B.4.4.3.6.3.3.1 People, including human health

No effects due to hydrological changes; no additional impairments due to noise, light or odour emissions; compliance with the guideline values of AVV Baulärm (German Construction Noise Ordinance); no traffic restrictions; protected assets are also not affected in other respects

➔No negative environmental impact

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.2 Fauna, flora and biodiversity

The sealing and overstamping of biotope types with general importance leads to considerable impairment of the efficiency of the natural ecosystem in accordance with Sections 14, 15 BNatSchG; but balancing by compensatory measures; tree protection measures according to DIN 18920 during the construction period, felling of trees and shrubs outside the period from 01.02. to 30.09, felling/clearing of woody plants outside the breeding season of breeding birds, which exclude significant impairment; significant impairment of the breeding birds species groups is excluded by the clearing of building land outside the breeding season; no impairment of potential hunting sites of bats; no impact on other species groups

➔Overstamping and the sealing of areas of grasslands as biotope types of general importance for nature conservation, compensatory measures in place; removal of individual young trees and individual areas of hedging with potential breeding bird habitats; prevention measures in place; potential hunting habitat for bats, but impairments excluded.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.3 Area

No land use beyond existing and used wastewater treatment plant property; new surface sealing there about 500 m^2, land use for soil relocation about 70 m^2

➔New land use on already used wastewater treatment plant property

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.4 Ground

Small-scale, permanent exposure to contaminated soils without special site characteristics (area sealing 500 m^2, relocation approx. 70 m^2); no impact on near-natural or sensitive soils; no impact on soils of cultural-historical importance; no impact on soils with archive function or rare soils; prevention measures to protect the soil from the introduction of pollutants, protection and restoration of the topsoil.

➔Surface sealing on contaminated soil without special site characteristics; small-scale soil relocation; prevention measures to protect against pollutant inputs

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.5 Water

Exclusively temporary, local effects during the construction period; no significant project effects if planned prevention and mitigation measures are adhered to, such as refuelling of construction vehicles on sealed surfaces, use of preloaded areas for construction equipment and material storage, protection of groundwater and surface water against pollutants; minimisation of nutrient loads in the effluent of wastewater treatment plants leads to positive effects on the water quality of the Greifswald Bodden.

➔Pollutant input is possible during the construction phase; if necessary, groundwater retention during the construction phase; both are only temporary and local; prevention and mitigation measures are available; permanent and significant minimisation of nutrient load in the effluent of the wastewater treatment plant.

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.6 Air / Climate

Only temporary, local, insignificant emissions of pollutants from individual construction vehicles at the pre-contaminated wastewater treatment plant site during the construction period

➔Temporary, local, insignificant emissions of pollutants from individual construction vehicles

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.7 Landscape

Construction of the plant for downstream denitrification on the site of the Stralsund wastewater treatment plant; realisation of the new plant in the context of the existing plant stock

➔New construction of new plant components on the site of existing Stralsund wastewater treatment plant without significant damage to the landscape or scenery, only local expansion of the existing plant stock

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.8 Cultural heritage and other material goods

No noticeable concerns
Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.3.3.9 Interactions between the aforementioned objects of protection

In the previous analysis of the individual protected assets and the assessment of the effects of the altered project with regard to the protected assets, the expected and decision-relevant effects were recorded. Interactions between the protected assets including area, soil (sealing, relocation) and water (reduction of nutrient load) are intended as a positive effect of the measure.

➔No negative environmental impact due to interactions

Conclusion: no significant adverse environmental impacts due to the change in the sense of Section 9 Paragraph 2 sentence 1 No. 2 UVPG

B.4.4.3.6.4 Summary

The nature and extent of the project-related effects on the protected assets cannot be assessed as significant in these documents, in particular with regard to the geographical area concerned, the population concerned, the severity and complexity, the likelihood, duration, frequency, reversibility and the interaction of the impacts with the impacts of other existing or authorised projects, as well as mitigation measures. The impacts do not have a cross-border character.
Taking into account the criteria listed in Annex 3 to the UVPG, the amendment cannot cause any significant adverse environmental impacts (Section 9 Paragraph 2 Clause 1 No. 2 UVPG). There is no requirement to carry out an environmental impact assessment for the proposed amendment.

B.4.5 FFH compatibility testing (Natura 2000)

B.4.5.1 Foundations in law

Under § 34 para. 1 sentence 1 BNatSchG, before projects can be authorised or implemented, they must be tested to see that they comply with the preservation goals of a Natura 2000 area if they are liable to affect the area substantially, either alone or in combination with other projects or plans and do not serve directly to

manage the area. If the compatibility test shows projects could affect the area substantially in terms of its preservation goals or components material to its protective purpose, they will not be authorised (§ 34 para. 2 BNatSchG).

Under § 34 para. 1 sentence 2 BNatSchG, compatibility standards are derived from the protective purpose and the regulations issued pursuant thereto insofar as a Natura 2000 area is a protected part of nature and the landscape as defined in § 20 para. 2 BNatSchG. § 7 para. 1 (9) BNatSchG defines preservation goals as those laid down with a view to conserving or restoring a favourable state of conservation of a natural habitat type of a species listed in Annex II to Directive 92/43/EEC (the Habitats Directive) or in Art. 4 para. 2 or Annex I to Directive 2009/147/EC for a Natura 2000 area.

The protective purpose of Natura 2000 areas within the 12 nm zone is laid down in Natura 2000-LVO M-V (09.08.2016 version) and is therefore what the FFH compatibility test is based on in each case. Under § 1 para. 2 Natura 2000-LVO M-V, the protective purpose of European bird protection areas is to protect wild bird species and their habitats under Annex 1 Natura 2000-LVO M-V. The preservation purpose of each European bird protection area is, by conserving or restoring its material factors, to help ensure a favourable state of conservation of the bird species listed in Art. 4 para. 2 or Annex I to Directive 2009/147/EC is maintained. In Annex 1 Natura 2000-LVO M-V, the material factors are defined as the species of birds listed and the habitat factors they require in each area (§ 3 Natura 2000-LVO M-V).

Under § 4 para. 2 Natura 2000-LVO M-V, the protective purpose of the areas is to protect the natural habitats and species of communal interest as in Annex 4 Natura 2000-LVO M-V. The conservation goal for each area is, by maintaining or restoring its material factors, to help ensure that a favourable state of conservation of the natural habitat types of communal interest and the animal and plant species listed in Annex II to the Habitats Directive is maintained or restored. Annex 4 defines the material components as the natural habitats and species of communal interest and the area-based habitat elements these requires (§ 6 Natura 2000-LVO M-V).

Whether a project could affect a bird conservation area substantially in terms of the elements relevant to its conservation goals must be assessed based on how it affects the state of conservation of the material area factors (established case law BVerwG judgment 17.01.2007, 9 A 20/05, BVerwGE 128, 1 = NVwZ 2007, 1054, 1059 para. 43; judgment 12.03.2008, 9 A 3.06, BVerwGE 130, 299, *juris* para. 68; cf. BVerwG, judgment 06.11.2012, 9 A 17.11, BVerwGE 145, 40, para. 35; judgment 06.04.2017, 4 A 16/16, NVwZ-RR 2017, 768, 771 para. 33). The assessment criterion is based on the favourable state of conservation of the protected habitats and species as defined in Art. 1 e) and i) of the Habitats Directive. Under § 7 para. 1 (10) BNatSchG in conjunction with Art. 1 e) of the Habitats Directive, the state of conservation of a natural habitat is "all the input factors which influence that habitat and the species which are characteristic of it and which could influence their natural distribution, structure and functions and the survival of their characteristic species in the area as stated in Art. 2." The 'state of conservation' of a natural habitat is deemed to be 'favourable' for the purposes of § 7 para. 1 (10) BNatSchG in conjunction with Art. 1 e) of the Habitats Directive "if its natural distribution area and the areas it occupies in this area are being maintained or are expanding and the structure and specific function required for its long-term continuing existence

continue to exist and are likely to continue to exist for the foreseeable future and the state of conservation of the species which are characteristic of it within the meaning of i) is favourable.“

To exclude any significant effects under § 34 para. 1 BNatSchG, a favourable state of conservation must remain stable despite implementing the project; if the existing state of conservation is poor, on the other hand, it must not be worsened any further (BVerwG judgment of 17.01.2007, 9 A 20/05, BVerwGE 128, 1 = NVwZ 2007, 1054, 1059 para. 43; judgment of 06.04.2017, 4 A 16/16, NVwZ-RR 2017, 768, 771 para. 33). A strict standard of testing must be applied when testing compatibility. A project can only be authorised if, once the compatibility test has been completed, there is no reasonable scientific doubt that considerable effects will be avoided (ECJ judgment of 07.09.2004, case C-127/02 *“[National Association]“*, Coll. 2004, I-7449, EuZW 2004, 730 paras. 59 and. 61; BVerwG, judgment of 17.01.2007, 9 A 20/05, BVerwGE 128, 1 = NVwZ 2007, 1054 para. 56 and judgment of 11.08.2016, 7 A 1.15, BVerwGE 156, 20, para. 67; judgment of 06.04.2017, 4 A 16/16, NVwZ-RR 2017, 768, 771 para. 33).

There are no established standards to be used in recording and assessing project effects, so the planning authority is not bound to follow any particular procedure; but established BVerwG case law requires a reliable assessment to comply with the 'best material scientific knowledge' for the standards material to the compatibility test (BVerwG judgment of 17.01.2007, 9 A 20/05, BVerwGE 128, 1 = NVwZ 2007, 1054 para. 62; Judgment of 12.03.2008, 9 A 3.06, BVerwGE 130, 299 para. 73; judgment of 06.11.2012, 9 A 17.11, BVerwGE 145, 40 para. 35; decision of 28.11.2013, 9 B 14.13, NuR 2014, 361 para. 7; judgment of 06.04.2017, 4 A 16/16, NVwZ-RR 2017, 768, 771 para. 34). This assumes "all scientific sources and resources have been exhausted" (BVerwG judgment of 17.01.2007, 9 A 20/05, BVerwGE 128, 1 = NVwZ 2007, 1054 para. 62; judgment of 23.04.2014, 9 A 25.12, BVerwGE 149, 289 para. 26; judgment of 06.04.2017, 4 A 16/16, NVwZ-RR 2017, 768, 771 para. 34).

The project's effects are established and assessed based on these standards.

B.4.5.2 FFH compatibility test results

Within the 12 nm zone, the project crosses the following Natura 2000 areas for which FFH compatibility tests were conducted to § 34 BNatSchG, § 21 NatSchAG M-V:

- EU bird protection area "Greifswald Bodden and southern Strelasund“ (DE1747- 402),
- EU bird protection area "Western Bay of Pomerania" (DE1649-401),
- FFH area "Greifswald Bodden, parts of Strelasund and northern tip of Usedom"(DE1747-301),
- FFH area "Greifswald Bodden escarpment and parts of the Bay of Pomerania“ (DE1749-302).

FFH compatibility tests were also conducted for the following Natura 2000 areas which lie at various distances from the project:

- FFH area "Greifswalder Oie" (DE1749-301),
- FFH area "South-east Rügen coastal landscape" (DE1648-302).

FFH compatibility tests were conducted for the following Natura areas, which are adjacent to the 12 nm zone and hence relevant to be considered in the plan approval in terms of possible effects of the project:

- EU bird protection area "Bay of Pomerania" (DE1552-401),
- FFH area "Bay of Pomerania with Oder bank" (DE1652-301),
- FFH area "Adlergrund" (DE1251-301).

The area designations used in this Plan Approval Decision correspond to those of the FFH compatibility tests and the current position in law at the time of the Plan Approval Decision. The compatibility studies examined how far, and taking other plans and projects into consideration, the project could seriously affect areas in terms of their conservation goals or protective purposes.

The compatibility test the planning authority conducted found that, even considering the effects of other plans and projects, as far as the route within the 12 nm zone is concerned, the project is not liable to affect the above-mentioned Natura areas substantially.

B.4.5.2.1 EU bird protection area "Greifswald Bodden and southern Strelasund“ (DE1747-402)

The project lies within the 87,362 ha European bird protection area (SPA) "Greifswald Bodden and southern Strelasund". The Nord Stream 2 route crosses the SPA over a length of approx. 24 km (cf. application document part E.10 section 4.3, p. 71). The section within the SPA is expected to take 7.5 months in all to build. For any given point along the pipeline trench, the effects on the seabed are expected to last four months in each case (digging the pipe trench, laying pipeline and backfilling pipe trench) (cf. application document part E.10 section 1.2, p. 9). In the landing area, only a narrow band of sand lies within the SPA (cf. application document part E.10 section 4.2.1, p. 39).

Under Federal State [*Land*] nature conservation law, the bird protection area in its parts affected by the project is protected by § 1 in conjunction with Annex 1 to the Natura 2000-LVO M-V (see the relevant area elements listed there in table form).
The compatibility standards result, as shown, from the protective purpose of the area and the regulations issued to that end if the conservation goals concerned are taken into account. For SPA DE1747-402, for the conservation goals for the area, the material factors turn out to be from § 3 in conjunction with Annex 1 of the Natura 2000-LVO M-V and from the standard datasheets. As the SPA largely overlaps with SCI DE1747-301, the habitat areas of relevant breeding and bird species which are shown and assessed in the management plan for the SCI must also be taken into account. Something else which must be taken into account is the regulation on the LSG "Greifswalder Bodden" of 10.12.2008 (GVOBl. M-V p. 509), the protective purpose and conservation goals of which are directed solely at bird species. The project does not contain any other protected areas which overlap with the SPA and/or any specific area findings, and/or the protection goals contain exclusively terrestrial components of the nature budget which cannot be affected substantially by the project (cf. application document part E.10 section 2.2).

The project was reviewed to see if it was compatible with the conservation goals of the Natura 2000 area (cf. application document part E.10). As the Detailed Study Area (DSA), an impact area was selected of up to 1,000 m either side of the pipeline route within the Greifswald Bodden and 3,000 m either side of the pipeline route outside the Greifswald Bodden for marine diving birds and sea ducks. The DSA's boundaries were obtained by overlaying the areas of the protective area relevant to the conservation goals with the maximum range of the effects of the project relevant to them. The widest range belongs to the visual and noise disturbance of construction ship traffic on sensitive seabirds. As a precautionary measure, the impact areas were made so large that they cover the largest possible disturbance area and/or the most sensitive species in each case (cf. application document part E.10 section 3.1 p. 31).

The main effects of the project are due to construction, so are limited to the construction phase, whereas system and operational effects are negligible (cf. application document part E.10 section 7 p. 76).

Onshore impact factors arise at at least 200 m from the SPA on the "Lubmin Heath" industrial estate, as the pipeline crosses the coastline via a micro-tunnel and does not have any relevant impact on the area (cf. application document part E.10, section 1.2 p. 9).

Impacts on breeding birds as material factors of SPA DE1747-402 are as follows (cf. application document part E.10 section 4.2.1)

The project does not affect any breeding bird species in the landing area (no evidence of breeding bird grounds, laying in micro-tunnel). Sea eagles (eyrie on the western edge of the Freesendorf meadows) were considered as a precaution because of their large hunting grounds. Potential sea eagle shallow water habitats upstream of Lubmin Heath are partly within the DSA.

Building the pipeline could cause localised disturbances of the sea eagles' hunting grounds; but the landing area is not a relevant feeding habitat of the sea eagle. The size of the grounds up to 45 km² means localised disturbances of hunting habitats can be tolerated. It can be ruled out that the project will impact on sea eagles.

Impacts on overwintering birds as material factors of SPA DE1747-402 are as follows (cf. application document part E.10 section 4.2.2)

The pipeline trench occupies an area of 65.1 ha, i.e. less than 0.1% of the total protected area.

Substantial impacts on all wintering birds may therefore be excluded. Effects on conservation goals can also be excluded. The main and most far-reaching effects on wintering birds will be disturbances by shipping in the construction phase; but most types of ships will not be involved. Flight and avoidance distances from moving and anchored ships are normally less than 500 m; and no construction will be allowed during the winter and spring wintering from 01 January to 15 May and during the herring spawning season; this is a fixed part of the construction plans. Banning

construction at times of maximum wintering stocks thus minimises the construction effects of the projects. As laying proceeds progressively, the disturbances at any given time, such as on a given day, will only affect part of the total route corridor and a small part of the wintering area at any time.

Impact forecasts are based on Nord Stream monitoring findings.
Given the large number of species which could be affected, the project effects during the wintering and migration periods are based to some extent on grouping them as wintering communities and/or guilds. Taking the individual species (and groups of species:

Scaup ducks (cf. application document part E.10 section 4.2.2.1) and **long-tailed ducks** (cf. application document part E.10 section 4.2.2.2)

The pipeline trench occupies 20-30 ha of habitats scaup ducks and long-tailed ducks could use. During the construction phase, the benthos will be lost while the trench is being excavated, although it will regenerate itself once construction is complete. According to Nord Stream's monitoring findings, the two species' potential prey organisms will have recovered completely in two years. The feeding areas which will be affected temporarily are very small compared with the total feeding area of the Greifswald Bodden as a whole. Reducing the food supply temporarily will not substantially affect scaup ducks or long-tailed ducks as material factors of the SPA.

Nor will audible or visible stimuli have any substantial impact in the above-mentioned sense. Restricting construction times from 15 May to 31 December means no construction activities are planned at a time when the concentrations of these two species of ducks are at their maximum. It is only in November and December that scaup ducks and long-tailed ducks might be scared off, and that only very temporarily. These areas are already polluted by disturbances, so that the route area will only have a minor impact on wintering birds.

The impact due to sediment drift on benthic organisms as food for scaup and long-tailed ducks is extremely minor and insubstantial. Restricting construction times means herring spawn as an essential food source is not affected.
We can definitely say that the Nord Stream 2 project will not have any substantial impact on scaup and long-tailed ducks as material factors of the "Greifswald Bodden and southern Strelasund" SPA (DE1747-402).

Wintering community on the eastern flank of the Bodden escarpment (**common scoters, velvet scoters, divers and horned grebes**) (cf. application document part E.10 section 4.2.2.3)

None of these species will be affected permanently or substantially by changes to their habitat structures. The pipeline trench will take up < 10 ha of habitats which common scoters and velvet scoters could use. The macrozoobenthos will be lost while excavating the pipeline trench, but will recover within three *["years", presumably – trans.]* of construction being completed. The feeding areas affected temporarily are very small compared with the feeding habitat in the Greifswald Bodden as a whole. Restoring the abiotic conditions once the pipelines are laid means the habitat structures of both species will not be affected permanently; and using areas temporarily is not expected to substantially affect common or velvet

scoters as they are highly mobile fish-eating seabirds which gather their food over very wide areas.

Nor will audible or visual stimuli affect the species above substantially as material components of the SPA. Restricting construction times means there is only a short period (November-December) when construction work could scare off bentophage common and velvet scoters and fish-eating divers and horned grebes in parts of the area east of the Bodden escarpment. This will be outside the main wintering season and only affect a small part of the wintering area, which is also only used to look for food to a limited extent as it is already polluted.

The impact due to sediment drift on benthic organisms as the food base for common and velvet scoters will be extremely minor and insubstantial. For divers and horned grebes as highly mobile fish-eating seabirds which gather their food over very large areas, temporarily muddying the waters and so possibly driving away fish as food is not expected to be substantial either (Nord Stream construction monitoring 2010, p. 93 et seq.).

We can definitely say that the Nord Stream 2 project will not substantially affect the wintering community of common scoters, velvet scoters, divers and horned grebes as material factors of the "Greifswald Bodden and southern Strelasund“ SPA (DE1747-402).

Red-breasted mergansers (cf. application document part E.10 section 4.2.2.4) and **common mergansers** (cf. application document part E.10 section 4.2.2.5)

Neither of these two fish-eating species is expected to be affected substantially by loss of space during construction. The biotope structure of the feeding grounds (clearwater zone) will not be changed structurally. Indirect effects on their food base (scaring off fish, sediment turbulence) will be limited locally, and will not be substantial for these highly mobile fish-eating species, which cover very large areas in finding their food.

Nor will audible or visual stimuli affect these species substantially as a material factor of the SPA. Restricting the construction times means there is little potential conflict; and the travelling site means that construction work will only be short-term at any one point. Local dredgers, barges and ships will cause avoidance behaviour locally, but the species which use large areas can avoid them without any problems.

The Nord Stream monitoring findings (Nord Stream construction monitoring 2010 p. 93 et seq.) indicate there will be very little impact on the fish fauna and visibility conditions. Muddying the waters temporarily and hence possibly driving away the fish which are a food source for the two mobile fish-eating species, which also feed over large areas, is not considered substantial.

We can definitely say that the Nord Stream 2 project will not have any substantial impact on red-breasted and common mergansers as material factors of the "Greifswald Bodden and southern Strelasund" SPA (DE1747-402).

Wintering community in shallow water zones (**goldeneye ducks, tufted ducks, mute swans** etc.) (cf. application document part E.10 section 4.2.2.6)

The pipeline trench will occupy some 10-20 ha usable habitat of the diving ducks in the wintering community. The benthos in the trench will be lost while construction is underway but will recover once construction is complete. According to the Nord Stream 2 monitoring findings, the potential organisms on which goldeneye and tufted ducks feed will recover in one to two years. The feeding grounds which will be affected temporarily are very small, compared with the feeding grounds in the Greifswald Bodden as a whole. Reducing the food supply temporarily will not have any substantial impact. The feeding grounds of the mute swans overwintering by the coast will not be affected as the pipeline will cross the coastal area in a microtunnel.

The impact of visual and audible stimuli is not expected to be substantial. Goldeneye and tufted ducks feed over large areas and can avoid areas easily if scared off. Restricting the construction periods outside the winter and spring wintering times of seabirds and outside the herring spawning season has an alleviating effect.

Whilst the construction site in the landing corridor could theoretically affect the exchange relationships of overwintering birds flying parallel to the Bodden bank, the construction equipment will not be very tall, so will not act as a barrier. Vulnerable and/or low-flying species will not have to avoid them much and will find this easy, given also that any potential impact will be short-lived.

Nord Stream monitoring findings indicate there will be very little impact on the feeding grounds in the shallow water wintering areas (Nord Stream construction monitoring 2010, p. 138 et seq.): the tides will have restored the topography of the shallow water areas within 10 days of construction work being completed (Nord Stream construction monitoring 2010 p. 93 et seq.). Sediment drift, increased muddying of the waters and sedimentation is not expected to affect the feeding base substantially.

We can definitely say that the Nord Stream 2 project will not substantially impact the shallow water wintering community as a material factor of the "Greifswald Bodden and southern Strelasund" SPA (DE1747-402).

Cormorants (cf. application document part E.10 section 4.2.2.7)

Cormorants are highly mobile, feeding on fish over large areas, so areas temporarily occupied around the pipeline trench will not affect food availability.

Nor will audible or visual stimuli have any considerable impact. Restricting construction times means there will be little potential conflict; and the travelling site means that construction work will only be short-term at any one point. Local dredgers, barges and ships will cause avoidance behaviour locally, but a species which is far-ranging can avoid them without any difficulty.

Nord Stream monitoring findings indicate that the impact on fish fauna and visibility conditions will be very limited. Cormorants are also used to searching for food in muddy estuary waters: so turbulence plumes will not affect this species.

We can definitely say that the Nord Stream 2 project will not substantially impact cormorants as a material factor of the "Greifswald Bodden and southern Strelasund" SPA (DE1747-402).

Wintering community **black terns, Caspian terns and little terns** (cf. application document part E.10 section 4.2.2.8)
Occupying areas during the construction phase is not expected to substantially impact on these afore-mentioned fish-eating species. The biotope structure of the feeding grounds (clearwater zone) will not be structurally changed. Indirect effects on food stocks (frightening off fish and sediment turbulence) are limited locally and will not affect these highly mobile fish eaters which feed over large areas.

Nor will any audible or visual stimuli have any substantial effects. Terns keep very close to ships and use the turbulence ships' propellers generate to help them search for food; and species which search for food over very large areas can move easily to other areas.

Caspian and little terns are expected to avoid muddied areas; but Nord Stream monitoring findings indicate there will be little effect on fish fauna and visibility conditions (Nord Stream construction monitoring 2010 p. 93 et seq.) or on food uptake. Muddied waters and sedimentation will not affect the foods black terns prefer (insects etc. on surface of water).

We can definitely say that the Nord Stream 2 project will not substantially impact black terns, Caspian terns and little terns as material factors of the "Greifswald Bodden and southern Strelasund" SPA (DE1747-402).

The following damage limitation measures and other avoidance and mitigation measures will be carried out to prevent conservation goals being affected substantially:

- Minimising intervention area in hard bed biotope (construction phase; measure M1 section B.4.4.1.9.1)
- Restoring seabed in trench areas (construction phase; measure M3 section B.4.4.1.9.1)
- Maintaining the turbidity limit of 50 mg/l at 500 m from the suspension source (may be 100 mg/l temporarily above background turbidity) (construction phase; measure M5 section B.4.4.1.9.1)
- Construction period restriction: restricting offshore construction in offshore area between coming ashore and KP 53 to period from 15.05. to 31.12. (construction phase; measure M6 section B.4.4.1.9.1)
- Reducing light emissions during offshore construction work (construction phase; measure M8 section B.4.4.1.9.1)

To test and assess aggregate effects, we considered the project connecting the "Western Adlergrund" (CWA) and "Arkona See" offshore wind farm clusters (project sponsor: 50Hertz) to the grid (cf. application document part E.10 section 6.1, p. 75). Testing and assessing the cumulative effects shows no substantial aggregate effects can be predicted which exceed materiality thresholds.

Conclusions

The planning authority finds that the avoidance and mitigation measures are effective and that they can definitely be implemented by construction monitoring. Our assessment therefore finds that the project will not have a substantial or lasting impact on the material factors of the "Greifswald Bodden and southern Strelasund" bird protection area (DE1747-402) in terms of its conservation goals or protective purpose and that the project is therefore permissible under these terms (§ 34 para. 1, 2 BNatSchG, § 21 NatSchAG M-V).

B.4.5.2.2 "Western Bay of Pomerania" EU bird protection area (DE1649-401)

The project lies within the 97,945 ha "Western Bay of Pomerania" European bird protection area (SPA). The Nord Stream 2 route crosses the SPA over a length of approx. 29 km (cf. application document part E.11 section 4.2 p. 38). Constructing the short trench section on the eastern flank of the Bodden escarpment is scheduled to take five months and the much longer northern single pipeline trench section four months (cf. application document part E.11 section 1.2 p. 8).

In the areas affected by the project, the bird protection area is protected under State nature conservation law by § 1 in conjunction with Annex 1 to the Natura 2000-LVO M-V (see the area components listed in table form there).

The standards for testing compatibility are based, as shown, on the protective purpose and the regulations issued to that end, taking the conservation goals concerned into account. For SPA DE1649-401, the material factors for the area conservation goals are based on § 3 in conjunction with Annex 1 of the Natura 2000 LVO M-V and the standard datasheets.

The project was examined to see if it is compatible with the conservation goals of the Natura 2000 area (cf. application document part E.11). The Detailed Study Area (DSA) was an impact area of 3000 m either side of the pipeline route. The DSA was demarcated by overlaying the material elements for the conservation goals of the protected area with the maximum range of the process effects of the project relevant to it. Visual and audible disturbances from construction shipping traffic have the greatest range on sensitive seabirds. As a precautionary measure, we defined the impact areas as large enough to cover the maximum possible disturbance area and/or the most sensitive species (cf. application document part E.11 section 3.1 p. 17).

The essential effects of the project are construction-linked, i.e. are limited to the construction phase, whereas system and operational effects are negligible (cf. application document part E.11 section 7 p. 59).

In sections in which the pipelines are laid on the surface, the pipeline runs which are laid on the seabed form artificial hard beds (concrete sheath) in which epibenthos will settle in the short to medium term and have a 'reef effect'. As such biotope structures will benefit various species of fish, we cannot say there will be any negative effects on fish as seabird food.

The impact on wintering birds as material factors of SPA DE1649-401 is as follows (cf. application document part E.11 section 4.2):

The pipeline trench occupies an area of 78.5 ha, i.e. less than 0.1% of the total protected area.

We can rule out this will have any substantial impact on any wintering birds or conservation goals. The main and most extensive effect the project will have is shipping disturbing seabirds during construction. Most species avoid ships. As the most sensitive groups of species, sea ducks and loons take flight from and/or avoid sailing and anchored ships by approx. 1 to 2 km (max. 3 km). Restricting construction from 01 September to 31 December. outside the winter and spring winterings of seabirds and moulting of black terns is a fixed part of the construction schedule. Prohibiting construction at a time when wintering flocks are at their maximum will limit the intensity of the project's effects. Laying work will move progressively, so the disturbances at any one time (within a day, for example) will only affect a section of the total route corridor and a small part of the wintering area concerned at any time.

The impact forecasts are based on the Nord Stream monitoring findings.

Given how many overwintering birds will potentially be affected, we have grouped the wintering community to analyse and assess the project's effects, based on how wintering communities are distributed spatially, the phenology of wintering communities (project activities at different times), different habitat functions (how species find food, specific lifecycles) and differing sensitivities to project effects, such as species-specific behavioural responses to disturbance stimuli. Taking species groups individually:

Divers (**black-throated divers, red-throated divers**) and **horned grebes** (cf. application document part E.11 section 4.2.1)

The pipeline route lies within the feeding grounds of loons and grebes. Unlike benthophage species, however, the food stocks of fish-eating species are only affected indirectly by fish being scared off and sediment turbulence. The highly mobile, mainly fish-eating (piscivore) species cover large areas looking for food, so affecting the area affected temporarily may be regarded as insubstantial.

Audible and visual stimuli will scare off loons and grebes temporarily from September to December; but only a few animals are likely to be disturbed and will avoid the area temporarily. Having a travelling site means only a small area will be disturbed at any one time. Fish-eating species by their nature are highly mobile, with extensive feeding and overwintering grounds. Construction disturbances are not regarded as substantial for the state of conservation and exchange relationships of the loons and grebes in this SPA.

Based on the monitoring findings from the Nord Stream project 2010 (Nord Stream construction monitoring 2010 p. 93 et seq.), the influence on fish fauna and visibility conditions while feeding in the SPA is considered extremely low, and the impact on the feeding of the mainly fish-eating seabirds is not considered substantial.

We can definitely say that the Nord Stream 2 project will not substantially impact divers and grebes as a material factor of the "Bay of Pomerania" EU bird protection area (DE1649-401).

Benthophage sea ducks with concentrations in the winter season (**long-tailed ducks, black scoters, velvet scoters**) (cf. application document part E.11 section 4.2.2)

In the construction phase, the benthos will be lost in the area of the pipeline trench, although it will recover once construction is complete. The mussel stocks which are suited as food should recover in one to two years, so the food supply will only be reduced locally in two winters in all; and the area affected is very small compared with the food supply in the SPA as a whole, and birds are already avoiding it due to the disturbance stimuli which exist (commercial shipping).

Visual and audible stimuli from laying and supply/support ships means sea ducks will be scared off and avoid the working areas around those ships temporarily. According to the construction schedule for the Nord Stream 2 project, sea ducks will be mainly affected in November. The most likely effect is temporary disturbances to velvet scoters which may be present in concentrations in the route area during this time. The scaring-off effects of construction will only be short-lived and are not considered substantial, given the conservation levels of sea ducks in the EU bird protection area. Part of the route section here is in heavily-used shipping corridors, such that the distribution of sea ducks is already limited due to existing shipping. Overwintering birds flying around the vessels and equipment being used will not have any substantial consequences, as the birds already fly major distances within the large scale overwintering area in the Bay of Pomerania. We do not expect the temporary construction work to have any considerable impact on the exchange relationships of the sea ducks.

Increased levels of suspension and sedimentation of the seabed particles which pass into the water column from the excavation works could have a detrimental impact on the benthos bordering the pipeline trench as a food supply for the sea ducks and visibility conditions when they are feeding. The seabed on the Nord Stream 2 route in the "Western Bay of Pomerania" EU bird protection area is mainly sandy, so relatively little construction-induced sediment drift is forecast. Effects on filtering mussel species can be excluded. Any disturbance due to sediment turbulence is in an area which terns already avoid due to other disturbances (commercial shipping).

We can definitely say the Nord Stream 2 project will not have any substantial impact on sea ducks as a material factor of the "Bay of Pomerania" EU bird protection area (DE1649-401).

Relatively scarce, highly mobile, largely fish-eating species found in this area (**great crested grebes, cormorants and red-breasted mergansers**) and little gulls (cf. application document part E.11 section 4.2.3)

Unlike the benthophage species, the foodstocks of the fish-eating species will only be affected indirectly by scaring off fish and muddying sediment, which are estimated

as low. The highly mobile piscivore species cover very large areas while feeding, so the area the project will use temporarily should be regarded as insubstantial.

Visual and audible stimuli from dredgers, barges and ships will cause local avoidance behaviour which these species can do easily, flying constantly long distances as they do. Although pipelaying will progress rapidly on the seabed, the pipelaying ship will act as if it is moving slowly, so is not expected to have any substantial impact on the exchange relationships of the highly mobile fish/plankton-eating species.

The monitoring findings from the Nord Stream project (Nord Stream construction monitoring p. 138 et seq.) indicate that the impact on the fish fauna and visibility conditions through releasing suspended matter while birds are feeding in this EU bird protection area is thought likely to be extremely low and the impact on seabirds feeding negligible. Little gulls may even benefit from the benthos organisms in the construction-induced turbulence plumes.

We can definitely say that the Nord Stream 2 project will not have any substantial impact on the species of great crested grebes, cormorants, red-breasted mergansers and little gulls as material factors of the "Western Bay of Pomerania" EU bird protection area (DE1649-401).

Auks (**razorbills, guillemots**) (cf. application document part E.11 section 4.2.4)
Auks prefer deep waters, so often concentrate in the area between the sandy shallows of the Oder bank and the Adlergrund outside the coastal waters. They are not expected to be affected by releasing suspended matter or by laying the pipelines on the seabed.

Laying the pipeline coincides with the sensitive phase of the full moulting of guillemots and razorbills: but auks prove to behave extremely variably when using marine habitats, and the number of birds found in the route area at the end of September during the Nord Stream 2 stock survey 2015 (cf. application document part D1.01 section 5.5.5.1 p. 335 et seq., Figs. 5-97 and 5-98) and during the Nord Stream seabird monitoring 2010 (Nord Stream construction monitoring p. 1 et seq.) was low. It was not until November 2015 that guillemots and razorbills gathered in the coastal waters in any numbers: so the disturbances in the construction phase are only expected to have a very minor impact which is not expected to be substantial for these species.

We can definitely say that the Nord Stream 2 project is not expected to have any substantial impact on auks as material factors of the "Western Bay of Pomerania" EU bird protection area (DE1649-401).

To test and assess aggregate effects, we considered the project connecting the "Western Adlergrund" (CWA) and "Arkona See" (project sponsor: 50Hz) offshore wind farm clusters to the grid. Testing and assessing the cumulative effects shows no substantial aggregate effects can be predicted which exceed materiality thresholds.

The following damage limitation measures below and other avoidance and mitigation measures below will be conducted to prevent conservation goals being substantially affected:

- Restoring the seabed in trench areas (construction phase; measure M3 section B.4.4.1.9.1)
- Complying with turbidity limits of 50 mg/l at 500 m from the suspension source (may reach 100 mg/l temporarily above background turbidity) (construction phase; measure M5 section B.4.4.1.9.1)
- Restricting construction times: restricting offshore construction work in the offshore area between KP 53 and KP 17 to the period from 01 September to 31 December (construction phase; measure M7 section B.4.4.1.9.1)
- Reducing light emissions during offshore construction (construction phase; measure M8 section B.4.4.1.9.1)

Conclusions

The planning authority finds the avoidance and reduction measures are effective and that they can be definitely implemented by construction monitoring. Our assessment therefore finds that the project will not have a substantial or lasting effect on the material factors of the "Western Bay of Pomerania" EU bird protection area (DE1649-401) in terms of its conservation goals or protective purposes and that the project is therefore permissible under these terms (§ 34 para. 1, 2 BNatSchG, § 21 NatSchAG M-V).

B.4.5.2.3 "Greifswald Bodden, parts of Strelasund and northern tip of Usedom" FFH area (DE1747-301)

B.4.5.2.3.1 Testing and findings

The project lies within the approx. 60,400 ha "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" FFH area, and was assessed based on the documents the project sponsor submitted and opinions received to see if it is compatible with the conservation goals of the area according to Annex 4 Natura 2000-LVO M-V (cf. application document part E.03).

Potential impacts

The FFH habitat types found in the Detailed Study Area [DSA] as listed in Annex 4 Natura 2000-LVO M-V (cf. application document part E.03 section 2.2.4.1, 3.3.1) are as follows:

Table 7: FFH habitat type in DSA of SCI DE1747-301

FFH habitat type (usual short name[85])	EU code	Conservation status*	Assessment overall*
Overwashed sandbanks	1110	B	A
Area of large sea arms and bays	1160	C	B

[85] Source: BfN

Reefs	1170	B	A

*According to management plan, identical to standard datasheets 2016

The species listed in Annex II to the Habitats Directive, which are listed for the area in Annex 4 Natura 2000-LVO M-V, which (potentially) occur in the DSA and for which impact forecasts are therefore made are grey seals, common seals, porpoises, river lampreys, sea lampreys and asps.

B.4.5.2.3.1.1 Impacts to be considered

The project effects to be considered are: construction removes the zoobenthos and macrophytes temporarily by excavating a trench and laying the pipelines, affecting habitat quality by stirring up sediment, turbidity and sedimentation, disturbing fish and marine mammals temporarily during the construction phase by noise and visual effects. Substantial effects through pipelaying releasing aluminium compounds from sacrificial anode materials, consequential effects of operations due to the cold natural gas influencing temperatures and disturbances due to inspection, safety and servicing/ repair measures are excluded (cf. vol. E.01 section 2.5.2 p. 31 et seq.).

The effects on the FFH habitat type including the characteristic species are as follows (cf. application document part E.03 section 4.3 p. 71 et seq.):

The area will only be occupied temporarily, so the abiotic habitat characteristics (hydrography, morphology and substrate characteristics) will be fully restored in the course of backfilling the trench once the pipeline is laid within six months as far as any one location is concerned. The impact on the area is expected to last about four months depending on the location. Construction in SCI DE1747-301 is expected to take around 7.5 months in all.

The benthic fauna will recover quickly once construction is complete, as the Nord Stream monitoring results show. The areas occupied by construction as a gradual and temporary reduction of function are not regarded as a substantial impact, measured by the guideline values in LAMBRECHT & TRAUTNER (2007) and considering the assessment approach in BFN (2012)/BERNOTAT (2013), including FFH habitat type 1160 which is affected to a relatively large extent.

B.4.5.2.3.1.2 Assessment standard

The presentations in the application documents and the opinions and objections received, particularly in the context of the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom“ FFH area, mean there are grounds to discuss the assessment standard. Seen in legal terms, the permit authority is not bound to follow any particular procedure when it comes to assessing the effects on the material factors to the conservation goals or protective purpose (see B.4.5.1 above); but established BVerwG holds (as already stated in B.4.5.1) that a reliable assessment must be based on the 'best relevant scientific findings' for the compatibility test, 'exhausting all scientific sources and resources'.

To deny any substantial impact under § 34 para. 1 BNatSchG, the conservation status must remain favourable in spite of the project: so what matters is not how many individuals (or habitat space) the populations of protected species lose due to the project, but rather whether the populations concerned can recover their original balance despite the losses the project causes, through reproducing increasingly etc. as the concept of stability also includes a species' ability to do so (BVerwG judgment of 21.01.2016, 4 A 5.14, *juris* para. 122; judgment of 06.04.2017, para. 45). There are trivial or irrelevance thresholds involved here, which indicate a level of project effects below which the relevant area factors can recover their original equilibrium despite being affected (BVerwG judgment of 21.01.2016, 4 A 5.14, *juris* para. 122).

While they cannot claim to be normative, the 'best relevant scientific findings' in terms of the significance threshold in the case of permanent effects on habitat types are generally considered to be the 'Case Convention' of LAMBRECHT & TRAUTNER[86] (specialist information system and case conventions to determine materiality in FFH compatibility testing – final report on the case convention section, final status as at June 2007. R&D projects as part of the environmental research plans of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety under contract to the Federal Agency for Nature Conservation) (BVerwG judgment of 23.04.2014, 9 A 25.12, BVerwGE 149, 289 para. 66; BVerwG judgment of 06.11.2012, 9 A 17.11, *juris* para. 46 et seq.; OVG [Administrative Court of Appeal] Lower Saxony judgment of 22.04.2016, 7 KS 27/15, *juris* para. 86.). In practice and case law, LAMBRECHT & TRAUTNER (2007) is the only professionally recognised standard when it comes to assessing permanent area effects. The convention proposals link assuming trivial effects to very narrow conditions and are based cumulatively on guideline values for absolute and relative area losses, assuming area losses to be permanent. According to the final report, the relative guideline value for the triviality threshold is 1% of the habitat type area concerned (cf. p. 33 of the report). The relative absolute guideline value for the triviality threshold can be found in Table 2 of the final report. Established case law holds that the values suggested may be used as guideline decision-making values (incl. BVerwG judgment of 12.03.2008, 9 A 3.06, *juris* principle 7 and para. 125).

Particular reasons may justify departing from this in exceptional cases, however. Such reasons may be because area losses are tolerable because the area a sub-population and/or a reproductive unit clearly requires, considering the functional significance of these areas, will survive as a mandatory and/or optional habitat element and/or against the background of the favourable conservation status which is present or to be developed in each case, without the project-induced losses needing to be classified as critical (BVerwG judgment of 06.11.2012, 9 A 17.11, BVerwGE 145, 40 para. 47, citing LAMBRECHT & TRAUTNER [2007] p. 45 et seq.).

As the planning authority sees it, such a departure from the guideline values according to LAMBRECHT & TRAUTNER (2007) is required, if only because the guideline values according to LAMBRECHT & TRAUTNER (2007) state relevance thresholds for permanent effects on habitat types, but the project's effects in this case must be defined as temporary (cf. application document part E.08 section 1.2 p. 9). Where

[86] Final report on the case convention part of the research project conducted under contract to the Federal Agency for Nature Conservation "Specialist information system and case conventions to determine materiality in the course of FFH-VP“, final status as at June 2007.

projects such as Nord Stream 2 do not cause permanent area losses for habitat types, LAMBRECHT & TRAUTNER (2007) merely give 'guidelines on possibly using the case convention proposals in the case of gradual loss of functions' in section H p. 83, 84, and even these 'guidelines' are based on the basic assumption that a project has permanent effects which are not equivalent to losing 100% of the habitat functions completely, however.

There is no such convention for assessing the temporary effects on FFH habitat types to date, however; but the guideline values for the (permanent) 'quantitative absolute area loss' according to LAMBRECHT & TRAUTNER (2007) may be used in assessing the consequences for long-term survival provided they are converted temporarily to permanent loss of functions, i.e. the temporary loss of functions due to the pipeline project are expressed in the same 'currency' as the guideline values according to LAMBRECHT & TRAUTNER (2007).

As the planning authority sees it, to convert temporary to permanent loss of functions, the exclusive economic area (AWZ) developed and insofar accepted and practised method for determining the materiality of restrictions as part of statutory biotope protection under § 30 BNatSchG (BfN (2012[87])/BERNOTAT (2013[88]), BFN (2012): Method for determining the materiality of restrictions as part of statutory biotope protection under § 30 BNatSchG in the AWZ as at 27.02.2012) is a suitable instrument because the habitat types which are relevant to protecting the area correspond largely to the biotopes protected by law and the protection goal is identical. BERNOTAT's (2013) and/or the BFN'S (2012) approach develops LAMBRECHT & TRAUTNER's convention proposal (2007), and also includes temporary (i.e. mainly construction) effects. Both publications concern biotypes which are widely distributed in the AWZ, so they need to be tailored to suit habitat type 1160 which prevails in the Greifswald Bodden. The theoretical examples BERNOTAT (2013)/BFN (2012) use also relate to constructing offshore wind farms including cabling, and therefore had to be translated to the specifics of Nord Stream 2, using the Nord Stream monitoring findings, which have also been largely accepted by scientists.

Using the standards and findings above, the assessment model which was applied to the Nord Stream 2 project FFH-VU was as follows (cf. application document part E.03 section 4, 61 et seq.):

- First, we determined the area affected by the project (length and breadth of cable/pipeline trench)
- Depending on the quality and intensity of the impact above, the degree of loss of function was evaluated at the time after construction was completed in each area and quantified with regard to the FFH habitat type concerned. This was obtained by making a before and after comparison of the natural abiotic and biotic structures and functions of the FFH habitat types within the FFH area, including the function of the area for the cohesion of the Natura 2000

[87] Method for assessing the materiality of impacts as part of statutory biotope protection under § 30 BNatSchG in the AWZ, as at 27.02.2012, 19 p. (download: https://www.bfn.de/23094.html).

[88] Materiality thresholds when considering biotopes protected by law in the AWZ. Presentation at the conference on "[Perspectives of connecting offshore wind energy to the grid environmentally compatibly in the German AWZ]", Leipzig, 21.-22.11.2013 (https://www.bfn.de/fileadmin/MDB/documents/themen/erneuerbareenergien/tgng_offshore2013/bernotat_biotopschutz_erheblichkeit.pdf).

network and the expression of the characteristic species, defining the change as the relative decrease of the ecological function and/or its relative increase in the regeneration period (in %) based on the status quo.

- Quantifying the temporary gradual loss of function (application document part E.03 section 4.1.3, Tab. 4-1 p. 68 and corresponding part E.08) is based on the material criteria used in assessing the state of conservation as used in the habitat profiles of the LUNG M-V (cf. KRAUSE et al. 2008). The competent nature conservation authority also regards this as a sensible approach. As the LUNG assessment diagram does not weight criteria against one another on a percentage basis, we had to obtain an expert finding on this. Based on the findings of modern habitat analyses, the abiotic parameters (salt content, water depth/exposure, sediment parameters), which explain more than 80% how benthic invertebrates occur in the western Baltic (Zettler et al. (2013)[89]; PLOS ONE 8(10); Gogina, M., et al. (2009)[90]; Gogina, M., et al. (2010)[91]) receive a corresponding weighting (55% of the percentage assessment when quantifying the gradual loss of function, Tab. 4-1 p. 68 section 4.1.3 part E.03). The indicators considered are derived from the criteria used in assessing the conservation status of marine FFH habitat types of the BfN and/or LUNG M-V. Depending on how it is weighted, each indicator is assigned a percentage component for relevant, while at the same time, measurable descriptive parameters. If a parameter differs measurably (significantly) from the reference value in the effective range in the analysis results, this is valued as a parameter-specific loss of function. Only if the differences are non-significant will a parameter be considered in the final summation at its percentage value. The difference between 100 % and the sum of the unchanged parameters (in %) determines the temporary gradual loss of function (in %). The temporary gradual loss of function is recalculated annually in the course of the regeneration process. Assessing whether a parameter varies significantly from a reference value in the effective area of the project is based on the specific measurement results of environmental monitoring of the Nord Stream project as shown in section 4.3 (Nord Stream construction monitoring 2010, Nord Stream offshore monitoring 2011-2013, 2016).
- This is reassessed for each further subsequent calendar year until regeneration is complete.
- Converting the area affected temporarily in individual years to a value which can be compared with the guideline values for permanent effects on FFH habitat types according to LAMBRECHT & TRAUTNER (2007) was done by taking how long the gradual loss of function/regeneration lasts with how long a generation lasts (30 years) (i.e. divided by 30). This was then included when considering the area as a whole, based on its effects on conservation goals, i.e. above all until regeneration is complete.

[89] Zettler, M.L., et al. (2013): On the Myths of Indicator Species: Issues and Further Consideration in the Use of Static Concepts for Ecological Applications.

[90] PLOS ONE 8(10); GOGINA, M., ET AL. (2009): Distribution of benthic macrofaunal communities in the western Baltic Sea with regard to near-bottom environmental parameters. 1. Causal analysis. Journal of Marine Systems 79: 112–123.

[91] GOGINA, M., ET AL. (2010): Distribution of benthic macrofaunal communities in the western Baltic Sea with regard to near-bottom environmental parameters. 2. Modelling and prediction. Journal of Marine Systems 80: 57–70.

- When considering matters cumulatively, the same approach was used for all projects (tailored to the specific situation in each case) individually and then cumulatively. This approach enabled us to allow for the rarity, endangeredness and regeneration ability of the FFH habitat types in the coastal waters and how the project would affect the FFH area.
- The area derived from the intervention area, degree of loss of function and conversion factor (temporary/permanent) was compared for each FFH habitat type involved with the guideline values according to LAMBRECHT & TRAUTNER (2007). If the FFH habitat type affected by the project was below the guideline values throughout the regeneration period, the project is unlikely to affect the area substantially, either in isolation or in combination with other projects or plans.

As well as the research findings, we also considered the monitoring data for the adjacent Nord Stream project (2007-2013) which has been in operation since 2010. This provided an essential basis for assessing the temporary gradual loss of function determined annually. We also considered monitoring data from the WSA Stralsund (expanding eastern approach Stralsund), the LUNG M-V (concerning water quality) and the Institute of Baltic Fisheries (concerning the herring larvae survey.

Under the existing administrative practice in M-V, interventions in marine habitat types, resorting to the intervention rules, even if only temporary, are considered substantial if a project's effects mean that the guideline values according to LAMBRECHT & TRAUTNER (2007) will be exceeded for more than five years. This assumes that a certain part of the intervention area (in percent) regenerates each year. Considering that the habitat type in each part of the intervention area starts regenerating as soon as the intervention ends, i.e. its functions are virtually restored within a year after the intervention, the planning authority does not believe that a purely area-based consideration (of the regeneration component as a percentage) is appropriate. According to the planning authority and the nature conservation authority (which considered this approach plausible in its opinions of 12.06.2017 and 13.12.2017), the method the project sponsor extrapolates is better suited to assessing the area compatibility of temporary effects on habitat types as it can reproduce the degree of impact in terms of the conservation status and its long-term development more precisely so it reflects the statutory purpose of § 34 BNatSchG better while at the same time being derived from accepted and practised scientific standards.

B.4.5.2.3.1.3 Habitat types

Making the trench occupies approx. 47.5 ha of marine FFH habitat types directly, which breaks down as follows:

- 10.1 ha to FFH habitat type 1110 (sandbanks)
- 28.9 ha to FFH habitat type 1160 (large shallow sea bays)
- 8.5 ha to FFH habitat type 1170 (reefs).

Laying the pipeline in the Greifswald Bodden and in the area of the Bodden escarpment mainly involves a non-recurrent intervention of around four months which will not have any measurable permanent gradual effects. Experience with

building the Nord Stream pipeline 2010 and subsequent monitoring indicates no local stabilisation measures will be required for the backfilled pipeline trench in subsequent years (Nord Stream offshore monitoring 2016 p. 114 p. 154).

FFH habitat type 1110 can be found along the pipeline route in the shallows where it comes ashore upstream of the industrial port at Lubmin and in the area of the Bodden escarpment (cf. application document part E.03 section 3.3.1.1 p. 31). The construction effects will come mainly through digging the pipelaying trench, temporarily removing isolated macrophytes and the zoobenthos; but comparable conditions will be restored once the pipelaying trench is filled in again, so that the biocommunities can be expected to regenerate within two years. In the shallows close to where the pipeline comes ashore, effects will be reduced by laying it in a microtunnel from KP 83.8 onwards. The plant and operational effects are considered as minor. The pipeline trench will occupy 10.1 ha of FFH habitat type 1110 in all, which breaks down into approx. 9.8 ha on the Bodden escarpment and approx. 0.3 ha where the pipeline comes ashore by the industrial port of Lubmin. The pipeline therefore takes up approx. 0.4% of the protected area of FFH habitat type 1110 compared with its area as a whole, considerably less than the 1% of the habitat type area according to the relative guideline values of LAMBRECHT & TRAUTNER (2007) (see above). This is also well below the absolute guideline value of 2.5 ha (affecting < 0.5% of the total stock within the protected area, as the equivalence value of the gradual impact on function in the year in which the Nord Stream 2 project is due to be built is 0.3 ha and 0.2 ha in the following year (cf. application document part E.03 section 4.3.1 of FFH-VU p. 72 et seq.).
The only characteristic species which is found commonly in the DSA of FFH habitat type 1110 is the amphipod *Bathyporeia pilosa.* The Nord Stream monitoring findings show this species reoccupies the pipeline trench within a few days or weeks (Nord Stream offshore monitoring 2011 p. 5).
Laying the Nord Stream 2 pipeline is also unlikely to affect other much less abundant characteristic species (North Sea prawns und demersal fishes) which are still considerably more mobile than the amphipod *Bathyporeia pilosa* if the habitat parameters are restored once construction is complete.

As the effects are markedly less than the guideline values for permanent area losses according to LAMBRECHT & TRAUTNER (2007) and there are no other justified reasons not to compare these with the converted areas occupied, we can rule out LRT 1110 being impacted substantially.
According to the standard datasheet for the SCI DE1747-301, which was updated in 2016, FFH habitat type 1160 occupies around 51,775 ha or most of the protected area (total area approx. 60,400 ha) (cf. application document part E.03 section 3.3.1.2 p. 37). The pipeline trench will occupy a large shallow sea bay of 28.9 ha in total from the FFH habitat types. The relative encroachment on FFH habitat type 1160 is approx. 0.05% compared to its total area in the protected area. Excavating the pipeline trench will affect the hydrography and morphology of FFH habitat type 1160 temporarily. The pipeline trench, which will not exist for more than 7.5 months, will not affect the hydrography (water turnover, salt content, oxygen content close to the seabed) of SCI DE1747-301 measurably, as the water body of the Bodden is not layered and so does not affect the hydrography of SCI DE1747-301 substantially. The upper layer of the excavations from the Greifswald Bodden will be used faithfully to its origin to restore the upper bed horizon approx. 30 cm thick which can be occupied by invertebrates, thus restoring the bathymetrics with an accuracy of +20

cm. If the upper horizon is restored with the material originally excavated when backfilling the pipeline trench, the typical local sediment characteristics of FFH habitat type 1160 in the route sections affected will be regenerated within two years and will not be affected substantially.
Whether the biocommunities affected by displacing the sediment can regenerate depends essentially on whether the original abiotic conditions (hydrographics, bathymetrics and sediment parameters) can be restored. The reoccupation will be made by vagile species actively immigrating, by adult individuals being carried passively or meroplankton larvae settling in. Benthic fauna will generally regenerate faster in shallow waters (Bodden) than in deeper ones. The Nord Stream monitoring shows that most of the benthic invertebrate animal species were found in the backfilled trench area as little as a year after construction work started. By two years after construction started, the species composition and total abundance in the area of the pipeline trench and at the reference stations were identical once again. By three years after construction started, the only difference which was found in the occupation between the pipeline trench and the reference area was in terms of the long-lived soft-shell clam *(Mya arenaria)* biomass which is foreign to the area. By four years after construction, the regeneration in terms of the total biomass was also complete (based on the conditions found during the basic survey in 2016). The period in which the project can be expected to affect functions gradually is therefore set conservatively at four years.

FFH habitat type 1160 Greifswald Bodden will not be substantially affected, as the 1% criterion of the 'quantitatively relevant area loss' according to LAMBRECHT & TRAUTNER (2007) is met (0.05 %) and the LRT will be restored functionally after four years (cf. application document part E.03 section 4.3.2 p. 80 et seq.). Nor does this LRT exceed the absolute guideline value to assess the materiality of affecting 5 ha (affecting < 0.1% of the total protected area), as the equivalent value of affecting the functions gradually in the year in which the Nord Stream 2 project is constructed is 1.9 ha in the year the construction work is done, 1.5 ha in the first year after construction, 0.4 ha in the second year after construction and 0.2 ha in the third year after construction (cf. application document part E.03 section 4.3.2 p. 80 et seq.).

Lagoon cockle *Cerastoderma glaucum* is the only characteristic (autochthonous) species in FFH habitat type 1160 in the Greifswald Bodden which is highly sensitive to organic stress and lack of oxygen and might therefore be affected by constructing the Nord Stream 2 project. The Nord Stream monitoring 2011-2016 found that these cockles benefited on a small scale temporarily from the construction work (cf. application document part E.03 section 4.3.2 p. 82) as they compete amongst others with the soft-shell claim *Mya arenaria* which is alien to the area but which dominates the biomass in the Greifswald Bodden. Nor do we expect the other characteristic autochthonous invertebrate species which are currently rarer in the DSA to be affected by constructing the Nord Stream 2 pipeline if the habitat parameters are restored once construction is complete. All these species are short-lived, highly vagile and are highly plastic in terms of sediment parameters but are sensitive to oxygen deficiency and decreasing macrophyte growth. These parameters of the SCI DE1747-301 will not be affected by construction; nor are herring spawn expected to be affected.

As these values are markedly below the guideline values for permanent loss of area according to LAMBRECHT & TRAUTNER (2007) and there do not appear to be any

further justified reasons not to compare them with the converted areas occupied, we can rule out the possibility that LRT 1160 will be affected substantially.

Nor can we find that FFH habitat type 1170 will be affected substantially. In the DSA, FFH habitat type 1170 occurs in three route sections on the eastern flank of the Bodden escarpment, in the deep-water area north of the Schumachergrund and in the area of debris grounds west of the Schumachergrund (cf. application document part E.03 section 3.3.1.3 p. 55). The pipeline trench will occupy 8.5 ha of the FFH habitat type reefs in total, which breaks down as approx. 6.5 ha on the eastern flank of the Bodden escarpment (rock and stone grounds/till outcrops), 0.4 ha on a short route section with till outcrops at a depth of 9 m west of the Bodden escarpment and 1.6 ha of debris grounds at a depth of approx. 5 m west of the Schumachergrund. The relative proportion of encroachment of the FFH habitat type 1170 in proportion to its total area in the protected area is 0.113 % (7,504 ha according to the standard datasheet).

The impact on habitat type 1170 will also be only temporary. Excavating the pipeline trench will affect the hydrography and morphology of FFH habitat type 1170 temporarily. Each pipeline trench will be around 20 m wide in the reef area. Allowing for the minimum cover required, each pipeline trench will be 2 to 2.5 m deep at the 8.5-9.5 m wide base. This will not affect the hydrographics (water turnover, salt content, oxygen content close to the seabed) of SCI DE1747-301 measurably or hence substantially; nor will it affect the FFH habitat type structure permanently. Rock and stone grounds can be restored more or less identically as part of restoring the FFH habitat type 1170 (reduction measure M3 section B.4.4.1.9.1) along the pipeline trench. The stone cover produced will be higher in the area of debris grounds in which the stone cover is mostly < 20%. Till outcrops which in SCI DE1747-301 are not occupied by epibenthic macrophytes or invertebrates cannot be restored and will be replaced with rock and stone grounds. As far as the epibenthic macrophytes or invertebrates are concerned, the supply of projecting occupiable hard substrate thus appears to be virtually unchanged in the route sections concerned. Using autochthonous till will ensure that the surface structures and spatial distribution will remain virtually unchanged once the pipeline trench in SCI DE1747-301 is backfilled. Regenerating the benthos communities cleared in the course of excavating the pipeline trench will be completed within four years of construction, even in the debris ground areas (cf. application document part E.03 section 4.3.2 p. 83).

This is markedly less than the relative guideline value according to LAMBRECHT & TRAUTNER (2007) of 1% of the LRT area (see above) at 0.113%. Nor does this LRT exceed the absolute guideline value used in assessing materiality of the impact of 2.5 ha (when impacting < 0.5% of the total stock in the protected area), as the equivalence value of the gradual influencing of function is 0.5 ha in the year in which the Nord Stream 2 project is built, 0.5 ha again in the first year after it is built, 0.3 ha in the second year after it is built and 0.1 ha in the third year after it is built (cf. application document part E.03 section 4.3.3 p. 88 et seq.).

The characteristic species blue mussel (*Mytilus edulis)* will not be affected, as this species only settles sporadically in the DSA in the Greifswald (juveniles after spat fall). On the Bodden escarpment also, almost exclusively one- to two-year old juveniles are to be found. This is presumably due to the low salt content of the

Greifswald Bodden and the high exposure levels of the shallow Bodden escarpment. Older individuals are the exception even here.

As this is markedly below the guideline values for permanent area loss according to LAMBRECHT & TRAUTNER (2007) and there do not appear to be any other justified grounds why they should not be compared with the converted areas occupied, we can rule out the possibility that the LRT 1170 will be substantially affected.

StALU [*State Office for Agriculture & the Environment]* Western Pomerania's criticisms in its opinion on weighting the selected parameters of 12.06.2017 are unjustified. Weighting abiotic parameters is due to the general marine ecological fact that the species composition of the biocommunity of a marine LRT depends primarily on this and biotic factors are rarely proximate (except for biogenic reefs, dense macrophyte growth – kelp forests, seagrass meadows). This assessment also agrees with the BfN's assessment of marine LRTs: "Habitat structures are normally assessed via the sediment structure and hydromorphological characteristics of the areas, bearing in mind whether the sediment composition and distribution, salt content, temperature and exposure determine the characteristic species inventory of the area. […] Many of the marine habitat types are characterised by their geomorphological, hydrophysical and hydrochemical processes being naturally highly dynamic. A favourable state of conservation can usually only be achieved here if the natural dynamics of the natural processes can be left as undisturbed as possible." (Krause et al. 2008[92]).

It was the fact that abiotic parameters are highly important to the distribution of benthic marine species and assessing anthropogenic interventions which triggered the intensive marine habitat modelling of the German sea areas since offshore wind energy was first subsidised which continues to this day (starting point IfAÖ & AWI 2008[93]). Numerous studies of anthropogenic changes to marine biotopes due to temporary interventions such as excavation and dumping) show that it is above all those oceanographic or sediment parameters which are altered permanently which are those which are liable to have a gradual impact (e.g. DYNAS projects on dumping, Harff 2006[94], Krause dissertation 2002[95]). Changes to marine biotopes due to temporary anthropogenic interventions, such as killing animals, on the other hand, are often reversible (Nord Stream offshore monitoring 2011 p. 171 et seq., p. 309 et seq., p. 346 et seq., p. 410 et seq.; Nord Stream offshore monitoring 2012 p. 170 et seq., p. 317 et seq., p. 366 et seq., p. 456 et seq.; Nord Stream offshore monitoring 2013 p. 109 et seq., p. 252 et seq., p. 334 et seq., p. 432 et seq.; Nord Stream offshore monitoring 2014 p. 64 et seq.; Nord Stream offshore monitoring 2016 p. 57 et seq., p. 110 et seq.). The main question to consider with temporary (construction)

[92] Krause, J., v. Drachenfels, O., Ellwanger, G., Farke, H., Fleet, D.M., Gemperlein, J., Heinicke, K., Herrmann, C., Klugkist, H., Lenschow, U., Michalc-zyk, C., Narberhaus, I., Schröder, E., Stock, M., Zscheile, K. (2008): Assessment diagrams for marine and coastal habitat types of the Habitats Directive. Habitat type 11: seawaters and tidal zones p. 2).

[93] IfAÖ & AWI (2008): [Autecological atlas of benthic invertebrates in the German North Sea and Baltic Sea], Version 2.1. CD-ROM commissioned by BMU, FKZ.

[94] Harff (ed.) 2006: Project: DYNAS Dynamics of natural and anthropogenic sedimentation; project: sedimentation processes in Mecklenburg Bay, Phase II, final report. Research project of the Federal Ministry for Education and Research.

[95] Krause, J. (2002): The effects of marine sediment extraction on sensitive macrozoobenthic populations in the southern Baltic Sea. Diss. Univ. Rostock.

effects is therefore whether these could cause lasting gradual changes to abiotic parameters.

In the consultation proceedings, the planning authority, drawing on nature conservation expertise, also considered the question as to whether the buried pipeline will affect the habitat types concerned permanently or only temporarily, and concluded that it may be assumed that the structure and specific functions required for long-term survival will only be affected temporarily and not permanently, based on the assumptions below, which the environmental experts recruited confirmed:

Art. 1 f) of the Habitats Directive defines a species' 'habitat' as: 'the habitat determined by specific biotic and abiotic factors in which this species occurs at any of the stages of its life cycle.' The habitat structures which are included as a criterion for assessing the state of conservation of FFH habitat type 1160 according to the LUNG profiles and are reflected there amongst others by the sub-criterion of sediment structures are therefore clearly linked to the presence of characteristic species. Deeper lying sediment strata which are occupied only by bacteria or other single-cell species, on the other hand, are not relevant to the assessment.

The settlement depth of the macrozoobenthos in the sediment of the Bay of Pomerania and the inner coastal waters of Western Pomerania has been well known for 20 years. It was studied intensively in the course of the ecosystem research projects GOAP (Univ. Greifswald) and TRUMP (IOW) and a number of dissertations from Rostock and Greifswald Universities over the years (e.g. DIERSCHKE 1997, KUBE 1996[96] and ZETTLER 1996[97]). Soft-shell clams and Baltic clams settle at depths down to 10-15 cm. The two large tubifex polychaetes *Hediste* and *Marenzelleria* burrow down to 20/30 cm. All other endobenthic species of the macro- and meiozoobenthos are mostly found only in the topmost 5 cm of sediment (e.g. mud shrimps): so gradual substrate changes (sand) or laying a pipeline in a trench cannot in any way be assessed as permanent or gradual effects on the state of conservation of marine LRT 1110 and 1160 in the DSA of the Natura 2000 areas to be tested. This also applies to the LRT 1170 reefs. As the pipeline is therefore in an area which is irrelevant to the habitat function, leaving the pipeline in the seabed is irrelevant when assessing the effects.

B.4.5.2.3.1.4 Species

The project's impacts on the species relevant to the area as listed in Annex II to the Habitats Directive are as follows:

Harbour porpoises (cf. opinion to the FFH-VU after conducting the consultation proceedings 15.11.2017 section 4 p. 16 et seq.)

Any substantial impact on harbour porpoises in this FFH area and in its FFH area adjacent to the east "Greifswald Bodden escarpment and parts of the Bay of Pomerania" (DE1749-302) can be ruled out, as this species frequents the Greifswald

[96] Kube 1996: Spatial and temporal variations in the population structure of the soft-shell clam, Mya arenaria, in the Pomeranian Bay (Southern Baltic Sea). J. Sea Res. 35: 335-344.
[97] Zettler 1996: [Ecological studies of the neozoon *Marenzelleria viridis* (Verill 1873) (Polychaetes, Spionidae) in a coastal water of the southern Baltic. Dissertation, Rostock University: 149 pp.

Bodden only sporadically and a construction vessel and a harbour porpoise meeting is even less likely than in the adjacent area (also cf. statements on species protection sections B.4.6, B.4.8.7).

Any substantial impact on the harbour porpoise as a material factor of the SCI "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" (DE1747-301) by the Nord Stream 2 project can be definitely ruled out.

Grey and common seals (cf. application document part E.03 section 4.4.1 p. 99 et seq.):

Grey seals will be slightly affected by construction disturbances (mainly the noise of the dredging and laying ships), so we cannot rule out that these animals will adopt small-scale avoidance behaviour in the Greifswald Bodden. Grey seals feed in and pass through very large areas, such that individual animals may appear temporarily in the DSA. There are no sensitive life phases (such as overwintering sites) in the DSA. The nearest overwintering site, the sandbank by the Grosser Stubber, is approx. 3 km from the route line; but as there is no reason to fear that individuals' health will be put at risk and the Greifswald Bodden will be fully usable once again once construction is complete, any substantial impact can be ruled out. Much the same applies to common seals, which are found only sporadically in this area (cf. application document part D1.01 section 6.2.4.6 p. 582).

Any substantial impact of the Nord Stream 2 project on grey seals and common seals as material factors of the SCI "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" (DE1747-301) can be definitely ruled out.

River lampreys, marine lampreys and asps (cf. application document part E.03 section 4.4.2 p. 102 et seq.):

River lampreys, marine lampreys and asps are rheophile species (THIEL & THIEL 2015[98]), live in the pelagic zone and are therefore unaffected by areas being taken up excavating trenches. These species do not spawn in the SCI, so there is no need to consider sensitive development stages like eggs and larvae. River lampreys, marine lampreys and asps are species for which the Bodden provides a partial habitat but in which they do not reproduce. Only a few individuals of each species are found in the Bodden; and there is a slight possibility that some individuals affected will avoid the construction phase: so construction is not expected to have any substantial effect.
Any substantial impact of the Nord Stream 2 project on river lampreys and asps as material factors of the SCI "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom“ (DE1747-301) can be definitely ruled out.

The following damage limitation measures and further avoidance and mitigation measures are being used to ensure that substantial impacts on conservation goals can be definitely ruled out (section B.4.4.1.9.1):

[98] Thiel, R., Thiel, R. (2015): Atlas of fish and lampreys Hamburg inventory of species, ecology, distribution, stocks, red list, risks and protection, Free and Hanseatic City of Hamburg (eds.), as at 2015.

- Minimising intervention areas in hard bed biotopes in the FFH area (measure M1),
- Minimising intervention areas in biotopes of soft beds in the Greifswald Bodden (relevant in this case: FFH habitat type 1110 and 1160) (measure M2),
- Restoring the seabed in the trench areas (including reef structures, measure M3),
- Reducing turbidity plumes by using mechanical excavators in the Greifswald Bodden and Bodden escarpment (measure M4),
- Meeting turbidity limits of 50 mg/l above the background turbulence at 500 m from the suspension source (temporarily 100 mg/l above background turbidity possible) (measure M5),
- Restricting construction time in the protected area (Greifswald Bodden and in the south-west of the Bay of Pomerania to the period from mid-May to end-December (measure M6),
- Reducing light emissions from offshore construction activities (measure M8).

B.4.5.2.3.1.5 Combined effects with other projects

Under § 34 BNatSchG, compatibility testing must consider cumulative effects which arise from the interaction with other projects if this is 'advised in the present case' (ECJ judgment of 24.11.2011, case C-404/09, Alto Sil, Coll. 2011 I-11853, para. 103). The purpose of the cumulative consideration in the course of materiality testing is to prevent effects which are slight when taken in themselves having substantial effects in combination with other effects (cf. EUR-OP 2000[99]). This aims to exclude a creeping impact by other approved projects, none of which taken in isolation affects the area substantially (BVerwG judgment of 05.09.2012, 7 B 24.12, Buchholz 406.403 § 34 BNatSchG 2010 no. 1 para. 12). According to BVerwG case law, however, the effects of these other plans and projects and hence the extent of the aggregate effect must be reliably foreseeable (BVerwG judgment of 05.09.2012, 7 B 24.12, Buchholz 406.403 § 34 BNatSchG 2010 no. 1 para. 8). This should not in principle be the case until the permit required has been issued (BVerwG judgment of 21.05.2008, 9 A 68.07, Buchholz 406.400 § 34 BNatSchG 2002 no. 1 para. 21 and judgment of 14.07.2011, 9 A 12.10, *juris* para. 81). The certainty required is lacking if, when issuing the planning decision, it cannot yet be foreseen whether and, if so, when the further project will go ahead. The foreseeability of effects required is only given if the other plans to be considered have advanced to a stage where the 'whether' and 'how' (the nature and scope) of their effects on the protected area can be assessed. If the plans have not already been established in this sense, calculating their aggregate effects will fail for reasons of fact alone (SaarlOVG judgment of 20.07.2005, 1 M 2/04, *juris* para. 174).

To test and assess aggregate effects, we considered the project to connect the "Western Adlergrund" (CWA) and "Arkona See" (project sponsor: 50Hz) offshore wind farm clusters to the grid (cf. application document part E.03 section 6 p. 105 et

[99] EUR-OP (Office of Publications of the European Union) (2000): Natura 2000 area management guidelines, Provisions of Art. 6 Habitats Directive 2000 p. 37 et seq,

seq. and section E.01 p. 44 et seq. and part E.02). Testing and assessing the cumulative effects with this project shows that no substantial effects can be forecast, even in combination.

In the outcome of the 'Opinion on the FFH-VU having conducted the consultation proceedings", we can say that two cables will be laid in 2017 and in 2018, the year in which the Nord Stream 2 project is due to be built, merely one additional marine cable system (261) can be built to connect to the VT 50Hertz grid which must be considered in terms of potential cumulative effects. One or two cables may be built in 2019, although it is not certain that the second will be built, and it will not be decided whether it is needed until after the outcome of the invitation to tender in April 2018. Based on the case law above, only one cable would have to be taken into account in 2019 as the 'when' is unclear. On p. 2 of its opinion of 13.12.2017, StALU Vorpommern points out that, under the chronological order of connecting CWA to the grid, the cumulative gradual impact on the FFH habitat types 1160 and 1170 in the SCI DE1749-302 und DE1747-301 are well below the respective relevant guideline values (FFH habitat type 1170 is at least 4.2 ha below and FFH habitat type 1160 at least 1.5 ha below (cf. Nord Stream 2 opinion on the FFH-VU after conducting the consultation proceedings 15.11.2017, Figs. 3-1 to 3-6). The above-mentioned chronological sequence involved in connecting CWA to the grid considered by the project sponsor is also confirmed by the Ministry for Energy, Infrastructure and Digitalisation as the competent planning authority for the "Connecting CWA to the grid" project in its letter of 29.11.2017. We must therefore assume that the scenarios for 2018 to 2021 above represent a worst-case approach in view of the EM M-V's planning decision on "Connecting CWA to the grid" of 09.07.2015.

In view of the modified chronological sequence above and minor gradual effects, the StALU Vorpommern as the nature conservation authority maintains its conclusion it gave in its opinion of 16.06.2016 that the expert's certification that the project (FFH habitat type 1160 — "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" SCI (DE 1747-301)) combined with the project to connect CWA to the grid is valid, based on the project sponsor's (TdV) expert's assumptions. The planning authority supports StALU Vorpommern's statements.

The above-mentioned chronological sequence involved in connecting CWA to the grid considered by the applicant is basically confirmed by the Ministry for Energy, Infrastructure and Digitalisation as the competent planning authority for the "Connecting CWA to the grid" project in its letter of 29.11.2017. We must therefore assume that the scenarios for 2018 to 2021 above represent a worst-case approach in view of the EM M-V's planning decision on "Connecting CWA to the grid" of 09.07.2015.

By way of a precautionary assumption going even further, the planning authority nonetheless assumed a cumulative effect of a cable as part of its deviation test which it conducted as a precaution (section B.4.5.2.3.2).

Conclusions

The planning authority finds that the damage limitation, avoidance and reduction measures are effective and that their implementation can be assured by the construction monitoring. In the outcome of the assessment, it must therefore be

found that the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" SCI project (DE1747-301) does not have a substantial or lasting impact on the material factors which govern the conservation goals or protective purpose and that the project can therefore be approved in terms of these aspects (§ 34 para. 1, 2 BNatSchG, § 21 NatSchAG M-V).

B.4.5.2.3.2 Precautionary avoidance test

In view of the statements above, the planning authority finds that it can be ruled out that the "Greifswald Bodden, parts of the Strelasund and the northern tip of Usedom" FFH area (DE1747-301) will be substantially impacted.

On the other hand, a number of comments received argue that the FFH area will be substantially impacted in the sense that the construction will affect LRT 1160 to an extent which can no longer be regarded as irrelevant. Some of them regard the area underneath the occupied sediment layer, that is, more than 30 cm below the seabed, as important to the functioning of the habitat types; and some of them question the assumptions used in assessing the scope of the gradual impact or the regeneration times derived from the Nord Stream monitoring. The planning authority has considered these doubts and finds them ultimately unjustified. It is also a fact that being at least 1.5 ha below the guideline values according to LAMBRECHT & TRAUTNER leaves sufficient room to manoeuvre for forecasting uncertainty (cf. section B.4.5.2.3.1.3). If we follow the urging of the StALU Vorpommern and assume as a precautionary measure, despite the immateriality as confirmed (cf. opinion 13.12.2017), that the project ultimately exceeds the triviality threshold according to LAMBRECHT & TRAUTNER which is recognised in the case law (say, for example, that we assume the regeneration time is longer or believe that an alternative 'conversion standard' to be used in assessing temporary and/or gradual effects is correct and do not therefore use functional discounts for merely temporary uses), then assuming that the project as planned would affect an area of 28.9 ha at the most (cf. application document part E.03 section 4.3 p. 71, 80 et seq.) and assuming 10 ha for a marine cable system included in the aggregate assessment as a precautionary measure (cf. application document part E.03 section 6.2, Tab. 6-2, 6-3 p. 108), while we would have to assess this as substantial, construction would only affect the habitat temporarily and gradually as before. Even assuming that the pipeline in the area below the occupied sediment layer is impacted by the installation and operation permanently and thus calculated to be greater, LRT 1160 is still potentially able to perform habitat functions, return to its natural state and hence remain stable: so, even if the area were to be assessed as theoretically larger as being affected permanently, this is not material in terms of protecting the area.

Nonetheless, purely as a precautionary measure, assuming that LRT 1160 is affected substantially, the planning authority has examined the conditions for granting a variation under § 34 paras. 3, 5 BNatSchG. This examination has shown that a variation can be issued as a precautionary measure. The planning authority then granted a precautionary variation (cf. sections A.1.1.4), based on the considerations below:

B.4.5.2.3.2.1 Compelling grounds of overwhelming public interest

Under § 34 para. 3 (1) BNatSchG, contrary to the prohibitions of area protection, a project may only be authorised or implemented insofar as it is necessary on compelling grounds of overwhelming public interest, including those of a social or economic nature. The variation decision therefore assumes in the first place as a legal requirement that the circumstances of the individual case are assessed and that the grounds which argue in the project's favour are weighed against the countervailing interests of protecting the habitat concerned. In other word, the interests of the project must be weighed against the interests of the area.

In the present case, it is assumed that the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" FFH area (DE1747-301) are affected substantially by the construction removing a calculated 28.9 ha (plus another 10 ha for a marine cable system of 50Hertz) from LRT 1160. As this habitat type is not a priority habitat type according to Annex I to the Habitats Directive and hence a priority habitat type under § 34 para. 4, Art. 6 para. 4 sub-para. 2 of the Habitats Directive, a (precautionary) variation test is required to § 34 paras. 3, 5 BNatSchG. The more stringent authorisation conditions under procedural and substantive law under § 34 para. 4 BNatSchG do not apply here: so many other variation grounds can be considered as well as those of a social and economic nature (as there are no priority conservation goals involved). There must not in particular be any factual constraints which no-one can avoid.

By their very nature, avoidance grounds which meet the strict common good requirements of Art. 14 para. 3 sentence 1 of the Federal Constitution [GG] also justify an avoidance decision in any case if, as is the case here, no priority conservation goals are substantially affected (BVerwG judgment of 23.04.2014, 9 A 25/12, BVerwGE 149, 289 para. 73; BVerwG judgment of 16.03.2006, 4 A 1075.04, BVerwGE 125, 116 para. 566 re. Art. 16 para. 1 c) of the Habitats Directive). To achieve the level required by Art. 6 para. 4 sub-para. 2 of the Habitats Directive, the project must pursue similarly weighty common good interests as those who wrote the Directive stated specifically as example applications in Art. 6 para. 4 sub-para. 2 of the Habitats Directive (BVerwG judgment of 17.01.2007, 9 A 20/05, BVerwGE 128, 1 = NVwZ 2007, 1054 para. 129; cf. also judgment of 09.02.2017, 7 A 2/15 (7 A 14/12), *juris* para. 389). Even if not each and every ground meets these conditions in itself, a compelling public interest may be founded on the sum of multiple grounds as a whole (BVerwG judgment of 23.04.2014, 9 A 25/12, BVerwGE 149, 289 para. 74).

Assuming the standards just mentioned, weighing the grounds which argue in favour of the NSP 2 project as has actually been done against the interests of the integrity of the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" FFH area (DE1747-301) comes out in the project's favour. The project accepts that there are compelling grounds of overwhelming public interest.

Weighing the interests of the project against the interests of the integrity of the area

Interests of the area

The interests of the integrity of an FFH area in being protected from being affected by projects may be weighted variably. The criteria here are how far the materiality threshold is exceeded (if it is only exceeded to a minor extent, this weighs less

heavily than if it is exceeded massively), whether the area has already been damaged in the past, whether the project occupies only a relatively small part of the area or only affects an area which is relatively unimportant in terms of networking the coherent Natura 2000 system. As well as the extent to which it is affected, other decisive factors are how important local resources are and how well they are conserved, how far the habitat type concerned or the species and its development dynamics are endangered. What is also important is how many conservation goals have been defined for the area and whether they are affected (BVerwG judgment of 12.03.2008, *juris* para. 165; BVerwG judgment of 09.07.2009, 4 C 12/07, BVerwGE 134, 166 para. 27; interpretation guidelines 2007 p. 12). The coherence assurance measures proposed may reduce the weight of the integrity interests, provided they also contribute to conserving the integrity of the FFH area, even though it is known that coherence assurance measures cannot avoid substantial effects (BVerwG judgment of 12.03.2008, 9 A 3/06, *juris* para. 165, 202). Whether coherence assurance measures in this sense also help maintain the integrity of the FFH area must be assessed based on the actual circumstances of the individual case (BVerwG judgment of 09.07.2009, 4 C 12/07, BVerwGE 134, 166 para. 28).

As has been shown, constructing the project will affect 28.9 ha of habitat type 1160 in the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" FFH area temporarily and gradually. Seen in cumulative terms, there is another marine cable system to be laid in 2018 for which, as has been shown according to secondary provision A.1.4.25 of the EM's planning decision of 09.07.2015, an updated FFH compatibility study must be submitted. Habitat type 1160 covers 51,775 ha in total in this area: so the area affected is small compared with the area habitat type 1160 covers as a whole. Also, it is only this habitat type 1160 which the project is (assumed to) affect to any considerable extent. The area also has many other conservation goals: another 28 habitat types have been established as conservation goals in this FFH area as defined in Annex I to the Habitats Directive and 16 species as defined in Annex II to that Directive (cf. application documents, part E.03 Tables 2-1 and 2-2 section 2.2.3 p. 15 et seq.); the project does not affect these other conservation goals seriously. The effects on the FFH area do not evidently affect the materiality threshold to such an extent that the area can no longer perform its function as part of the Natura-2000 network. Given how large the area is, how large habitat type 1160 is in total and how many further conservation goals have been defined for the area, the protected area can continue performing its function, even if possibly at a somewhat reduced level (cf. BverwG judgment of 12.03.2008, *juris* para. 165, "A 44"). In no way is the suitability of FFH area DE1747-402 for habitat type 1160 or as such is not undermined in any way. It should also be noted that, no matter whether the area occupied is regarded as material or not, the project's effects are reversible in any case and will not affect habitat type 1160 adversely in the medium to long term. The functions which are lost temporarily are not so serious that they could weaken the area's interests permanently.

The coherence assurance measures to establish and/or restore the habitat and nutrient reduction by extending the treatment plants at Bergen, Göhren, Stralsund and Greifswald (cf. section B.4.5.2.3.2, ancillary provisions A.3.8.11 to A.3.8.13 and application document supplementary volume: specific proposals, updated compensation strategy, section 3.5) mean the prospects that the project losses will be made good completely within the foreseeable future, even assuming its effects are serious, are good.

As has been stated, the impact on habitat type 1160, even if it were regarded as serious, would weigh less seriously because restoring the sediment once work is complete immediately after the intervention would recreate the conditions for habitat type 1160 to perform its function as part of the protective goals of the area. Then there is also reducing the nutrients as proposed at the treatment plants mentioned which reduce the interests of the area further. In the planning amendments it submitted in October 2017 (cf. application document supplementary volume: specific proposals, updated compensation strategy section 3.5), the project sponsor showed in this context what effects the coherence assurance measures and, specifically, reducing nutrients to the conservation status of FFH habitat type in the six SCIs of the Rügen Bodden waters could have. We will therefore assume in the first instance that providing compensation under the intervention rules as part of the fish land meadows eco-account and beyond as part of the additional Bargischow polder nature conservation measure will reduce nutrients in themselves. The application documents do not discuss this in more detail, however, so the planning authority will not consider it any further.

Proving that the measures in treatment plants are technically and legally feasible (see sections B.4.4.3.2; B.4.4.3.3; B.4.4.3.5; B.4.4.3.6; B.4.2.3.2.3) enables the planning authority to include the reduction in nutrients which can be achieved in 15 years and how it affects the habitat type affected by the construction. After the planning authority has deleted the compensatory measures for which the project sponsor has applied in respect of third party properties (cf. section B.4.8.4.4), this leaves the nitrogen and phosphorous load reductions below:

Table 8: Load reductions by individual treatment plants

Treatment plant	N (t/a)	P (t/a)
Greifswald	21.5	0.5
Stralsund	31.4	1.8
Bergen	16.3	0.3
Göhren	3.1	0.2
Total	**72.3**	**2.8**

(cf. application document, supplementary volume: specific notes, part of feasibility study Greifswald treatment plant section 3.7; Stralsund treatment plant feasibility study section 3.6; Bergen treatment plant feasibility study, section 6.1, 6.2; Göhren treatment plant feasibility study section 6.1, 6.2)

It should be noted in particular that the load reduction is calculated based not on what is permissible given the established monitoring values or the volume of dirty water at any time but on the actual loads in the comparison years 2015/2016 (conservative approach).

It has been shown verifiably and citing scientific studies that the nutrient reduction reduces the biomass of the phytoplankton and the macrozoobenthos by around 2-3% in the pelagic and benthic zones of the bodden waters stated. This is not equated, correctly, with improving the conservation status of the FFH habitat type

over 2-3% of the Rügen Bodden waters: rather, citing the improvement in visibility depth and the increase in macrophyte coverage this involves, which is to be regarded as a good state of conservation for FFH habitat type 1160, and the logarithmic relation between chlorophyll (Chl a) concentrations and visibility depth, this gives an estimate for an area-based improvement in the conservation state of habitat type 1160 in the Rügen Bodden waters over a beneficial area of 2-3 km^2. Relative to the approx. 70,000 ha which are assigned to FFH habitat type in the protected areas of the Rügen Bodden waters (cf. application document, supplementary volume: specific notes, updated compensation strategy section 3 Table 3-4 and map), this gives an improvement in the state of conservation of FFH habitat type 1160 alone over an area of 140 to 210 ha (0.2-0.3% of the total area of LRT 1160 in the SCI of the Rügen Bodden waters, cf. supplementary volume: specific notes, updated compensation strategy section 3, Table 3-4). The slightly lower reduction volume of 1.1 t nitrogen and 0.1 t phosphorus which was ultimately due to the loss of real measures actually planned is not taken into the balance as the assumptions are conservative in any case. As the planning authority sees it, this also makes a relevant contribution to maintaining the state of habitat type 1160 and hence to the integrity of the FFH area in any case.

This assumption is also confirmed by the lower nature conservation authority's opinion of 13.12.2017: StALU Vorpommern believes that the expert statements in the updated compensation strategy on upgrading FFH habitat type 1160 are plausible in principle, citing the management plan (MaP) for SCI DE1747-301 "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" and of SCI DE1547-303 "Small Jasmund Bodden with peninsulas and Schmaler Heath", and confirms that this corresponds to the nature conservation goals to improve the conservation status of FFH habitat type 1160 in the coastal waters of M-V.

On the inter-area relations between the SCI and its hydrological interactions, we would refer to the statements on the intervention settlement (cf. section B.4.8.4.2). StALU Vorpommern also refers in this context to the management plan for the SCI "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom", which states that improving the conservation status of LRT 1160 "may not be influenced by measures within the FFH area alone. The long-term goal should therefore be to develop a good state of conservation of the 1130, 1150* and 1160 habitat types." (MaP p. 158). The nutrient reduction affects all these habitat types. The inter-area relations between the SCIs cannot be ignored when assessing the conservation status of habitat type 1160 in the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" because of the immediate spatial and functional connections. The management plan for the SCI "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" and SCI "Small Jasmund Bodden with peninsulas and Schmaler Heide" assumes implementing priority development measures for the LRT 1160 and 1150*. These are not, therefore, overriding conservation and restoration measures for the habitat types: otherwise they could not be included as compensatory measures (BVerwG decision of 02.10.2014, 7 A 14/12, *juris* para. 42.; cf. also the EU Commission's interpretation guidelines on Art. 6 para. 4 of the Habitats Directive of January 2007 p. 15). Current scientific findings (as the StALU Vorpommern continues on p. 7) indicate that these measures are highly likely to be effective; and the planning authority shares this view in view of the expert statements considered in the updated compensation strategy.

StALU Vorpommern sees the nutrient reduction basically suitable as a flanking measure to designate the habitat type extension area south of the site of community importance "West Rügen Bodden landscape with Hiddensee", cited in the draft of the 3rd Federal State Regulation to alter the Natura 2000 area – Federal State regulation of 08.08.2017. The nutrient reduction also serves to improve the conservation status of the habitat type 1160 extension area in northern Strelasund.

Project interests

This decision approves a project which complies with the principles of sec. 1 EnWG and helps safeguard the energy supply in Germany and Europe generally to a substantial extent. Safeguarding our energy supply in general and through the project which the planning authority has approved in particular is a community interest of the highest order (cf. BVerfGE 38, 258, 270 et seq.; E 45, 63, 78 f; BverfG decision of 10.09.2008 – 1 BvR 1914/02, *juris* para. 15). To justify the project's interest, we would also refer to the statements on justifying the plans in section B.4.1. The important common interest the project pursues of supplying the general public natural gas (cf. section B.4.1; cf. application document part A.01 p. 45 et seq.) is an outstanding public interest within the meaning of sec. 34 para. 3 (1) BNatSchG; as an existential concern, it weighs so heavily that the planning authority believes it also meets the common good requirement of Art. 14 para. 3 sentence 1 of the Constitution (cf. sec. 45 EnWG).

As we have already stated and shown in section B.4.1 of this decision in detail, the project serves to provide a secure supply of piped energy through importing an additional volume of natural gas of approx. 55 billion m³ p.a. reliably to Germany and Europe. As part of an overall energy strategy, Nord Stream 2 will network Russian natural gas reserves with the existing natural gas distribution system in Europe, particularly via the natural gas receiving station planned at Lubmin 2 via the planned EUGAL and the connecting pipeline to the NEL to be built via the existing NEL. The Lubmin 2 natural gas receiving station, the connecting pipeline to the NEL and EUGAL are being planned by GASCADE Gastransport GmbH. Under the Nord Stream 2 overall energy strategy, the incoming gas will be transported on via the connecting pipeline to the NEL (AL NEL) via the NEL westwards and the EUGAL to the south. The new infrastructure will deliver the natural gas to Germany and north-west Europe and to central and southern Europe via the Baumgarten gas intersection in Austria. Through the Nord Stream pipeline, Nord Stream 2 will enhance and extend the existing gas transport route through international waters to the domestic European market as is required. Nord Stream 2 will thus improve the reliability of supply within the Federal Republic of Germany and in the 28 (or 27 in future) Member States of the European Union as a whole and Switzerland and the Ukraine (and then the United Kingdom) und, particularly through extending the existing import routes and increasing carrying capacity accordingly. Considering the supply situation also from the position of the Union as a whole is compelling. Implementing the Third Energy Package and so creating an increasingly networked European gas infrastructure will implement a pool model in the EU 28 in which gas can be fed in and/or drawn off anywhere desired. Demand will continue to be determined at national level; but as importing natural gas can no longer be assigned to individual Member States in particular, but will be imported to and distributed in the single market via the EU's external borders, this supply is Union-wide. The project will make a major contribution to closing the natural gas supply gap which is

being created in the Federal Republic of Germany and the European Union, which is also expected to enable Switzerland and the Ukraine to import gas from the EU 28. The continuing development of demand as a whole and producing gas in the EU is subject to a host of uncertainties in principle, as the differing forecasts on how natural gas demand will develop in the EU 28 and from OECD Europe based on considering target or reference scenarios show. Fig. 5-3 in the application document, part A.01, lists studies published on the growth in demand for natural gas using target/reference scenarios, reflecting the various forecasts. Even using the moderate assumptions in the conservative reference scenarios used in assessing the supply gap which may arise, which are basically confirmed by the updated data for 2017 based on the EU Reference Scenario plus the EU's natural gas exports to Switzerland and the Ukraine, the EU 28 including Switzerland and the Ukraine are expected to need to import 26% more natural gas in the medium term up to 2045. Natural gas demand in the EU 28 is forecast to remain more or less stable from 2015 to 2050. During the same period, Switzerland is expected to need an extra approx. 3 billion m³ p.a., while the Ukraine is expected to need around 16 billion m³ p.a. from 2020. What this means is that the EU 28's demand, including Switzerland and the Ukraine, is expected to be around 494 billion m³ p.a. from 2020 onwards. As natural gas production in the EU is expected to fall sharply, especially in the United Kingdom, Germany, Italy, Denmark and the Netherlands, which is not expected to be made up for by increasing natural gas production in other EU Member States, particularly Rumania, Poland and Cyprus, and by producing biogas or importing more natural gas into the EU from non-member states, even considering the matter duly conservatively, we expect to need to import an additional 30 billion m³ of natural gas as soon as 2020 and 57 billion m³ by 2025, peaking at 123 billion m³ by 2045 and then falling although only slightly to needing to import an extra 110 billion m³ by 2050. To close the energy gap which will exist even in the short term, i.e. from 2020, we need to increase our natural gas supplies. Apart from the fact that natural gas reserves are diminishing, importing more pipeline gas from Norway, North Africa (Algeria, Libya) or via the so-called 'southern corridor' also faces technical, financial and/or political obstacles in principle. Importing more from Russia via the so-called 'central corridor'/the Ukraine faces the problem that this is obsolete and needs rationalising, such that, even including the emergency rationalisation programme for the Urengoi-Pomary-Uschhorod pipeline, we can only expect a (maximum sustainable) carrying capacity of 30 billion m^3 p.a., which, while it may remain available for longer than the reference case underlying the plans assumes, will not be enough to cover the additional imports required. As LNG supplies are forecast to fall short in the early 2020s, LNG is unlikely to be able to cover the EU 28's net import demand, including the Ukraine and Switzerland and/or the additional imports required as stated above cost-effectively. Building Nord Stream 2 as planned will also provide another way to supply Russian natural gas, improving covering demand and creating a reliable supply for the Federal Republic of Germany and the EU 28, including the Ukraine and Switzerland, and help cover the extra demand to be expected. Even ignoring other risks importing natural gas involves, such as the central corridor via the Ukraine failing completely, the tight LNG market deteriorating even further or other supply and demand based risks, like the EU 28's own production continuing to fall or demand being greater than forecast, at a typical loading, the Nord Stream 2 will cover 90% of the import gap of 52 billion m³ p.a., i.e. 50 billion m^3 p.a., as early as 2024. The natural gas gap will therefore continue to grow through using/exploiting the existing transport infrastructure and that planned with the Nord Stream 2 pipeline. The further developments in total demand for

natural gas and gas production in the EU and the possibilities for importing pipeline and LNG gas are subject to many uncertainties: but a clear trend can also be deduced for the Nord Stream 2 pipeline whereby the risks to the reliability of supply in Europe from 2020 onwards would be significantly more acute than the likelihood of countervailing trends, such as reducing demand, increasing the EU 28's own production or importing more gas from other sources. Without contracting additional natural gas supplies, the EU (including Switzerland and the Ukraine) will be facing a supply gap of between 30 billion m³ natural gas by 2020 and up to 123 billion m³ by 2045. Taken as a whole, the Nord Stream 2 project, which is expected to supply an additional 55 billion m³ p.a. or so from the end of 2019, could close some of this gap.

By connecting Russian natural gas deposits and the German and European natural gas long-distance pipeline networks, the Nord Stream 2 natural gas pipeline will also serve to diversify natural gas distribution routes in the EU. Realising it will also help optimize and secure supplying gas to supply the national markets in the EU. The Nord Stream 2 pipeline will link the existing production areas in Russia, mainly the Yamal peninsula, with the European natural gas market by the shortest route. This will also relieve the logistics of existing transit routes. Diversifying the transport routes will not only make it possible to bring more gas to southern and eastern European markets, but would also provide a diversionary route if supplies fail. Nor would building or operating the Nord Stream 2 pipeline make Europe or Germany more dependent on Russian natural gas, as merely building it does not create an obligation to use the transport capacity and the natural gas supplied would be sold on the competitive European markets. It will also create transport capacities which meet the transport facilities the market actually needs (cf. sec. 11 para. 1 sentence 1 EnWG) and which cannot be covered otherwise via existing pipeline networks or alternative transport (LNG, pipeline gas) or production opportunities (biogas). From its own findings, the planning authority knows that the demand for carrying natural gas which would initially only be demanded on a non-binding basis was essentially confirmed by binding bookings by players in the market in the annual auctions which were held in March 2017. While there are also onshore transmission pipeline networks linking Russian gas fields with the EU and Germany, the transit capacities via the central corridor and via the Ukraine in particular are already subject to the uncertainties as addressed. Neither the central corridor nor the other existing pipeline networks could be expanded financially or environmentally viably to meet the additional demand as calculated to satisfy demand which is expected to reach a forecast additional transport capacity of 123 billion m³ of natural gas p.a. by 2045 and which is suited to linking the northern Russian gas fields to the EU. Nor can this be done by using the existing Nord Stream pipeline to the full, as this was already under an 80% load in 2016, such that increasing capacity here is hardly possible and could not be used to the full in any case, due mainly to the limitations of the OPAL pipeline.

Due to the lack of actually existing additional pipeline capacity from the northern Russian natural gas reserves in the Nadym-Pur-Taz and Yamal regions which could be used or expanded in the course of network access, the whole of the present project's transport capacity is needed. Even the Nord Stream 2 pipeline cannot cover all the EU's future transmission requirements, as comparing the project's transport capacity (55 billion m³ p.a.) with the import gap expected as stated above shows; but

the project will make a significant contribution to cover the natural gas import demand to come.

Bipolar considerations

The planning authority has weighed up the project interests as shown and the area interests also as shown and has decided in favour of the project. The impact on habitat type 1160 as shown does not justify rejecting this project which is so important to supplying Germany and Europe with energy.

Constructing the project will temporarily and gradually affect 28.9 ha of the existing habitat type 1160 with a total area of 51,775 ha which exists in the FFH area (plus 10 ha for a marine cable which 50Hertz is to lay in 2018). The area which will be affected is thus relatively small compared with the total area of LRT 1160. Also, it is only this habitat type 1160 which the project affects (presumably) considerably): it does not affect the other 28 habitat types defined as conservation goals in the area according to Annex 1 of the Habitats Directive or 16 species as listed in Annex 1 to the Habitats Directive significantly. We also find that the project's effects are reversible in any case and will be restored functionally in habitat type 1160 so soon that its conservation status will not be affected adversely in the medium to long term. The FFH area as a whole and habitat type 1160 will also be strengthened by the coherence assurance measures of extending the FFH area and reducing toxins by adding extra filtration at four treatment plants.

The aforementioned project-linked temporary limited area impact on habitat type 1160 in the FFH area must yield to the considerable interest in realising the project and the underlying interests of supplying Germany and Europe with energy. The project will also make a major contribution to covering demand and ensuring a reliable supply in Germany and Europe. Ensuring the reliability of supply, which the plan-approved project serves particularly, is of the highest importance to the common good. Having a reliable supply is a fundamental need in ensuring a reasonable human life (cf. BVerfGE 38, 258, 270 et seq.; E 45, 63, 78 et seq., BVerfG decision of 10.09.2008, 1 BvR 1914/02, *juris* para. 15). If the project could not be constructed at the place where it is proposed in the FFH area, due to lack of reasonable alternatives (cf. on this point both considering the FFH alternatives and in section B.4.3), the project would have to be put on ice, which would have serious, unacceptable effects on the public interest in an energy supply.

There are therefore compelling reasons of the overwhelming public interest which argue in favour of the project.

B.4.5.2.3.2.2 No other reasonable alternative

When considering the assessment of FFH alternative solutions under 34 para. 3 (2) BNatSchG, the decisive rule in law is whether an alternative solution could achieve the project's planning goals despite what might be acceptable losses elsewhere or with less effects and the alternative is reasonable in the sense of the proportionality principle. If an alternative solution to achieve the planning goal or bundle of goals is unsuitable or not protective for internal FFH reasons or disproportionate for non-FFH reasons, it must fail as an alternative (BVerwG judgment of 27.01.2000, 4 C 2.99,

juris; BVerwG, judgment of 17.01.2007, 9 A 20.05, "[Western Halle bypass]"; BVerwG judgment of 12.03.2008, 9 A 3.06, *juris* para. 166 et seq., "A44", established case law).

Considering the alternatives as the planning authority did in section B.4.3 of this planning decision found that the alternative sites and technical alternatives which could be considered are not only less suitable than the plan-approved project in specialist planning terms, but also, tested against the more stringent regime of testing alternative FFHs in sec. 34 para. 3 no. 2 BNatSchG are neither suited to achieving the goals nor more favourable measured in terms of FFH habitat protection or reasonable for non-FFH reasons. As we explained in more detail in section B.4.3 of this decision, there are no alternative landfall target areas, no large-scale route variants within the Bay of Pomerania, no small-scale route variants and no technical variants available which would not involve little or no effects on FFH areas than is the case with the plan-approved project with its (assumed) substantial impact on the habitat type in the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" FFH area (DE1747-301) (cf. section B.4.3 with further proofs). So there is no reasonable alternative as defined in sec. 34 para. 3 no. 2 BNatSchG.

Of the two landfall alternatives in the Greifswald Bodden (Vierow and Lubmin), the one selected was the one expected to have the least impact on habitat types and hence on the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" FFH area in terms of its components which are material to its conservation goals or protective purpose (cf. application document part B.01 sections 8.3.3, 8.3.5 and 9.3.3).

Crossing the island of Usedom can be ruled out as an alternative for a number of reasons: it has no suitable landfall options and no sufficient logistical infrastructures which would enable even reasonably presumable construction: so there would considerable construction risks onshore which the planning authority thought would be unreasonable. Offshore, routing the pipeline via Usedom would either conflict with zoning goals (military exercise area) or would run for 9.5 km over biotopes which qualify as 'reef' habitat types and are essential elements of the "Greifswald Bodden escarpment and parts of the Bay of Pomerania" area.

The planning authority followed up the aspects which were presented in the assessment of alternative solutions (cf. section B.4.3; application document part B.01 section 9.3.2) which ruled out a Mukran alternative as unreasonable and agrees that, in state planning terms, the Rügen/Mukran alternative would conflict with accommodating port-related businesses and the tourism which is essential to Rügen, private property for the receiving station and the connecting pipeline which would be disproportionate to the benefits thus achievable of protecting the area over a section of 68 km and more would also be affected by the Rügen/Mukran alternative and, on the onshore side, a considerable impact on the "Small Jasmund Bodden with peninsulas and Schmaler Heide" FFH area (DE1547-303) could not be ruled out (cf. also section B.4.3).

Landfall target areas further west of Rügen face unreasonable obstacles in fact and in law (cf. application document part B.01 section 9.3.1). What is particularly important here is that the considerable additional length in itself would be a

disproportionately more far-reaching intervention in the ecosystem and it could not be ruled out that even Natura 2000 areas would be affected. Also, such a route would conflict with regional planning goals (cf. application document part B.01 section 6.2.6.4). And, finally, not only would it be considerably more expensive to the project developer in technical and financial terms, but, having looked into the matter accordingly, the planning authority shares the alternative testing assumption (cf. application document part B.01 section 6.2.6.5; section B.4.3) that the alternative route west of Rügen would be disproportionate due to the size of the dredging volume. The capacities required to dispose of excavated soil with an organic content of >3% (alluvial sediment) of the order of 3-12 m m³ on land are not available. It is unreasonable to expect the project developer to bear the uncertainties concerned.

B.4.5.2.3.2.3 Ensuring the "Natura 2000" network is cohesive

As a precautionary measure, this Plan Approval Decision provides for the measures to ensure the spatial and chronological coherence of the Natura 2000 European ecological network (cf. ancillary provisions A.3.8.2, A.3.8.11, A.3.8.12, A.3.8.22; sections B.4.5.2.3.2.1, B.4.8.5.2). These coherence assurance measures as laid down in the plan are legally and factually suited, individually and even more so taken together, to make a complete coherence equalisation of the impact on habitat type 1160 which is assumed to be considerable. The coherence assurance measures laid down are justified below.

Under sec. 34 para. 5 sentence 1 BNatSchG, measures must be provided to ensure the Natura 2000 European ecological network is cohesive (coherence assurance measures) if a project is approved despite affecting the protective purpose or conservation goals of Natura 2000 areas under sec. 34 para. 3 BNatSchG.

Neither the Habitats Directive nor its German enacting regulations define the concept of (compensatory) measures to ensure coherence as defined in sec. 34 para. 5 BNatSchG, Art. 6 para. 4 sub-para. 1 of the Habitats Directive. Unlike with damage limitation measures which are attached directly to the project and prevent its having adverse effects on the area, wholly or in part, coherence assurance measures serve to compensate for a project's adverse effects (cf. EC interpretation guidelines). From the legislative and meaning context of these regulations, we may also conclude that, in terms of both nature and scope, the design of coherence assurance measures is designed to be function-based aligned with the substantial impact concerned which is why they are taken (cf. BVerwG judgment of 12.03.2008, ref. 9 A 03.06, *juris* para. 199; BVerwG judgment of 13.05.2009, ref. 9 A 73.07, *juris* para. 69). The nature and scope of the coherence assurance measures must be designed such that they compensate completely for the functions of the coherent Natura 2000 network. The compensatory measures defined must take account of the conservation goals defined for the area concerned and create conditions for the habitats and species which the project affects which are both quantitatively and qualitatively comparable. At the same time, they must create a sufficient replacement for the function of the area concerned in terms of the network as a whole if necessary.

Creating a new habitat and/or restoring an existing one

The measures required as defined in sec. 34 para. 5 BNatSchG include restoring or

improving the habitat which remains or creating a new habitat which is to be integrated with the Natura 2000 network (EU Commission, interpretation guidelines to Art. 6 para. 4 of the Habitats Directive 92/43/EEC, January 2007 p. 11, 16 and 21, (in future, the 'EU interpretation guidelines'); cf. also BVerwG, 06.11.2012, 9 A 17.11, BVerwGE 145, 40 para. 82 et seq. and BVerwG judgment of 12.03.2008, 9 A 3.06, BVerwGE 130, 299 para. 199).

Restoring the sediment areas which are relevant to the habitat type functioning to approximately their original condition and hence restoring the habitat conditions (cf. ancillary provisions A.3.8.2, A.3.8.22; sections B.4.5.2.3.2.1, B.4.8.5.2) should be classified as a measure which is necessary in itself to ensure the connectivity of the Natura 2000 network and hence as a coherence assurance measure which also benefits the integrity interest of the area itself. As part of implementing the construction project, measures have already been taken to ensure that if the project is assumed as a precautionary measure to exceed any guideline values which are relevant to the area's significance, this is merely of a temporary nature; what this means is that, in the long term, this project will not affect the state of conservation of the habitat types concerned. Any impact which is assumed to be considerable could only arise from certain habitat functions being temporarily unavailable. Restoring the sediment will create the conditions for the state of conservation of the habitat types concerned not deteriorating. From the monitoring which was conducted in the course of the Nord Stream project, the planning authority is convinced that it has been shown that these measures work: so the planning authority therefore assumes, as has already been justified elsewhere in this Plan Approval Decision, that this means that the necessary measures have already been taken, that the impact will not even be substantial and that habitat type 1160 will remain stable. In any case, however, this measure in itself serves to ensure coherence completely.

Designating extended area

As a further coherence assurance measure for habitat type 1160, the planning authority has as a precautionary measure defined the area which is proposed in Annexe 3 to the draft of the Federal State regulations on amending the Federal State Natura 2000 area regulations (cf. proclamation of 08.08.2017, OJ M-V p. 578) as an extension area to the site of community importance "West Rügen Bodden landscape with Hiddensee" (DE1544-302) (cf. ancillary provision A.3.8.22). This area is approx. 50 ha in size, approx. 40 ha of which are to be designated. This is enough in any case to compensate for the loss of the 28.9 ha concerned which the project is assumed to cause and for a permanent loss assumed of 10 ha of habitat type 1160 for a 50Hertz marine cable to be laid in 2018.

It may also be taken as read that the legislative proceedings on the draft regulation above will soon be completed by issuing the regulations and that the area above will also be declared an FFH area (in the shape of an area extension to the "West Rugen Bodden landscape with Hiddensee" FFH area as mentioned above) (DE1544-302) insofar as is required to ensure coherence.

According to the Commission's interpretation guidelines to Art. 6 para. 4 of the Habitats Directive 92/43/EEC, the measures which are suitable and/or necessary to compensate for detrimental effects on designated Natura 2000 areas include:

- Restoration or improvement measures in existing areas: restoring the habitat to maintain its conservation value and ensuring that the conservation goals defined for the area are met or improving the remaining habitat pro rata in proportion to the losses which the plan and/or project have created in the designated Natura 2000 area;
- Creating a new habitat: creating a new habitat in a new or extended area to be incorporated in the Natura 2000 network.

The Federal State of Mecklenburg-Vorpommern has therefore conducted the procedure for a third Federal State regulation amending the Federal State Natura 2000 areas regulation (cf. proclamation of 08.08.2017, OJ M-V p. 578) to extend the "West Rügen Bodden landscape with Hiddensee" site of community interest (DE1544-302) by 50 ha purely in view of the requirement which may arise out of the permit procedure to ensure the Natura 2000 network is continuous as required by sec. 34 para. 5 BNatSchG. The area proposed to be used in extending the area is on the west coast of Rügen west of Rambin, and is adjacent on the south to the long-standing FFH area "West Rügen Bodden landscape with Hiddensee" (DE1544-302) and supplements this. Even if the area of 50 ha as proposed as the designs currently stand should change once the regulatory procedure is complete, the planning authority is convinced that, according to the regulation's stated purpose, it is established that this will have a coherence area size of at least approx. 39 ha as the planning authority determined as a precaution.

The law does not require compensatory measures to be taken immediately where effects are felt: it is enough that the losses be compensated for which the area suffers in terms of its function for the biogeographical distribution of the habitats and species affected (BVerwG judgment of 06.11.2012, 9 A 17.11, BVerwGE 145, 40 para. 82; BVerwG judgment of 08.01.2014, 9 A 4/13, BVerwGE 149, 31, para. 54; OVG RP, judgment of 01.07.2015, 8 C 10494/14, *juris* para. 113; EU interpretation guidelines p. 20 et seq.). The task of the coherence assurance measures which are added to the project is to compensate for the loss of functions for the conservation goals (cf. for example BVerwG judgment of 13.05.2009, 9 A 73.07, NuR 2009, 711 and *juris* para. 69, with further notes). The functional reference is the governing criterion here, particularly also in determining how the impact on the area and ensuring coherence relate to one another in terms of space and time. This means coherence assurance measures may also be provided in the FFH area affected or in another FFH area (ECJ judgment of 15.05.2014, case C-521/12, NVwZ 2014, para. 38). They must relate to the same biogeographical region in the same Member State and provide functions which are comparable with those based on which the original area was selected (EU Commission, Natura 2000 – area management – The provisions of Art. 6 of the Habitats Directive 92/43/EEC, 2000 p. 49 et seq.). Extending the area as planned meets these conditions.

The area as proposed meets the conditions required to be considered as a coherence assurance measure for offshore projects planned, for the habitats and species affected must be affected to a comparable extent (BVerwG judgment of 06.11.2012, 9 A 17/11, BVerwGE 145, 40, para. 83). This is the case in and with the area proposed to be used in extending the area. Even assuming that an area of approx. 39 ha would be permanently affected, the area designated as an extension area by this decision would be sufficient.

The area as proposed is particularly suitable for extending the area because there are areas of dense macrophyte growth, in consideration of the resulting assessment of the conservation status of FFH habitat type in the SCI "Greifswald Bodden, parts of Strelasund and northern tip of Usedom" (DE1747-301) due in particular to the reduced macrophyte occupation as category C (unfavourable state of conservation) in the management plan for the FFH area (StALU Vorpommern 2011 p. 110). The eastern bank of the northern Strelasund currently has one of the highest macrophyte coverages in the West Rügen coastal waters. We may assume a number of endangered stoneworts reside here, similarly to the rest of the course of the Strelasund. The dense macrophyte growth here means that we may assume that the species diversity in the macrozoobenthos is particularly high, particularly of phytal-resident epifauna (freshwater and marine shrimps), the levels of which have been falling in the Greifswald Bodden for years. The macrophytes serve as food for overwintering phytophage water birds (dabbling ducks, mute swans). The adjacent land area outside the small bodies of water, swamp and reed bed areas and woodlands is used extensively as grassland. The bank is close to nature and is bounded by a girdle of reeds. There are no moorings or bathing beaches.

The project developer conducted a LIDAR survey of the seabed in the area proposed, with a measurement accuracy of 2 cm, on 06.10.2017, finding a shallow largely unstructured seabed falling gradually westwards to a depth of 2.5 m. In 2017, the current light penetration depth in this section of the Strelasund allowed a lower growth limit of macrophytes of approx. 1.8 to 2 m water depth. All in all, macrophytes were still growing on 50% of the extension area in October 2017; and this proportion is presumably even somewhat greater at the seasonal peak in August. Comparing the LIDAR survey findings with the airborne image (DOP) from the Mecklenburg-Vorpommern map portal from summer 2015 shows the macrophyte growth is largely unchanged. As seabeds which are densely grown with submerged macrophytes and stonewort algae (particularly as manifested in habitat type 1160) on the one hand and the occurrence of habitat type 1110 and/or 1170 on the other hand are mutually exclusive, we may assume that habitat type 1160 alone is found in the area proposed.

Protecting this area in accordance with the Natura 2000 regulation regime means that this area, which is important to the state of conservation of habitat type 1160, will be protected against external detrimental effects (such as maritime tourism infrastructure).

In its opinion of 26.05.2017, the Mecklenburg-Vorpommern Ministry for Energy, Infrastructure and Digitalisation points out that within the area proposed as a designated extended area in LEP M-V 2016 is designated for mainly shipping, a reserved shipping area, a reserved marine tourism area and reserved marine fisheries area: so it can only be redesignated as a Natura 2000 area if this does not affect its priority functions for and use by shipping within the priority area in any way (under sec. 8 para. 7 (1) ROG). And in those partial areas which were designated as reserved areas, the interests of shipping, tourism and/or fisheries must be given particular weight when redesignating them and when subsequently producing FFH management plans.

We cannot accept this: only reserved areas are designated for the extension area, and not priority areas. Under sec. 8 para. 7 no, 2 ROG, reserved areas are those which are to be assigned certain spatially important functions or uses when weighing against competing spatial uses. Insofar as the extension area proposed lies within a reserved shipping area, the interests of shipping are already of little weight because, with a prevailing water depth of < 2 m, this area cannot be used by deeper draught ships; the depths encountered are largely too shallow, even for pleasure motor boats. According to marine charts, the fairways west of the extension area are 6.5 to 6.8 m deep and hence considerably deeper than the northern approach to Stralsund adjacent to the north, which the WSA Stralsund last had dredged to a continuous depth of 4.50 m in autumn 2015: so the roads in this area can hardly be expected to be deepened, as this would mean deepening the northern approach within the existing FFH area by more than 2 m to start with.

Nor does the reserved tourism area prevent the area being extended. The reserved area is intended to preserve and improve its attractiveness for water tourism and an experience for water sports enthusiasts and other user groups while conserving nature. The shallow waters (< 2 m deep) are unsuitable for motor boats. Access is poor, and the area is far from residential areas tourists can use. There is no bathing beach, instead continuous reed beds. There is a cycle track of regional importance close to the bank (RREP 2010) which extending the area will not restrict being used. The onshore area is designated the "West Rügen" protected landscape area (L143) and is shown in the LEP M-V (2016) and the RREP (2010) both as a reserved tourism area and a reserved nature conservation and landscape management area. According to the regulation on the LSG of 10.03.2009 (Rügen rural district official journal no. 117 of 24.03.2009 p. 7), the LSG serves as a buffer zone to the adjacent national park. According to sec. 4, the protective purpose includes maintaining and improving the peace of the area and its suitability for undisturbed rural relaxation. Recognising the natural boundaries (including in the national park environment) to tourist development, this excludes other forms of tourism.

Conflicts with fisheries and the area reserved for them can also be ruled out. Reserved marine fisheries areas are intended to reflect the interests of coastal fisheries and maintain fish species and stocks and their habitats in particular. One of the criteria used in designating a reserved marine fisheries area includes areas with a high proportion of macrophytes as particular marine habitats for reproducing and breeding young fish and other important fish habitat functions. Cast nets and fish traps appear to be absent; passive fishing is not excluded in FFH areas, and is also found in FFH area DE1544-302.

Once again, this measure of extending the FFH area ensures full coherence in itself.

Reducing nutrients at treatment plants

The updated compensation strategy which the project developer has presented also provides for reducing nutrient inputs through extra filtration by extending the Bergen, Göhren, Stralsund and Greifswald treatment plants (cf. section B.4.5.2.3.2 just above <with further cross-references> and the application document, supplementary volume: specific details, updated compensation strategy section 3.5 p. 57 et seq.) to achieve a partial improvement of the state of conservation of habitat types and, while based on FFH habitat type 1160 alone, theoretically on an area of 140 to 210 ha

(0.2-0.3% of the total area of habitat type 1160 in the SCI of the Rügen bay waters, cf. supplementary volume: specific details). As to the effects of the nutrient reduction, we would refer to the statements made above (cf. section B.4.5.2.3.2.1).

If we assume that the nutrient reduction will become ecologically effective in the year following that in which the additional filtration comes into service, we can expect to see an improvement in the state of conservation of habitat type 1160 of the order of size stated as soon as 2020/2021. StALU Vorpommern (opinion of 13.12.2017 p. 6) feels work must start on this by when Nord Stream 2 goes ahead at the latest. Seen in chronological terms, for coherence assurance measures, it must at least be ensured that the area is not irreversibly damaged in terms of the conservation goal affected (BVerwG judgment of 17.01.2007, 9 A 14/12) but does not compensate for the impact promptly – as is usually the case, it is acceptable if the coherence assurance measures start to work in good time by when the project is completed, but the loss of functions are only combatted in the longer term (BVerwG judgment of 06.11.2013, 9 A 14/12, BVerwGE 148, 373 para. 93, judgment of 06.11.2012 op. cit. para. 82 and of 12.03.2008 op. cit. para. 200), nor do they need to be effective immediately (BVerwG judgment of 06.11.2012, 9 A 17.11, BVerwGE 145, 40 para. 82; BVerwG judgment of 08.01.2014, 9 A 4/13, BVerwGE 149, 31, para. 54).

The planning authority is convinced that sufficient legal measures have been taken to ensure that the measures above will be implemented in time (the project developer has applied that they be considered and/or defined). The planning authority cannot rule that the four treatment plants above be expanded as it does not have the authority to do so, as these treatment plants and/or expanding them involve structural changes to sewage treatment plants which are neither energy installations as defined in sec. 43 EnWG or other installations as defined in sec. 75 para. 1 sentence 1 VwVfG. In view of the planning and construction applications which the project developer has presented, which it has concluded with the treatment plant operators, the permits under water resources laws which the project developer has also presented for expanding the treatment plants and the fact that, as the planning authority sees it, the modifications to the treatment plants are admissible in construction law, the measures may be assumed to be feasible and that they will be implemented in good time. Given also that the planning authority has ordered under ancillary provisions that the project developer may not start implementing the planning and construction contracts concluded with the operators under the permits under water resources laws or start any construction work in the habitat type 1160 area until it has also shown the planning authority that the extensions proposed are permissible under construction law by submitting the planning permissions (sec. 59 LBauO M-V) or by showing procedural or approval exemptions (secs. 61, 62 LBauO M-V) (cf. ancillary provisions A.3.8.11 to 13).

These nutrient reduction measures would therefore also ensure complete coherence in themselves.

Not 'standard measures'

On the other hand, coherence assurance measures must go beyond the standard conservation measures (Art. 6 para. 1 of the Habitats Directive) and avoid deterioration and disturbance (Art. 6 para. 2 of the Habitats Directive) as part of the area management (BVerwG judgment of 12.03.2008, 9 A 3.06, BVerwGE 130, 299,

para. 203; citing sec. 32 para. 3 sentence 3 BNatSchG: BVerwG judgment of 06.11.2012, 9 A 17/11, BVerwGE 145, 40, *juris* para. 82). Whether this condition is met is something which the planning authorities have to consider and show verifiably in their planning decision (BVerwG decision of 02.10.2014, 7 A 14/12, *juris* para. 409). The fact that a measure is mentioned in the management plan under sec. 32 para. 5 BNatSchG does not prevent its being considered as a coherence measure in principle, as not all measures mentioned in the management plan are necessary within the meaning of sec. 32 para. 3 in conjunction with Art. 6 paras. 1 and 2 of the Habitats Directive. We need to distinguish between conservation measures which are mandatory under Art. 6 paras. 1 and 2 of the Habitats Directive and development measures which are non-mandatory and may therefore be considered as coherence assurance measures.

The planning authority agrees with the StALU Vorpommern that there is no obligation to reduce the load reduction. This applies in any case insofar as the contractual agreements are based on a timeframe of 15 years. Judging by the technical documents submitted, the treatment plants are state of the art: they comply with currently prescribed monitoring values and are even clearly below them.

B.4.5.2.3.2.4 Summary, discretion

Considering all the aspects above, and if the impact on the habitat type 1160 in the "Greifswald Bodden, parts of the Strelasund and northern tip of Usedom" FFH area (DE1747-301) is assumed to be substantial, the conditions for a deviating decision under sec. 34(3), (5) BNatSchG are in place. The planning authority may therefore allow the derogation provisionally. We cannot see any reason not to do so.

B.4.5.2.4 FFH area "Greifswald Bodden escarpment and parts of the Bay of Pomerania" (DE1749-302)

The project lies within the approx. 39,872 ha marine SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania". The Nord Stream 2 route crosses the SCI over a length of 10.365 km (cf. application document part E.08 section 4.3 p. 45).

The project was reviewed, based on the documents the project developer has presented and the comments and objections received, to see if it is compatible with the Natura 2000 area's conservation goals according to Annexe 4 of the Natura 2000-LVO M-V (cf. application document part E.08, part E.09).

The SCI is protected under Federal State nature conservation law by sec. 4 in conjunction with Annex 3 to the Natura 2000-LVO M-V and hence a protected part of nature and the landscape as defined in sec. 20 BNatSchG. The area extends from the bodden escarpment of the Greifswald Bodden eastwards and connects to the SCI "Bay of Pomerania with Oder bank" in the EEZ. It is thus coherent with areas of the EEZ.

An impact area of 1,000 m either side of the pipeline route and transport routes was designated as the Detailed Study Area or DSA. The DSA boundaries were defined

by overlaying the components material to the conservation goals with the range of the project's impact processes relevant to them. The greatest range comes from the audible and visual disturbances from construction shipping on marine mammals (cf. application document part E.08 section 3.1 p. 17).

The FFH habitat types which are found in the study area are shown in the table below (cf. application document part E.08 section. 2.2.4.1, 3.3.1):

Table 9: FFH habitat types found in the DSA of SCI DE1749-302

FFH habitat type (usual short description[100])	**EU code**	**State of conservation***	**Assessment overall***
Reef	1170	B	B

*Standard datasheet details 2016

FFH habitat type 1110 is not found in the DSA. The underlying data and reasons for demarcating this habitat type on the bodden escarpment are described at length in the application document part E.03 section 3.3.1.1 (p. 31 et seq.). Habitat type 1110 is demarcated in the same way as the Nord Stream planning procedure, which was based on identical geophysical studies (multi-beam echo sounder, sideview sonar, boomers, drill cores and sediment analyses) and biological studies (Van-Veen grabs and UW videos). Incidentally, this approach meets mapping instructions (LUNG M-V 2011). Otherwise, please see what was said on protecting the biotope (cf. section B.4.8.5).

The species in Annex II to the Habitats Directive which are listed in Annex 4 to the Natura 2000-LVO M-V for the area, which (potentially) occur in the detailed study area and for which an impact forecast is therefore made are grey seals, common seals, harbour porpoises, river lampreys, marine lampreys, sturgeon and twaite shad.

The common pipeline trench for laying Nord Stream 2 crosses the SCI in a strip 10.365 km long and at least 18.5 m wide. According to the construction schedule, the construction period proposed for making the pipeline trench, laying the pipeline and backfilling the trench starts in the "Eastern flank of the bodden escarpment" section on 07 July and ends when the reef areas are restored in December the same year, so is less than six months overall.

The project's main effects are in construction, that is, they are limited to the construction phase, whereas system and operational effects are negligible.

In assessing the impact on the habitat type in the FFH area "Greifswald Bodden escarpment and parts of Bay of Pomerania", we used the same assessment model as for the FFH area "Greifswald Bodden, parts of Strelasund and northern tip of Usedom" (DE1747-301) (cf. section B.4.5.2.3.1.2).

Impacts on FFH habitat type 1170, including the characteristic species, are as follows (details see application document part E.08 section 4.3.1):

[100] According to the BfN

FFH habitat type 1170 areas are found on the eastern flank of the Bodden escarpment and on Idunagrund (cf. application document part E.08 section 3.3.1.1): so construction can be expected to affect habitat type 1170. Excavating the pipelaying trench will lose areas of around 0.5 ha temporarily. The characteristic stones and blocks will be stored separately in the intermediate store and restored to cover the soft bed substrate once the trench has been backfilled. The construction effects as a whole are reversible, the FFH habitat type can be expected to regenerate within three years of being restored (mitigation measure M3 section B.4.4.1.9.1). Installation effects will be due mainly to replacing sediments with artificial pipeline materials. The operational impact is only minor, clearly below the relative guideline value of 1% of the habitat type surface area (8,957.1504 ha) at 0.006%. Nor does this habitat type exceed the absolute guideline value to assess the materiality of affecting 5 ha (level III to LAMBRECHT & TRAUTNER 2007), as the gradual functional effects are equivalent to just 0.02 ha in the year the Nord Stream 2 project is built, 0.02 ha again in the first year after it is built and 0.005 ha in the second year after it is built (cf. application document part E.08 section 4.3.1 p. 56). As this clearly meets the guideline values which relate methodologically to permanent area losses, any substantial effects can be safely excluded.

The impact on the species listed in Annex II to the Habitats Directive is as follows:

Harbour porpoises (cf. application document part E.08 section 4.4.1):

Any considerable effects on harbour porpoises from muddied sediments and increased matter in suspension in the SCI can be ruled out, as the suspensate levels and duration of the project's effects are too low.

Harbour porpoises being affected by underwater noise during the construction work or by ship noise can also be ruled out. Construction fleet ships are highly unlikely to encounter harbour porpoises in the protected area as they are rare here; and the noise emission levels emanating from construction ships do not exceed the limits required to harm them. The pipelaying work will progress steadily, so disturbances from ship noise will only affect part of the whole route corridor and a small part of the potential habitat concerned at any one time (e.g. within a day).

Substantial effects from colliding with construction fleet ships can also be ruled out. With harbour porpoises, the risk of being injured comes mainly from vessels approaching the animals very fast from behind, as they do not hear so well behind them. The main risks are from ships travelling at over 10-14 knots, whereas dredging ships are stationary or move only slowly at 1-3 knots while working.

Conservation goals for harbour porpoises are not affected either.

The Nord Stream 2 project cannot, therefore, be expected to have any considerable effects on harbour porpoises as a material element of the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania" (DE1749-302).

Grey and common seals (cf. application document part E.08 section 4.4.2):

Grey and common seals feed in and cover very large areas, so individual animals may be found briefly in the DSA at any one time. There are no sensitive life areas (such as berthing places) in the DSA. The nearest berthing places are around 10 km

away by Grosser Stubber in the Greifswald Bodden and the Greifswald Oie. Thiessower Haken is nearer but is not used as a berthing place in summer during the tourist season.

Construction work offshore will take up a small part of the grey seals' feeding habitat temporarily, in that dredging work, waterborne noise emissions and turbidity plumes will cause small-scale changes to the distribution patterns of demersal fish species. But the effects will only be temporary, such that temporary small-scale changes in food supply will not have any substantial effects; and using low-turbulence dredging technologies (mitigation measure M4 section B.4.4.1.9.1) and monitoring turbulence continuously (mitigation measure M5, incl. measurement and management plan if limits are exceeded, section B.4.4.1.9.1) are proposed.

The main and spatially most far-reaching effect of the project is disturbance by shipping and construction traffic in the construction phase; but seals avoid ships in good time if noise levels become excessive. Keeping their distance from ships will prevent seals being affected. Pipelaying will proceed progressively, so the disturbances will only affect a sub-section of the whole route corridor and a small part of the potential habitat concerned at any one time. Seals will be able to hear the underwater noise emitted by construction and take small-scale temporary avoidance measures, so their hearing will not be damaged. Any substantial effects on seals can be ruled out.

Any considerable injuries through colliding with construction vessels can be ruled out.

Analysing and assessing the disturbances to grey and common seals over a limited space and time shows that the species-specific conservation goals will not be affected.

Any substantial effects on grey and common seals as material elements of the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania" (DE1749-302) by the Nord Stream 2 project can be safely ruled out.

River lampreys, sea lampreys, twaite shad and Baltic sturgeon (cf. application document part E.08 section 4.4.3)

In the excavation area, the habitat for the bottom-dwelling fish found there will be lost. Of the species examined, the Baltic sturgeon alone is bottom-dwelling; but the habitat it uses will only be affected for a limited time. The studies of the regeneration of the habitats affected by constructing the Nord Stream pipeline have shown that the pipeline area had recovered completely within four years at most. Lampreys and twaite shad live in the pelagic zone, and hence are unaffected by space being occupied by trench digging.

The fish species and lampreys which are relevant here do not spawn in the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania", so any impact on sensitive development stages such as eggs and larvae can be ruled out.

Dredging and pipelaying work will cause turbulence plumes and sediment redistribution which could spread in the direction of flow. How sensitive fish and

lampreys are to turbulence plumes depends on the species involved and what phase of their life they are in at the time. Amongst adult fish, pelagic fish species are more sensitive to sediment in suspension in water than those which live on the seabed, which are used to turbid water due to resuspension caused by wave impact. The juvenile and adult stages of most species of fish found in the survey area are more mobile and will leave areas with high levels of sediment burden. As the disturbances due to turbulence and sedimentation are limited in space and time, their impact on these stages is low. Fish eggs and larvae are vulnerable to sediment in suspension. The fish species and lampreys which are relevant here do not spawn in the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania", so there is no question of sensitive development stages like eggs and larvae being affected by turbulence and sediment deposits; and it is also proposed to use low-turbulence dredging technologies (mitigation measure M4 section B.4.4.1.9.1) and monitor turbulence continuously (mitigation measure M5, incl. measurement and management plan in event of overruns, section B.4.4.1.9.1).

Nor will audible or visual stimuli (noise from ships and working equipment, moving ships and pontoons) cause any substantial effects.

The specific conservation goals for the species examined will not be affected.

The likelihood of the Nord Stream 2 project having any substantial impact on river lampreys, sea lampreys, twaite shad and Baltic sturgeon as material elements of the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania" (DE1749-302) can safely be ruled out.

The following damage limitation measures and other mitigation measures are being conducted to ensure that substantial effects can safely be ruled out:

- Minimizing the intervention area in hard soil biotopes (construction phase; measure M1 section B.4.4.1.9.1)
- Restoring the seabed in the excavated areas (construction phase; measure M3 section B.4.4.1.9.1)
- Reducing turbidity plumes by using mechanical dredging equipment (construction phase; measure M4 section B.4.4.1.9.1)
- Complying with the turbidity limits of 50 mg/l at 500 m from the suspension source (transiently 100 mg/l above background turbidity possible (construction phase; measure M5 section B.4.4.1.9.1)
- Restricting construction times: restricting offshore construction work between landfall and KP 53 to from 15.5. to 31.12. (construction phase; measure M6 section B.4.4.1.9.1)
- Reducing light emissions during offshore construction work (construction phase; measure M8 section B.4.4.1.9.1)

To examine and assess aggregate effects, we used the project to connect offshore wind farm clusters "Western Adlergrund" (CWA) and "Arkona-See" (project developer: 50Hertz) to the grid as a comparison. Examining and assessing the cumulative effects shows that no substantial aggregate effects which exceed materiality thresholds are foreseeable. Considering the following alternative time bandings of implementing CWA:

- Two cables in 2017, one cable in 2018, 2019, 2020 and 2021 or
- Two cables in 2017, one cable in 2018, two cables in 2019, one cable in 2020,

the cumulative gradual impact on FFH habitat type 1170 is well below the guideline value according to LAMPRECHT & TRAUTNER (2007) (cf. Nord Stream 2 opinion on the Habitats Directive after conducting the consultation procedure on 15.11.2017).

As the competent planning authority for the "Connecting CWA to the grid" project, the Ministry for Energy, Infrastructure and Digitalisation confirmed the chronological sequence involved in connecting CWA to the grid which the applicant considers in principle in its letter of 29.11.2017. We may therefore assume that the scenarios for 2018-2021 above are a worst case approach as far as the EM M-V's planning decision on "Connecting CWA to the grid" of 09.07.2015 is concerned.

Conclusions

The planning authority finds that the damage limitation, mitigation measures are effective and that implementing them can be assured through construction monitoring. In the ultimate assessment, we can therefore say that the project does not affect the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania" (DE1749-302) in terms of its material elements which govern its conservation goals or protective purpose and the project can be authorised (section 34 para. 1, 2 BNatSchG, section 21 NatSchAG M-V).

B.4.5.2.5 "Greifswalder Oie" FFH area (DE1749-301)

The project is approx. 9 km from the 218 ha SCI "Greifswalder Oie" (cf. application document part E.17 section 1.2 p. 9).

Under Federal State nature conservation law, this SCI is protected by section 4 in conjunction with Annex 3 to the Natura 2000-LVO M-V, and as such is a protected part of nature and the landscape as defined in section 20 BNatSchG. The SCI "Greifswalder Oie" is enclosed by the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania", and is characterised by habitat classes as follows: sea areas and arms (approx. 77%, of which 165.8 ha are reefs); damp and mesophile pastureland (approx. 12%); deciduous woods (approx. 5%); stony beaches, rocky coasts and islets (approx. 3%) and other habitat classes (approx. 3%). Upstream of the island is a reef with marine block and stony grounds (cf. application document part E.17 section 2.1 p. 10).

The elements relevant to the area's conservation goals can be found in section 4 in conjunction with Annex 4 to the Natura 2000-LVO M-V and the standard datasheet (cf. application document part E.17 section 2.2). There is no area management plan.

The project was reviewed to see if it is compatible with the conservation goals of the Natura 2000 area (cf. application document part E.17). Given that the area is 9 km from the project as planned, there is no possibility of the Nord Stream 2 pipeline affecting this SCI. As project effects which could not be excluded a priori, barge shipments to the marine intermediate storage facility during the construction phase were considered (cf. application document part E.17 section 7 p. 20). These

shipments may cause audible and visual nuisance to species of the "Greifswalder Oie" FFH area (DE1749-301).

The detailed study area (DSA) was defined as an impact area of 1,000 m either side of the route. This lies outside the "Greifswalder Oie" SCI. The DSA's borders were obtained by overlaying the elements relevant to the conservation goals with the range of the project impact processes relevant to them, the furthest ranging being the audible and visual nuisances of the construction ship traffic on marine mammals (cf. application document part E.17 section 3.1 p. 13).
The Nord Stream 2 project, including the transport routes, do not have any impact factors which might affect the habitats and species (narrow-mouthed whorl snail) onshore. Marine FFH habitat type 1170 reefs and their characteristic species are not sensitive to the audible or visual stimuli which shipping transport traffic emits, so these effects can be excluded (cf. application document part E.17 section 3.2).

Audio-visual disturbances to grey and common seals by barge shipments to the intermediate marine storage facility can be ruled out, thanks to the avoiding distance to ships, given that the SCI and shipping routes are 1.7 km apart. Then there is also the fact that ancillary provision A.3.8.3 lays down that the ways from the shipping routes to the site and/or intermediate storage facility must be kept as short as possible. This also ensures that the approach will use existing shipping routes as far as possible. This therefore rules out the possibility that barge shipments will leave the shipping route and hence operate close to the "Greifswalder Oie" SCI. Analysing and assessing the potential disturbances to grey and common seals leads to the conclusion that the species-specific conservation goals of Natura 2000-LVO M-V will not be affected (not even cumulatively with other projects) (cf. application document part E.17 section 4.2 und 7).

There are no other plans or projects which would impact on the "Greifswalder Oie" SCI, so no substantial aggregate effects or exceeding materiality thresholds are foreseeable.

Conclusions

The planning authority finds that the "Greifswalder Oie" SCI (DE1749-301)'s material elements in terms of its conservation goals or protective purpose are not affected substantially or lastingly and that the project may therefore be authorised from these standpoints (section 34 para. 1, 2 BNatSchG, section 21 NatSchAG M-V).

B.4.5.2.6 "South-east Rügen coastal landscape" FFH area (DE1648-302)

The project lies south-east of the 2.422 ha SCI "South-east Rügen" SCI. The project as planned is at least 1.5 km away (cf. application document part E.12 section 7 p. 9).

This SCI is protected under Federal State nature conservation law by section 4 in conjunction with Annex 3 to the Natura 2000-LVO M-V. The material elements for the area's conservation goals can be found in section 4 in conjunction with Annex 4 to the Natura 2000-LVO M-V, the standard datasheet and the management plan currently being produced for the area. Conservation goals from other protected area

regulations are irrelevant, as the project's effects do not affect any other protected areas which overlap with the SCI (cf. application document part E.17 section 2.2).

This SCI consists of a number of sub-areas which include the mosaic of the Bodden, coastal, open landscape and woodland habitats of the south-east Rügen landscape. The marine areas make up 55.57% of the protected area. The "South-east Rügen coastal landscape" SCI, with its sub-areas at Südperd, Lobber Ort and Nordperd covers shallow water areas of the Bodden escarpment and/or the Bay of Pomerania with a band approx. 200 m wide along the shores of Mönchgut (cf. application document part E.12 section 2.1 p. 11).

The project was reviewed to see if it is compatible with the Natura 2000 area's conservation goals (cf. application document part E.12). The detailed survey area (DSA) was defined as an impact area 1,000 m either side of the route, which is outside the SCI. The DSA was defined by overlaying the relevant elements for its conservation goals with the range of the project's impact processes which are relevant to these, the furthest ranging being audio-visual disturbance from construction shipping traffic on marine mammals (cf. application document part E.12 section 3.1 p. 18).

Any immediate construction and operation effects on the area's conservation goals can be ruled out given that the project is at least 1.5 km away. Installation effects are irrelevant, as the route lies outside the SCI (cf. application document part E.12 section 2.2.1 p. 16).

The Nord Stream 2 pipeline project will not have any effects which might affect habitats onshore and is far enough away for any indirect effects on the marine habitat types 1150, 1160 and 1170 to be affected by sediment being stirred up, increased turbidity and sedimentation in the course of the construction work. Any impact on habitat type 1140 which is far from the route can be ruled out from the start (cf. application document part E.12 section 3.2 und 4.2). Any impact on target species of the SCI can likewise be ruled out. Any impact on narrow-mouthed whorl snails and Eurasian otters can safely be ruled out, as neither species can be reached by the impact factors 1.5 km away (cf. application document part E.12 section 3.2).

The main and spatially most far-reaching impact of the project may be grey seals and harbour porpoises being disturbed by shipping and/or construction traffic in the construction phase; but the resulting avoidance distance from ships rules this out, given the distance between the "South-east Rügen coastal landscape" SCI (DE1648-302) and the site area, any individual grey seals or harbour porpoises being driven out of SCI waters. The project does not affect the target species of grey seals, as there are no current berthing places on the nearest land areas of the "South-east Rügen coastal landscape" SCI (DE1648-302), the Südperd, at Lobber Ort or Nordperd, nor are any expected to be established, as it is extensively used by tourists. Construction may cause hydrosound emissions. The hydrosound readings when the Nord Stream pipeline was built (Nord Stream construction monitoring) and the hydrosound forecast for the Nord Stream 2 project (cf. application document part I3.05 section 6.1 p. 22, Tab. 7) lead us to conclude that the hydrosound emissions within the SCI will always be below 134 dB re 1µPa² s, so the SCI will not be degraded as far as the harbour porpoise is concerned. As far as continuous noise,

such as dredger noise and pipeline laying, is concerned, we conclude from various studies on the bottlenose dolphin (*Tursiops truncatus*) which is related to the harbour porpoise that the threshold for a TTS or temporary hearing threshold shift appearing (that is, affecting the auditory organ temporarily without injuring it) of 188 dB re 1 µPa (Finneran 2015[101]). For the grey seal, a TTS (temporary threshold shift) of from 163 dB re 1 µPa may be assumed (KASTELEIN ET AL. 2013[102]). It may be predicted that the construction-induced underwater noise emissions will not exceed 115 dB re 1µPa² s continuous noise (cf. application document part I3.05 section 6.1 p. 23, Fig. 10), which does not reach the TTS (temporary threshold shift) or higher PTS (permanent threshold shift) for harbour porpoises or grey seals at any time. Analysing and assessing the potential spatially and chronologically limited disturbances to grey seals and harbour porpoises leads us to conclude that the species-specific conservation goals under Natura 2000-LVO M-V will not be affected (cf. application document part E.12 sections 4.3 and 7).

The following damage limitation and other mitigation measures will be used to ensure that affecting conservation goals substantially can safely be ruled out (cf. application document part E.01 section 5):

- Restricting construction times: restricting offshore construction between landfall and KP 53 to the period from 15 May to 31 December (construction phase; measure M6 section B.4.4.1.9.1)
- Reducing light emissions during offshore construction work (construction phase; measure M8 section B.4.4.1.9.1)

There are no other plans or projects which affect the SCI, so no substantial aggregate effects which exceed materiality thresholds are predicted.

Conclusions

The planning authority finds that the damage limitation, mitigation measures will be effective, and that construction monitoring can ensure they are implemented. In the light of our assessment, we can therefore conclude that the project will not impact the "South-east Rügen coastal landscape" SCI (DE1648-302) in terms of its material factors for its conservation goals or protective purpose and that the project can be authorised in terms of these aspects (section 34 para. 1, 2 BNatSchG, section 21 NatSchAG M-V).

B.4.5.2.7 EU bird protection area "Bay of Pomerania" (DE1552-401)

The 110.115 ha FFH area "Bay of Pomerania with Oder Bank" lies entirely within the EEZ. Neither the project as planned or its continuation into the EEZ lie within the FFH area. The pipeline with its route line in the coastal waters approaches the north-western boundary of the area except for a short distance (2 km) to the FFH area and then distances itself both westwards and eastwards from the area (cf. application document part E.14 section 2.4 p. 19).

[101] Finneran, J. J. (2015): Noise-induced hearing loss in marine mammals: A review of temporary threshold shift studies from 1996 to 2015. J Acoust Soc Am 138:1702-1726.

[102] Kastelein, R.A., Gransier, R. & Hoek, L. (2013) Comparative temporary threshold shifts in a harbor porpoise and harbor seal, and severe shift in a seal (L). Journal of the Acoustical Society of America, 134, 13–16.

The FFH area lies in the area of the NCA "Bay of Pomerania – Rönnebank" which was mentioned above (cf. section B.4.5.2.7) designated by the protective area order.

As the project runs partly at a short distance from the protected area beyond the 12 nautical mile zone, these planning proceedings considered whether the project is compatible with the Natura 2000 area's conservation goals. The FFH-VU concerned can be found in the application document, part E.14. This examination also considered whether the section of the Nord Stream 2 pipeline which lies in the EEZ is compatible with the area's protection goals. Deciding whether the section which lies within the EEZ is permissible is within the competence of the BSH.

As was said above, the route lies at least approx. 2 km north-west of the SCI "Bay of Pomerania with Oder Bank". The maximum impact area in the detailed survey area is for habitats and waters at 100/500 m (cf. application document part E.14 section 2.3 p. 19, Tab. 2-6): so we can rule out that any FFH habitat types will be affected from the outset. Nor does the 1,000 m impact area for sea lampreys cover any part of the protected area. We included the harbour porpoise (*Phocoena phocoena*) and twaite shad (Alosa fallax) in the further examination as a precautionary measure.

Neither the harbour porpoise (*Phocoena phocoena*) nor the twaite shad (*Alosa fallax*) can be affected indirectly by turbidity plumes. The Bay of Pomerania has far less fine-grained material which can be suspended. The Nord Stream pipeline construction monitoring confirmed this, as no increased matter in suspension levels could be recorded 200 m from the suction hopper dredgers (Nord Stream construction monitoring p. 86). The hydrosound readings obtained when building the Nord Stream pipeline (Nord Stream construction monitoring) and the hydrosound forecasts for the Nord Stream 2 project (cf. application document part I3.05 section 6.1 p. 22, Tab. 7) lead us to conclude that the hydrosound emissions within the SCI will be less than 134 dB re 1µPa² s at all times: so the SCI will not be degraded as far as the harbour porpoise is concerned. For continuous noise, such as dredger noise and pipelaying, based on various surveys of the bottlenose dolphin (*Tursiops truncatus*) which is related to the harbour porpoise, a threshold for the appearance of a TTS or temporary threshold shift (i.e. which affects the hearing but does not damage it) of 188 dB re 1 µPa is assumed (Finneran 2015[103]). We may also forecast that the construction-induced underwater noise emissions will not exceed 115 dB re 1µPa² s as continuous noise (cf. application document part I3.05 section 6.1 p. 23, Fig. 10), which will not reach the PTS (permanent threshold shift) or TTS (temporary threshold shift) for harbour porpoises at any time. No pulsed noise will be emitted, and harbour porpoises being killed through colliding with ships in the laying fleet can also be excluded. It may be assumed that the animals will avoid them in good time. As the area disturbed by construction work is limited in time and space (site 'travelling' section by section), we may assume that harbour porpoises and grey seals which can cover great distances in short times, will avoid these areas if need be: so a barrier effect can also be ruled out. Any operational impact on the harbour porpoise can also be ruled out. Should the pipeline need to be repaired, which is not expected, this could theoretically have the same effects as when it was built; but that would be only local, depending on how far the pipeline was damaged, i.e. much

[103] Finneran, J. J. (2015): Noise-induced hearing loss in marine mammals: A review of temporary threshold shift studies from 1996 to 2015. J Acoust Soc Am 138:1702-1726.

more limited in time and space than when the pipeline was built. The Nord Stream project can safely be expected not to affect the harbour porpoise as a relevant element of the SCI "Bay of Pomerania with Oder Bank" (DE1652-301) substantially.

As far as the twaite shad is concerned, we may assume that this species has sensitivities which are comparable with those of the harbour porpoise at most and will not therefore be affected as a material element of the SCI "Bay of Pomerania with Oder bank" (DE1652-301) substantially either.

Conclusions

The planning authority's examination of the FFH compatibility test (cf. application document part E.14) has shown that the project as planned does not in itself have any substantial (indirect) effects on the adjacent protected area, and that no substantial effects will arise even in conjunction with the section of the pipeline which lies in the adjacent EEZ.
In conclusion, we therefore find that the project as planned will not affect the SCI "Bay of Pomerania with Oder Bank" (DE1652-301) in terms of its relevant elements for its conservation goals or protective purpose substantially or durably and that the project can therefore be authorised from these aspects (section 34 para. 1, 2 BNatSchG, section 21 NatSchAG M-V).

B.4.5.2.8 FFH area "Bay of Pomerania with Oder Bank" (DE1652-301)

The western boundary of the 200,417 ha "Bay of Pomerania" EU bird protection area (DE1552-401) which lies in the EEZ borders on the 12 nautical mile limit of the territorial waters of Mecklenburg-Vorpommern and hence the end of section of the project (cf. application document part E.13 p. 13). The Nord Stream 2 pipeline crosses the area over a length of 31.065 km. Whether to authorise the section in this EEZ is for the BSH to decide.

The bird protection area is protected nationally as the FFH "Bay of Pomerania – Rönnebank", section 7 of the regulation defining the nature conservation area "Bay of Pomerania – Rönnebank" (NSGPBRV) of 22.09.2017 (BGBl. I p. 3415) defines the protective purpose of area IV of the nature conservation area which is relevant here. The protective purposes and conservation goals which the conservation area regulation lays down correspond to the conservation goals contained in the area report (standard datasheet).

As the project borders directly on the SPA directly on the other side of the 12 nautical mile zone, the planning proceedings considered whether the project is compatible with the SPA's conservation goals. The FFH-VU concerned can be found in the application document part E.13. This examination also considered whether the section of the Nord Stream 2 pipeline which lies in the EEZ is compatible with the area's conservation goals.

The "Bay of Pomerania" EU bird protection area (DE1552-401) is where a number of overwintering bird species overwinter and pass through: red-throated divers, black-throated divers, horned grebes and little gulls (Annex I - Species) and the regularly found migratory species red-necked grebes, long-tailed ducks, common scoters, velvet scoters, common guillemots, razorbills, black guillemots, common gulls and

herring gulls (cf. application document part E.13 section 3.3 p. 19 et seq.). The project's significant effects are construction-related, whereas installation and operation-related effects are negligible. The project's main and most far-reaching effect will be shipping disturbing seabirds in the construction phase. Most species avoid ships. The resulting flight and/or avoidance distances from ships sailing or at anchor in the most sensitive groups of species, sea ducks and divers, are approx. 1-2 km (max. 3 km) (cf. application document part E.13 section 7 p. 70); but as the construction period lies outside the main overwintering times of most seabird species, the disturbances will clearly be limited. Mitigation measures M6 und M7 (section B.4.4.1.9.1) restrict construction in the section west of KP 17 from 01 September to 31 December and in the section east of KP 17 to KP 0 (German EEZ border - Denmark) to 15 May to 31 December, so the construction period is outside the winter and spring overwintering times of seabirds and moulting common scoters. In virtually all species, maximum overwintering stocks are not reached until midwinter or spring as a general rule (cf. application document part F.07 section 6.1.2 p. 151 et seq.), which limits the intensity of the project impact factors. The pipelaying fleet will move slowly forwards, so the interference will be limited to just a subsection of the route corridor as a whole and a small part of the overwintering area concerned at any given time (e.g. within a day). This was documented comprehensively in the Nord Stream monitoring seabirds in the Bay of Pomerania (Nord Stream construction monitoring p. 128 et seq.).

Conclusions

The FFH compatibility test conducted (cf. application document part E.13) has shown that the project as planned will not in itself have any substantial (indirect) effects on the neighbouring protected area and that no substantial effects will arise even in conjunction with the pipeline section which lies in the adjacent EEZ.

In outcome, the assessment therefore finds that the project as planned will not affect the relevant elements to the "Bay of Pomerania" bird protection area (DE1648-302)'s conservation goals or protective purpose and that the project can therefore be authorised from these aspects (section 34 para. 1, 2 BNatSchG, section 21 NatSchAG M-V).

B.4.5.2.9 FFH area "Adlergrund" (DE1251-301)

The 23,399 ha "Adlergrund" SPA which lies in the EEZ is well away both from the project as planned and the pipeline section which runs in the EEZ. Because of the distances involved, any project-related effects can be excluded (cf. application document part E.15 section 7 p. 29). The question of whether the section of the pipeline which lies in the EEZ can be authorised is for the BSH to decide.

B.4.5.2.10 Natura 2000 areas in Polish territory in Bay of Pomerania

EU bird protection area (SPA) PLB990003 "Zatoka Pomorska" (PLB990003) lies in the Polish area of the Bay of Pomerania, including parts of the Oder Bank in the northwest. The species of birds which are found there regularly, which overwinter or pass through there, are long-tailed ducks, black guillemots, great crested grebes, red-breasted mergansers, horned grebes, black-throated divers, red-necked grebes,

velvet scoters, red-throated divers, razorbills and common scoters. It is an important part of the international network of bird protection areas along the Baltic coast.

The SCI PLH990002 "Ostoja na Zatoce Pomorskiej" (PLH990002) overlaps largely with the EU bird protection area "Zatoka Pomorska". Apart from the bird species already mentioned, harbour porpoises and the fish species twaite shad are governing features of the area. Oder Bank is an important habitat for many species of fish and fish eaters: so the FFH habitat type sandbank (EU code 1110) plays a major role in the network of surrounding FFH areas but particularly in the adjacent "Bay of Pomerania with Oder Bank" area (DE 1652-301).

EU bird protection area "Zatoka Pomorska" (PLB990003) and SCI "Ostoja na Zatoce Pomorskiej" (PLH990002) are well removed both from the project as planned and the section of pipeline which runs in the EEZ. EU bird protection area (SPA) "Zatoka Pomorska" (PLB990003) and the FFH area (SCI) "Ostoja na Zatoce Pomorskiej" (PLH990002) are outside the impact radius of the pipeline route (> 21 km from the Nord Stream 2 route and > 24 km from the marine intermediate storage facility). The distances involved mean that any cross-border effects the project may have can be excluded (cf. application document part E.16).

B.4.6 Summary account of impact on particularly and strictly protected species as defined in section 44 BNatSchG

B.4.6.1 Foundations in law and subject matter of species law test

The particular species protection law in sections 44 et seq. BNatSchG is founded on what are known as the access violations under section 44 para. 1 BNatSchG. section 44 para. 1 BNatSchG prohibits (1.) hunting, trapping, injuring or killing wild animals or removing, damaging or destroying their developmental forms from nature, (2.) disturbing wild animals in strictly protected species and European bird species during their breeding, rearing, moulting, overwintering and migrating seasons substantially (a disturbance is said to be substantial if it worsens the state of conservation of a species' local population substantially), or (3.) removing wild animals' breeding or overwintering places of particularly protected species from nature, damaging or destroying them, or (4.) removing wild plants of particularly protected species or their developmental forms from nature or damaging or destroying them or their locations.

Under section 44 para. 5 sentences 1 and 2 BNatSchG, special rules apply to effects which are unavoidable under section 15 para. 1 BNatSchG due to interventions in nature or the landscape which are authorised or done by an authority under section 17 paras. 1 or 3 BNatSchG and to projects in areas with development plans as defined in section 18 para. 2 sentence 1 BNatSchG. Tests extend only to the species of animals and European bird species listed in Annex IV a) to Directive 92/43/EEC or such species as are listed in regulations under section 54 para. 1 (2) BNatSchG; no such regulations have been issued, however.

As far as these species are concerned, the prohibition on killing and injuring under section 44 para. 1 (1) BNatSchG is not breached if the intervention or project's effects do not increase the socially adequate risk of killing or injuring significantly and

these effects cannot be avoided by using the appropriate professionally recognised protective measures, section 44 para. 5 sentence 2 (1) (cf. also on this point what is known as significance case law which was included expressly when the privileges in section 44 para. 5 sentences 1 and S. 2 BNatSchG, BT publication 18/11939, 6, 17: BVerwG judgment of 28.04.2016, 9 A 9/15, BVerwGE 155, 91 = NVwZ 2016, 1710, 1728 et seq.; judgment of 14.07.2011, 9 A 12/10, BVerwGE 140, 149 = ZUR 2012, 95 para. 99; judgment of 18.03.2009, 9 A 39/07, BVerwGE 133, 239 = NVwZ 2010, 44, 49 para. 58; BVerwG judgment of 09.07.2008, 9 A 14/07, BVerwGE 131, 274 = NVwZ 2009, 302, 311 para. 90 et seq.; BayVGH judgment of 29.03.2016, 22 B 14.1875, 22 B 14.1876, NuR 2016, 564; OVG Weimar judgment of 14.10.2009, 1 KO 372/06, *BeckRS* 2010, 46390; OVG Lower Saxony judgment of 10.11.2008, 7 KS 1/05, NuR 2009, 188, 193; HessVGH decision of 02.01.2009, 11 B 368/08.T, NuR 2009, 255, 279; for more details of this case law see *Bick/Wulfert*, NVwZ 2017, 346, 347 et seq.; *Gellermann*, NdsVBl. 2016, 13 et seq.; cf. *Kratsch* in: Schumacher/Fischer-Hüftle, BNatSchG, 2nd edition 2010, section 44 para. 16; crit. Lau in: Frenz/Müggenborg, BNatSchG 2011 section 44 para. 9). According to the case law above, the risk of killing may be deemed to be increased significantly if a linear infrastructure project crosses bird hunting areas or amphibian migration corridors or if wind parks are to be built in a correspondingly highly frequented flight corridor and/or in the area where certain birds nest or feed (see for example OVG Saxony-Anhalt judgment of 23.07.2009, 2 L 302/06, *BeckRS* 2009, 37913; *Gellermann* in: Landmann/Rohmer, [Environmental law], 84 EGL. July 2017, section 44 BNatSchG para. 9), in the case of bats if their main flight routes or preferred hunting grounds are affected by infrastructure projects (BVerwG judgment of 28.04.2016, 9 A 9/15, BVerwGE 155, 91 = NVwZ 2016, 1710, 1728). When testing whether the significance threshold is exceeded, this generally involves specific species characteristics, particularly a particular collision sensitivity of the animals which are found in the project area and how regularly they are found there (for more details see *Gellermann*, NdsVBl. 2016, 13, 14 with further notes).

As the project as planned involves intervening unavoidably in nature and the landscape under section 15 para. 1 BNatSchG which is authorised under section 17 para. 1 BNatSchG, if animal and bird species are affected in Annex IV to the Habitats Guideline, under section 44 para. 5 sentence 1 BNatSchG, the measures as laid down in sentences 2 to 5 come into play. Under section 44 para. 5 sentence 2 (3) BNatSchG, if the species listed there are affected, this is not in itself contrary to the habitat-related intervention prohibition in section 44 para. 1 (3) BNatSchG, provided the ecological function of the breeding or overwintering places continues to be met in a spatial context. Even though protected places, such as nests, breeding hollows and spawning grounds, are in fact affected, the prohibition does not apply if the ecological situation of the area affected as a whole is not worsened (BT publication 16/5100 p. 12). As individual locations being lost always constitutes a deterioration over the status quo before, this is to be taken to mean that those locations' ecological function remains in full as structures are available in the intervention's surroundings which can serve as breeding or overwintering grounds. What this functionally based understanding means is that the consequences of section 44 para. 5 sentence 2 (3) in law are only material if the examples of the species concerned of its actual habitats concerned continue to be fulfilled (BVerwG judgment of 18.03.2009, 9 A 39.07, NuR 2009, 776 para. 67; Gellermann, in: Landmann/Rohmer, [Environmental law], section 44 para. 42). section 44 para. 5 sentence 2 (2) BNatSchG also provides an exemption from being bound to the

prohibition in section 44 para. 1 (1) BNatSchG if the fact of hunting and catching wild animals and taking, damaging or destroying their developmental forms amounts to an unavoidable impact on wild animals and those animals or their developmental forms are involved in the course of a necessary measure which aims to protect those animals against being killed or injured or their developmental forms from being taken, damaged or destroyed and conserving the ecological function of their breeding and overwintering grounds in a spatial context.

Section 44 para. 5 sentence 3 BNatSchG allows taking preferred compensation measures insofar as is necessary. Under section 44 para. 5 sentence 4 BNatSchG, the rules tailored to animals apply accordingly if wild plant locations of the species listed in Annex IV to the Habitats Directive are listed.

This complex system of regulations is designed to make it possible to authorise intervention projects without having to satisfy the conditions laid down in section 45 para. 7 BNatSchG and implementing Art. 16 para. 1 of the Habitats Directive and/or Art. 9 para. 1 VRL on issuing species protection law exemptions. The legislators are thus guided by the European Commission's relevant considerations on interpreting and applying Art. 12 para. 1 lit. d of the Habitats Directive (European Commission guidelines p. 53, para. 72 et seq.) extrapolated to cases of the kind as laid down in Art. 5 b) of the Birds Directive.

B.4.6.2 The project's impact on particularly and strictly protected species as defined in section 44 BNatSchG

The specialist species protection contribution (cf. application document part F.07) examined whether there were any grounds for refusal under section 44 para. 1 BNatSchG.

At the preliminary examination stage, even without an in-depth conflict analysis, it could already be ruled out that those species which the project cannot affect would be involved under species protection law. An in-depth conflict analysis considers whether any grounds for refusal can be expected for the species potentially affected. If grounds for refusal cannot be ruled out *ex ante* in the light of the conflict analysis, conflict avoidance and mitigation measures are considered; and if de facto grounds for refusal cannot be avoided even by preferred compensation measures, a third step considers whether the conditions for allowing an exemption under 45 para. 7 BNatSchG are met.

In the case of wild plants of particularly protected species as defined in section 44 para. 1 (4) BNatSchG, any matters which might constitute grounds for refusal could be ruled out at the preliminary examination stage, as the project having any adverse effects both on plant species which are proven to occur and those which could potentially occur can be ruled out.

As for the species as listed in Annexe IV (a) to Directive 92/43/EEC, European bird species or those species which are listed in a regulation pursuant to section 54 para. 1 (2), a conflict analysis was conducted for the following species which are relevant to the Nord Stream 2 project:

- Marine mammals (harbour porpoises)

- Bats (brown long-eared bats, serotine bats, Natterer's bat, common noctule bat, Brandt's bat, greater mouse-eared bat, lesser noctule bat, soprano pipistrelle bat, Nathusius's pipistrelle, pond bat, Daubenton's bat, parti-coloured bat and common pipistrelle)
- Fish and cyclostomes (Atlantic sturgeon)
- Amphibians (tree frogs) and reptiles (sand lizards)
- Overwintering birds (scaup, Sandwich terns, long-tailed ducks, white-billed divers, common terns, common mergansers, black guillemots, great crested grebes, cormorants, Arctic terns, divers, horned grebes, black-throated divers, red-necked grebes, velvet scoters, black-headed gulls, red-throated divers, common gulls, razorbills, common scoters, black terns, common guillemots, little gulls, smews, little terns and other species in two collective factsheets)
- Breeding birds (tree pipits, brown linnets, whinchats, skylarks, grasshopper warblers, tree sparrows, little ringed plovers, woodlarks, house martins, red-backed shrikes, house swallows, common stonechats, barred warblers, starlings, wheatears, sand martins, wood warblers, long-eared owls, woodcocks and other species in the collective factsheet)

Marine mammals

Harbour porpoise

The marine mammal species relevant for testing purposes in the German Baltic area relevant here is the harbour porpoise (Phocoena phocoena) as the only species of small cetacean which occurs permanently but rarely in the Bay of Pomerania. Harbour porpoises are found only very rarely in the Greifswald Bodden. For the Greifswald Bodden area, this is confirmed by the South-East Rügen biosphere reservation office (cf. South-East Rügen biosphere reservation office opinion of 14.06.2017 p. 8). According to a study by DIEDERICHS ET AL. (2014, unpublished), between 2008 and 2014, there was a pronounced seasonal appearance of harbour porpoises in the Bay of Pomerania, with a maximum in late summer/autumn and with detection rates in the Bay of Pomerania rising exponentially since 2008 (cf. application document part F.07 section 5.1.1.1, 5.1.1.2.1 p. 41, 47). Correspondingly, detection also peaked while the Nord Stream pipeline was being laid. The DIEDERICHS ET AL. study (2014, unpublished) incorporated harbour porpoise monitoring data from the German Oceanographic Museum Stralsund and Nord Stream pipeline accompanying monitoring data (Nord Stream harbour porpoise monitoring 2013) (cf. application document part F.07 section 5.1.1.2.1 p. 47). It is likely that the local seasonal increase in detection rates north of the Oder bank in the summer/autumn involves the seasonally migrating animals of the Danish Beltsee and not the largely stationary animals of the central Baltic which visit the Bay of Pomerania in very small numbers in winter (cf. application document part F.07 section 5.1.1.1 p. 41).

For the harbour porpoise, grounds for exclusion under section 44 para. 1 BNatSchG can be excluded. Any significant risks of individuals being killed or injured by colliding with pipelaying fleet ships are ruled out, as it can be assumed that harbour porpoises avoid ships (cf. application document part F0.7 p. 49). Monitoring the harbour porpoise when laying the Nord Stream pipeline found that 14 hydrophones installed to detect harbour porpoises did not record any ships and harbour porpoises

being present at the same time (cf. application document part F0.7 p. 49); and, compared with the shipping which occurs in this sea area ordinarily anyway, the construction shipping traffic is not so heavy that one would have to assume a significant increase in any risk to be feared otherwise. It is verifiable that ship noise from the pipelaying fleet during the construction period will not lead to any injuries or deaths and that ship noise will not cause any substantial disturbance at breeding and migration times. If ship noise arises in the course of operational inspection and maintenance work, it must be assumed that the boats used will be smaller and less than while laying the pipeline: so no harbour porpoises will be killed or injured, and operational ship noise will not cause any substantial disturbance at breeding and migration times.

Any relevant injury risks which the project could cause through hydrosound emissions is limited to the construction period; but any relevant injury risks can also be ruled out for this period (cf. application document part F0.7 section 5.1.1.2.1 p. 44 et seq.). The risk of injury is not expected to increase significantly. The hydrosound emission forecast conducted shows a maximum noise level of 129 re 1 µPa at 1 km distance in 28 m of water for large hopper suction dredgers as the loudest ships in the fleet (cf. application document part I3.05 p. 22, Tab. 7). We may assume that individuals will perceive this noise and avoid it in good time rather than remain permanently by the dredger ships: so any injuries to hearing organs and temporary hearing threshold shifts can be ruled out (cf. application document part D1.01 section 6.2.4.2.6 p. 585 et seq.). The 140 dB noise level proposed in the BMUB's noise level strategy for pulsed noise and temporary hearing threshold shift in harbour porpoises is met (cf. application document part I3.05 section 6.1 p. 22, Tab. 7). The forecast for hydrosound emissions during the installation work concludes that laying the Nord Stream 2 pipeline will not affect the marine fauna (cf. application document part I3.05 section 8 p. 27). The maximum noise level with suction dredgers is reached at 200 dB at 1 m distance (cf. application document part I3.05 section 6.1 p. 22, Tab. 7). Creatures could approach the greatest source of noise emissions, suction dredgers, as close as 142 m, as it is only at this short distance that the BMUB's noise value of 140 dB for pulsed noise and a temporary hearing threshold shift in harbour porpoises is reached. They could even come within 50 m without any risk (cf. application document part I3.05 section 6.1 p. 22, Tab. 7). On the other hand, it may be assumed, as was stated above, that harbour porpoises will not come that close to the pipelaying fleet and that the emissions from all emission sources at 1 km distance will be less than 140 dB (cf. application document part I3.05 section 6.1 p. 22, Tab. 7).

And, even if they came closer than described above, no potentially harmful noise could be expected. There are no limits or guideline values in administrative practice for continuous noise, which alone is relevant here. The environmental opinion states a 'limit' for a temporary hearing threshold shift (i.e. affecting hearing temporarily without damaging it) for continuous noise (e.g. dredging noise or pipelaying) of 188 dB re 1 µPa (cf. application document part F.07 section 5.1.1.2.1 p. 49). This figure refers to a temporary hearing threshold shift, i.e. a response which cannot yet be regarded as relevant for prohibition purposes, and is therefore sufficiently conservative. The levels do not exceed 188 dB re 1 µPa in the areas which are particularly relevant to harbour porpoises (SCIs, FFH areas). Only large suction hopper dredgers can generate noise levels of >188 dB re 1 µPa at 1 m distance, as has been shown (cf. application document part I3.05 p. 22, Tab. 7); but ships of this

type are only used in deeper waters, in the western Bay of Pomerania on excavating the two separate pipeline trenches, outside the protected areas (east of the boundary of the Greifswald Bodden escarpment and parts of the Bay of Pomerania FFH area DE1749-302) (cf. application document part D1.01 section 6.2.4.2.6 p. 585). The area and/or time this affects is so minor that this cannot be expected to increase the risk of death or injury materially either; and in any case, it may be assumed, as has already been said, that harbour porpoises will not come so close to large suction hopper dredgers. As no tamping work is required at sea (cf. application document part D1.01 section 5.5.6.2 p. 381), only continuous noise need be considered, and not pulsed noise, say.

Exploding munitions found is not expected to cause injuries, let alone deaths. As part of the pre-planning for building the pipeline, Nord Stream 2 AG has gathered and analysed all details of suspected munitions sites available, particularly on minefields and areas used to dispose of conventional and chemical weapons in the Baltic in the route area (cf. application document part D1.01 section 3.2.9 p. 119 et seq.). These research results were taken into account when optimising the route: so no munitions can be expected to be found in the route area. Should munitions, unexpectedly, be found while inspecting the route before laying the pipeline, which would undoubtedly be classified as safe to handle and move, they would be removed from the seabed by subsea basket. Such munitions would be stowed in special storage containers available on board the ships used and kept there until they were handed over to the M-V munitions salvage service to be disposed of further. If target objects cannot be identified with absolute certainty, or if they are munitions which cannot be handled or moved safely, the pipeline route will be diverted (cf. application document part C.01 section 3.3.2.5). There are no proposals to explode munitions.

Nor is the project expected to cause any substantial disturbance through affecting food habitats. Under the construction schedule (cf. application document part C.01 section 3.2), the essential construction work is not expected to coincide with the presence of seasonally migrating harbour porpoises from the Danish Belt Sea (cf. application document part D1.01 section 5.5.6.1 p. 354 et seq.). Less than ten ships will be involved in construction (backfilling pipeline trenches, restoring the reef on the Bodden escarpment) in the season in which a few harbour porpoises from the central Baltic may be staying in the Bay of Pomerania). This work will be done mainly in and around shipping routes. At the same time, 2,000 commercial ships will pass through this sea area along this route in November/December (cf. application document part D1.01 section 3.2.3 p. 107 et seq.); so the project will not affect the harbour seal catching prey materially.

An analysis which was conducted as part of the Nord Stream pipeline harbour porpoise monitoring found no measurable effect between the presence of harbour porpoises and pipelaying work at any time during pipelaying. No habitat is lost as the area which pipelaying work disturbs is very small in terms of time and space and noise levels will only be elevated in the immediate vicinity of the pipelaying fleet (cf. application document part F.07 section 5.1.1.2.1 p. 51). The areas the project affects will continue to meet their ecological function in spatial terms. The project will not harm any harbour porpoise breeding or overwintering places, as they are not known to breed east of the island of Rügen in German sea areas (cf. application document part F.07 section 5.1.1.2.1 p. 47). Harbour porpoises do not have 'overwintering places' as such, as mother and child pairs move around freely at sea.

No avoidance measures are required other than those already planned as part of the intervention avoidance, as it can be ruled out that harbour porpoises will be killed, injured or seriously disturbed in connection with the Nord Stream 2 project.

Bats

To determine the occurrence of bats in the survey area, the mapping required was done (cf. application document part F.07 section 5.1.3.1 p. 53; part D1.01 section 5.5.10.1 p. 393 f). The population survey for the bat group of species was done methodically correctly, in accordance with the state of knowledge and was presented in the application document, part I3.03, which shows the bat hunting observations and courtship activities in the areas affected by the project from September 2015 to September 2016 in sufficient detail and was used as the basis for the application document. The species found were soprano pipistrelles, common pipistrelles, Nathusius's pipistrelles, common noctules, brown long-eared bats, Natterer's bats, Brandt's bat, greater mouse-eared bats, lesser noctule, pond bats, Daubenton's bats, parti-coloured bats and serotine bats.

For all bat species found in the survey area, we can rule out the project's effects increasing the risk of death or injury. Site vehicles and ships in the pipelaying fleet will largely move slowly in the site area, so bats can locate them in good time, and so can be expected not to collide with vehicles or ships.
In a supplementary hollow trunk analysis (cf. verbatim record of 26.09.2017 p. 165) in the area of the pig reception station planned, the project developer confirmed the suspected winter quarters of the common noctule described in the northern area of the pig reception station (cf. application document part F.07 section 5.1.3.2.4 p. 79) as a potential quarter structure and potential bat winter quarters. If potential winter quarters are found when inspecting before felling woods as planned, these will be checked to see if any bats are present. If any bats are found in the quarters, the woods will not be cleared until after the animals leave in the spring (measure AFB VM7). Ancillary provision A.3.8.20 lays down that, before the trees concerned are felled, they must be checked to see if they are occupied and, if the winter quarters are found to be occupied by example of common noctules, these must be rehoused professionally. If they cannot be rehoused, the tree in question must be felled in segments. Segments which contain quarters must be taken down carefully and taken to a new location, closing the entrance to the quarters while the work is in progress. The potential loss of the proven home tree for the common noctule will be made up for by hanging suitable boxes on a ratio of 1:7 far enough from the construction site. Provided the conditions of supplementary provision A.3.8.20 are met, no grounds for refusal under section 44 para. 1 BNatSchG can be expected on account of common noctule bats.

Insofar as bat species' quarters could be established in the landfall area of the Nord Stream 2 pipeline, courting quarters of soprano, Nathusius's and common pipistrelles may be involved (cf. application document part F.07 section 5.1.3.2.1 p. 53 et seq. section 5.1.3.2.2 p. 61 et seq. section 5.1.3.2.3 p. 69 et seq.). At the construction and operations stage, construction noise and light emissions may lead to the bat species involved abandoning quarters around the pig reception station to be built (cf. application document part F.07 section 5.1.3.2.1 p. 53 et seq.). The project developer does not believe that the construction work during the breeding and

rearing seasons will cause any noise impact which could be expected to cause bats to abandon quarters (cf. application document part F.07 section 5.1.3.2.1 p. 60 section 5.1.3.2.2 p. 66 section 5.1.3.2.3 p. 74), although using compressors at the pre-commissioning stage would have intensive noise emissions which could affect the courting quarters of the soprano pipistrelles, Nathusius's pipistrelles and common pipistrelles. As part of avoidance measure AFB VM5 (cf. section B.4.4.1.9.1), noise minimisation measures will be implemented for the noise-intensive pre-commissioning stage if pre-commissioning is necessary during the bat reproduction season. These measures will reduce the noise emissions to such an extent (not exceeding 47 dB(A) at 100 m from the site) that the function of the breeding sites will not be affected and that the animals can use them to the full. It can therefore be ruled out that the breeding site will be destroyed. As far as construction and operational light emissions are concerned, light emissions and/or illuminating quarters and exit openings at a number of metres up could lead bats to abandon the quarters so they would not breed successfully. Implementing avoidance measure AFB VM3 (cf. section B.4.4.1.9.1) will reduce light emissions if performing construction work at night and/or when commissioning in the site area and adjacent areas by designing the lighting system professionally and so minimising the disturbance to these species and their quarters. Soprano, Nathusius's and common pipistrelles will not be disturbed as defined in section 44 para. 1 (2) BNatSchG if avoidance measures VM3 and VM5 are taken into account.
Also, construction and/or operation will each lose a courting quarter of the soprano and common pipistrelles (cf. application document part F.07 section 5.1.3.2.1 p. 60 in conjunction with section 5.1.3.2.2 p. 68). CEF measure 2 ensures that alternative courting quarters will be created in the immediate vicinity of the project: so the ecological function in a spatial context will be preserved. As far as soprano, Nathusius's and common pipistrelles are concerned, we may conclude that impacts which would constitute grounds for refusal (substantial disturbances and relevant losses of reproduction and overwintering places) can be ruled out via avoidance and compensation measures M11 (VM3), M12 (VM5) and CEF2 (soprano and common pipistrelles): so no grounds for refusal can be expected to arise in connection with soprano, Nathusius's or common pipistrelles. Installing bat boxes in CEF measure 2 ensures that the ecological function of the reproduction and overwintering places of soprano and common pipistrelles will continue to be met, geographically speaking (cf. application document part F.07 section 5.1.3.1 p. 38 et seq.).

No summer or winter quarters were found in the survey area for brown long-eared, house bats and Natterer’s bats, Brand's bats, great mouse-eared bats, common noctules, pond bats or parti-coloured bats. Any substantial disturbances during the reproductive, rearing and overwintering season and destroying reproduction and overwintering places can safely be ruled out.

Disturbances during the migration period of migrating bat species on the open seas and onshore will not affect the species concerned in terms of population as individual animals are involved at most; and as the construction vehicles will only be moving ahead slowly, both offshore and onshore, this cannot be expected to increase the risks of being killed or injured significantly. Although bats can be attracted by light, they will locate obstacles in good time, so any significant risk of collision can be ruled out (cf. application document part F.07 section 5.1.3.2.1 p. 57 et seq.).

All the bat species found could also be shown to have hunting grounds in the area studied. Working onshore in the course of the Nord Stream 2 project will partly destroy feeding habitats. As the proven feeding habitats are distributed widely throughout the area studied, only a small and non-essential part of the large scale used area around the Lubmin Heath industrial estate will be lost. Despite destroying the feeding habitats around the pig reception station planned, the ecological function of the habitat as a whole will not be lost: so any de facto damage to bat species in terms of hunting or feeding habitats can generally be ruled out.

Considering the measures above, no grounds for refusal have been found in respect of any bat species under section 44 para. 1 BNatSchG.

Breeding birds

The occurrence of breeding birds in the survey area was determined by mapping and analysing existing data (cf. application document part F.07 section 6.2 p. 274 et seq.). Based on the data gathered, the specialist species protection law contribution looked more closely at the species which belong to the strictly protected species under section 7 para. 1 (14) BNatSchG or the species in Annex 1 to the bird protection directive. A conflict analysis was therefore conducted for the following bird species: woodlarks, red-backed shrikes, tree pipits, woodcocks, starlings, common stonechats, barred warblers, brown linnets, grasshopper warblers, house martins, house swallows, wood warblers, long-eared owls, sky larks, sand martins, common wheatears and whinchats. For all bird species, the likelihood of the project meeting the de facto death and injury grounds for refusal under section 44 para. 1 no. 1 in conjunction with para. 5 BNatSchG can also be excluded in terms of a significant increase in the likelihood of individuals being killed by limiting preparing and releasing the site to the period from 01 January to 31 March (M9 (VM4)).

For woodlarks, the project is not expected to damage or destroy any breeding or overwintering places as defined in section 44 para. 1 (3) in conjunction with para. 5 BNatSchG or create any grounds for refusal under section 44 para. 1 (2) BNatSchG as it does not occupy any relevant proportion of grounds and/or in terms of the scope of the project's effects. The entrance area to the Lubmin oil works (truck parking place with formerly bushed fallow land, now with bushes removed) had already been converted to a parking space with intensively cultivated grass areas at the time the application documents were produced (on-site inspection in April 2017). In the 2016 breeding season, this area counted as part of the woodlark's territory (cf. application document part F.07 section 6.2.2.1 p. 273). As the habitat has been converted by building the car park, woodlarks can no longer be expected to settle here comparably close to the initial trench for the microtunnel. Two more woodlark grounds in the south-west of the survey area are relatively distant (approx. 800 m) from the construction area; and the woods also have a noise reduction effect and so exclude any relevant influence. It may be assumed that this species has become immune to disturbance in its existing environment with its existing stresses. For the fourth woodlark territory south of Lubmin oil works, any effects can also be ruled out on the grounds that it is distant from the construction area (approx. 180 m). The woodlark also has a sufficient territory area outside the construction area and at a larger distance (territory size 0.8 to 10 ha, cf. application document part F.07 section 6.2.2.1 p. 273), as the project developer has shown that the site area originally provided for parking spaces and a site office is no longer required (cf. application

document, amended part C.06, C.07). There are also other areas available to the woodlark as breeding habitats in the surrounding area: this has been ensured by the wood felling in the vicinity of the pig reception station to be built which was completed in recent years, so that new forest strip structures have been created which woodlarks have not occupied yet. If work has to be done in the species' breeding season, this is where avoidance measure M12 (VM5) comes in. During noisy onshore construction work with piling work or compressors operating, increased noise emissions must be avoided during the breeding season from 01.04. to 15.07. Should such work be unavoidable, however, noise reduction measures will have to be taken to ensure that the emission levels at approx. 100 m from the site are less than 47 dB(A) (cf. application document part F.07 section 6.2.2.1 p. 281).

Two red-backed shrike sites were found by and in the immediate construction area of the pig reception station as planned. The likelihood of the species being killed or injured within the meaning of section 44 para. 1 (1) BNatSchG, band/or sites being destroyed on the construction site within the meaning of section 44 para. 1 (3) BNatSchG are ruled out by avoidance measure M9 (VM4) (clearing site outside breeding season). There is also the fact that removing the bushes to create parking spaces east of the pig reception station rules out the chances of a breeding pair of red-backed shrikes settling immediately adjacent to the construction site again.
The project is not expected to damage or destroy breeding or overwintering sites as defined in section 44 para. 1 (3) in conjunction with para. 5 sentence 2 (3) 3 BNatSchG as the bushes which serve as a breeding place will largely be retained and/or bushes east of the pig reception station to be built have been removed to build a car park (on-site inspection, April 2017). As far as the breeding grounds east of the pig reception station to be built are concerned, there will not therefore be any new settlements immediately adjacent to the site. When the site starts being cleared, which M9 (VM4) means will be between 01 November and 31 March, we may assume people will be around operating machinery at all times, so the species cannot resettle on site until the site operations which follow immediately. These areas will thus no longer be available to the animals to breed on, as they will be occupied either temporarily (in the case of the site setup areas) or permanently. Avoidance measure M11 (VM3) uses professionally planned lighting installations to reduce the project's impact on the immediate environment of the construction and operating area. It involves in particular directing the site lights at the construction area and so avoids illuminating the surrounding breeding habitats.

To avoid substantially disturbing habitats as defined in section 44 para. 1 (2) BNatSchG and affecting them as defined in section 44 para. 1 (3) BNatSchG, avoidance measure M12 (VM5, cf. section B.4.4.1.9.1, noise reduction measures) is provided in case it should be necessary to pre-commission the gas supply line installed (which would be highly noise-intensive) while birds are breeding. This measure reduces noise emissions to such an extent (not exceeding 47 dB(A) 100 m from the construction site) that the function of the surrounding breeding sites is not affected, and birds can continue using them fully. This also benefits the red-crested shrike. It is also a fact that prevailing construction noise emissions have already been available in connection with building the pig reception station and that the animals have become accustomed to the effects of pre-commissioning. This assumption is supported by the Nord Stream onshore construction and operating monitoring findings, which found that, of the three original red-crested shrike sites which existed in 2007, it could be shown that there were two sites while construction

was underway in 2010/2011 and three red-crested shrike sites were back in operation again by the time of operations from 2012 onwards (cf. application document part F.07 section 6.2.2.2 p. 285). In the port area which borders directly on the Nord Stream receiving station and the landfall and compressor station right next to it, the Nord Stream monitoring (2013) found that it could be concluded from the monitoring years 2011 and 2013 that breeding bird stocks of red-crested shrikes had grown (cf. Nord Stream-Monitoring 2013 p. 9). Seen in this light, avoidance measures M11 (VM3) and M12 (VM5) are required, which will avoid birds giving up their breeding sites through being disturbed.

The only breeding sites predicted which have been used for many years which will be destroyed by clearing the construction site are those of a breeding pair of starlings which will be compensated for by creating substitute and fallback habitats under CEF measure 1. CEF measure 1 proposes to install five starling boxes in the vicinity of the project (cf. section B.4.4.1.9.1). Light and noise emissions which might give grounds for refusal of substantial disturbance and potential abandonment of breeding sites during the construction and operation phases are reduced considerably by avoidance measures (M11 (VM3) and M12 (VM5), cf. section B.4.4.1.9.1), which will also prevent breeding sites being disturbed or destroyed. The grounds for refusal of substantial disturbance as defined in section 44 para. 1 (2) BNatSchG and the possible abandonment of breeding and overwintering sites under section 44 para. 1 (3) BNatSchG do not therefore apply as far as the breeding pair of starlings is concerned. Grounds for refusal under section 44 para. 1 (1) BNatSchG are avoided by avoidance measure VM4. Clearing the construction site for the project must therefore be done between 01 November and 31 March (VM4, cf. section B.4.4.1.9.1).

No barred warblers have been found in the construction area. As far as potential settlements by this species are concerned, the habitats are the same as for the red-crested shrike. Barred warblers have often associated with breeding red-crested shrikes at the breeding site (cf. application document part F.07 section 6.2.2.7 p. 309): so to that extent, the remarks which were made on red-crested shrikes apply here too. There are therefore no grounds for refusal under section 44 para. 1 BNatSchG for barred warblers either.

For the tree pipit, brown linnet, skylark, stonechat and woodcock and other species found in the construction area (cf. application document part F.07 section 6.2 p. 272 et seq.), the project will not damage or destroy any breeding or overwintering places, as under avoidance measure VM4 (M9 section B.4.4.1.9.1), the site will be cleared between 01 November and 31 March and hence before the breeding season begins. Any relevant grounds for refusal for noise and disturbance will be ruled out by clearing the construction site before the breeding season and by avoidance measures M11 (VM3) and M12 (VM5) (see above).

No whinchats, common grasshopper warblers, little ringed plovers or northern wheatears were found in the construction area. Little ringed plovers and northern wheatears were found to have breeding grounds on the Deutsche Ölwerke Lubmin GmbH site during the breeding bird mapping campaign of 2016 (cf. application document part D1.01 section 5.5.11.1 p. 418, Fig. 5-130): so we assume that these species in particular have grown accustomed to humans being present. Whinchats and common grasshopper warblers have been shown to be present as breeding

birds more than 200 m from the pig reception station construction area (cf. application document part D1.01 section 5.5.11.1 p. 418, Fig. 5-130). We may therefore assume that building the pig reception station will not disturb the whinchats or common grasshopper warblers visually as visual disturbances only arise at 40 m (whinchats) or 20 m (common grasshopper warblers) (cf. application document part F.07 section 6.2.2.10 p. 328 section 6.2.2.12 p. 339). As far as settlements of the whinchat, common grasshopper warbler and little ringed plover are concerned, in terms of being affected by the grounds for refusal, the same applies as for the species above. The grounds for refusal of substantial disturbance by light and noise emissions are excluded by avoidance measures M11 (VM3) and M12 (VM5) (see above).

Tree sparrows, house martins, house swallows, sand martins, long-eared owls and wood warblers were not found in the construction area. Tree sparrows, house martins, house swallows, sand martins and long-eared owls were found as breeding birds on the premises of or in the immediate vicinity of businesses (cf. application document part D1.01 section 5.5.11.1 p. 418, Fig. 5-130), so we can assume they accept humans being present and vehicle noise. There is also the fact that the tree sparrows', house martins', house swallows', sand martins, long-eared owls and wood warblers settling can be ruled out for lack of breeding facilities. This also applies to other wood and settlement species which were not found in the construction area.

For all breeding birds, the prohibition on disturbance under section 44 para. 1 (2) BNatSchG does not apply subject to avoidance measures M12 (VM5) and M8 (VM3) being taken (cf. section B.4.4.1.9.1). These will prevent any deterioration in the state of conservation of the local population.

Overwintering bird species

The occurrence of overwintering birds in the survey area was determined by mapping and analysing the data available (cf. application document part F.07 section 6.1 p. 152 et seq.). What are relevant in terms of species protection law for the area out to the 12 nautical mile zone are the overwintering and migrating birds of the Greifswald Bodden and the Bay of Pomerania. A conflict analysis was conducted as part of the specialist species protection contribution for those species for which grounds for refusal under section 44 para. 1 BNatSchG cannot be ruled out from the start.

For the diver species black-throated diver and red-throated diver and the white-billed diver, yellow-billed diver, tufted duck and eider duck which are found only individually, grounds for refusal under section 44 para. 1 BNatSchG can be ruled out as they are not significantly at risk of being killed or injured, their breeding and overwintering sites (moulting sites) will not be damaged or destroyed and neither the merely temporary disturbances nor the construction exclusion period in the Bay of Pomerania from 01 January to 30 August VM2 (cf. section B.4.4.1.9.1) nor any other measures are expected to affect local stocks (populations. Black-throated divers may appear in small numbers along the route from October and red-throated divers from December (cf. application document part D1.01 section 5.5.5.1 p. 324 et seq.). Black- and red-throated divers are fish eaters and thus highly mobile, and use the whole marine area of the Bay of Pomerania. The transient local effects of shipping traffic are unlikely to affect the state of conservation of the local population. Except

restricting construction times, no CEF measures are required, nor are any measures to improve the state of conservation. Diving water birds are most sensitive to manmade disturbances at sea. Water birds tolerate larger ships moving slowly in straight lines more easily than small motor boats which change course frequently. It may be assumed that birds will avoid ships by swimming away promptly. The carrier ships and barges which it is proposed to use in laying the Nord Stream 2 pipeline correspond to the type of larger, slowly moving ships (cf. application document part D1.01 section 6.2.4.2.5 p. 573). Laying the Nord Stream 2 pipeline will have temporary transient effects (sailing and anchored ships) which cannot be compared with permanent interference sources like wind parks. The environmental compatibility study (cf. application document part D1.01 section 6.2.4.2.5 p. 573 et seq.) shows the impact distance in specific detail for each species and calculates it empirically from the literature cited. The species potentially involved must be assessed as sufficiently mobile and so can easily avoid the slowly moving ships which are constantly moving on and which hence appear only temporarily, so the risk of their being killed or injured will not increase significantly, so there are no circumstances of fact under section 44 para. 1 (1) BNatSchG. There is also the fact that disturbing marine divers substantially while they are overwintering or resting will be avoided by ending the offshore construction work in the Bay of Pomerania on 31 December (mitigation measure VM 2 (section B.4.4.1.9.1) (cf. application document part F.07 section 4 p. 36). Overwintering red-throated diver populations in the Bay of Pomerania reach their maximum in January-February (cf. application document part F.07 section 6.1.2.8 p. 185). White-throated divers occur mainly in the Bay of Pomerania in autumn and spring, and then mainly in the area of the Oder Bank. The pipeline passes the Oder Bank and hence where the white-throated diver is mainly found to the north (cf. application document part F.07 section 6.1.2.7 p. 180 et seq.).

Arctic terns, common terns, Sandwich terns and black terns are found mainly in coastal areas. Pipelaying and support ships are a slowly 'travelling site', so any significant risk of flying and swimming individuals colliding with them can be ruled out. Creatures can be expected to avoid this slow-moving 'travelling site' and can do so easily. Then there is also the fact that the pipeline will cross the coast in a 700 m long microtunnel (cf. application document part C.01 section 3.1.3 p. 57), which also avoids Arctic terns, common terns, Sandwich terns and black terns being put at risk: so the risk of these species being killed or injured is not expected to increase significantly. Any disturbances will only affect smaller sections of the specific species' rest areas, as using the microtunnel method means the landfall area will take up only a small part of the coastal area. Birds can avoid it by moving to adjacent areas, so any substantial disturbance can be excluded. Damaging circumstances of fact under section 44 para. 1 (3) BnatSchG can be ruled out as the nearest breeding site are well away from the Nord Stream 2 project. In the case of Arctic terns, the nearest reproduction site is on Neuer Bessin (isle of Hiddensee) (HERRMANN 2013[104]). The nearest common tern reproduction sites in Mecklenburg-Vorpommern are currently on the island of Tollow and Schoritzer Wiek (HERRMANN 2013). As for Sandwich terns, the nearest reproduction sites in Mecklenburg-Vorpommern are currently in

[104] Herrmann, C., Junge, M. (2013): [Breeding stocks of coastal birds in the protected areas of Mecklenburg-Vorpommern 2001-2012]. eds. Verein Jordsand zum Schutze der Seevögel und Natur e.V. In: [Seabirds] 34 H. 3: 86-148.

the Wismar Bay area (HERRMANN 2013). The nearest black tern reproduction sites are well outside the project's reach in the Peene valley area (VÖLKER 2014[105]).
For the Arctic tern, common tern, Sandwich tern and black tern, any grounds for refusal under section 44 para. 1 BNatSchG can be ruled out as a whole.

In spring, when herrings are spawning (March to early May), large numbers of long-tailed ducks use the Greifswald Bodden to feed on herring spawn, including several hundred birds in the area of the Nord Stream 2 pipeline route; but no breeding or overwintering (moulting) sites will be destroyed within the meaning of section 44 para. 1 (3) BNatSchG as disturbances will only be short-lived and creatures can avoid them easily at this time. The species only rests in insignificant numbers on the route as planned in autumn. Excluding construction in the Bay of Pomerania from 01 January to 30 March (M7 (VM2) and from 01 January to 14 May in the U bird protection area "Greifswald Bodden and southern Strelasund" (M6 (VM1)) rules out the ground for refusal of substantial disturbance, as the construction times proposed are outside the main overwintering periods. During the construction period, the Nord Stream 2 route as planned is not part of the preferred rest area, although this does not rule out a few individuals stopping there temporarily. In the Greifswald Bodden, long-tailed ducks prefer overwintering when the herring are spawning (cf. application document part F.07 section 6.1.2.4 p. 165); but mitigation measure M6 (M1) rules out construction from 01 January to 14 May. Long-tailed ducks residing in the route area outside the herring spawning season can also move easily to other areas of the rest area outside the main overwintering season, as overwintering stocks are much less at this time and the habitat's capacity as a rest area is not exhausted. Under these conditions, what birds there are can easily respond to disturbances by moving within the rest area, so long-tailed ducks will not be affected. Overwintering stocks in the Bay of Pomerania peak in March when long-tailed ducks migrate in spring (cf. application document part F.07 section 6.1.2.4 p. 166). Mitigation measures M6 (VM1) and M7 (VM2) mean work building the Nord Stream 2 pipeline in the Bay of Pomerania will be completed in good time before the main overwintering season. Apart from herring spawn, which occurs seasonally, long-tailed ducks feed largely on the macrozoobenthos. As the Nord Stream monitoring (cf. application document part I3.04 section 4.1.6 p. 57) on the macrozoobenthos showed, the benthic biocommunity affected by building the Nord Stream 2 pipeline can regenerate itself within two to four years (cf. application document part D1.01 section 6.4 p. 694) to the extent that it will be available as a food source again; and only a very small part of suitable feeding grounds will be affected. Disturbing individuals temporarily is unlikely to affect the state of conservation of the local population: so disturbing long-tailed ducks substantially under section 44 para. 1 (2) BNatSchG can be ruled out.

As for the prohibition on killing and injuring under section 44 para. 1 (1) BNatSchG, individuals present outside the main overwintering season can easily avoid the slowly advancing fleet of ships used in laying the Nord Stream 2 pipeline: so the risk of long-tailed ducks being killed or injured will not increase significantly.

Not far from the Nord Stream 2 pipeline route is one of the main overwintering areas of the common scoter on the Oder Bank (cf. application document part F.07 section 6.1.2.5 p. 170). This is outside the 12 nautical mile zone to be considered here: so

[105] Vökler, F. (2014): [Second atlas of breeding birds of the Federal State of Mecklenburg-Vorpommern]. eds. Ornithologische Arbeitsgemeinschaft Mecklenburg-Vorpommern e. V.

any grounds for refusal under section 44 para. 1 BNatSchG can be ruled out for the 12 nautical mile section. Much the same applies to the velvet scoter, which is found almost all year round, particularly far from the coast of the Bay of Pomerania. According to the findings in the specialist species law contribution, most velvet scoters are found on the northern edge of the Bay of Pomerania and on the Oder Bank in the EEZ all year round (cf. application document part F.07 section 6.1.2.6 p. 175).

Any prohibitions under animal protection law can also be ruled out for scaups. The project will not increase the risk of their being killed significantly through possibly colliding with ships if only because scaups generally are not prone to colliding with ships (collision rate with lightships in Denmark: 0.01 birds p.a., HANSEN 1954[106]). Scaups will avoid the slowly advancing convoy of ships used in laying the Nord Stream 2 pipeline: so the risk of any flying or swimming individuals being killed over and above what the individuals concerned would be exposed to naturally anyway can be ruled out. Otherwise, as far as causing disturbance during the migration period under section 44 para. 1 (2) BNatSchG and/or affecting overwintering places under section 44 para. 1 (3) BNatSchG is concerned, scaups overwinter in the Greifswald Bodden area all year round (cf. application document part F.07 section 6.1.2.6 p. 151). Scaups peak in spring when herrings spawn at 40,000 to 60,000 (cf. application document part F.07 section 6.1.2.6 p. 152); so no scaups will be left in the Greifswald Bodden by when the herrings cease spawning in mid-May each year. According to the project developer's consultant's findings, no scaups have been moulting in the Greifwald Bodden since the waters were developed for maritime tourism in 1990, the moulting sites having been in lagoons before then. The winter migration starts at the beginning of October (cf. application document part F.07 section 6.1.2.1 p. 153). Scaups do not feed in the open Bay of Pomerania, and the seabird surveys did not find them there either (cf. application document part F.07 section 6.1.2.1 p. 153): that is because they only feed in waters up to 10 m deep (BAUER ET AL. 2005[107]).
The transportation route between the marine intermediate storage facility and the pipeline trench lies in >10 m of water (cf. application document part D1.01 section 5.5.1.3.2 p. 223), so does not affect anywhere where scaups feed or rest in the daytime. There are no relevant scaup feeding grounds in the area of the pipeline planned (the shallow reef on the Bodden escarpment is settled by blue mussels only sporadically, and is therefore only important as a feeding habitat while the herrings are spawning from February to April) (cf. application document part D1.01 section 5.5.5.1 p. 316). After the end of September, the work will comprise backfilling the pipeline trenches and restoring reefs (cf. application document part C.01 section 3.2 p. 75, Fig. 3-8). In the area which is potentially relevant to scaups, this work will run into December. In this season, scaups eat virtually only zebra mussels in the Oder Haff, sleeping by day mostly there as well or on the Peenemünde Haken.
We can also rule out safely that the project will have any impact on scaup feeding grounds. As far back as 2012, 18 months after construction work was completed, it was found that the length-to-frequency distribution of blue mussels on the Bodden escarpment as the relevant element of scaup food (shells <1 cm long) showed no

[106] Hansen, L. (1954): Birds killed at lights in Denmark 1886-1939. Vidensk. Medd. Dan. Naturh. Foren. 116: 269-368.
[107] Bauer, H.G., Bezzel, E. Fiedler, W. (2005): [The compendium of the birds of Central Europe. All about biology, risk and protection]. 2nd edition, AULA-Verlag.

differences between the pipeline trenches and reference areas (cf. application document part I3.04 section 4.2.5.2.5.2 p. 108 et seq.). Blue mussels do not always occur here in any case (cf. application document part D1.01 section 5.5.1.3.1 p. 213): s the transient impact on the food supply only affects a small proportion of the area next to a shipping route for the duration of two winter seasons (cf. application document part C.01 section 3.2 p. 77, Fig. 3-9). As avoidance measures VM 1 (section B.4.4.1.9.1) (see above) exclude any construction work in the focal areas during the main overwintering season, there will be no relevant disturbances within the meaning of section 44 para. 1 (2) BNatSchG which could affect the conservation status of local populations of the species.

Red-breasted mergansers also have one of their main overwintering areas in the Greifswald Bodden. When the project developer made its maps, most were found at depths between 10-15 m, where the species prefers to dive for food (cf. application document part F.07 section 6.1.2.3 p. 161). From September to November 2015, only a few flying red-breasted mergansers were found, overwintering in the Bodden escarpment area was only recognisable from December 2015. Work in the Bodden escarpment area will largely be finished by this time (cf. application document part C.01 section 3.2 p. 75, Fig. 3-8), so any substantial disturbances of or effects on overwintering places can be ruled out. There will only be one ship working on restoring the reef there at a time (the reef on the Bodden escarpment is adjacent to the Landtief) (cf. application document part C.01 section 3.2 p. 77, Fig. 3-9). The project developer's consultant says that moulting red-breasted mergansers were not found. For red-breasted mergansers which overwinter in the Greifswald Bodden in particular (cf. application document part F.07 section 6.1.2.3 p. 161), the project will not disturb them, as reduction measure M7 (VM2) provides that the offshore construction work will end on 31 December. As a fish-eater, this species is also flexible about where it finds its prey (BAUER ET AL. 2005). As avoidance measures M6 (VM1) and M7 (VM2) also rule out construction work in the Bay of Pomerania during the main overwintering season, and as red-breasted mergansers can divert to undisturbed areas, of which there are many, the Nord Stream 2 project will not qualify as a disturbance under section 44 para. 1 (2) BNatSchG as far as red-crested mergansers are concerned; and they can avoid the slowly advancing Nord Stream 2 construction fleet easily, avoiding the immediate area where the construction site is located at any time. Red-breasted mergansers tend to keep moderately well away from ships and generally take off ahead of those which are moving (GARTHE ET AL. 2004). The risk of their being injured or killed will not increase significantly, as no grounds for refusal under section 44 para. 1 (1) in conjunction with para. 5 BNatSchG are expected to arise. The red-crested merganser, which is classified as a rare breeding bird in Germany (MENDEL ET AL. 2008) does not have any breeding sites in the project's catchment area. The nearest breeding is on the north and west coast of the Greifswald Bodden and in the Strelasund area (VÖLKER 2014). No overwintering places can be expected to be permanently damaged or destroyed (cf. application document part D1.01 section 5.5.5.1 p. 317, Fig. 5-79): so we can safely exclude de facto damage under section 44 para. 1 (3) BNatSchG. In summary, we can conclude that the Nord Stream 2 will not raise any grounds for refusal under section 44 para. 1 BNatSchG in conjunction with section 44 para. 5 sentence 2 (1) BNatSchG.

Any substantial disturbances to horned grebes and red-necked grebes under section 44 para. 1 (2) BNatSchG can be excluded. When the project developer's consultant

compiled their maps in the winter of 2015/2016, they found black-throated divers almost exclusively in the EEZ with a focus on the Oder Bank, and hence outside the 12 nautical mile area of the Nord Stream 2 route to be considered here (cf. application document part F.07 section 6.1.2.10 p. 192). Northwards, the black-throated divers concentrate as far as the Adlergrund channel at times; and the red-necked grebe rests mainly on the Oder Bank from autumn onwards, i.e. also outside the area to be considered here. North of the Oder Bank, the Nord Stream 2 pipeline will be routed in such a way that the construction work can only disturb peripheral occurrences of red-necked grebes at most (cf. application document part F.07 section 6.1.2.10 p. 192). Avoidance measure M7 (VM2) (see above) excludes any construction work during the main overwintering season, which prevents any substantial disturbances arising under section 44 para. 1 (2) BNatSchG. horned grebes, great crested grebes and red-necked grebes can also move to the surrounding area. These species do not have any moulting places separate from the overwintering areas found (cf. application document part F.07 section 6.1.2.10 und 6.1.2.11 p. 193 et seq.). Grounds for refusal under section 44 para. 1 BNatSchG can be excluded for horned grebes and red-necked grebes if avoidance measure M7 (VM2) is taken.

Great crested grebes occur in large numbers in the Greifswald Bodden, in the area of the Bodden escarpment and the western Bay of Pomerania in the winter (cf. application document part F.07 section 6.1.2.9 p. 189); but any substantial disturbance while they are overwintering will be excluded by mitigation measures M6 (VM1) (see above) and M7 (VM2) (see above). The risk of their being killed or injured is not expected to increase significantly, as they can avoid the slowly advancing fleet involved in laying the Nord Stream 2 pipeline. There is enough space for the overwintering great crested grebes to go elsewhere, as the slowly progressing Nord Stream 2 pipeline laying fleet will only occupy a small area, and that only temporarily. They can use their overwintering places fully again once construction is complete: so no grounds for refusal for great crested grebes are expected to arise under section 44 para. 1 BNatSchG.

The project will also only affect the cormorant slightly. Its reproduction sites (breeding colonies) are not affected, as they nest on coastal cliffs or on trees on inland lakes (cf. application document part F.07 section 6.1.2.12 p. 201), which the project does not affect. Any disturbances due to possible inspection and/or maintenance work during the construction and operational phases will be only temporary; and the animals will not be disturbed substantially while they are overwintering or resting, as the offshore construction work in both the Greifswald Bodden and the Bay of Pomerania will end on 31 December (mitigation measures M6 (VM1) and M7 (VM2). This species is not particular about where it eats, so is not tied to any given sea area. The advancing pipelaying fleet will only occupy a small section of the cormorant's main feeding areas, the eastern Greifswald Bodden and the Bodden escarpment area (cf. application document part D1.01 section 6.2.4.2.5 p. 577) briefly. Once the pipelaying fleet has passed, the piscivore cormorant will have its feeding areas back: so this species is not likely to raise any grounds for refusal under section 44 para. 1 BNatSchG either.

Nor can the project be expected to raise any grounds for refusal for little gulls under section 44 para. 1 BNatSchG. These animals are mainly found where the Oder enters the Bay of Pomerania off the coasts of Usedom and south-east Rügen (cf.

application document part D1.01 section 5.5.5.1 p. 332). Little gulls tend not to stay too far from ships (cf. application document part F.07 section 6.1.2.13 p. 206), and can also avoid the slow-moving pipelaying fleet like other species: so they are not at risk of being disturbed or killed or injured significantly more than normal. Little gull breeding sites are not near the Nord Stream 2 pipeline (cf. application document part F.07 section 6.1.2.13 p. 207).

Common guillemots, razorbills and black guillemots occur in very small individual numbers at most around the Nord Stream 2 pipeline (transient concentrations are found outside the 12 nautical mile zone), so any relevant effects can be ruled out in the area to be considered here. For the black guillemot, it is mainly the Adlergrund area, which is outside the 12 nautical mile zone for overwintering which is of interest (cf. application document part F.07 section 6.1.2.16 p. 219). The common guillemot and razorbill are distributed mainly in the north along the edges of the Arkona basin and seasonally also in the south of the Arkona basin along the Sassnitz channel (cf. application document part F.07 section 6.1.2.16 p. 219; section 6.1.2.16 p. 221) and hence outside the area which could be affected by building and operating the Nord Stream 2 pipeline. The razorbill also overwinters in the Adlergrund channel, which is outside the 12 nautical mile zone and hence the area to be considered here. The common guillemots, razorbills and black guillemots which occur in the 12 nautical mile zone can easily avoid the slowly advancing pipelaying fleet, so the risk of their being killed or injured is not expected to increase significantly. Avoidance measure M7 (VM2) (see above) will rule out construction work while common guillemots, razorbills and black guillemots are overwintering in the winter and spring and when common guillemots are raising their young. For all three species, the breeding grounds are far beyond the project's effects. The only place where common guillemots and razorbills breed in Germany is on Helgoland (MENDEL ET AL. 2008[108]). So no de facto damages can be expected to arise for these species under section 44 para. 1 (3) BnatSchG. Razorbills and common guillemots are fish eaters and use the whole of the Bay of Pomerania. Black guillemots are found in small numbers on the Adlergrund, and will only enter the Nord Stream 2 route's impact area in exceptional cases, e.g. when looking for food, as was said above (cf. application document part F.07 section 6.1.2.16 p. 219). The temporary local effects of shipping on stocks are unlikely to affect the stats of conservation of the local populations; then there is also avoidance measure VM2 (cf. section B.4.4.1.9.1) which will reduce common guillemots, razorbills and black guillemots encountering the impact of production. In conclusion, there are no grounds for refusal for common guillemots, razorbills and black guillemots under section 44 para. 1 BNatSchG.

As far as gulls are concerned, it should be mentioned that, as a fish eating species, they cover large areas of sea and are not tied to specific water depths. Gulls are found mainly in coastal areas, but may be observed in the Bay of Pomerania or Greifswald Bodden all year round. Gulls often follow ships closely, but are highly manoeuvrable, so there are no collision risks (MENDEL ET AL. 2008). Any de facto disturbances for gulls under section 44 para. 1 (2) BNatSchG can be ruled out: so there are not expected to be any grounds for refusal in their case under section 44

[108] Mendel, B., Sonntag, N., Wahl, J., Schwemmer, P., Dries, H., Guse, N., Müller p., Garthe p. (2008): [Species datasheets of sea and water birds of the German North Sea and Baltic. Distribution, ecology and sensitivities to interventions in their marine habitats. Nature conservation and biodiversity], Landwirtschaftsverlag. Volume 59: 437 pp.

para. 1 (1) BNatSchG. As far as disturbance is concerned, gulls are largely immune to manmade disturbances and have no problems coming close to ships (GARTHE ET AL. 2004[109]), which means there are not expected to be any grounds for disturbance prohibitions under section 44 para. 1 (2) BNatSchG in their case. Their breeding sites are outside the reach of the project's effects and it does not affect them. There are no grounds for refusal for harming gulls under section 44 para. 1 (3) BNatSchG.

Other offshore species (piscivores incl. parasitic species of Northern storm petrel) will only be affected by disturbances to a very limited extent, and any effects can be ruled out in the shallows of Greifswald Bodden thanks to avoidance measures M6 (VM1) and M7 (VM2) (see above).

Overwintering birds on the Freesendorf meadows and the island of Struck will also only be affected slightly and temporarily at most, with avoidance measure M7 (VM2) (see above) excluding construction during their main overwintering period.

In conclusion, it should be pointed out, once again, that, given that the work will be carried out in an area of the sea which shipping uses regularly, a significant increase in the risk of being killed and hence the grounds for refusal under section 44 para. 1 (1) can be ruled out.

Fish and cyclostomata (Atlantic sturgeon)

Annex IV to the Habitats Directive lists the fish species European sea sturgeon (*Acipenser sturio*), Atlantic/Baltic sturgeon (*Acipenser oxyrinchus*) and houting (*Coregonus oxyrhynchus*). Only the Atlantic sturgeon can be found in the area to be considered here. The fish consultant's mappings to record fish species in 2015 and 2016 found no evidence of Atlantic sturgeon in the survey area (cf. application document part F.07 section 5.2.2.1 p. 139).

The project does not affect the Atlantic sturgeon to such an extent that any of the grounds for refusal under section 44 para. 1 BNatSchG could be triggered. The Atlantic sturgeon will perceive the construction works early on through cumulative effects such as noise, vibration and visual disturbances and so avoid them and the pipelaying fleet actively (cf. application document part F.07 section 5.2.2.1 p. 140). The risks of colliding with the pipelaying fleet and the resulting risk of these animals being injured or killed will not exceed the life risks of the individuals concerned in nature generally significantly. Nor are any substantial disturbances to be expected during the dredging work, as the turbidity study shows that relevant limits of material in suspension of 50 mg/l at a distance of 500 m (M5 section B.4.4.1.9.1) are not exceeded, at 30 mg/l at 500 m (cf. application document part I3.06 section 5 p. 19): so no barrier effect is expected for Atlantic sturgeon (cf. application document part D1.01 section 6.2.4.2.4 p. 562). The noise emissions expected are not expected to affect the Atlantic sturgeon in species protection law terms. The hydrosound noise level generally, both with and with construction work, is between 100 and 140 dB re

[109] Garthe p., Dierschke, V., Weichler, T., Schwemmer, P. (2004): [Overwintering bird occurrences and offshore wind power usage: analysing the conflict potential for the German North Sea and Baltic, in: Marine warm-blooded animals in the North Sea and Baltic: principles for evaluating wind parks offshore (MINOS), final report]. Subsidised by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, FKZ 0327520: 195-334.

1 µPa at 1 km from the construction site (cf. application document part I3.05 p. 22, Tab. 7): so the construction noise emissions are generally in the range of the prevailing shipping, and are too low to affect the Atlantic sturgeon's hearing temporarily, let alone permanently. The breeding sites and relevant overwintering sites within the meaning of section 44 para. 1 (3) BNatSchG are not within the project's impact area, so there are no grounds for refusal under section 44 para. 1 BNatSchG. The Atlantic sturgeon breeds in flowing waters; no specific overwintering places where animals concentrate at sensitive phases of their lives are known (cf. application document part F.07 section 5.2.2.1 p. 142).

Amphibians and reptiles

There are no waters of any kind in the survey area or its environs which could serve as spawning waters (cf. application document part D1.01 section 5.5.7.1 p. 383): so many amphibians will not occur in the survey area, let alone extensive stocks. On the other hand, the survey area is important as a migrating corridor between spawning waters and summer and overwintering areas. The only species of amphibian which is found in the survey area which is specifically and strictly protected under section 44 BNatSchG is the moor frog. Any other relevant amphibian species can be ruled out for the Nord Stream 2 pipeline landfall area to be considered here (cf. application document part F.07 section 5.3.1 p. 143).

As far as the moor frog is concerned, we note that, once the spawning waters of the former Lubmin treatment plant (EWN) are removed, there will no habitat left required to maintain the species in the survey area (cf. application document part D1.01 section 5.5.7.2 p. 385). We may therefore assume that, irrespective of the project, the survey area's ecological function as a moor frog habitat will be lost. The basic studies found very few animals in any case, with just seven individuals in two years (cf. application document part D1.01 section 5.5.7.1 p. 384, Tab. 5-92). Losing its spawning waters through the rebuilding meant that the moor frog could no longer breed in the area as far back as 2016 (cf. application document part D1.01 section 5.3.1.2 p. 185), such that the species was compelled to leave the survey area; but ancillary provision A.3.8.13 was imposed on the project developer to rule out the possibility that the risk of moor frogs being injured or killed being increased significantly as they migrated sporadically in the Nord Stream 2 pipeline project landfall area. This ancillary provision provides for an amphibian protection fence in the area of the pig reception station between the beginning of March and the end of October which should prevent amphibians wandering into the construction area. The amphibians will be collected in box traps at the protective fence and released outside the danger area. Catching the amphibians does not qualify as a fact under section 44 para. 1 (1) BNatSchG, as it is a necessary protective measure within the meaning of section 44 para. 5 sentence 2 (2) BNatSchG which is unavoidably necessary to protect construction killing or injuring creatures.

Sand lizards as a reptile species could not be found when mapping the basic records (cf. application document part I1.03 section 5.10 p. 90 et seq.) (cf. application document part D1.01 section 5.5.8.1 p. 386): so any significant risk of their being killed under section 44 para. 1 (1) in conjunction with para. 5 sentence 2 (1) BNatSchG can safely be ruled out. So there is no question of any grounds for refusal on the grounds of damaging or destroying breeding and overwintering places arising

under section 44 para. 1 (3) BNatSchG. Nor can any disturbances be predicted which would be prohibited under section 44 para. 1 (2) BNatSchG.

The amphibian protection fence which ancillary provision A.3.8.13 requires the project developer to install during the main amphibian migration season between the beginning of March and end of October will prevent any amphibians which may arise wandering into the construction area during this period, so the risk of injuring or killing reptiles which occur can be ruled out. The amphibian protection fence will also prevent reptile seeking winter quarters in the area of the pig reception station and possibly being disturbed or killed during their winter rest. No reptiles of note are expected to occur in the onshore project area once the amphibian protection fence in ancillary provision A.3.8.13 is removed at the beginning of November.

Conclusions

Taken as a whole, the planning authority concludes that there are no grounds for refusal under section 44 para. 1 BNatSchG section 44 para. 5 sentence 2 (1) BNatSchG for any species listed in Annex IV (a) to Directive 92/43/EEC, European bird species or species which are [listed] in any regulations under section 54 para. 1 (2) BNatSchG.

B.4.7 Cross-border environmental effects

Cross-border environmental effects beyond the German area of competence were presented, assessed and balanced in the environmental compatibility test conducted (cf. application document part D1.01), the Espoo report (cf. application document part J.01), in the compatibility studies in respect of Natura 2000 areas (cf. application document part E.16), in the cross-border public consultation opinions received, at the discussion hearing on the cross-border environmental effects beyond the German area of competence (cf. Wortprotokoll of 26.09.2017 p. 432 et seq.), during the consultation under Art. 5 of the Espoo Convention on 05.12.2017 and in the reasons for the decision in sections B.4.4, B.4.5 and B.4.6 above. The environmental compatibility test on cross-border environmental effects concluded that the project as planned does not have any substantial negative effects of a cross-border nature. The project as planned does not have any essential large-scale and hence no cross-border environmental effects. Our eastern neighbours, Russia, Finland, Sweden, Denmark, Lithuania, Latvia, Estonia and Poland are not affected by the environmental effects the project will have inside the German 12 nautical mile zone and/or the German landfall area at Lubmin. This applies both to indirect effects like the increased burden on air or water from toxins released spreading and indirect effects such as harming animal populations within the German area of competence which also use (part) habitats in areas of other countries and/or animal populations from other countries which also seek out (part) habitats in the German area of competence.

The general public in our neighbour states have commented on what the environmental effects of constructing and operating the Nord Stream 2 pipeline in and from the German area of competence might be (see section B.4.8.21 of the decision).

B.4.8 Assessment of public interest considerations / decisions

B.4.8.1 Spatial planning, State and regional planning

A separate spatial planning procedure under the "Raumordnungsgesetz" (Federal Spatial Planning Act) or "Landesplanungsgesetz" (State Planning Act) was not carried out for the project (cf. Section B.2.1 of this decision), since project compatibility with spatial planning was ensured by the fact it was being examined elsewhere, namely in this planning approval procedure (Section 16, subsection 2, 1st sentence of the Raumordnungsgesetz - ROG of 22.12.2008, BGBl. 2808). The route approved in the plan runs from the Pomeranian Bight (German 12-nautical mile zone from KP 31.065) and in the Bay of Greifswald until landfall within an offshore area reserved for pipelines, (above ground, underground, offshore), which was laid down by the "Landesverordnung über das Landesraumentwicklungsprogramm Mecklenburg-Vorpommern (LEP-LVO M-V) of 27/05/2016 (GVOBl. M-V p. 322, corrected p. 872). The State Regional Planning Program sets out the objectives and principles of spatial planning and State planning which affect the entire State area, including the 12-nautical mile zone, and which are important for the spatial relationships of the parts of the State to each other. Reserved areas, which have the legal character of spatial planning principles (LEP M-V 2016, p. 19), should remain reserved for specific functions or uses of spatial significance and should be of when particular importance evaluating them in comparison with competing spatially-significant functions or uses (Section 7, subsection 3, 2nd sentence, no. 2, ROG). Conflicting uses have therefore already been the subject of the considerations regarding LEP M-V 2016.

The project developer has carried out an extensive survey of alternatives in relation to finding a route. The determination and examination of alternatives can be understood in terms of spatial concerns (cf. application document, part B.01, Sections 5.4, 6.2.5, 6.2.6.4, 7.2.3, 7.3.1.4; 7.3.2.4; 7.3.3.4; 7.4.1.4; 7.4.2.4; 7.4.3.4; 7.5.4, 8.1.2.4; 8.2.2.4; 8.2.3.3; 8.3.4). The only State planning decisions possibly affected are set out correctly in Sections 7.3.1.4.1 and 7.3.2.4 of the document B.01 of the application document. It should be emphasised here that the plan approval authority does not see any conflict with the priority zone for shipping (objective no. 8.3 (2), LEP M-V 2016), which under Section 4, 1st sentence of 4(1) ROG would be considerable. As set out in the description under Section B.4.8.18, the impairments to regarding and the ease of passage for shipping during the construction of the pipeline are justifiable, taking possible safety measures into account. For the operational phase, the plan approval authority rules out any conflicts in relation to the existing risk assessment of the DNV-GL (cf. application document, part I3.07). The landfall, and therefore also the necessary receiving terminal, are situated on a site zoned for harbour industries and commerce according to the objective in No. 4.3.1 LEP M-V 2016. However, the landfall of the natural gas pipeline and its receiving terminal are not part of harbour industries and commerce (cf. footnote 93 in LEP M-V 2016) and would have to be disallowed were they to affect the settlement of harbour industries adversely. The natural gas receiving terminal is planned for areas which have no connection with water or the harbour. The receiving terminal does therefore not obstruct further development of the (not nationally) important Baltic port of Lubmin, which has further large areas where a harbour industrial and commercial estate is possible. Furthermore, Greifswald / Lubmin in the LEP M-V (Objective no. 5.3, Section 5) is to be kept and further developed as an energy generation location

not based on nuclear fission or thermal utilisation of coal. The construction of natural gas transport facilities complies with this objective.

Due to its location parallel to the Nord Stream pipeline, the Nord Stream 2 pipeline follows the bundling principle of Section 8.2 of LEP M-V 2016, under which the desired bundling of pipelines within the reserved offshore areas should keep fragmentation effects and impairments to other intended uses at a low level and facilitate laying in areas with as little conflict as possible. Wherever the Nord Stream 2 pipeline deviates from the strict bundling with the Nord Stream pipeline, this is done taking into account the agreement (Section 8(2) [Z] LEP M-V) with other claims for use, above all nature conservation interests (avoiding reefs, proper crossings of subsea cables).

These deviations to the east of the Mönchgut peninsula and within the Bay of Greifswald are therefore assessed as unproblematic in terms of regional planning (cf. the statement by the Amtes für Raumordnung und Landesplanung, Vorpommern, of 24/04/2017). Neither the coastal protection offshore priority area nor its use is impaired (cf. the application document, Part D2.01, distance approx. 220 m); the same applies equally to the reserved area for securing raw materials (distance approx. 100 m). No findings to the contrary were identified in the planning approval procedure. The Ministerium für Energie, Infrastruktur und Digitalisierung M-V, Department for Land Development, did not raise any misgivings in its statement of 26/05/2017.

The Landesamt für Landwirtschaft, Lebensmittelsicherheit und Fischerei Mecklenburg-Vorpommern demanded in its statement of 31/05/2017 that closer consideration should be given to the reserved offshore fishery area laid down under Section 8.4(2) LUP M-V 2016. It was not possible to comply with this, since as described in Section B.4.8.11, only minor impacts on fishing are to be expected. Furthermore, the ancillary provisions A.3.2.1, A.3.2.2 and A.3.2.3 ensure that no substantial effects on the fishing industry will occur.

In its statement of 29/05/2017 the Bauernverband Mecklenburg-Vorpommern its statement of 29/05/2017 raised the objection that the planned offset measures would conflict with regional planning considerations, due mainly to the use of areas with a yield index greater than 50. The final plan takes into account the concerns expressed in this statement that no area with a yield index greater than 50 should be used. The "Supplementary Volume: Concretisation" document submitted by the project developer no longer envisages any areas with a yield index greater than 50 (cf. Supplementary Volume: Concretisation" Parts 3 and 4, Chapters 1 in each, pages 9 and 7 respectively). The "Supplementary Volume: Concretisation" document also reduces to a minimum the load on areas used for agriculture (cf. Section B.4.8.9); where these occur, these uses should be based on amicable settlements with the affected farmers. The set-off for eco-account measures, now established in the plan to an extent which is sufficient to compensate for the intervention (cf. Section B.4.8.4.4), rules out any compulsory usage of areas used for agriculture.

Overall, it can therefore be said that the project agrees with the objectives, principles and other requirements of spatial and State planning. The pipeline route and the route deviations compared to the spatial planning do not result in any significant impact in spatial planning terms on coastal protection interests, nature and

landscape, the settlement structure and recreation/tourism, drinking water and infrastructure. The project therefore complies with spatial planning requirements.

B.4.8.2 Immissions control

The project is not subject to the need for approval under Section 4 of the "Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch Luftverunreinigungen, Geräusche, Erschütterungen und ähnliche Vorgänge" (Bundes-Immissionsschutzgesetz - BImSchG) [Act for protection from harmful environmental impact due to air pollution, noise, tremors and similar processes (Federal Immissions Control Act] hereinafter BImSchG, in the version published on 17/05/2013 (BGBl. BGBl. I p. 1274) as last amended by Section 3 of the Act of 18/07/2017 (BGBl. I p. 2771), in conjunction with the Fourth Order for the Implementation of the Federal Emissions Control act (Order on Plants Requiring Approval (Section 4. BImSchV) in the version published on 31/05/2017 (BGBl. I S. 1440).

The immissions control assessment of the project does however take into account the aspects of noise, vibrations, light, heat, radiation and air pollution for both the construction phase and for operation under Section 22 BImSchG.

No immissions in the form of radiation or similar forms are emitted by the project.

Immissions are expected offshore during the construction phase, particularly in the form of noise, and onshore in the form of noise, vibration and air pollution. The construction activities are limited in time. The technology employed complies with the specifications of the 32nd BImSchV (Plant and Machinery Noise Protection Order). The guideline immission values of the "Allgemeine Verwaltungsvorschrift zum Schutz gegen Baulärm" (AVV Baulärm) [General administrative regulation for protection against construction noise] and TA Lärm [Technical Instruction on Noise] are observed. At most, the permissible value of immissions may be exceeded in individual cases at night (cf. application document, Part I2.06, Chapter 7, pp. 21 et seq.). This mainly affects the phase of simultaneous deployment of construction machinery while digging the pipe trench, laying the pipeline with a laying barge, and simultaneous parallel dredging work to construct the sea ends of the microtunnels. The guideline immission values are not expected to be exceeded by the onshore work or during commissioning (cf. application document, Part I2.07, Chapter 7, pp. 16 et seq.). If guideline values are exceeded, appropriate sound protection measures shall be implemented in a verifiable manner (see ancillary provision A.3.3.6 and Section B.4.8.4.1.1). Damaging environmental impacts within the meaning of Section 3(1) BImSchG are therefore not expected. The ancillary provisions set out in Section A.3.3 are intended to ensure compliance with the above guideline values, and matters relevant to immissions control.

The pipeline does not cause any environmentally-harmful impact within the meaning of Section 3(1) BImSchG during operation for its intended purpose, in other words during the operational phase, because no emissions in the form of smell, vibration or light are produced during the operational phase, or at most are produced to a very small extent.

Overall, there are no immission protection considerations that prevent the project.

B.4.8.3 Waste disposal legislation and soil protection

Under the ancillary provisions in A.3.4, the project developer is obliged to send all waste generated by the construction work for proper recycling, or if this is not possible, for proper disposal (Sections 7 and 15 KrWG), observing the provisions of the NachwV.

Under Section 4, subsection 1 BBodSchG, no harmful changes to the soil may be caused. Harmful changes to the soil are impairments to the soil functions likely to give rise to hazards, substantial disadvantage or substantial nuisance to individuals or the general public (Section 2(3) BBodSchG [Federal Soil Protection Act]. The impact of the construction phase on the soil as an object to be protected is described in the environmental impact summary. The impact consists, above all, of the structural change caused by excavation and sedimentation, soil compaction on the pipeline itself, microtunnel works, clearance of the building site for constructing the pig receiving station, the use of the offshore interim storage facility and minor impacts on the morphology when backfilling the trench and laying the pipeline on the sea bed. Some of these impacts are temporary but others are permanent, as described below. They shall be avoided or mitigated as much as possible by appropriate measures (excavation methods matched to the type of soil when digging the trench and replacement when backfilling the trench, specific storage of soil types at a temporary dumping site, disposal of soil with an increased organic content onshore, restoration of soil structures and morphology; see also Section B.4.4.1.9). Substitution will be carried out for unavoidable impairments which cannot be compensated. Observance of these conditions is ensured by the corresponding ancillary provisions A.3.7.2, A.3.8.2 and A.3.8.6.

The soil is permanently loaded in the area where the pipeline rests on the seabed, and on onshore installations (landfall site with pig station and trap and transfer equipment). Trenching the pipeline will continue to result in a disturbance to the sedimentary sequence offshore. However, at least the top 30 cm of the sediment will be restored (cf. the application document, Part D1.01, Chapter 6.2.1.4, p. 492) which is crucial for the ecological functions of the sediment. Furthermore, no soil types are known offshore like those onshore, which feature characteristic soil horizons and which could therefore be destroyed by construction of the pipeline.

Use of the offshore interim storage site results in impairment to the surface sediment at the interim storage site. However, these impairments are of a temporary nature, since the excavated material stored there will be transported away for re-laying and the original conditions of the upper sediment will return after restoration of the seabed surface and a regeneration period of five years (cf. application document, part D1.01, Chapter 6.2.2.2.1. Table 6-8, p. 495). The microtunnel method for the pipeline landfall will cause a disturbance in the sedimentary sequence due to the inclusion of allocthonous material. However, this will not result in any permanent adverse impacts on the soil, since the construction of the microtunnel takes place almost exclusively at a depth where no soil formation processes occur. The construction of a launching and target pit is part of the microtunnel method, which leads to a disturbance of the soils or in the case of the target pit, to a disturbance of

the offshore surface sediment. The microtunnel method can be regarded on balance as positive for soil protection, since only a very small part of the soils is affected by this method compared to laying the pipeline in an open trench. Drilling debris will be separated from drilling mud, transported away and disposed of in accordance with regulations (cf. application document, Part D1.01, Chapter 6.2.1.2.2, Table 6-8, p. 483). The construction of the pig receiving station necessitates the excavation of an area of 6 ha (cf. the application document, part D1.01, Chapter 6.2.1.2.2, Table 6-8, p. 482). The impaired soils are partly anthropogenic in character, since buildings are present in this afforested area. Moreover, re-laying removed topsoil is planned for the non-sealed area (cf. application document, Part D1.01, Chapter 6.2.1.2.2, Table 6-8, p. 483). One geomorphological feature in the form of a dune is affected by the construction of the pig receiving station. However, the dunes in this area are less distinctive (cf. the application document, part D1.01, Chapter 6.2.1.2.2, Table 6-8, p. 484); therefore, the impacts can be classed as negligible.

Areas that are only used during the construction period will be recultivated after use (cf. application document, part D1.01, Chapter 6.2.1.2.2, Table 6-8, p. 488). The installation of anchor blocks is planned to prevent changes to the length of the pipeline caused by pressure and temperature fluctuations. These anchor blocks necessitate the introduction of allochthonous materials in the soil, which can be regarded as negligible in view of the size of the anchor blocks. Depending on the installations, 1.4 ha will be permanently rendered impermeable (individual foundations, pig station, buildings, roads) or 0.1 ha rendered partially impermeable (roadstone/macadam roads). This gives a site coverage factor of 0.26, which is clearly less than the maximum permissible site coverage factor of 0.8 under the provisions of the B plan no. 1 "Industrie- und Gewerbegebiet Lubminer Heide" (cf. the application document, Part D1.01, Chapter 7.2, Table 7-1, p. 759).

Due to the use of sacrificial anodes along the pipeline pipes, aluminium is precipitated as a hydroxide, which is not soluble in water and can therefore be deposited in the sediment bodies. The sacrificial anodes also result in the release of zinc, which due to the anoxic conditions in the seabed, reacts with sulphur to form inert zinc sulphide (cf. the application document, Part D1.01, Chapter 4.2.3, p. 759). This can to lead slightly increased local concentrations, which are too small to be measured for ecotoxilogical purposes and are therefore not relevant either. The release of other elements resulting from the sacrificial anodes is also negligibly small, since the proportion of other components is extremely low in the sacrificial anodes and a measurable increase in the concentrations of these substances in the surrounding sediment cannot occur. Releases of substances made of polyethylene or polyurethane materials (PE / PU) are similarly negligible, and not measurable. The PE or PU materials used have been deployed for many years in sensitive areas such as water management and have proved themselves there without any deleterious impacts on the water balance or drinking water being detected. However, the cooling of gases occurring in the trenched section due to the Joule-Thomson effect does not exceed one ΔT of 2 K at 20 cm under the seabed surface, so no relevant chilling occurs (cf. application document, Part I2.02, Chapter 4, p. 7 et seq.).

Therefore, harmful changes to the soil within the meaning of Section 2(3) BBodSchG likely to cause hazards, substantial adverse effects or substantial nuisance to individuals or the general public are not to be feared. The duty of care under Section 7 BBosSchG against bringing about harmful changes to the soil, e.g. by the

introduction of pollutants, has been met by appropriate avoidance and mitigation measures, and by ancillary provisions A.3.7.2, A.3.8.2 and A.3.8.6.

Therefore, there are no considerations under waste disposal legislation and soil protection that prevent the project.

B.4.8.4 Nature conservation and landscape management

B.4.8.4.1 Basic principle: Priority of avoidance

As a basic principle, priority is to be given to avoiding significant impairments to nature and the landscape by the intervening party (Section 13 BNatSchG). By emphasising the priority of the duty on intervening parties to avoid any significant impacts in the first sentence of Section 13, the BNatSchG embodies the nature conservation principle of preserving the status quo. *Guckelberger*, in: Frenz/Müggenborg, BNatSchG, Section 13 margin no. 17). It is not the intervention but rather the unnecessary adverse impacts from carrying it out which are subject to a mandatory duty of avoidance (*Gellermann*, in: Landmann/ Rohmer, Umweltrecht [Environmental Law], Section 13 BNatSchG, margin no. 8) This shows that the intervention rule is a nature conservation form of the principle of proportionality under constitutional law, which has greatly determined and shaped it (*Gellermann*, in: Landmann/ Rohmer, Umweltrecht, Section 13 BNatSchG, margin no. 8 with further references). The duty of avoidance applies within the specific planned project. Avoidance measures which partially entail a different project must be checked within the context of general sectoral considerations; measures such as cancelling the project completely, or more than a minor deviation from the spatial pipeline route are not demanded by the duty of avoidance (BVerwG [Federal Administrative Court], judgement of 16/12/2004, 4 A 11/04, juris margin no. 16).

B.4.8.4.1.1 Onshore avoidance measures

The avoidance measures for the onshore area are set out in the LBP (cf. application document, part G.01, p. 242 et seq.). They are therefore a constituent part of the final plan. There are no discernible aspects from this or the hearing to show that these measures would be inappropriate or inadequate. In its expert statement of 13/06/2017, the lower nature conservation authority of the Vorpommern-Greifswald rural district demanded a detailed description of the planned noise abatement measures during the noise-intensive preliminary commissioning, should this be planned for the breeding season for bats and birds. Allowance has been made for this by scheduling the pre-commissioning for outside the breeding season for bats and birds. This means that no special noise abatement measures are planned, apart from the occupational safety guidelines. In the event of any changes to the schedule, silencing measures will be developed in the execution plan for the specific compressor type selected. According to the present state of knowledge and state of the art, this limitation of the construction period represents an effective measure to avoid exceeding the sound limit of 47dB(A). Corresponding technical measures constituted the basis of the noise forecast (cf. application document, part I2.07). The project developer must inform the lower nature conservation authority of the Vorpommern-Greifswald rural district of any changes to the schedule (ancillary provisions A.3.8.1).

B.4.8.4.1.2 Offshore avoidance measures

In addition to the measures provided in the planning for avoiding and mitigating the impacts on the offshore ecosystem (cf. the application document, Part G.01, p. 239 et seq.) the following were examined at the instigation of StALU Vorpommern and its expert statement of 16/06/2017:

- continued use of existing shipping routes,
- more extensive restrictions on the speed of construction vehicles,
- guarantee and proof of compliance with the so-called 2 K criterion.

The continued use of shipping lanes shall be ensured by the project developer as far as this is possible in the light of a normal construction process, and has been stipulated as ancillary provision A.3.1.6. The legal basis for the ancillary provision is Section 31(5) WaStrG. This prevents or compensates for any impairment to the condition of the Federal waterway as required for shipping purposes or to the safety and ease of passage of the shipping traffic.

The request to restrict the speed of construction vehicles has not been accepted. Suction dredgers, or barges if mechanical dredgers are used, will be employed for transporting soil. The permissible transport speed has a direct impact on the number of necessary units of these vessel types. If the speed is substantially restricted, considerably more vessels must be mobilised. Furthermore, a larger number of vessels in the estuary would not only challenge the purpose of the speed restriction (calming) but would also increase the logistical outlay disproportionately. More than 29 vessels are already engaged in the dredging work for Nord Stream 2 within the 12-nautical mile zone. The local harbour capacities are already fully stretched in the event of bad weather. Coordination work with the construction operations of 50Hz would be considerably higher. Further detailed proof of compliance with the so-called 2K criterion is not justified, because such proof has already been provided as part of the ground temperature study (German summary in Part I2.02) and the cover heights necessary for compliance with the 2K criterion are guaranteed. Even under conservative conditions, at 20 cm under seabed surface a temperature difference greater than 2K is to be expected, thus complying with the so-called 2K criterion.

The offshore avoidance and mitigation measures provided for by HZE are met, as shown by the description in the compensation concept concrete folder (cf. application document, concretisation folder, offset concept, Chapter 2.2.1, p. 12).

B.4.8.4.2 Intervention

The project represents an intervention under Section 14(1) BNatSchG, but this an unavoidable intervention since natural gas can only be transported with the construction and operation of gas supply lines including the associated ancillary facilities.

Interventions in nature and landscape within the meaning of the BNatSchG are changes in the topography or use of areas, or changes in the ground water level associated with the active soil layer which may significantly impair the performance

and functioning of the natural ecosystem or landscape appearance (Section 14(1) BNatSchG). Relevant changes of this kind are actions, projects and measures that can affect the external appearance of a land surface. These include the construction of buildings or other structures, excavations or deposits or fillings (cf. e.g. BVwerG, judgement of 27/09/1990, 4 C 44/87, NVwZ 1991, 364; *Gellermann*, in: Landmann/ Rohmer, Umweltrecht, Section 14 BNatSchG, margin nos. 6 and 12 et seq.; *Schrader*, in: Giesberts/Reinhardt, BeckOK Umweltrecht, Section 14 BNatSchG margin no. 10) These changes impair the ecological interaction complex of a land surface, consisting of the factors of soil, water, air, animal and plant world including their diverse interactions, within the meaning of Section 14 subsection 1 BNatSchG, if individual factors among these or their ecological interaction is disturbed in a way that appears from an ecological view point to be a deterioration. An impairment can therefore be assumed in particular if populations of animal or plant species are deprived of the basis of their existence, the diversity of species decreases or the number of individuals in a species decreases. The act of intervention is not limited to these cases, however, but also extends to the consideration of any of these factors in isolation. The possibility alone of such an impairment is sufficient.

According to environmental standards, the area of the pipeline trench and the sedimentation and turbidity zones are to be regarded as (temporary) interventions within the meaning of Section 14 BNatSchG. This does not apply to the pipeline remaining in the seabed under the sediment inhabited by macrobenthos (or other organisms). The view of StALU Vorpommern in its expert statements of 12/06/2017 and 08/12/2017, according to which the change in the geological sequence of strata at the pipe trench is to be assessed as an intervention "notwithstanding the biotic yield function, at least with regard to the information function (pedogenesis)" is not shared by the plan approval authority.

The impacts on the bottom of the trench as a result of laying the pipeline and embedding it in imported gravel does not, in the view of the plan approval authority, affect the sequence of strata in the sediment in a way that could present itself as a deterioration according to environmental standards. The zone at a depth greater than 30 cm is anoxic (without oxygen), and therefore not inhabited by respiratory organisms. StALU Vorpommern also does not accept the existence of a (natural) biotic yield function, in other words the function of cultivation results, offshore. Regarding the information function (pedogenesis, "HzE 1999": potential land information), this does not exist in the offshore area, as can be the case in the terrestrial zone. The function of offshore seabed strata as a provider of information about events referred to by StALU does not incidentally affect the performance and functioning of the ecosystem or scenery within the meaning of the intervention rule in Section 14(1) BNatSchG.

This assessment is not contradicted by "HzE 1999" either. StALU Vorpommern refers to p. 36 "HzE 1999", according to which a functionality with a particular meaning is assigned to all natural and nearly-natural types of biotope and use. It follows from this that every impairment of such biotope and usage types is to be regarded as significant. In the view of the plan approval authority, not just the sediment as such, but also its significance as a habitat for species, in this case macrozooebenthos, belongs to the biotope and usage type relevant for an intervention within the meaning of Section 14 BNatSchG. Otherwise, the HzE would

have concentrated not on biotope and usage types, but rather on the sediment alone.

Furthermore, this would not correspond to the definition of intervention in Section 14 BNatSchG, under which the deterioration of the ecological interaction complex of an area is also relevant to the idea of intervention. The reference in the intervention rule to the restoration of "impaired functions of the natural balance ... to an equivalent value" (Section 15, subsection 2, 3rd sentence of BNatSchG) makes it clear that no significance can be attached to elements without any functional value (cf. VGH Kassel, decision of 20/03/2013, 2 B 1716/12, juris margin no. 86 on the intervention character of groundwater extraction in deeper, inactive soil layers). For this reason, actions that leave the surface topography unaffected, such as underground mining, are not regarded as changing the shape of land areas (*Schrader*, in: Giesberts/Reinhardt, BeckOK Umweltrecht, Section 14 BNatSchG margin no. 10). The BNatSchG only protects soils inasmuch as they can fulfil their function in the natural balance, as shown in Section 1 subsection 3, no. 2. Consequently, the presence of the pipeline in the seabed should not be assessed as an intervention.

In addition, according to No. 3.1 "HzE marine", pipelines, among other things, are on the one hand treated as permanently-acting interventions with the consequential losses of areas and habitats because they result in permanent changes (e.g. changes in the depth profile and sediment structure), sealing of the seabed (e.g. by structures) or impairment of other assets protected by the intervention rule (e.g. landscape appearance, faunistic functions). On the other hand, according to Table 1 of "HzE marine", underground pipelines can clearly also only be regarded as temporary if avoidance measures are observed in full. The precondition for assessment as a temporarily acting intervention according to "HzE marine" is that no technical installations remain at the intervention site (no. 3.2 "HzE marine").

This is the case here, because the pipeline remains in a depth zone of the sediment where no intervention takes place. If a restoration of cohesive substrates, such as till, is fundamentally impossible in the upper soil horizon, a biotope type of a similar kind will be restored that fulfils the same functions as the sediment before the intervention. In some places, even more favourable conditions for colonisation by macrozoobenthos will be created. The deliberations of the environmental impact assessment do not lead to any different conclusions (cf. application document, Part D.01, p. 475). The changes in the geological strata sequence are expected to have a local, permanent impact of low intensity, since the offshore bottoms in the relevant area here do not have soil horizons as onshore (no natural settled bottoms in the offshore area). The resulting structural and functional change is consequently minor.

Current administration practice is not to assess pipelines below the bioactive horizon as a permanent intervention (cf. p. 79 of the planning approval decision for the OWP Lubmin network connection - offshore route of 09/07/2015). As regards the planning approval decision of 21/12/2009 for the Nord Stream Pipeline (cf. p. 132 of the LBP, Part C.3), the plan approval authority again understood that the presence of the pipeline was assessed as a permanent intervention with an impact factor of 1 (and deducted the trench width in this respect). However, this was done in relation the "loss of natural communities at the structure", which has turned out to be incorrect based on the present state of knowledge.

Ultimately, in the offshore area, it is correct to regard only the areas affected by the trenching (plus sedimentation and turbidity) as a temporary intervention.

B.4.8.4.3 Extent of the Intervention

In addition to NatSchAG M-V, in Mecklenburg-Western Pomerania the "Hinweise zur Eingriffsregelung" from 1999 (HzE 1999) issued by the Landesamt für Umwelt, Naturschutz und Geologie M-V also exist as a yardstick for assessing interventions in nature and landscape. HzE 1999 remains the regulation to be applied for onshore interventions in M-V. These "Hinweise zur Eingriffsregelung" (HzE) from 1999 constitute for Mecklenburg-Western Pomerania a general and binding basis for not just assessing unavoidable interventions in nature and landscape under the BNatSchG, but also for deriving the offset requirement and for measuring compensation or substitution measures.

In addition to "HzE 1999", on 07/02/2017 the Mecklenburg-Western Pomerania Ministry of Agriculture and the Environment passed the "HzE marine" as a special assessment aid and guidance for investigating and assessing interventions, avoidance measures and determining compensation measures when dealing with interventions in Mecklenburg-Western Pomeranian territorial waters under nature conservation laws. This "HzE marine" entered into force on 01/03/2017. The letter from the Ministry of Agriculture and the Environment of 07/02/2017 states: "Projects already in the approval phase will be continued to the end under the previous regulations, provided that the project developer does not apply for a change to the new regulations. The regulations are the result of a technical process with the intense participation of various nature conservation bodies and water authorities and the Stralsund Mining Authority". According to the letter sent to the nature conservation and water protection authorities of the State of Mecklenburg-Western Pomerania, "HzE marine" represents the latest criterion in force for assessing offshore interventions. The preliminary remarks to the HzE state: "However, use of the regulations for offshore areas is subject to certain specific factors, however. In addition to the "Hinweise zur Eingriffsregelung Mecklenburg-Vorpommern", assessment aids and notes on investigating and assessing interventions, on avoidance measures and on determining compensation measures are given below."

StALU Vorpommern points out in its expert statement of 08/12/2017 (p. 5) that: "The regulations are the result of a technical process with the participation of various authorities, introduced by decree of the LM of 07/02/2017 to 01/03/2017 and therefore fundamentally binding on nature conservation authorities. HzE marine is intended to achieve uniform application with legal certainty of the regulations on interventions in the territorial waters of the Federal State of Mecklenburg-Western Pomerania (cf. LM 07/02/2017). The regulation has a direct external impact on the operations of the nature conservation authorities. Furthermore, the principle of equal treatment shall be taken into account."

According to this, interventions caused by projects in nature and landscape within the meaning of BNatSchG and the resulting offset requirement offshore must always be investigated and assessed using the "Hinweisen zur Eingriffsregelung für den marinen Bereich (HzE marine)". These bind authorities in the respective approval proceedings since their entry into force in 01/03/2017. As shown in the transition

regulations in the publication by the Mecklenburg-Western Pomerania Ministry of Agriculture and the Environment, only projects for which the approval procedure had already started are to be conducted to the end under "HzE 1999"; a change to "HzE marine" is possible in these cases if the project developer submits a corresponding application. In addition, the plan approval authority considers the decisive factor to be which criterion under Section 15 BnatSchG applies at the time of the plan approval.

In view also of the substantial differences in calculating the offset requirement under HZe 1999 and "HzE marine", clarification was needed as to the extent to which "HzE 1999" or "HzE marine" is suitable for assessing interventions in the offshore area adequately in accordance with the statutory requirements of Sections 13 et seq. BNatSchG. According to the case law of the BVerwG (judgement of 06/11/2012, 9 A 17/11, BVerwGE 145, 40; juris margin no. 145 et seq.), a comprehensible implementation of the avoidance, compensation, balancing and substitution obligations under the intervention regulations under nature conservation law presupposes a sufficient degree of quantification of both the impact of the intervention and the offset measures to be disclosed in the planning approval decision. Now as before, neither Federal law guidelines nor generally-accepted scientific methods exist for assessing the extent of lost and compensation areas; therefore no objection can be raised if administrative regulations – such as "HzE marine" or "HzE 1999" – seek to establish a consistent administrative practice (cf. BVerwG, judgement of 15/01/2004, 4 A 11.02, juris margin no. 56; judgement of 6/11/2012, 9 A 17/11, BVerwGE 145, 40; juris margin no. 145 et seq.; judgement of 11/01/2001, 4 A 13.99, juris margin no. 55). The quantifications carried out in the planning approval decision must be justifiable individually from a nature conservation point of view, and must not rely on an assessment method that turns out to be inadequate or even unsuitable to meet the statutory requirements (BVerwG, judgement of 31.01.2002, BVerwG 4 A 15.01, Buchholz 407.4 Section 17 FStrG no. 168 p. 117; judgement of 22/01/2004, BVerwG 4 A 32.02, Buchholz 407.3 Section 5 VerkPBG no. 15 p. 30; judgement of 09/06/2004 op. cit. p. 84 and judgement of 18.03.2009, 9 A 40.07, Buchholz 407.4 Section 9 FStrG no. 16).

Consequently, it must be decided from the scientific nature conservation aspect whether the calculation of the amount of compensation under "HzE marine" represents an inadequate or unsuitable means of ensuring compensation corresponding to the type and intensity of the specific intervention. The plan approval authority shares the view of StALU Vorpommern in its expert statement of 08/12/2017, according to which, in the light of the basic principles mentioned above, the decision on the application of the rules available for selection (HzE 1999 or "HzE marine") is ultimately one to be taken by the plan approval authority.

For the plan approval authority, there is no reason to assume that the basic principles expressed in "HzE marine" provide a quantitatively or qualitatively inadequate evaluation of the intervention and compensation (cf. BVerwG, judgement of 06/11/2012, 9 A 17.11, juris margin no. 147 on this assessment criterion). It should be emphasised at the outset that "HzE marine" takes into account the special features of interventions in the offshore area for the first time. These lie above all in the fact that due to the retention or restoration of sediment structure, soil profile and communities, autogenic processes come into play that lead to a restoration of the functioning of the natural balance impaired in the course of the intervention.

Mathematically this has a major influence, in that offshore biotopes are no longer all assigned the same highest biotope number as in "HzE 1999", (cf. Table 2, p. 95) and therefore correspondingly an offset value of at least 8 is to be set as the coefficient when calculating the KFÄ. Instead, Annex 1 to "HzE marine" lists scientific nature conservation ratings, mainly from 0 to 3, for the individual offshore biotopes. This results in "average biotope values" between 1 and 6 as coefficients to be set in the calculation of the KFÄ. These differing treatments of individual biotope types are also appropriate, because only in this way can the areal extent of a biotope type, its endangerment and its regenerational capability be taken into account. Furthermore, under "HzE marine" all impairments which finish 15 years at the latest after the start of the intervention are regarded as temporary and not permanent (HzE marine, no. 3.2) if the stated avoidance and mitigation measures are observed and maintained. The biotopes affected by this are marked accordingly in Annex 1 to "HzE marine". The temporary nature is taken into account in "HzE marine" by a time limitation factor, calculated as the ratio of the regeneration times of regeneration stage 1 (regeneration in a period of up to 15 years) and regeneration stage 2 (period of up to 150 years) with a value of 0.1 (HzE marine, no. 5.9). The offset requirement is reduced accordingly to a tenth for the affected biotopes. HzE 1999 provided in this respect that a (lesser) intensity and regenerational capability is taken into account by a coefficient. This is normally higher than the time limitation factor of 0.1 in "HzE marine". Furthermore, in the case of temporary interventions, no location factor (from 1.25 to 1.5 taking into account the impact on conservation areas, cf. "HzE marine", Section 5.3 p. 9, Section 5.9 p. 13) should be taken into account.

HzE marine refers to various monitoring results as grounds for the updated method, among other things. The Nord Stream monitoring results also support a reduction in the offset requirement compared to comparable interventions on land. In view of the fact that the impaired offshore functions are available again to the natural balance after a relatively short period, the approach of lower compensation value figures or "average biotope values" seems to be correct to the plan approval authority.

Moreover, a comparison of the criteria of other offshore evaluation bases shows that these roughly correspond to a calculation under "HzE marine" and that an offset under "HzE 1999" would be several multiples larger. A rough initial assessment by the IfAÖ on 15/11/2017 on the "Application of further intervention control models for the construction and operation of the Nord Stream 2 pipeline system" showed that both the model used in the AWZ for calculating the offset requirement and the nature conservation orientation framework applied in Lower Saxony territorial waters produced a lower offset requirement than that given under "HzE marine".

The plan approval authority, in light of these facts and allowing for the fact that the nature conservation authorities of the state of Mecklenburg-Western Pomerania consider the calculation of the intervention extent according to "HzE marine" for the offshore area as correct and binding upon them, considers that "HzE marine" should be taken as the basis here as well for calculating the extent of the offshore intervention.

The plan approval authority does not consider a separate application to be necessary for this, because the plan approval authority has to base its assessment of the extent of the intervention on a technically correct evaluation criterion,

regardless of such an application. Notwithstanding this, the project developer has submitted such an application.

B.4.8.4.3.1 Landfall site - assessment under "HzE 1999"

Chapter 10.2, p. 26 et seq. of the landscape conservation and management plan describes the assessment of the extent of the onshore intervention under "HzE 1999". Based on conflict analysis, the utilisation of biotope structures and soils and the areas used for the pig receiving station and a share of the ring road during the construction period were assessed as interventions. In contrast, the LBP shows that interventions in faunistic functional relationships through impairment of breeding bird and bat habitats due to construction and facility-related works can be largely precluded by implementing avoidance and mitigation measures (cf. application document, Part G.01, Chapter 10.2.5, p. 245).

Compensation for lasting conflicts under species protection law resulting from the destruction of a breeding ground for common starlings and of staging and breeding grounds for bats (common and soprano pipistrelles) through project-related land usage will be effected by the implementation of compensation measures (CEF measures) brought forward (cf. application document, Part G.01, Chapter 9.3, p. 245 et seq.), and not included in the quantitative intervention balance.

Areas of intervention that were taken into account as affected by the utilisation of biotope structures and soils were the areas for the microtunnel launching shafts, the storage and assembly area south of the pig receiving station operating area, and an area to the east originally planned as construction site offices and a car park, which are planned outside the actual operating areas and therefore not affected by facility-related intervention works.

According to the description in the landscape conservation and management plan, work-related interventions on the operating area of the pig receiving station and on the shared part of the ring road take the form of full or partial sealing of biotopes and of overimprinting of natural biotope structures.

The following biotope types are affected by the interventions: pine forest dry to cool locations, ruderal herbaceous meadows and creeping grasses, fallow areas used for traffic, and industrial areas.

The offset requirement for onshore interventions is given by a combination of the following factors under "HzE 1999":

- the size of each affected area of a biotope,
- the functional value of the affected area at the time of the planned intervention (offset value figure based on the rating of the affected biotope type)
- Due to the project's distance of less than 50 m from the sources of disturbance or areas already adversely affected, a correction factor to take prior adverse effects into account (obstruction of open space) of 0.75 has been included.
- Effective intensity of the intervention (effect factor according to the intensity of the impairment)
- Factor for taking planned partial or complete sealing into account

The result in the LBP was that an offset requirement of 30.6278 ha for onshore interventions in biotope structures was calculated.

For the construction of a blow-out unit at the pig receiving station up to 30 m high, the State uniform method of "Hinweise zur Eingriffsbewertung und Kompensationsplanung für Windkraftanlagen, Antennenträger und vergleichbare Vertikalstrukturen" (Notes on evaluating interventions and compensation planning for wind turbines, antenna masts and comparable vertical structures) (hereinafter Antenna Mast Guidelines, LUNG M-V 2013) for the evaluating offset requirements in the landscape was used. For an impact zone of 46 ha, derived from the installation height, an offset requirement of 0.0295 ha for interventions in the landscape was established in compliance with the antenna mast guidelines, taking into account the areas with an obstructed view, the conservation importance of the landscape view area and the degree of impairment. Allowance was made when determining the area with an obstructed view for overlaps with the impact zone of four planned chimneys at the natural gas receiving station.

For onshore interventions, the result is a total offset requirement of 30.66 ha, based on "HzE 1999".

B.4.8.4.3.2 Offshore area - assessment under "HzE 1999"

Notwithstanding the fact that in the opinion of the plan approval authority, "HzE marine" is authoritative for assessing the extent of the offshore intervention, the project developer has also assessed the intervention using "HzE 1999". According to the landscape conservation and management plan (LBP) submitted by the project developer for the hearing, the use of HzE1999 results in a total offset requirement of 2,154 ha for offshore interventions (cf. application document, Part G.01, Chapter 11.1, p. 279 et seq.). The offset value figure at the pipe trench of 10.5 to 13 was adopted here, similar to the Nord Stream project. Based on corresponding indications, the calculation was revised in the submitted supplementary offset concept, where an offset value figure of 8.5 was taken for the total area of the offshore interim storage site instead of the 2.5 used so far in the calculation. This increases the offset requirement from about 994 ha to 3,148 ha KFÄ (cf. supplementary volume: Concrete specifications, no.1, Chapter 2.1.3, p. 11).

StALU Vorpommern put forward the following in its calculation of the extent of the intervention in its expert statements of 12/06/2017 and 08/12/2017: taking the seabed into account with a pipeline intervention area with impact factor = 1 instead of 0.8. According to the expert statement of 08/12/2017 from StALU Vorpommern, an offset requirement of some 3,300 ha arises from this alone (expert statement of 08/12/2017, p. 4 below). An exact recalculation shows that, even taking into account the pipeline in the seabed, the offset requirement would increase from 61.23 ha to 3,209 ha KFÄ. However, as set out above, according to the assessment by the plan approval authority the pipeline left in the seabed is not to be regarded as an intervention within the meaning of Section 14 BNat.

Moreover, StALU Vorpommern noted that in the submitted expert assessments (LBP), natural regeneration processes were quantified on a biotope type basis over

the performance factor both in the area of the restored pipe trench surface and in the sedimentation and turbidity impact areas. This approach deviates from the Nord Stream method. In the Nord Stream project, no performance factor was taken into account for the gradual activity complexes of turbidity, sedimentation and the 10-metre zone around the surface-laid pipeline. With Nord Stream, the performance factor was applied solely to the area of direct impairments (pipe trench and dumping site where restoration measures were undertaken) and not in the turbidity and sedimentation zones.

The performance factor is allocated as a deduction as part of the calculation of the value of a compensation measure, justified on the basis that the offset measure is carried out in the project's impact area or existing man-made structures. The magnitude of the performance factor is given by 1 - impact factor (cf. p. 105 "HzE 1999", footnote 1). This translates into practice when calculating the offset requirement as follows: the sediment at the pipe trench is mainly restored. This is treated as an offset measure due to its nature, so that the intervention at the pipeline trench would be fully compensated. Since this offset takes place at the intervention location (pipe trench), a performance factor of 0.2 is used. Therefore, the performance factor reflects the regeneration time after restoration of the pipe trench, in other words the period required for the biotope completely to completely fulfil its original functions in the habitat in question again. The performance factor therefore reduces the offset provided by the restoration. Consequently, an offset requirement remains for the pipe trench that has to be met in some other way. In addition, there is an offset requirement which is initiated in the sedimentation, turbidity and 10-metre zone around the surface-laid pipeline.

According to the Nord Stream 2 approach, the offset (taking into account the various performance factors from 0.2 to 0.9) extends to include both the pipeline trench and the area of sedimentation, turbidity and the 10-metre zone around the surface-laid pipeline. The reason for this is that, among other things, it was found as part of the Nord Stream monitoring that regeneration within the sedimentation and turbidity zones took place within a very short time (NORD STREAM OFFSHORE-MONITORING 2011, P. 172 ET SEQ.; NORD STREAM OFFSHORE-MONITORING 2012, P. 171 ET SEQ.). As a result, when the application documents for the Nord Stream 2 pipeline system were drawn up, it was assumed that the impact would only be entirely local, short-term and of low intensity (cf. application document, Part G.01, Chapter 6.2, p. 52 et seq.). The conclusion is also drawn in Chapter 8.2.1 of the examination under biotope protection law (cf. application document, part F.01, p. 80) that turbidity plumes and sedimentation from laying the Nord Stream 2 pipeline will have a localised low-intensity impact, so that it can be assumed that the biotopes will be restored to their full extent immediately after the construction period. Consequently, there will be no lasting impairment to the functions of the natural balance.

Due to the use of backhoe dredgers, the impact from sedimentation and turbidity will be further reduced compared to the Nord Stream project. The use of special techniques (reverse dredging, diffusors) when backfilling the pipe trenches ensures that the sediment remains mainly in the pipe trench, thereby reducing the impacts of sedimentation. Backfilling the pipe trenches has a positive effect on reducing the impact caused by sedimentation and turbidity. This fact is also taken into account by the performance factor for sedimentation and turbidity.

The differentiation in the impact factor for soft and hard bottoms for sedimentation assumed in the project developer's calculations and challenged by StALU Vorpommern in its expert statement of 12/06/2017 is based on the following assumptions, which are accepted by the plan approval authority: temporary impacts on the benthos by lateral deposition of sediment and an increased concentration of suspended sediment occur locally, particularly where there are sandy soils. An impact factor of 0.3 is therefore set here. Cohesive material generally gives rise to less suspended material than sandy dredged material when loosened, and loose fine-grained or larger fractions sediment quickly (cf. application document, Part G.01, Chapter 8.1.1.2, Table 8-2, p. 108 et seq.). Backhoe dredgers are generally envisaged for excavating cohesive and mixed soils and for dredging in shallow waters, so the impact of sedimentation and turbidity in hard bottom areas is lower and has therefore only been given an impact factor of 0.1

If the request by StALU Vorpommern were to be allowed and the performance factor for sedimentation and turbidity and the 10-metre zone around the surface-laid pipe were set to zero, this would trigger a further offset requirement of 1,323 ha KFÄ. This would then result in a total offset requirement under "HzE 1999" for marine interventions of 4,531 ha KFÄ. This would correspond roughly to the offset requirement that was calculated for the Nord Stream project. These figures make it clear in the view of the plan approval authority that compared to "HzE marine" and other regulations applied offshore, an assessment of the extent of the intervention using "HzE 1999" in the offshore area is disproportionate.

Whether complete restoration is possible after four years at the most is also questioned. Against the background of the purely forecast estimate by the expert assessor, this would depend on the validity of the project developer's data. The plan approval authority has examined the project developer's assumption and the basis of the data given for it. The existing research results allow a very high forecast reliability for the offshore biotopes affected by the project. The statements in the offshore monitoring report for Nord Stream 2016 at first seem irrefutable. This 2016 report states, in relation to the Bay of Greifswald, that at least six years after the start of construction work there are no differences between the benthic communities at the pipe trench and those at the reference areas unaffected by construction work, and that therefore these are clearly subject to the same dynamics (cf. NORD STREAM OFFSHORE MONITORING 2016, P. 58). Furthermore, according to Chapter 5.5.3.1 "Current status of macrozoobenthos populations along the Nord Stream 2 route - 12 nautical-mile zone" in the Bay of Greifswald in spring 2016, soft-shelled clams with lengths between 3 and 42 mm were recorded (cf. Fig. 5-55). In the offshore interim storage site, soft-shelled clams with lengths between 3 and 39 mm have been documented (cf. Fig. 5-59).

Moreover, this corresponds to the very high assessment standards of Nord Stream Monitoring Deutschland 2010 to 2014, which are available to the public. It is based thematically at least on STUK standards (BSH 2007[110]). The annual reports present the survey results in accordance with the guidelines of the responsible permitting authorities for the monitoring concept (NORD STREAM MONITORING CONCEPT GERMANY 201, NORD STREAM CONSTRUCTION MONITORING 2010, P. 22 ET SEQ.). Other

[110] BSH 2007: Standard - Investigation of the Impacts of Offshore Wind Turbines on the Marine Environment (StUK 3), BSH February 2007: 58 p., Hamburg und Rostock.

investigation methods not included in the STUC mostly represent the latest measurement methods (e.g. turbidity measurements by ADCP and aerial photo analysis). The data collection and analysis methods are described in detail in the monitoring reports (cf. NORD STREAM CONSTRUCTION MONITORING 2010, p. 61 et seq., p. 97 et seq., p 108 et seq, p. 122 et seq.; Nord Stream Pipeline OFFSHORE-MONITORING 2011, P. 22 et seq., p. 93 et seq., p. 284 et seq., p. 331 et seq., p. 362 et seq., p. 400 et seq., p. 424 et seq, p. 459 et seq.; Nord Stream Pipeline OFFSHORE-MONITORING 2012, P. 23 et seq., p. 86 et seq., p. 276 et seq., p. 347 et seq., p. 446 et seq., p. 474 et seq., 509 et seq.; Nord Stream Pipeline OFFSHORE-MONITORING 2013, P. 37 et seq, p. 205 et seq., p. 284 et seq., 357 et seq., p. 421 et seq., p. 454 et seq., p. 494 et seq.; Nord Stream Pipeline OFFSHORE-MONITORING 2014, P. 16 et seq., p. 41 et seq., p. 92 et seq.). The Nord Stream 2010-2014 monitoring reports also meet the requirements for scientific data analysis.

A total of three comprehensive scientific studies in the last 20 years on the regeneration capacity of benthic colonisation in the sea area ofthe Pomeranian Bay are available and justify similar assumptions:

- TRUMP Project by the "Institut für Ostseeforschung Warnemünde" [Institute for Baltic Sea Research] (1993-1997, e.g. Powilleit & Kube 1999[111], Effects of severe oxygen depletion on macrobenthos in the Pomeranian Bay (southern Baltic Sea): a case study in a shallow, sublittoral habitat characterised by low species richness. J. Sea Res., 42: 221-234)
- Coastal monitoring by LUNG MV (continuous data collection, some 100 benthos samples analysed since 100)
- Nord Stream / Nord Stream 2 monitoring (since 2006, Nord Stream monitoring reports 2010-2014, 2016 follow-up investigation)

There are at least two extensive surveys of the Bay of Greifswald from the last 20 years:

- Monitoring for the expansion of the eastern approach to Stralsund of the GDWS (WSA Stralsund 2005-2011, IfAÖ 2013: Monitoring of the benthic communities (macrozoobenthos) at the Strela Sound for the “7.50 metre expansion of the eastern approach to Stralsund” project - Brief report on the investigation years 2005 to 2011.
- Nord Stream / Nord Stream 2 monitoring (since 2006, Nord Stream monitoring reports 2010-2014, 2016 follow-up investigation)

In addition, further applied investigations from the monitoring of sand extraction from comparable biotopes by the state of Mecklenburg-Vorpommern after partially-similar interventions are available (e.g. accompanying benthic ecological investigations to sand sampling at the GRAAL-MÜRITZ II sand storage site in January 2003. Summary of monitoring results from November 2002 to August 2008, commissioned by FUGRO Consult GmbH, Greifswald branch). There are also many surveys of the impact of interventions with other kinds of permanent impairments (dumping, stationary gravel extraction, e.g. DYNAS projects 2000-2003 (Harff. (Ed.) 2006: Project: DYNAS "Dynamik natürlicher und anthropogener Sedimentation; Vorhaben:

[111] Powilleit & Kube (1999): Effects of severe oxygen depletion on macrobenthos in the Pomeranian Bay (southern Baltic Sea): a case study in a shallow, sublittoral habitat characterised by low species richness. J. Sea Res., 42: 221-234.

Sedimentationsprozesse in der Mecklenburger Bucht" [Dynamics of natural and anthropogenic sedimentation, Project: Sedimentation Processes in the Bay of Mecklenburg], Phase II, Final Report. Research projects by the Bundesministerium für Bildung und Forschung [Federal Ministry of Education and Research], which indirectly allow general conclusions to be drawn regarding the regeneration process (keyword: sediment parameters). In addition, many scientific studies exist from the past 30 years on the regenerational capacity of macrozoobenthos in the western Baltic Sea above the halocline after natural disturbances, with constant sediment ratios (O_2 deficiency, salinity changes due to salt water inflows, sediment redistribution, ice drift), which were already used as the basis for the Nord Stream pipeline planning approval. The detailed Nord Stream / Nord Stream 2 monitoring not only confirmed these forecasts (Nord Stream OFFSHORE MONITORING 2016, p. 58), but also completely clarified the uncertainties in the forecasts caused by existing technological aspects at the time.

Both the sand extraction for coastal protection in M-V from 2002 and the genesis of the offshore interim storage site for the Nord Stream project were accompanied by benthos monitoring programmes lasting several years. All the investigations confirm a rapid regeneration of benthic colonisation of sandy areas in water depths up to 15 m within 2 to 4 years This also applies to those few species occurring there with a lifespan of several years, as these are frequently mobile (cockles, Baltic clams, polychaeta). Only soft-shell clams with a shell length greater than 2 cm are stationary throughout their lives. Animals of this size are 3 to 4 years old, depending on the sea area (the shell growth is primarily a function of the salinity). Individuals up to 4 years old are regularly drifted passively by bedload transport, so that a rapid adaptation of the age structure between affected and unaffected areas can also be expected with this species. Many of the sand areas in the territorial waters of MV investigated in relation to the age structure of soft-shell clams revealed the presence of individuals from 7 to 8 years old. Older individuals were seldom found. Accordingly, the adaptation of the age structure takes a maximum of 3 to 4 years. It can also take place more rapidly in heavily exposed sea areas (e.g. the Oderbank, KUBE 1996).

In the survey of the regeneration of a sandy area off Graal-Müritz at a water depth of approximately 15 metres after the extraction of sand for coastal protection (benthic ecological surveys to accompany sand extraction at the "GRAAL-MÜRITZ II" sand storage site in January 2003: Summary of monitoring results from November 2002 to August 2008, In the commission of FUGRO Consult GmbH, Greifswald branch), quoted in "HzE marine" (2017), the regeneration of the soft-shell clam age structure took a maximum of 5 years (no sand samples were taken in the 3rd to 4th years after the sand extraction, however). The examined biotope is similar to the Nord Stream pipe trench in the Pomeranian Bight. The interventions are slightly different:

- The impairment of the seabed surface and the water depth lasted longer (levelling of suction dredging traces)
- The impairment was over an area and not linear.

Unlike Nord Stream, the regeneration process off Graal-Müritz was not affected by an O_2 shortage. Consequently, unlike the Nord Stream regeneration process, in this survey there were enough medium-sized soft-shell clams available for the bed-load import, and these colonised the intervention area after only 1 to 2 years. According

to the plan approval authority, this is sufficient evidence to show that at a conservative assessment, the regeneration of the relevant biotopes here will be complete after 4 years.

B.4.8.4.3.3 Offshore area - assessment under "HzE marine"

According to the concrete specifications folder submitted by the project developer, there is an offshore offset requirement for Nord Stream 2 of 363.31 ha results, according to "HzE marine" (cf. supplementary volume: Concrete specifications, no. 1, Chapter 2.2.2.3, p. 40. Table 2-21).

StALU Vorpommern also points out in the context of the "HzE marine" assessment that the presence of the pipeline on the seabed must be considered as permanent and therefore an impact factor of 1 must be applied (instead of 0.8 as before for the overlying surface of the pipe trench). According to the expert statement by StALU of 08/12/2017, it can be assumed that at a rough estimate, this would increase the offset requirement calculated by the environmental assessors by some 40 ha KFÄ, from 360 ha KFÄ to about 400 ha KFÄ. [For comparison, the "unit" KFÄ was used thereafter for the offshore interventions by the plan approval authority, in contrast to the "unit" EFÄ, which is used by "HzE marine" for the intervention. Use of the "unit" KFÄ does not change the magnitude of the calculated area of the intervention.] An accurate recalculation shows that the offshore offset requirement would only increase by 25.91 ha KFÄ to 389.22 ha KFÄ. As already stated (Section B.4.8.4.2 above), such an increase in the extent of the intervention is unjustified, because the pipeline under the inhabited sediment area should not be regarded as an intervention.

Furthermore, StALU Vorpommern proposes that permanent gradual impairments of biotopes in the region of the trench should also be assumed for soft-bottom biotopes, in other words any time-limiting factor should be ignored and instead an impact factor of 0.6 applied instead according to Table 3 "HzE marine" in relation to the restoration of an identical substrate, and to that extent an additional offset requirement of approx. 120 ha KFÄ taken into account. The recalculation result shows that this would mean an additional offset requirement of 98.91 ha. In total therefore, taking the assumptions of StALU Vorpommern as a basis, under "HzE marine" an offset requirement of 488.13 ha KFÄ arises (in other words slightly less than that roughly calculated by StALU Vorpommern, but still taking the pipeline areas into account twice with 520 KFÄ).
This contradicts the clear assumption in "HzE marine", which in Table 4, no. 1 explicitly describes "Trench Works with backfilling of an identical substrate in soft sediments (silt, sand, gravel)" as interventions whose impact is limited in time. A more extensive offset requirement does therefore not arise from this. The differentiation in the impact factor for sedimentation for soft and hard bottoms by StALU Vorpommern in the expert statement of 12/06/2017, with the consequent waiving of a time limit for the effects on sedimentation in the area of soft bottoms, cannot be followed in view of the low susceptibility of soft bottoms compared to hard bottoms as regards sedimentation, and has therefore not been considered. Moreover, only mechanical dredgers are used for the Natura 2000 areas (cf. M4 avoidance and mitigation measures).

Therefore, the calculation of the scope of the intervention according to "HzE marine" is as follows:

Table 10: Calculation of the offset requirement for the pipeline route in M-V territorial waters - pipe laid in a trench

Biotope	Time limitation possibility	Rating (as per Annex 1)	Average biotope value	**Temporary interventions in offshore soft bottoms**									
				Trench area [m²]	Time limitation factor	Temporary interventions offset requirement [m² KFÄ] Trench in soft bottoms	Sedimentation 25 m on both sides [m²]	Time limitation factor	Temporary interventions offset requirement [m² KFÄ] sedimentation	Turbidity 50 m on both sides [m²]	Time limitation factor	Temporary interventions offset requirement [m² KFÄ] turbidity	Total [m²]
NIB*	**x**	1	1.5	3,389	0.1	508	6,199	0.1	930	18,282	0.1	2,742	**4,181**
NIF	**x**	2	3	281,668	0.1	84,500	577,393	0.1	173,218	1,153,837	0.1	346,151	**603,869**
NOB*	**x**	2	3	97,846	0.1	29,354	82,992	0.1	24,898	167,655	0.1	50,297	**104,548**
NOF	**x**	1	1.5	878,861	0.1	131,829	2,451,111	0.1	367,667	3,252,422	0.1	487,863	**987,359**
													1,699,957
													170.00 ha

Biotope	Time limitation possibility	Rating (as per Annex 1)	Average biotope value	**Interventions with function impairment in biotopes without the possibility of time limitation**									
				Trench area [m²]	Time limitation factor	Interventions offset requirement [m² KFÄ] Trench in hard	Sedimentation 25 m on both sides [m²]	Time limitation factor	Interventions offset requirement [m² KFÄ] sedimentation	Turbidity 50 m on both sides [m²]	Time limitation factor	Temporary interventions offset requirement [m² KFÄ] turbidity	Total [m²]
NIG*	**-**	3	6	16,021	0.8	76,901	39,811	0.4	95,546	81,708	0.1	49,025	**221,472**
NIN*	**-**	3	6	0	0.8	0	0	0.4	0	357	0.1	214	**214**
NIO	**-**	3	6	2,718	0.8	13,046	4,512	0.4	10,829	4,069	0.1	2,441	**26,317**
NIR*	**-**	3	6	3,609	0.8	17,323	11,109	0.4	26,662	25,707	0.1	15,424	**59,409**
NOG*	**-**	3	6	0	0.8	0	392	0.4	941	3,507	0.1	2,104	**3,045**
NON*	**-**	3	6	4,118	0.8	19,766	12,423	0.4	29,815	11,105	0.1	6,663	**56,245**
NOR*	**-**	3	6	73,695	0.8	353,736	126,838	0.4	304,411	253,628	0.1	152,177	**810,324**
													1,177,025
													117.71 ha

* statutorily protected biotopes

Table 11: Calculation of the offset requirement for the pipeline route in M-V territorial waters - surface-laid pipeline

Biotope	Time limitation possibility	Rating (as per Annex 1)	Average biotope value	Location factor	Interventions with function impairment								Total
					2 pipelines [m²]	Impact factor	Sealing additional factor	Sealing equivalent intervention area [m²]	Pipelines equivalent intervention area [m²]	10 m each side - various influences [m²]	Impact factor	Reef effect equivalent intervention area [m²]	
NOF	**x**	1	1.5	1.25	18,146	1	0.5	4,839	**22,985**	130,977	0.5	98,233	121,218 m²
NoS	**x**	2	3	1.25	6,274	1	0.5	837	**7,110**	22,320	0.5	33,480	40,590 m²
NOG*	**-**	3	6	1.25	0	1	0.5	0	**0**	446	0.5	1,338	1,338 m²
												* statutorily protected biotopes	**163,146 m²**
													16.31 ha

Table 12: Calculation of the offset requirement for the pipeline routes in M-V territorial waters - interim storage site

Biotope	Time limitation possibility	Rating (as per Annex 1)	Average biotope value	Interventions with function impairment						Total [m²]
				Interim storage area [m²]	Time limitation factor	Temporary intervention equivalent intervention area [m² KFÄ] for interim storage area [m²]	Turbidity 50 m [m²]	Time limitation factor	Temporary interventions area equivalent [m² KFÄ] for turbidity [m²]	
NOF	**x**	1	1.5	3,093,698	0.1	464,055	579,646	0.1	86,947	**551,002**
										55.10 ha

Table 13: Calculation of the offset requirement for the pipeline routes in M-V territorial waters - AWTI and cable crossings

Biotope	Time limitation possibility	Rating (as per Annex 1)	Average biotope value	Additional location factor	Interventions with function impairment					
					Rock placement area [m²]	KFÄ [m²]	WF	Sealing additional factor	Sealing KFÄ [m²]	KFÄ total [m²]
AWTIs KP 54.4										
NOF	x	1	1.5	1.25	13,750	25,781	1	0.5	6,875	**32,656**
Cable crossings(KP 50.703 to KP 51.203)										
NOF	x	1	1.5	1.25	3,920	7,350	1	0.5	1,960	**9,310**
										41,966
										4.20 ha

This gives the following overall picture:

Table 14: Summary of calculations according to "HzE marine"

	Plan approval calculation	StALU Vorpommern calculation	
Calculation according to "HzE marine"		Pipeline IF = 1	Pipelines IF = 1, trench IF=0.6
Laying in trench	287.70 ha	313.61 ha	412.52 ha
Interim storage area	55.10 ha	55.10 ha	55.10 ha
Surface-laid pipelines	16.31 ha	16.31 ha	16.31 ha
AWTI and cable crossings	4.20 ha	4.20 ha	4.20 ha
Total	363.31 ha	389.22 ha	488.13 ha
		+25.91 ha	+124.82 ha

Therefore the extent of offshore interventions amounts to 363.31 ha KFÄ.

B.4.8.4.4 Compensation and substitution measures

Under Section 15, subsection 2, sentences 2 to 4 of BNatSchG, the intervening party is obliged to compensate for any avoidable adverse impacts through nature conservation and landscape management measures (compensation measures) or substitute them in some other way (substitution measures). An adverse impact shall be considered to have been compensated as soon as the impaired functions of the natural balance have been restored in an equivalent way and the landscape appearance has been restored or re-designed in a manner consistent with the landscape. An adverse impact shall be considered to have been substituted as soon as the impaired functions of the natural balance, in the relevant natural region, have been restored to an equivalent value and the landscape appearance has been re-designed in a manner consistent with the landscape. Under the wording of Section 16 subsection 1 BNatSchG, advance offset measures already taken are to be recognised as full compensation and substitution measures. The provisions of ÖkoKtoVO M-V are to be observed when implementing eco-account measures.

B.4.8.4.4.1 Offsetting onshore interventions

The result of the landscape conservation and management plan set an offset requirement of 30.6278 ha for onshore interventions in biotope structures (Section B.4.8.4.3.1). If the measures envisaged as part of the offset planning for the B plan no. 1 "Industrie- und Gewerbegebiet Lubminer Heide for" Nord Stream 2 are available, they can be used to meet the offset demands for the onshore route section amounting to 27.8862 ha (cf. application document, Part G.01, Chapter 11.1, p. 479). As part of the B plan, an additional factor of 30% was applied to the forestry offset requirement for implementation in succession areas in the initial afforestation to allow for nature conservation interventions. The remaining offset demand of 2.7711 ha (cf. application document, Part G.01, Chapter 11.1, p. 479) will be met by ancillary provision A.3.8.8, thereby complying with the provisions of the B plan "Industrie- und Gewerbegebiet Lubminer Heide". This also satisfies the onshore offset requirement of 30.6278 ha (cf. application document, Part G.01, Chapter 11.1, p. 480, Table 11-7) under the nature conservation intervention rule.

B.4.8.4.4.2 Offsetting offshore interventions

According to the case law decided under BNatSchG 1988, as far as this is applicable to the current BNatSchG, the description of the elements of compensation has a qualitative and a spatial element. The compensation and substitution measures to be provided in an overall nature conservation concept must provide qualitative compensation or substitution of equal value for unavoidable interventions in nature and the landscape caused by the project.

Compensation measures must be designed in terms of quality so that a condition is brought about in the affected landscape area which continues the previous condition in the same way and with the same impact (BVerwG, judgement of 16/03/2006, 4 A 1075/04, BVerwGE 125, 116 et seq., juris margin no. 532.)

The spatial element calls for the compensation to act in the described manner wherever project-related adverse impacts occur. The spatial area when the compensation and substitution measures come into play is determined by the legally-approved location of the project. Compensation measures do not necessarily have to take place at the place of the intervention, but must act where adverse impacts occur (BVerwG, judgement of 24/03/2011, 7 A 3/10, juris margin no. 23 et seq.). A spatial link must exist between the place of compensation and the place of intervention (BVerwG, judgement of 27/10/2000, 4 A 18.99, BVerwGE 112, 140, 163 = Buchholz 406.401 Section 8 BNatSchG no. 29 and judgement of 9/06/2004, 9 A 11.03, juris margin no. 128 = Buchholz 406.400 Section 61 BNatSchG 2002 no. 5 = BVerwGE 121, 72 et seq.) The suitability of compensation measures in terms of nature conservation depends neither exclusively nor primarily on their distance from the place of intervention. So long as a compensation site has an impact on the place of intervention, it is not less suitable just because it is further away from the place of intervention than another protection compensation site.

These considerations apply even more to substitution measures. If a spatial link still exists between the place of intervention and the substitution measure, whether the alternative sites are closer to the place of intervention is not the deciding factor. Otherwise, a flexible approach to the intervention rule would be rendered unnecessarily difficult, particularly as monetary substitution only comes into consideration as a last resort if interventions can be neither compensated nor replaced. Unlike compensation measures, a substitution measure is "only" required to provide a substitute of equal value to the impaired functions of the natural balance, and not – as in the case of compensation – to offset them in the same way. What is demanded is the creation of similar functions, although not identical with those impaired (BVerwG, judgement of 22/11/2016, 9 A 25/15, juris margin no. 21; judgement of 15/01/2004, 4 A 11.02, BVerwGE 120, 1, 16; *Gellermann*, in: Landmann/Rohmer, Umweltrecht, Section 15 BNatSchG margin no. 15 et seq.). Substitution measures must also have a spatial link to the place of intervention. However, this is defined more broadly than for compensation measures. Substitution measures do not have to have an impact on the place of intervention. It is sufficient if there is any spatial link at all between the place of intervention and the implementation of the substitution measures. Even a distance of 15 km between the place of intervention and the site of the substitution measures can be acceptable if the compensation site and intervention area are in the same natural region (OVG Niedersachsen, judgement of 04/07/2017, 7 KS 7/15, juris margin no. 190 with reference of BVerwG, judgement of 17/08/2004, 9 A 1.03, NuR 2005, 96; BVerwG, decision of 07/07/2017, 7 VR 2.10, NuR 2010, 646).

The explanatory memorandum to BNatSchG 2002 refers in the context of the concept of a natural region to Germany's 69 major landscape units (BT paper 16/12274, 57; map BR- paper 332/13, Appendix 49). In view of the purpose of the Act, which is to introduce a degree of flexibility to compensation by treating compensation and substitution in the same way (cf. BT paper 14/6378, p. 49) and of continuing to apply a broad interpretation to the spatial relationship requirements between the place of intervention and the place of the substitution measure (cf. BVerwG, judgement of 17/08/2004, 9 A 1.03, NuR 2005, 96) as a response to the difficulties in many instances in finding suitable offset areas for interventions in nature and landscape, there are justified doubts as to whether the legislator took the

offshore factors, and in particular the inshore coastal waters, into account when following Ssymank. Due to the hydrological interactions, measures in kind often meet the qualitative compensation requirements imposed by the legislator in Section 15 subsection 2, sentence 2 of BNatSchG, regardless of whether the impacts occur in natural region D01 or D73 according to Ssymank. The rigid application of Ssymank would therefore lead to the spatial link between intervention and substitution measures being narrower under some circumstances than that between intervention and compensation measures. This would contradict the express objective of the legislator.

Consequently, when dealing with nature conservation functional relationships, the administrative practice in M-V has created the landscape zones/natural regions of Beltsee (to the west of the Darss Sill) and Arkonasee for territorial waters, with Arkonasee including the inshore territorial waters of relevance here.

Such areas may only be used for compensation and substitution measures if they are objectively suitable for this purpose. This means that such areas are only considered if they need improving or can be improved. They meet this precondition if they can be brought to a condition which can be classified as having a higher ecological value than their previous condition (BVerwG, decision of 07/07/2010, 7 VR 2/10, juris margin no 26).

Section 15, subsection 2, sentences 4 and 5 BNatSchG, provides for the following: the designations of development and restoration measures for areas within the meaning of Section 20 subsection 2 nos. 1 to 4, and in the management plans pursuant to Section 32 subsection 5, of the measures pursuant to Section 34 subsection 5, and Section 44 subsection 5, sentence 3 of BNatSchG and of the measures in programmes of measures within the meaning of Section 82 of the Federal Water Act shall not hinder the recognition of such measures as compensation and substitution measures.

When determining the nature and scope of compensation and substitution measures, the programmes and plans under Sections 10 and 11 BNatSchG must be considered.

When using agricultural or silvicultural areas for compensation and substitution measures, concerns regarding agricultural structures shall be taken into account; in particular, areas with soil particularly suited for agricultural use should only be taken to the extent necessary. Priority shall be given to reviewing whether relevant compensation or substitution can also be achieved through measures for unsealing soil or relinking habitats, or cultivation or management measures supporting lasting improvements to the natural balance or landscape appearance, in the interest of avoiding taking land areas out of use if at all possible (Section 15 subsection 3 sentence 1 BNatSchG).

Under Section 15 subsection 4 sentence 1 BNatSchG, compensation and substitution measures shall be maintained throughout the relevant required period and shall be legally protected.

Under the original plans provided by the project developer, the offset requirement should be covered by onshore coastline measures that have a functional relationship

with the impaired functions of the offshore natural balance. This is particularly advisable because due to the high onshore inputs of nutrients and contaminants, most coastal waters have shown an unsatisfactory condition for many years. This also applies to the offshore Habitats Directive habitat type in the SCI in the territorial waters of Mecklenburg-Western Pomerania.

A large number of objections have been raised against the offsetting concept first put forward in the hearing. The "Landwirtschaft und Flurneuordnung" [Agriculture and Land Reorganisation] department of StALU Vorpommern pointed out in its expert statement of 16/06/2017 that in terms of agricultural structures, the planned offset measures implemented on high-quality arable land to the extent envisaged do not represent the preferred options, particularly in the regions designated by the federal State regional planning programme as reserved areas for agriculture. Measures to improve or maintain agricultural structure include maintaining and subsidising productive farms. Endangering these objectives, in particular the existence of individual farms with a large part of their acreage in the search areas, should not simply be accepted as a consequence of the emphasis on offsetting involving high-quality arable land or the acreage of a farm. Consequently, it is requested out of agricultural considerations that a check shall be made first as to whether the necessary offset can also be achieved by offset measures outside the stated search areas, or whether so-called "eco-account measures" can be considered. Should this not be possible, and should no offset be possible for monetary payment, agricultural arable land should only be used taking into account specific aspects, in particular the soil values.

The "Ministerium für Energie, Infrastruktur und Digitalisierung Mecklenburg-Vorpommern", Department 4, and the "Bauenrverban M-V" have opposed the initially planned measures on the basis of similar considerations. It has been pointed out that existing eco-accounts should be used for offsetting first, as for example in the expert statement by the "Wasser- und Bodenverband Rügen", the "Bauernverband MV" and also in the expert statements of large numbers of private owners affected by in-kind measures on Rügen. The affected landowners regard their existence as being threatened by the measures. In its expert statement of 26/05/2017 the Straßenbauamt Stralsund expressed the objection that the project developer had not examined any alternative measures. The large-scale use of arable land was a significant interference in the civil rights of the owners.

StALU Vorpommern notes in its expert statement of 12/06/2017 that the nature conservation objective of a reduction in the input of nutrient into coastal waters and improvements in the water quality is common ground, even if the relevant management plan does not make any final proposals in terms of measures. The function-related improvement due to the reduction in nutrient inputs is basically agreed.

Neither "HzE 1999" nor "HzE marine" make any mention of an area-related assessment of the offsetting impact offshore of onshore offset measures. The background is the link between interventions and land areas as defined in Section 14 subsection 1 BNatSchG. Consequently, the oceanographic condition of marine biotopes has not yet been assessed in the context of intervention regulation. The unsatisfactory ecological state of the inshore coastal waters, however, is primarily the result of onshore nutrient inputs (especially nitrogen, today) and pesticides,

particularly from conventional agriculture. Therefore, measures which bring about a reduction in nutrient and pesticide inputs from agriculture or communal point sources have an especially positive impact on marine biotopes in the inshore coastal waters and serve – as required in Section 15, subsection 2, sentence 3 BNatSchG – to improve the impaired functions of the natural balance to an equal value. The positive impacts occur in cascade form, due to biogeochemical cycles and water systems. The principal active processes in the LBP are presented in Chapter 11.2.3. Currently, the offset action - regardless of whether it serves to offset onshore or offshore interventions - is calculated in M-V in accordance with "HzE 1999". "HzE 1999" was used by Nord Stream 2 as a basis for the LBP. The link to onshore areas was not dropped in "HzE marine".

It its expert statement of 31/05/2017, BUND basically agrees with the assumption in the original offsetting concept, under which the proposed measures should take place in intervention landscape D73 (waters). Whether these impacts occur to the extent of the compensatory intervention calculated under HzE 1999 cannot be ascertained on the basis of the LBP balance submitted. BUND therefore requests a balance for the offset measures on the landscape area D73.

The project developer submitted a supplementary offsetting concept in documents from October 2017. Under this, two of the offset measures set out in the LBP have been dropped completely (K1 – Wreecher See, K3 – Mellnitz-Üselitzer Wiek). The areas identified for two other measures (K2 - Ossen, K7 - Lobber See) were reduced, because these areas were unsuitable or unavailable. In order for the K2 – Ossen and K7 – Lobber See measures to still effect a considerable reduction in nutrients entering the Rügen Bodden waters, additional N and P voluntary filtering at the Bergen treatment plant (which drains into the Small Jasmund Bodden not far from the mouth of the Ossen) and Göhren (which drains into the Lobber See) was incorporated in the strategy. As additional N and P filtering at the Greifswald-Ladebow and Stralsund treatment plants considerably reduces nutrient inputs, this was included as an additional measure in the offsetting strategy. The aims of the offsetting concept therefore continue to consist of reducing the nutrient inputs from the major treatment plants in the region, while improving the conservation status of offshore FFH habitat types in the SCI of the Rügen Bodden waters, especially with the presence of FFH habitat type 1160, and improving the ecological condition of the Rügen Bodden water bodies in line with the aims of the management plan for the Warnow/Peene river basin unit (cf. supplementary volume: Concretisations, no. 1, Chapter 2.5, p. 57). The objective of a reduction in nutrient inputs into the Rügen Bodden waters should also be achieved largely without resorting to converting conventionally managed farmed arable land into managed nature conservancy pasture (now 73 t of nitrogen and 3 t of phosphorus, instead of originally 28 t of nitrogen each year).

The offsetting concept updated by the above-mentioned document of October 2017 consists of the following measures:

- reducing the nutrient discharge into the ameliorated marsh areas of Schadefähre island through hydraulic engineering measures and establishing long-term nature-conservancy care management (K 4)
- measures to improve the ecological condition of the Small Jasmund Bodden in the area of the Ossen depression and filtering additional N and

P voluntarily at Bergen treatment plant (K 2)

- improving the water balance in the Lobber See depression and reducing the nutrient discharge into the Greifswald Bodden through voluntary additional filtration of nitrogen and phosphorus at the Göhren treatment plant (K 7)
- voluntary additional filtration of nitrogen and phosphorus at the Greifswald-Ladebow and Stralsund treatment plants to improve the ecological condition of the Greifswald Bodden, the Strelasund and the West Rügen Bodden (new).

Various aspects of the updated offsetting concept were criticised by the authorities and environmental associations involved. According to StALU Vorpommern in its expert statement of 08/12/2017, measures in the treatment plants could only be recognised in conjunction with area-related measures, and only under "HzE 1999". The catalogue of offsetting measures under "HzE 1999 "was not final, and therefore provided room to include the treatment plants in the offsetting concept as well (expert statement of 08/12/2017, p. 8). However, this would not be the case if "HzE marine" were applied. Although the reduction in nutrient inputs into coastal waters was in line with nature conservation objectives, the demarcation of an area-related improvement within the meaning of the rule on intervention was only possible to a limited extent. Even if the link between the proposed offsetting measures and the natural region is conceded, the present assessment disregards the indirect improvement of the Bay of Greifswald from the reduction in nutrient inputs both quantitatively (size of the benefiting area) and qualitatively (through the so-called offset value figure). The additional filtration of nitrogen and phosphorus in the Greifswald and Stralsund treatment plants is therefore not suitable for meeting the obligation upon the intervening party under Section 15 subsection 2 BNatSchG. Recognition as a compensation or substitution measure is therefore ruled out in the view of StALU Vorpommern.

The lower nature conservation authority of the Vorpommern-Greifswald rural district raised an objection against the updated offsetting concept that the additional filtration at the treatment plants does not lead to any beneficial change in the trophic degree of the Bodden waters. According to the lower nature conservation authority, the additional filtration at the treatment plants contradicts the basic principle of the intervention rules and has not been recognised previously as a technical environmental protection measure. According to lower nature conservation authority of the Vorpommern-Greifswald rural district, suitable eco-accounts for the acquisition of eco-points are available and there is no identifiable improvement potential for calculating the offset value figure of the measures at the Bagischow polder. The lower nature conservation authority of the Vorpommern-Greifswald rural district also questions the development of salt grasslands through the E1m measure, since the salinity of the Small Jasmunder Bodden would be too low and the new control regime at the barrage at Lietzower Damm, which determines the introduction of salt water, cannot be regarded as assured. The lower nature conservation authority of the Vorpommern-Greifswald rural district also demands an assurance for the offset measures E3 and E4 beyond the period of 25 years set out in the application document (cf. supplementary volume: Concretisations, No. 3, Chapter 3.1, p. 28).

In response, the project developer applied by supplementary letter of 30/11/2017 to cover any offset requirement not so far covered, by setting off against the Fishland meadows eco-account measure (VR-007) with an offsetting potential of up to 764 ha KFÄ. The plan approval authority has the recognising decision of 23/05/2017 on this from the Vorpommern-Greifswald rural district. The letter includes the option for recognising a further 214 ha KFÄ. In this regard, the Vorpommern-Greifswald rural district responsible for the eco-account has stated in its letter of 11/12/2017 that, at the moment, an available credit balance totalling 553.940 ha KFÄ exists. The measures underlying the eco-account VR-007 are suitable as offset measures for the Nord Stream 2 project both from technical and legal nature conservation aspects. This is also reflected in particular by the inclusion of offsetting measures of this kind in the catalogue of measures in the "HzE marine" regulation in force throughout the State for assessing offshore interventions in Mecklenburg – Western Pomerania as of 01/03/2017.

In a letter of 25/01/2018 the project developer submitted written confirmation from the agency responsible for proposing the measure, the Landgesellschaft M-V, for the binding reservation of 550 ha KFÄ of the eco-account measure Fishland meadows VR-007 in accordance with Section 9 subsection 3 ÖkoKtoVO M-V.

Furthermore, the project developer has submitted the contract of 23/01/2018 between it and the Landgesellschaft M-V on "the transfer an offsetting obligation under the Nord Stream 2 project" for the "Bargischow polder" in-kind offsetting measure, under which, pursuant to Section 14 subsection 4 sentence 1 of ÖkoKtoVO M-V, the Landgesellschaft M-V irrevocably assumes, to an amount of up to 1,200 ha KFÄ, the offsetting obligation arising in respect of the project for which approval has been applied, and in discharge of all liabilities in such a way that after the granting of final approval or permission, the Landesgesellschaft alone shall bear the duty of compliance with the offsetting obligation and shall ensure the appropriate inspections by the planning and nature cfonservation authority. Fulfilment of the offsetting obligations assumed by the Landgesellschaft M-V shall be performed by implementation of the nature conservation measure "Bargischow polder" on the basis of the Plan Approval Decision of 05/12/2012. The subject of the approved nature conservation measure "Bargischow polder" is the rewetting of grassland areas with a total area of about 415 ha in the Bargischow polder, which extends over 1,087 ha (hereinafter: the "measure"). The project developer specified the measure in its updated offsetting concept in October 2017.

Moreover, the project developer has submitted contracts with the operators of the Göhren, Bergen, Stralsund und Greifswald treatment plants, under which the latter undertook, in consideration of the assumption of costs by the project developer, to install additional purification technology to reduce the emissions of nitrogen and phosphorus and to operate this for 15 years. In addition, the plan approval authority is in possession of approvals under water law, under which the plants may be operated during this period and beyond and which contain monitoring requirements that ensure that the reduction of nitrogen and phosphorus documented in the project developers environment documents shall occur.

There are initial indications that the measures planned by the project developer and approved for the restoration of sediment at the pipe trench and/or the restoration of reef structures within the hard bottom substrates can be classed as nature

conservation compensation measures within the meaning of Section 15 subsection 2 sentence 2 of BNatSchG. Spatially the restoration measures are directly on the intervention site. The measures must also be designed qualitatively so that a condition is brought about in the impacted landscape areas that perpetuates the previous condition in the same way and with the same impact. On this basis, any further offset requirement by means of substitution measures within the meaning of Section 15 subsection 2 sentence 2 BNatSchG would only be justified for the short section of the surface-laid pipeline. However, the plan approval authority proceeds on the precautionary basis, in agreement with the application documents of the project developer, that the above approved measures do not produce any compensatory effect and that the entire project-related offshore intervention must therefore be offset by substitution measures.

If the offshore intervention is assessed according to the applicable administrative regulations ("HzE marine"), an offset requirement of 363.31 ha KFÄ results (see Section B.4.8.4.3.3).

The result of the hearing was that the technical suitability of the offset measures proposed by the project developer in the application documents for the restoration of impaired natural balance functions was not doubted. Only the spatial positioning, the degree of detail in the planning and the scope of the potential for offsetting the project-related offshore interventions were criticised at the hearing. As regards the areas affected by the original offsetting concept, but also in relation to the areas affected by the updated offsetting concept, it should also be pointed out that at hearings on the measures at the Small Jasmund Bodden (objectors E021, E022, E103, E134, E135) and Lobber See (objectors E084, E084+, E085), landowners raised objections against the use of their land. The project developer has not submitted contracts relating to the either stated objectors or other affected landowners which would allow it to use the land for the purposes of implementing offset measures. Therefore, the plan approval authority cannot rule out the possible compulsory purchase of land from its owners under Section 45 EnWG for either the areas originally affected or for the area-related measures included in the updated offsetting concept.

Accordingly, a balance must be struck between the interest in offsetting in kind and the conflicting interests of affected private individuals regarding the use of their land (BVerwG, judgment of 23.08.1996, 4 A 29/95, NVwZ 1997, 486). It should be noted here that the project developer must primarily use its own land or land it has purchased privately (cf. BVerwG, decision of 26.09.2013, 4 VR 1/13, juris margin no. 60).

As the project developer is in a position to meet the offset requirement through eco-account measures, the compulsory use of private property cannot be justified under these legal circumstances. The plan approval authority finds as follows on this: As stated above, under "HzE marine" there is an offset requirement of 363.31 ha KFÄ (cf. also Achenseestr B.4.8.4.3.3). As also determined above, up to 550 ha KFÄ are still available on the "Fishland meadows" eco-account. Furthermore, as also determined above, up to 1,200 ha KFÄ are available under the "Bargischow polder" measure based on the ÖkoKtoVO M-V.

The plan approval authority finds that the Fischland meadows eco-account measure

(VR-007) is allowed as an offset measure to the extent of 363.31 ha KFÄ in accordance with Section 16 BNatSchG in conjunction with Section 9 ÖkoKtoVO M-V, and, consequently, the project-related offshore intervention is offset. The calculated or additionally necessary 124.82 ha KFÄ (cf. Section B.4.8.4.3.3) according to the calculations of StALU Vorpommern are, on application by the project developer, also allowed as an offset in accordance with Section 16 BNatSchG in conjunction with Section 9 ÖkoKtoVO M-V (cf. ancillary provision A.3.8.9).

This results from the following considerations:

Under Section 9 subsection 1 ÖkoKtoVO M-V, after an eco-account measure has been recognised under Section 4 subsection 1 no. 2 ÖkoKtoVO M-V, that eco-account measure can be applied as an offset measure against an intervention, provided that the conditions for offsetting the intervention in question under Section 15 subsection 2 BNatSchG are met. The conditions are met if (1) the functions of the natural balance impaired by the intervention have been restored in an equivalent way and the landscape appearance has been restored or re-designed by the eco-account measure in a manner consistent with the landscape, or (2) the impaired functions of the natural balance in the relevant natural area have been restored to an equivalent value and the landscape appearance has been redesigned by the eco-account measure in a manner consistent with the landscape.

In its recognising decision, the lower nature conservation authority points out that the measure can be dealt with in the "Ostseeküstenland" (Baltic coastal region) landscape zone. It should be noted here that the KFÄ can only be allocated to interventions which are evaluated using the "HzE 1999" or "HzE marine" balancing model. In a letter of 01/11/2017, the nature conservation authority responsible for the eco-account, referring to "HzE marine", made it clear that the offset measure can be recognised as an offset just as much for interventions in the "Arkonasee" offshore landscape zone (landscape zone 0b in the Gutachtlichen Landschaftsprogramm Mecklenburg-Western Pomerania of the Ministry of the Environment, August 2003) and in the marine natural region D73 (after Ssymank 1994/BfN, Daten zur Natur 2008, "Naturräume und Großlandschaften"). Although the measure is located in the transition zone between the Baltic Coastal Region onshore landscape zone and the Arkonasee landscape zone where the intervention takes place, according to the assessment by the plan approval authority, the measure has an impact on the Arkonasee landscape area due to the demolition of the dyke (see "HzE marine", p. 16). The restorative effect consists in the fact that the areas of the eco-account measure possess a very high renaturing potential, in particular as a potential staging area for charadriiformes and staging sites for migratory birds. The removal of the dykes from the Fischland meadows has created a natural flooding regime and initiated the development of valuable salt grassland biotopes. The WWF correctly referred to this in its expert statement of 19/12/2017 with reference to the "relevant intervention guidance". Even if this might seem, at least partially, as a restoration of equal value and not in the same way of project-related impaired functions of the natural balance, a sufficient link to the natural area of the Bay of Greifswald, the Bodden bay sill and the Pomeranian Bight has nonetheless been shown (cf. above on this, at the beginning of Section B.4.8.4.4.2). The corresponding objections by NABU regarding the link to the natural region of 20/12/2017 are rejected.

The objection by NABU of 20/12/2017 that the eco-account measure would happen anyway is unfounded and is therefore rejected. The offset value figure of the "Fischland meadows" eco-account (VR-007) was examined by the Vorpommern-Rügen rural district and recognised as legally valid by the recognising decision of 23/05/2017.

The application of an eco-account measure as an offset measure for an intervention by the Bergamt is made under Section 9 subsection 2 sentence 1 ÖkokokontoV. The competent nature conservation authority under Section 4 ÖkoKtoVO M-V, the Vorpommern-Rügen rural district, was involved in accordance with Section 9 subsection 2 sentence 2 ÖkoKtoVO M-V.

The preconditions for offsetting under Section 9 ÖkoKtoVO M-V are therefore met.

As regards the claim by StALU Vorpommern in its expert statement of 12/06/2017 that it is not possible to assess whether the improvement of onshore biotopes stands in a reasonable relation to the actual improvement of offshore biotopes, the following is pointed out: a certain legally-valid offset potential is found in the recognising decision of 23/05/2017, which – according to the recognising decision – can be used for an offset requirement calculated under "HzE marine". Moreover, an offset potential of 643.462 ha KFÄ is recognised on an area of 214.487 ha, in other words 3 KFÄ per square kilometre. Another 214 come from a grazing concept. "HzE marine" provides, in no. 5.20 in conjunction with Appendix 3, for corresponding measures (development of salt grasslands after dyke demolition with assured permanent use) for the following increases: offset value figure: area unsuitable for grazing: 2.0, area suitable for grazing: 4.0, possible extras: +1 for complete dyke removal, +0.5 for an area greater than 50.0 ha of grazing surface. As shown in the plan approval of Vorpommern-Rügen rural district of 13/05/2016 in the possession of the plan approval authority (p. 9), the object of the measure was precisely the removal of dykes to encourage the development of cordgrass meadows. Consequently, the plan approval authority estimates that offset potentials that are comparable at least and probably higher can be achieved when applying "HzE marine" rather than when applying HzE 1999; therefore, setting off KFÄ for the Fishland meadows eco-account with an offset requirement calculated under HzE marine is more likely to result in a more extensive than an inadequate offset. Furthermore, the project developer has submitted the reservation for the required 363.31 ha KFÄ beyond 553.940 ha KFÄ, and as a precaution has explicitly requested the setting off of 488.13 ha KFÄ in relation to the misgivings expressed by StALU Vorpommern. Without an application of this nature, the plan approval authority would be prevented from setting off more than 363.31 KFÄ due to the lack of a legal basis. The express application by the project developer means that such a legal basis is not essential, however, because no third-party rights are adversely affected.

It is therefore clear that on the basis of "HzE marine", which is legally authoritative, the project-related interventions in nature and landscape are fully offset by the above-mentioned measures.

Notwithstanding this, the plan approval authority has also, by way of a legal presumption, checked to what extent an offset requirement calculated according to "HzE 1999" can be covered on the basis of the measures concept submitted by the

project developer. The plan approval authority has also as a precaution established the measures in this connection (cf. ancillary provision A.3.8.10).

The following considerations apply to this:

The measure applied for by the project developer for the purposes of offsetting under the application of "HzE 1999", consisting of the assumption of an offsetting obligation by the Landesgesellschaft M-V, which is expected to be discharged by the Bargischow polder nature conservation measure, and the implementation of technical measures in treatment plants to reduce nutrients, nevertheless achieves a partial offsetting of the offshore interventions within the meaning of "HzE 1999". As established by the plan approval authority, if "HzE 1990" is taken as the basis, then an offset requirement of 3,148 ha KFÄ in relation to the offshore interventions results (see Section B.4.8.4.3.2). This requirement is in any case largely covered by the applied eco-account (488.13 ha KFÄ), and the measures for which the project developer has applied for approval and which are based on the agreements with the Landgesellschaft M-V and the operators of the Göhren, Bergen, Stralsund and Greifswald-Ladebow treatment plants, which result in a total of 1,240 ha KFÄ (polder: 1,000 ha KFÄ, Stralsund and Greifswald-Ladebow treatment plants: 100 ha KFÄ; Bergen and Göhren treatment plants: 140 ha KFÄ) (cf. as stated immediately above and further below, cf. supplementary volume: Concretisation, no.5, Chapter 8.3, p. 76, Table 8-4).

The following must be stated regarding an offsetting obligation:

Under Section 14 subsection 4 ÖkoKtoVO M-V, the land agency can assume the obligations of the intervening party or an urban development planning agency to fulfil offset obligations in full discharge of all liabilities in return for monetary payment in such a way that it alone, after the granting of final approval or permission, takes over the fulfilment of the offsetting obligation and ensures the appropriate checks are performed by the approval and nature conservation authorities. The transfer of the offset obligations to the land agency must be performed in writing and without any conditions or limitations; it cannot be revoked and must be include the final approval or permission decision. The undertaking by the Landgesellschaft to implemenet an offset of 1,000 ha KFÄ is included in ancillary provision A.3.8.10. According to the plan approval authority, a more extensive transfer cannot be considered at this moment, even if expressly applied for by the project developer and with a written transfer declaration, because, beyond an offset value figure of 1,000 ha KFÄ there is no guarantee that the offset measure can be carried out within a period of two years after the final approval or permission decision. To that extent, Section 14 subsection 3, sentence 3 ÖkoKtoVO M-V prevents any further extensive transfer. Nor is there any identifiable important reason that could justify a departure from the requirements of the provision in Section 14 subsection 4, sentence 3 ÖkoKtoVO M-V. Apart from that, the plan approval authority shares the description in the updated offsetting concept, under which the Bargischow polder renaturing measure has a positive impact on both the Peenestrom and due to the hydrological interactions, on the place of intervention, since a substantial reduction in nutrient discharges into the Peenestrom and hence the Bay of Greifswald and the Pomeranian Bight is also achieved in the course of conventional grassland management with high doses of mineral fertiliser and a raising of the water level (reduction in peat mineralisation).

In terms of the technical measures undertaken by the project developer at the treatment plants, it is not apparent according to the plan approval authority why the Nature Protection Authority should not regard this measure as an offset as well. Nor can an administrative regulation such as "HzE marine" lay down a catalogue of final offset measures or those to be implemented preferentially to the exclusion of other offset measures if other offset measures also meet the statutory requirements for a compensation measure in kind. According to the plan approval authority and Nature Protection Authority, confirmed in their expert statement of 13/12/2017, these measures are so designed in terms of quality that they bring about a condition in the natural area affected by the intervention that continues the previous condition in the same way and with the same effect. The nutrient reduction promotes exactly those marine biotopes in their conservation goal and development stage which are subject (temporarily) to project-related interventions. These then receive the restorative effects that Section 15 subsection 2 BNatSchG demands from compensation and substitution measures by definition. Even if the application documents do not calculate an offset in relation to all the treatment plants and only calculate 100 ha KFÄ for some 50 t of nitrogen reduction, an offset of at least 140 ha KFÄ should be achievable, taking the Göhren and Bergen treatment plants into account. This is also adequately ensured by the water law permits granted for this and the associated monitoring of the reduction in freight within the meaning of Section 15 subsection 4 BNatSchG. The necessary sustenance period was set at 15 years upon application by the project developer. This corresponds to three to four times the period necessary for regeneration of the project-related interventions. The project developer is therefore showing an offset of up to 1,728.13 ha, without being compelled to do so in the view of the plan approval authority.

The Landesanglerverband M-V e.V. (State Anglers Association) demands an offshore offset in its expert statement of 22/05/2017. The renaturing and the ability of more suitable watercourses to flow into the Bay of Greifswald must be improved in the affected area for this. Since enough other suitable offsets in kind are available elsewhere, no other measure is necessary. Furthermore, realisation of these measures would require the (possibly compulsory) use of private property. Apart from this, no specific function-related suitability of corresponding measures to offset the interventions in German territorial waters to be offset here, and particularly the marine biotope, has been demonstrated, nor is any readily identifiable.

B.4.8.4.4.3 Examination of monetary payment as a precaution

Under Section 15 subsection 5 BNatSchG, an intervention can also be approved if the impairments cannot be compensated or replaced within a reasonable time and the grounds in favour of the project take priority over the nature conservation and landscape concerns when weighing up all the requirements of nature and landscape. These concerns include anything external to nature conservation in the interest of the public and the affected parties, in other words including private interests, in particular business and the interests of individual owners (*Guckelberger,* in: Frenz/Müggenborg, BNatSchG, 2nd edition 2016, Section 15 margin no. 105). Although the concerns of nature conservation and landscape management are not given any priority over the other concerns, it follows from Section 15 BnatSchG that particular weight is to be accorded to them. Nature and landscape impariments that are either avoidable or that can be compensated generally carry particular weight.

Only very serious concerns can overcome these (BVerwG, decision of 22.05.1995, 4 B 30/95, juris margin no. 11).

The assessment that the Nord Stream 2 pipeline is necessary for the security of European gas supplies and therefore meets the essential objectives of Section 1 subsection 1 EnWG is, according to the plan approval authority, a concern external to nature conservation which, in the event of measures in kind being untenable and therefore dispensed with, is important enough to meet the necessary conditions for approval under Section 15 subsection 5 BNatSchG and to take precedence over the interest in offsets in kind. The intervention is not serious enough to justify an assumption to the contrary. This is the case above all because by restoring the sediment at the pipe trench, the project developer is, to a great extent, creating the conditions for natural functions to return after completion of the works.

In order to prevent monetary compensation from amounting to a kind of "indulgence payment", provision is only made for it in such cases where even a substitution measure can no longer bring about any offset in kind. An intervening party who does not have to provide any, or who has to provide very little, offset in kind should not be in a better position than an intervening party who has to provide full offset in kind. Monetary compensation should expressly only be be a last resort (*Mühlbauer,* in: Lorz/Konrad/Mühlbauer/Müller-Walter/Stöckel, Naturschutzrecht, 3rd edition 2013, Section 15 margin no. 41; also *Gellermann,* in: Landmann/Rohmer, Umweltrecht, BNatSchG, Section 15 margin no. 49; *Lütkes,* in: Lütkes/Ewer, BNatSchG, Section 15 margin no. 76; *Gassner*/Heugel, Das neue Naturschutzrecht (The new nature conservation law), 1st edition 2010, margin no. 334). Moreover, the obligation to offset in kind is limited above all by the principle of proportionality (BVerwG, judgment of 11.11.2008, 9 A 52/07, juris, guiding principle 2; BVerwG, judgment of 07.07.2010, 7 VR 2/10, juris margin no. 22; *Gellermann*, in: Landmann/Rohmer, Umweltrecht, BNatSchG, Section 15 margin no. 27; *Guckelberger*, in: Frenz/Müggenborg, BNatSchG, 2nd edition 2016, Section 15 margin no. 61; *Erbguth/Schlacke*, Umweltrecht, 5th edition 2014, Section 10 margin no. 35). The Federal Administrative Court (BVerwG, judgment of 07.07.2010, 7 VR 2/10, juris margin no. 22) has said on this that *".... the application of this phased response of the nature conservation intervention rule (...) to the next response level down in any particular case is to be waived not only if compliance with the priority response stage is impossible in fact, but also if compliance were to be associated with disproportionate burdens on the interests of those affected.(...) "*

Even if the considerations in the planning approval decision regarding the capability of the intervention to be offset are disregarded, for example because of the binding nature of the Ssymank habitat categorisation or doubts about the hydrological relationships or their restorative effect on the impaired marine biotopes in the Bay of Greifswald or other territorial waters, at least the above preconditions would be met and offsetting in kind would be impossible or unreasonable. In this case, no other offset measures in kind for marine interventions were given. This is because all the other measures considered at the hearing are onshore, or not in the natural region D73 according to Ssymank. No other possibilities for offshore offsets in kind are identifiable.

If an intervention is permitted under Section 15 subsection 5 BNatSchG, although impairments are unavoidable or cannot be compensated or substituted within an

appropriate period of time, the intervening party shall provide monetary compensation. Section 15 subsection 6 sentences 2 and 3 BNatSchG provide that the monetary compensation shall be determined from the average costs of the infeasible compensation and substitution measures, including the necessary average costs for planning and maintaining such measures, and for providing the necessary areas, and also taking into account relevant personnel and other administrative costs. The costs of covering the offset requirement from eco-accounts based on cost items verified by the legislator may only be included if they do not include additional cost items, such as for example a bigger margin for developing eco-accounts. If the costs of the infeasible compensation and substitution measures cannot be determined, the amount of compensation payment shall be determined in accordance with the duration and severity of the intervention. This shall be based on the specific case in question, since otherwise it would not be specific to the intervention that was being offset (*Mühlbauer,* in: Lorz/Konrad/Mühlbauer/Müller-Walter/Stöckel, Naturschutzrecht, 3rd edition 2013, Section 15 margin no. 42).

Under "HzE marine" (no. 6.5), the average costs of Type 1 measures actually carried out (restoration of natural flooding conditions in coastal areas) shall be taken as the basis for determining the amount of the compensation. Any reference to measures not carried out shall be prohibited. Consequently, Nord Stream 2 has calculated the compensation based on a rough assessment of the costs of the measures carried out for renaturing the Immenstadt and Pinnow polders (costs of works and management outlays including landscape management). The compensation for offshore interventions according to this amounts to 10,333 euro per ha KFÄ and 15,250 euro per ha KFÄ for onshore interventions. For other projects in territorial waters, compensation amounts of 3.50 euro per ha KFÄ were stipulated (e.g. "Sea Lion cable"). In the AWZ, compensation amounting to 4.77 euro per m² of intervention for comparable projects was set. According to the plan approval authority, setting the compensation at 10,333 euro per ha KFÄ is an underassessment. Moreover, the yardstick in "HzE marine" that compensation should be calculated on the basis of performed measures contradicts Section 15 subsection 6 sentence 2 BNatSchG ("in accordance with the average costs of the infeasible compensation and substitution measures").

StALU Vorpommern, in its expert statement of 08/12/2017, p. 9, also concurs with the appropriateness of the offset measures specified in the calculation for the Nord Stream 2 project, and points out that costs amounting to € 10,333/ha KFA would be in the range of measures already implemented. However, the question is raised as to whether the compensation amount should not be determined using the costs of the actual measure under discussion, and whether a different calculation of the amount of the compensation would result under "HzE marine".

According to the plan approval authority, the eco-accounts available for offshore interventions under "HzE marine" offer an equally technically-correct baseline for the costs which would otherwise have to be charged for necessary substitution measures. The administration is aware that these on average refer to 2.50 to 5.50 euro per m² KFÄ. No final determination on the compensation amount is necessary, because according to the plan approval authority, adequate offsetting in kind is possible. Any determination of compensation money therefore remains reserved for the case where, contrary to expectations, a more extensive offset requirement arises than calculated here and which cannot be covered by further measures in kind or by

eco-accounts, or the offsetting ordered in this decision is not legally valid under Section 9 subsection 4 ÖkoKtoVO M-V.

B.4.8.4.5 Protection of specific parts of nature and landscape

There are no protected areas in the area under investigation (cf. application document, part D2.03) that impede the project. In particular, the "Bay of Greifswald" landscape conservation area (L142) is crossed by the Nord Stream 2 pipeline. A precautionary exception under Section 6 of the Landschaftsschutzgebietsverordnung (Landscape Protection Order) can be granted, as the conditions of Section 34 subsection 3 to 5 BNatSchG are met (cf. Section B.4.5.2.3.2).

B.4.8.4.6 Conclusion

The plan approval authority finds that the project complies with the legal requirements of the nature conservation intervention regulations and the intervention is therefore approved (Section 15 BNatSchG).

B.4.8.5 Biotope protection

B.4.8.5.1 Legal basis and subject of the examination

Under Section 30 subsection 1 BNatSchG, certain parts of nature and landscape are afforded special protection as protected biotopes. Actions that could lead to the destruction or other significant adverse impacts on the following biotopes are prohibited under Section 30 subsection 2 BNatSchG:

1. natural or semi-natural areas of flowing and standing inland water bodies, including their banks and the relevant natural or semi-natural vegetation associated with the banks, together with their natural or semi-natural sedimentation areas, backwaters and areas that are regularly flooded,
2. bogs, swamps, reeds and large-sedge reed beds, wetland meadows rich in sedges and rushes, springs and inland salt deposits,
3. open inland dunes, open natural boulder, rubble and scree slopes, clay and loess walls, dwarf-shrub, broom and juniper heaths, matgrass communities, dry meadows, heavy metal grassland, forests and bushes in xerothermic locations,
4. fen and bog woodlands, riparian forests, forests of ravines, slopes and screes, subalpine larch forests and riparian larch forests,
5. open rock formations, alpine grassland, snowbeds and elfin woodland,
6. rocky shores and cliffs, coastal dunes and beach ridges, coastal lakes, Bodden waters with terrestrialisation zones, salt grasslands and tidal shallows in the coastal region, seagrass meadows and other marine macrophyte populations, reefs, sublittoral sandbanks and silty bottoms with boring bottom megafauna and species-rich gravel, coarse-sand and shell layers in marine and coastal regions.

The prohibitions in sentence 1 also apply to statutorily protected biotopes under federal State legislation. By applying the flexibility and non-affection clauses of BNatSchG, more specific regulations and concretisations regarding the statutory

biotope protection in the Federal State of Mecklenburg-Western Pomerania were passed as part of the Naturschutzausführungsgesetzes des Landes Mecklenburg-Vorpommern (Nature Conservation Act Implementation Law of the State of Mecklenburg-Western Pomerania, hereinafter NatSchAB M-V). Accordingly, the statutory biotope protection prohibitions under Section 20 subsection 1 nos. 1 to 4 NatSchAG M-V also refer to:

1. semi-natural bogs and swamps, kettle holes, reed beds and reeds, wetland meadows rich in sedges and rushes,
2. semi-natural and unstabilised streams and rivers, springs, backwaters, peat-cutting sites, and standing small bodies of water including their bank vegetation, and sedimentation areas of standing waters,
3. dwarf shrub and juniper heaths, dry meadows, nutrient-poor grassland and disused chalk quarries,
4. semi-natural fen and bog woodlands, riparian forests, forests and bushes in xerothermic locations, copses and field hedgerows.

Under Section 20 subsection 2 NatSchAG M-V, the prohibitions in Section 20 subsection 1 NatSchAG M-V also apply to the geotopes named below, which correspond to the characteristics described in Annex 3 of NatSchAG M-V:

- glacial erratics, boulder packing, rock plates and eskers,
- dry valleys and tufa deposits,
- open inland dunes and cliff edge dunes,
- cliffs and spits.

With the passing of the amending Act for deregulation, administrative simplification of legislative consolidation in the portfolio of the "Ministeriums für Landwirtschaft, Umwelt und Verbraucherschutz" (hereinafter Ministry of Agriculture, Environment and Consumer Protection), LU Rechtsbereinigungsgesetz (Consolidation Act) of 27th May 2016 of the State of Mecklenburg – Western Pomerania, marine and coastal biotopes previously included in Section 20 subsection 2 sentence 1 no. 5 NatSchAG M-V were deleted from that Act. Marine and coastal biotopes are now solely by Section 30 subsection 2 no. 6 BNatSchG.

The legal biotope protection test was endorsed by the plan approval authority and the environmental experts consulted, with the result that statutorily protected biotopes under Section 20 subsection 2 BNatSchG and Section 20 subsection 1 NatSchAG M-V occurring in the survey area cannot be significantly or permanently impaired. To comply with the proposal by StALU Vorpommern, the conditions for exceptions under Section 30 subsection 3 BNatSchG and Section 20 subsection 3 NatSchAG MV will be checked.

Offshore

Biotopes which are included in the following protected biotopes under Section 30 subsection 2 no. 6 BNatSchG (cf. application document, Part F.01, Chapter 6.2, p. 59 table 6-1) were found in the survey area for the offshore pipeline route of the Nord Stream 2 Pipeline in the territorial waters of Mecklenburg – Western Pomerania:

- "Bodden waters with terrestrialisation zones" ("NIF", "NIN", "NIT", "NIR", "NIG", "NIO", "NIX")

- "reefs" (NOR, NOG, NON, NIN, NIT, NIR, NIG)
- "sublittoral sandbanks" (NOB, NIB)
- "species-rich gravel, coarse sand and shell layers" (NOK)
- "windwatt areas (mudflats occasionally exposed by wind)" (NIX)

The location of the "Seabed with fine to medium sands of the inshore coastal waters east of the Darss Sill" biotope (NIF) within the Bay of Greifswald justifies its classification as a protected biotope "Bodden waters with terrestrialisation zones".

Species of red and brown algae were found in association with reefs at the "Boddenrandschwelle", and the sparse occurrence of aquatic spermatophytes in the form of individual plants up to small islands of plants was found at the Lubmin 2 landfall site. These areas were therefore allocated to the statutorily protected "Seagrass meadows and other marine macrophyte populations" and thus included in the main examination.

The offshore interim storage area was mainly characterised by the NOF soft bottom biotope "Seabed with fine to medium sands of the outer coastal waters east of the Darss Sill". This biotope type cannot be allocated to any of the protected biotopes under Section 03 subsection 2 no. 6 BNatSchG, as the area of the interim storage site is not a Bodden water. Furthermore, "Cobble fields in outer coastal waters east of the Darss Sill" (NOG) were mapped in the area of the planned interim storage site, which in turn were allocated to the "Reefs" protected biotope under Section 30 subsection 2 no. 6 BNatSchG and included in the main examination.

Onshore

The following statutorily-protected biotopes were shown at the landfall site in the project-specific survey area for the Nord Stream 2 pipeline (cf. application document, Part F.01, Chapter 6.3, p. 67 et seq., Table 6-5):

- bushes in xerothermic locations (BLT) Section 20 NatschAG and Section 30 BNatSchG
- young hedgerows (BHJ) Section 20 NatSchAG
- reed beds (VRL) Section 20 NatschAG and Section 30 BNatSchG

Bushes in xerothermic locations are protected by law as "Semi-natural forests and bushes in xerothermic locations" (Section 20, subsection 1 nos. 1 to 4 NatSchAG M-V) or as "Bushes in xerothermic locations" (Section 30, subsection 2 nos. 1 to 6 BNatSchG). A young hedgerow is to be allocated to semi-natural hedgerows (Section 20 subsection 1 nos. 1 to 4 NatSchAG M-V). A biotope with reed beds is protected under the statutory definition of reed beds in Section 20 subsection 1 nos. 1 to 4 NatSchAG M-V and as reeds under Section 30 subsection 2 nos. 1 to 6 BNatSchG.

No further occurrences of protected biotopes were shown, or else they occur outside the impact area of the planned project for the construction and operation of the Nord Stream 2 pipeline system. The following biotopes were shown to be entirely outside the project-specific survey area for the Nord Stream 2 pipeline and are not affected by the project's impact:

- Other pine forest dry to cool location (WKZ)
- alder (and birch) bog wet eutrophic sites(WFR)
- copses comprising mainly local tree species (BFX)
- shrub hedges (BHF)
- ruderalised sand grasslands (TMD)
- sparse sand grasslands (TMS)
- pioneer sand meadow acidic sites (TPS)
- dry dwarf shrub heath (TZT)
- mat grassland (TBB)
- wetland eutrophic moor and swamp sites (GFR)
- moor grass meadows at moor and swamp sites (GFP)
- wetland shrubs at eutrophic moor and swamp sites (GFR)

As they are outside the project area, the biotopes listed cannot be affected by project-related impacts of soil loss and impairment, soil compaction and use of the land, or loss of habitat through removal of vegetation or soil. Nor can the project-related impacts due to the emission of air pollutants and dust adversely affect these biotopes. Any additional deposition of particulates from construction work is regarded as negligibl (cf. application document, Part I2.03, p. 50). The additional deposition of nitrogen onshore on the construction site only exists in the form of existing inputs from past pollution. site (cf. application document, Part D1.01, Chapter 6.2.4.3.1, p. 592).Therefore, pollution of the protected biotopes outside the onshore construction area by nitrogen as a nutrient can also be ruled out. NO_2 immissions are equally incapable of adversely affecting the biotopes located outside the construction site (cf. application document, Part D1.01, Chapter 6.2.4.3.1, p. 592, 593).

The following coastal biotopes protected under Section 30 subsection 2 no. 6 BNatSchG lie within the survey area (cf. application document, part F.01, Chapter 6.2, table 6-3).

- "salt grasslands in the coastal area" (KGO), Section 30 BNatSchG
- "Bodden waters with terrestrialisation zones" (KSB), Section 30 BNatSchG
- "coastal dunes" (KDG), Section 30 BNatSchG

The biotope types "Oligohaline salt grassland" (KGO), "Semi-natural beach at Bodden waters" (KSB) and "Dune grassland (grey dunes)" (KDG) have only been mapped in the expanded survey area to the east of the outlet canal into the Freesendorfer Wiesen, and therefore lie outside the survey area established for the Nord Stream 2 pipeline. These biotopes cannot be reached by project-related impacts.

B.4.8.5.2 Results of the examination under biotope protection law

B.4.8.5.2.1 "Bodden waters with terrestrialisation zones"

The protected biotope of Bodden waters with terrestrialisation zones includes the Bay of Greifswald, which as inshore coastal waters of Mecklenburg – Western

Pomerania is protected by biotope protection legislation under Section 30 subsection 2 no. 6 BNatSchG. As it is not possible for areas to be given a dual classification as statutorily protected biotopes, the area of Bodden waters placed under protection is restricted to all the areas which are not afforded any other protection under Section 30 subsection 2 no. 6 BNatSchG (e.g. reefs). This means that Bodden waters such as fine and medium sands (NIF), exposed peat (NIO) and silt substrates (NIT) are included in the survey area.

Since Bodden waters with terrestrialisation zones are crossed directly, impairments to the protected biotope from laying the Nord Stream 2 pipeline system in the pipe trench and through sedimentation and turbidity during dredging cannot be ruled out from the outset. The planned laying of the Nord Stream 2 pipeline system in the trench requires the use of an area of 284,386 m² for the trench surface, 581,905 m² for the sedimentation zones (25 m on each side of the pipe trench) and 1,157,906 m² for the turbidity impact zone (50 m on each side in addition to the sedimentation zone) (cf. the application document, Part F.01, Chapter 8.2.1.3, p. 75, Table 8-2). However, dredging the pipe trench will only temporarily impair the hydrography and morphology of the protected biotope, and meaning that it will not be significant or permanent. To minimise the use of soft bottoms (biotope types NOB/NIB, NIF) in the "Bay of Greifswald, parts of the Strela Sound and the northern tip of Usedom " SCI, which are shown as habitat types 1110 and 1160, they will be crossed taking as short a distance as possible (mitigation measure M2, cf. application document, Part G.02, Chapter 2.2, p. 9, and Section B.4.4.1.9 above). The pipe trench in the Bay of Greifswald will for the most part have a width of approximately 20 metres (somewhat wider when crossing shipping lanes) (cf. application document, Part F.01, Chapter 8.2.1.3, p. 75). The water depth in this route section is 2 to 10 metres, mostly more than 5 metres. Allowing for the required minimum cover height over the bed width of 8.5 to 9.5 metres, the pipe trench will have a depth of 2.5 to 3 metres. The target pits of the two microtunnels will be excavated to the west of the industrial port of Lubmin. The target pit will be approximately 30 metres wide at the top and 6 metres deep (cf. application document, Part F.01, Chapter 8.2.1.3, p. 75).

The top 30 cm to 50 cm of the dredged material from the Bay of Greifswald of well-sorted fine sands with an average grain size of 0.2 mm will be stored separately for each section and brought back for restoration of the topsoil in each original section (cf. application document, Part D1.01, Chapter 6.2.1.2.1, p, 467). The seabed at the pipe trenches will, as described in the avoidance and mitigation measures M3 (c.f application document, Part G.02, Chapter 2.3, p. 10, and Section B.4.4.1.9 above), be restored with a tolerance of +30 cm on completion of the construction works. Therefore, the dredging for laying the Nord Stream 2 pipeline may leave behind slight elevations in the form of trench shoulders. However, these should not be regarded as critical in relation to the colonisation by autochthonous macrozoobenthos, which has been confirmed by Nord Stream monitoring (cf. application document, Part F.01, Chapter 8.2.1.3, p. 79). Any trench shoulders that might be produced are therefore unlikely to impair the "Bodden waters with terrestrialisation zones" protected biotope. The essential precondition for restoring tthe functions of the protected biotope is ensured by the restoration of the seabed in the trench area. This means that the functions of the protected biotope can be expected to return within a short time after the pipelaying. Mitigation measure M3 includes the requirement for the work schedule and laying sequence to be staggered, so that the pipe trenches are only kept open for the duration of the

pipelaying if at all possible. Therefore, mitigation measure M3 thus ensures the short-term character of the use of the "Bodden waters with terrestrialisation zones" protected biotope. A complete regeneration of the "Bodden waters with terrestrialisation zones" protected biotope around the pipe trench can therefore be assumed within a maximum period of four years (cf. application document, Part D1.01, Chapter 6.2.4.2.1. p. 539). Dredging the pipe trench will initially almost completely clear out out the benthic fauna. The regeneration of the sediment characteristics will take two years, and the restoration of the macrozoobenthos community structure two to three 3 years. The age structure of soft-shell clams at the pipe trench will have adapted to the conditions in the unimpaired surroundings with four years of completion of the Nord Stream 2 pipeline construction work. This means that a gradual impairment of functions for a total period of four years can be forecast (cf. application document, Part F.01, Chapter 8.2.1.3, p. 77).

Therefore, any significant or lasting impairment can be ruled out.

It can be assumed that turbidity plumes and sedimentation from laying the Nord Stream 2 pipeline will result in a local short-term low-intensity impact on the protected "Bodden waters with terrestrialisation zones" biotope. However, this should also be not regarded as significant or lasting. The turbidity plumes generated are minimised in accordance with mitigation measure M4 (cf. application document, Part G.02, Chapter 2.4, p. 11) by using mechanical dredgers (backhoe dredgers) in the Bay of Greifswald and the "Boddenrandschwelle". The backhoe dredgers cause 50% less turbidity than trailing suction hopper dredgers and always ensure a sedimentation of less than 1 kg/m² away from the dredging work (cf. application document, Part D1.01, Chapter 6.2.1.2.1, p. 469). The suspended sediment concentrations at a distance of 500 m from the dredging work for laying the Nord Stream pipeline will not exceed the maximum turbidity that occurs naturally in the Bay of Greifswald temporarily during storms (wind greater than Beaufort force 4) (cf. application document, Part F.01, Chapter 8.2.1.3, p. 78) at any time. The limit value of 50 mg/l of suspended particulate material over the natural background value over a duration of 24 hours at a distance of 500 m on each side of the pipe trench during the construction of the Nord Stream pipeline, laid down in the plan approval for the construction and operation of the Nord Stream pipeline in the Bay of Greifswald, was also not found to have been exceeded. This finding is a consequence of the natural conditions in the Bay of Greifswald (regularly 40 mg/l, rarely 60 mg/l, at wind strengths greater than Beaufort force 4; subsequent sedimentation for 1 to 2 days). A slight sedimentation of suspended material less than 1 mm is forecast for the Nord Stream 2 project at the "Bodden waters with terrestrialisation zones" protected biotope, whereby sedimentation greater than 10 mm is also to be expected in the southern section of the route off the industrial port of Lubmin due to the shallow waters (cf. application document, Part F.01, Chapter 8.2.1.3, p. 79). At worst, a local short-term low-intensity adverse impact on the "Bodden waters with terrestrialisation zones" protected biotope can be expected from the lasting turbidity and resulting sedimentation.

No lasting or significant impairment of the "Bodden waters with terrestrialisation zones" protected biotope will be caused by anchor chains dragging along the seabed. During the Nord Stream monitoring, as early as six months after completion of the construction work, only minor bathymetric changes of ±10 cm, caused by the used anchor piles and anchor chain drag marks, were detected next to the pipe

trench by a high-resolution survey with a multibeam echo sounder and side-scan sonar. Visible bathymetric changes were only found where the sea state and current rarely reach the seabed (e.g. at depths greater than 6 m in the Bay of Greifswald) (cf. application document, Part D1.01, Chapter 6.2.1.2.1, p. 468). In the meantime, almost complete levelling of the seabed by the sea state and current is to be assumed, and traces of used anchor piles and anchor chain drag marks should hardly be identifiable.

Impacts on the protected biotope "Bodden waters with terrestrialisation zones" caused by project construction work can also be ruled out. The Nord Stream 2 pipeline is only planned to be laid outside Bodden waters. Laying the pipe trench does not result in any impact on the protected biotope "Bodden waters with terrestrialisation zones" due to construction work, since at least 30 cm of the topsoil will be restored with autochthonous material exactly as at the original location, and only the top bioactive 30 cm of the sediment is of significance for the marine biotope. Only the top 30 cm of the sediment is colonised by the macrozoobenthos (cf. application document, Part D1.01, Chapter 6.2.4.2.1, p. 538).

Due to the design of the installation, the planned above-water tie-ins (AWTIs) at km point 82.900 before the sea end of the microtunnel have no impact on the protected biotope "Bodden waters with terrestrialisation zones". The AWTIs will be covered with rock piles, concrete mattresses or something similar to ensure the long-term stability of the pipelines; after completion of the AWTIs these rock piles or concrete mattresses will be completely covered with backfill material and covered with topsoil when backfilling the pipe trench. The impacts and the regeneration of the biotope are accordingly to be assessed in the same way as the pipe trench area (cf. application document, Part F.01, Chapter 8.2.1.3, p. 75).

No impacts on the protected biotope "Bodden waters with terrestrialisation" as a result of operation are to be expected either. The burial depth in the sediment means that the pipeline buried in the bay water will not lead to cooling in the upper 20 cm of the seabed of more than 2K compared to ambient temperature (cf. application document, Part I2.02, Chapter 4, p. 8).

The project-related impacts only have a gradual temporary effect, and a maximum regeneration time of four years can be assumed, as already stated.

There will be no impairment to the function of the natural balance that can be regarded as significant or lasting and that might need to be restored through compensation. The results of the examination under biotope protection law are that taking into account the planned avoidance and mitigation measures, no significant or lasting impairments to the protected biotope "Bodden waters with terrestrialisation zones" are to be expected.

B.4.8.5.2.2 "Reefs"

The biotope types allocated to reefs under the M-V marine biotope mapping manual (2011) in the survey area occur in the form of

- "cobble fields in inshore/outer coastal waters east of the Darss Sill" (NIG/NOG)

- "boulder fields in inshore/outer coastal waters east of the Darss Sill" (NIG/NOG)
- "marl and chalk plates in inshore/outer coastal waters east of the Darss Sill" (NIN/NONG)

Due to the direct crossing of "Reefs" protected under Section 30 subsection 2 no. 6, impairments to the protected biotope from laying the Nord Stream 2 pipeline system in the pipe trench, and through sedimentation and turbidity during dredging, cannot be ruled out from the outset.

The "Reefs" statutorily-protected biotope is affected by the project, on the one hand, by the use of areas amounting to 98,738 m² for dredging the pipe trenches and, on the other hand, by the release of suspended matter when turbidity plumes are generated (389,406 m²) and the deposition of sediment (192,787 m²) (cf. application document, Part F.01, Chapter 8.2.2.3, p. 81 et seq., Table 8-4).

Pipe trench dredging results in a temporary impairment of the reef hydrography and morphology. The pipe trench will be about 20 metres wide at the reefs. Taking into account the necessary minimum cover height, the pipe trench will be 2 to 2.5 m deep at the 8.5 to 9.5-metre wide bottom (cf. application document, Part F.01, Chapter 8.2.2.3, p. 82).

Mitigation measure M1 provides for a minimisation of the intervention area at hard-bottom biotopes within FFH areas (cf. Section B.4.4.1.9). The pipeline route should be optimised to use as little of the reefs as possible and take the shortest route to cross them. The two pipelines will be laid in a common trench in this area. The reef at the eastern edge of the "Boddenrandschwelle" is formed by a push moraine, so that outcropping till, sedimentary residues and sand alternate at the sediment surface (cf. application document, Part F.01, Chapter 8.2.2.3, p. 83). Since cohesive dredged material should not be used for re-laying, the till of the "Boddenrandschwelle", in particular, is not intended for re-laying. The pipeline will be embedded in coarse-grained material (sand). The pipe trench will subsequently be backfilled with a sand/gravel mixture to ensure the long-term load-bearing positional stability for the rock covering. To create an outcropping hard substrate, autochthonous drift with a grain diameter of 64 to 200 mm will then be applied (cf. application document, Part F.01, Chapter 8.2.2.3, p. 83). The marl and chalk plates of the NIN and NON biotope types can only be reconstructed with great difficulty after removal. A reconstruction using autochthonous drift with a grain diameter of 64 - 200 mm nonetheless results in the reconstruction of the protected biotope "Reefs", since the function of a reef through epibenthic colonisation is more possible compared to marl and chalk plates, and the character as mineral hard substrates arising from the sea floor is retained. In the case of glacial till, sedimentary residues, stones and boulders left behind on the surface by the abrasion of the surrounding fine-grained material are mainly colonised by sessile species. Colonisation of the easily-eroded fine-grained interstitial material is not possible for sessile species, and the cohesive surface substrate of the outcropping till only offers boring macrozoobenthos a limited potential habitat. To that extent, the restoration of glacial till as cobble fields from the conservation objective and the function of the biotope should at least be at least seen as being of the same nature. The allocation of outcropping glacial till to the statutorily-protected biotope "Reefs" is based on the

close interaction with hard substrates which are classified as boulder and cobble fields. In order to counteract a covering of applied substrates through sedimentation, a higher degree of coverage with stones is generated initially during restoration than was found before the start of construction (cf. application document, Part F.01, Chapter 8.2.2.3, p. 83). This is intended to ensure that a sufficiently large hard substrate surface remains present for colonisation by sessile organisms. A thin sand covering on each side the pipe trench in the course of backfilling, for example as "trench shoulders", is not to be expected on the route sections in reefs, since coarse sand and gravel tend not to flow and wave action and current prevent the deposition of fine-grained sediments (cf. application document, Part F.01, Chapter 8.2.2.3, p. 83). Reefs were restored in a very similar way when constructing the Nord Stream pipeline. The positional stability of the restored reefs could be proved by means of monitoring (cf. application document, Part I3.04, Chapter 4.2.6.1, p. 110).

The boulder and stone fields removed by the project will also be restored. The stone covering will be recreated in the restored reefs so that the range of hard substrate arising from the sea floor remains virtually unchanged with regard to epibenthic macrophytes or invertebrates.

Monitoring the Nord Stream pipeline pipe trench and the "Boddenrandschwelle" shows that the seabed surface (exposure) was accurately restored and has not changed since 2010 (cf. application document, Part I3.04, Chapter 4.2.6.1, p. 110 in conjunction with Part D3.06). Colonisation of the restored sedimentary residues did not show any difference during the Nord Stream monitoring in 2016 to that of the naturally outcropping material. In places, a higher total abundance and total biomass was found, compared to the natural reefs (cf. application document, Part I3.04, Chapter 4.2.6.2, p. 111).

The application documents (cf. application document, Part F.01, Chapter 8.2.2.3, p. 81 et seq., Table 8-4) show that there is a total reef area of 9.87 ha to be restored. A stone covering of approximately 6.3 ha was calculated within the affected reef areas, which will have to be recreated within the restored reef zones. Mitigation measure M3 ensures the use of autochthonous drift, which in turn guarantees that the surface structures and spatial distribution of colonisable hard substrate will be virtually unchanged after backfilling the pipe trench.

Dredging the pipe trench will almost completely clear out the benthic epifauna The investigations as part of the Nord Stream monitoring show that it can be assumed that for the species-rich reef at the "Boddenrandschwelle", regeneration will occur within two years of the end of the construction work (cf. application document, Part I3.04, Chapter 4.2.1, p. 60). The maximum lifespan of the species encountered there during the investigations from 2011 to 2016 was two to three years for individual blue mussels, Mytilus edulis (cf. application document, Part F.01, Chapter 8.2.2.3, p. 83). All the other reef-inhabiting species have several generations each year. The results of the colonisation of the restored reef in the "Schuhmachergrund" are not unequivocal in terms of complete recolonisation after reef reconstruction, according to the Nord Stream monitoring. In the spring migration of 2016 (three years after the restoration of the reefs), the average degree of coverage was only a few percent below that of the reference area of the natural reef (cf. application document, Part I3.04, Chapter 4.2.5.2.1, p. 82, Fig. 4-49).

The reef areas in the present documents shown by surveys in the "Boddenrandschwelle" are plausible. The fact that the "Seabed with fine to medium sands" (NIF/NOF) biotope types have not been allocated to the "Reef" protected biotope is logical, as no moraine ridges were shown in the pipeline route. The "Boddenrandschwelle" consists in its western part and at the crest between Schumachergrund and Oderurstromtal of a layer of Holocene sand up to 6 metres thick, which was deposited postglacially in the static flow zone behind an ice-age core. The east flank is characterised by compressed glacial till, which was first filled in at sinks glacially with meltwater gravel and then with marine sand in the Holocene period. The surface of the glacial till eroded in the Holocene era is present on the seabed as sedimentary residues (gravel, stones, boulders), with a light covering of sand, also Holocene (cf. on this the remarks by the "Ministeriums für Energie, Infrastruktur und Landesentwicklung Mecklenburg-Vorpommern" in the planning approval decision of 09/07/2015, file ref. VIII-667-00006-2015/005-004, p. 92 et seq.). This "Boddenrandschwelle" cannot therefore be characterised as a continuous moraine ridge occasionally covered by a layer of sediment, but rather as a structure that has been characterised as a sandbank, consisting of glacial till or meltwater gravel in some places and predominantly stable Holocene sand deposits in others.

The result of the remarks is that due to the M3 mitigation measures (seabed restoration), a regeneration of the "Reefs" protected biotope at the pipe trenches over a maximum period of four years can be assumed. The gradual and temporary impairment is neither significant nor lasting.

Reference is made to the corresponding remarks about the intervention regulations concerning the character of a merely gradual impact by the project and the regeneration time of a maximum of four years. In terms of the construction-related impacts in the form of turbidity plumes and sedimentation, the same remarks apply to the "Reefs" protected biotope as has have been made above in relation to the "Bodden waters with terrestrialisation zones" protected biotope. Turbidity plumes and sedimentation while laying the Nord Stream 2 pipeline also only cause a local and short-term low-intensity impact on the "Reefs" protected biotope, so it can be assumed that the biotope functions will be restored immediately after the construction period has completely finished.

It should be borne in mind when planning out the anchor positions on outcropping sedimentary residues (hard bottoms) that the number of anchor touchdown points should be kept to the minimum possible (cf. application document, Part D1.01, Chapter 6.2.1.2.1, p. 469). The remaining impairments to extremely small areas of parts of the "Reefs" protected biotope are insignificant and temporary. No relevant removal or ploughing up of hard substrates such as stones or boulders by anchor piles and anchor marks is to be expected.

Construction-related impacts on the "Reefs" protected biotope are not to be expected either. The pipeline will not be laid on the surface of parts of this protected biotope.

Regarding the impact from the temperature change resulting from the operation of the Nord Stream 2 pipeline, the remarks about the "Bodden waters with terrestrialisation zones" protected biotope apply accordingly to "Reefs" as well.

As a result, there will be not be any impairment to the function of the natural balance that can be regarded as significant or lasting and that might need to be restored through compensation. Overall, the result is that, taking into account the planned avoidance and mitigation measures, there will be no significant impairment of the "Reefs" protection biotope.

At the marine interim storage area, there is a "Cobble field" biotope type (NOG) in the south to south-east, which is allocated to the "Reefs" protected biotope in accordance with Section 30 BNatSchG. The protected reef biotopes will not be used for the interim storage of dredged or embedding material (cf. application document, Part F.01, Chapter 8.3, p. 99, Fig. 8-3). Direct use of this statutorily-protected biotope area can consequently be definitely ruled out. Therefore, turbidity plumes and sedimentation resulting from the interim storage of dredged or embedding material for the construction of the Nord Stream 2 pipeline may occur as impacts on the "Reefs" protected biotope at the planned interim storage area. Based on the technically-delimited impact areas in the landscape conservation and the management plan of 25 metres each side of the pipe trench for sedimentation and 50 metres each side of the pipe trench for turbidity (cf. application document, Part G.01, Chapter 10.1.1, p. 251), it can be assumed that these project impacts will not reach the "Reefs" protected biotope, even at the minimum distance of approximately 100 metres from the planned area for interim storage of dredged material. In terms of the impacts of turbidity plumes and sedimentation beyond the technically-delimited impact areas on the "Reefs" protected biotope in the region of the planned interim storage area, it should be noted that trailing suction hopper dredgers will be used for this area (cf. application document, Part C.01, Chapter 3.3.3.3, p. 96). Trailing suction hopper dredgers cause more suspension of the dredged material compared to backhoe dredgers (cf. application document, Part D1.01, Chapter 6.2.1.2.1, p. 469), so the statements regarding the "Bodden waters with terrestrialisation zones" protected biotope apply here accordingly. However, it must be assumed that parts of the suspensible dredged material will be lost due to the dredging of material at the pipe trenches, and cannot therefore be released during the interim storage. This will be determined during the construction monitoring for the Nord Stream pipeline. The tendency to suspension reduces as a result of handling the dredged material several times, as the fine-grained proportion is successively lost. As a consequence, smaller turbidity plumes occur at the site of the interim storage area during dredging work than is the case when dredging the pipe trenches. Analysis of aerial photos also showed that the turbidity plumes at the Nord Stream dumping site were less extensive than those along the pipe trench in the Bay of Greifswald (cf. application document, Part F.01, Chapter 8.3, p. 100). Due to the planned use of backhoe dredgers for the construction of the Nord Stream 2 pipeline, less material with a tendency towards suspension will be lost compared to the construction of the Nord Stream pipeline. However, with a distance of at least 100 metres from the interim storage area and the impact areas of 50 metres laid down in the landscape conservation and management plan for allowing for the impacts relevant to the formation of turbidity plumes, and 25 metres for sedimentation, this effect will be sufficient to prevent any impacts on the "Reefs" protected biotope from handling the dredged material at the marine interim storage area.

In summary, significant impairments can also be ruled out for the "Reefs" protected biotope at the marine interim storage area off Usedom.

B.4.8.5.2.3 "Sandbanks"

In accordance with the instructions in the biotope mapping manual of the State of Mecklenburg – Western Pomerania (LUNG M-V 2011), sublittoral sandbanks of the State of Mecklenburg – Western Pomerania in the Bay of Greifswald are protected as part of "Bodden waters with terrestrialisation zones" without any minimum area being specified. In outer waters, these must have a minimum area of 1,000 m², which is also laid down in the following as the standard for being placed under the protection of Section 39 BNatSchG.

Sandbanks are present in the Baltic Sea in the survey area and in both the inshore and outer coastal waters east of the Darss Sill (NIB and NOB). One sandbank was found along the planned Nord Stream 2 route at the "Boddenrandschwelle", with another one in the "Boddenrandschwelle" at the landfall site next to the industrial port of Lubmin (cf. application document, Part F.01, Chapter 8.2.3.1, p. 89).

The usually-dense mussel population is a frequent and functionally-important element. Frequently-occurring species include *Mya arenaria, Cerastoderma glaucum, Macoma balthica* and drifting blue mussels *Mytilus edulis* (cf. application document, Part F.01, Chapter 8.2.3.1, p. 89). This is almost not the case at all on the flat sandbanks of the "Boddenrandschwelle" and east of Lubmin, due to the high degree of exposure. Mussels only occur sporadically here as juveniles. The characteristic infauna mussel species (*Mya arenaria, Macoma balthica*), although represented, only reach low densities and low biomass figures. Old, large specimens are absent (cf. StALU, Management Plan for the FFH area DE1747-301, 2011, p. 103).

Due to the direct crossing of "Sublittoral sandbanks", impairments to the protected biotope from laying the Nord Stream 2 pipeline system in the pipe trench, and through sedimentation and turbidity during dredging, cannot be ruled out from the outset. The statutorily-protected biotope "Sublittoral sandbanks" at the "Boddenrandschwelle" and at the landfall site next to the industrial port of Lubmin is affected by the project by the use of areas for dredging the pipe trenches (101,235 m²), and by the release of suspended matter when turbidity plumes are generated (185,937 m²) and the deposition of sediment (89,191 m²) (cf. application document, Part F.01, Chapter 8.2.3.3, p. 90 et seq., Table 8-8).

Pipe trench dredging will temporarily affect the hydrography and morphology of the protected biotope. The pipe trench at the "Boddenrandschwelle" will be about 80 metres wide to allow the necessary nautical depth of 4.5 metres for the laying vessel to manoeuvre (cf. application document, Part F.01, Chapter 8.2.3.3, p. 90). Water depths of 3 to 4 metres can be expected in this route section. Taking into account the required minimum cover height, the actual 8.5 metre-wide pipe trench will be 2.5 metres deep there. The "Sublittoral sandbank" to the west of the industrial port of Lubmin will be affected by the dredging of the target pits of the two microtunnels. The target pit will be approximately 30 metres wide at the top and 6 metres deep (cf. application document, Part F.01, Chapter 8.2.3.3, p. 90). The impact on the local hydrography, characterised in particular by water turnover, salinity and the oxygen content near the bottom, can be regarded from the outset as not relevant. The project-related impacts are unlikely to impair the water turnover, salinity or the

oxygen content near the bottom in relation to the protected biotope "Sublittoral sandbanks" to any significant extent.

The project developer's geotechnical investigation results indicate that the sandbank at the "Boddenrandschwelle" is 5.6 metres thick and consists predominantly of well sorted medium sands with an average grain size of 0.3 to 0.5 mm, but also with local occurrences of gravelly sediments (cf. application document, Part F.01, Chapter 8.2.3.3, p. 90). This is the scree of the material eroded at the east flank of the push moraine, and the marine sands deposited here do not present any stratification (cf. application document, Part F.01, Chapter 8.2.3.3, p. 90). In accordance with mitigation measure M3, the dredged material from the "Boddenrandschwelle" will be used for backfilling at its original location to ensure the positional stability of the cover in this exposed area of shallow water. Mitigation measure M3 ensures that the shape of the seabed and the sediment parameters at the bioactive sediment horizon (the top 30 cm) of the baseline biotope are restored in accordance with their character at the end of the construction work at the pipe trenches for the soil dredging (cf. Section B.4.4.1.9). When backfilling the pipe trench at the exposed sandbanks with the original excavated material, the local sedimentary characteristics of the sand banks in the affected route sections will be retained. Monitoring of the Nord Stream pipeline showed that due to the high exposure to currents and wave action, the natural morphology and sedimentary conditions at the "Boddenrandschwelle" return within a few weeks of backfilling the pipe trench (cf. application document, Part F.01, Chapter 8.2.3.3, p. 90). The restoration of the natural morphology and the sediment conditions at the "Boddenrandschwelle" was ascertained accordingly as early as 2011, shortly after the laying of the Nord Stream pipeline, which confirms the short-term nature of the similar impairment by the virtually-identical construction of a pipeline in this area. A thin cover on each side of the pipe trench as part of the backfilling ("trench shoulders") is not to be expected in the route section at the "Sublittoral sandbank" at the "Boddenrandschwelle", since medium sand tends not to flow, and levelling occurs quickly due to wave action and currents.

Due to the high exposure to currents and wave action, a return of the natural morphology and sedimentary conditions at the "Sublittoral sandbank" can be expected within a few weeks of backfilling the pipe trench. This is confirmed by monitoring the Nord Stream pipeline (Nord Stream Offshore Monitoring 2011, p. 309 et seq.), whose landfall is in the same kind of area to the east of the industrial port of Lubmin.

However, pipe trench dredging will initially almost completely clear out out the benthic fauna. After the Nord Stream pipeline was laid, the regeneration of the macrozoobenthos at the sandbanks was examined by divers from 2011 to 2013 at both the "Boddenrandschwelle" and the Lubmin landfall site (cf. application document, Part I3.04, Chapter 4.2.2.1, p. 62). The monitoring survey results for the Nord Stream pipeline show that in 2016, six years after the start of the construction work for the Nord Stream project in the Bay of Greifswald, there was no difference between the benthic soft-bottom communities on the pipe trench and in areas unaffected by construction work (cf. application document, Part I3.04, Chapter 4.1.1, p. 15). As early as the spring of 2012, no more changes in the biocenosis structure in the backfilled pipe trench were recorded (cf. application document, Part F.01, Chapter 8.2.3.3, p. 92 et seq.). As for the recolonisation with macrophytes, only very

slight differences from the reference areas could be identified for the same kind of area at the landfall site east of the industrial port of Lubmin (cf. application document, Part F.01, Chapter 8.2.3.3, p. 93). This suggests the conclusion that the benthic soft bottom biocenosis and macrophyte growth at the area of the "Sublittoral sandbanks" protected biotope will also fully regenerate within a short time after the similar construction of the Nord Stream 2 pipeline. The result of the Nord Stream pipeline monitoring is that, due to the M3 mitigation measures (seabed restoration), a regeneration of the "Sublittoral sandbanks" protected biotope at the pipe trenches within a period of 2 years can be assumed. The regeneration of the benthos community will also be completed within this period, and, at a conservative assumption, a complete regeneration of the macrophyte population at the landfall site can be expected after four years.

In terms of the impacts of turbidity plumes and sedimentation when laying the Nord Stream 2 pipeline in the "Sublittoral sandbanks" protected biotope, the statements made regarding the "Bodden waters with terrestrialisation zones" protected biotope apply accordingly. Turbidity plumes and sedimentation from laying the Nord Stream 2 pipeline will only cause a local short-term low-intensity impact, so it can be assumed that the biotope functions will be restored immediately after the construction period has completely finished. There will be no lasting impairment to the functions of the natural balance that might need to be restored through compensation.

Anchor piles and anchor marks are not expected to give rise to any relevant impairment of the "Sublittoral sandbanks" protected biotope. As already stated, wave action and storms will level the seabed surface within short periods of time.

Construction-related impacts on the "Sublittoral sandbanks" protected biotope are not to be expected either. The pipeline will not be laid on the surface of parts of this protected biotope.

Regarding the impact from the temperature change resulting from the operation of the Nord Stream 2 pipeline, the remarks about the "Bodden waters with terrestrialisation zones" protected biotope apply accordingly to "Sublittoral sandbanks" as well.

Overall, taking into account the planned avoidance and mitigation measures, there will be no significant or permanent impairment of the "Sublittoral sandbanks" protected biotope.

B.4.8.5.2.4 "Species-rich gravel, coarse sand and shell layers"

The definition and characterisation of the "Species-rich gravel, coarse sand and shell layers" biotope by the BfN is in the alternative also transferred to the 12-nautical mile zone of the Federal State of Mecklenburg-Western Pomerania (cf. application document, Part F.01, Chapter 8.2.4.1, p. 95). These are pure or mixed occurrences of gravel, coarse sand or shell sediments on the seabed, which are colonised by specific endofauna and by macrozoobenthos. Gravel and coarse sand biotopes occur in the outer coastal waters of the Baltic Sea mainly at a water depth of -5 to -15 metres, including at submarine sills and together with reefs (cf. application

document, Part F.01, Chapter 8.2.4.1, p. 95). The biotope type "gravel, coarse sand and shell layers" (NOK) is allocated to this protected biotope (cf. application document, Part F.01, Chapter 8.2.4.2, p, 96).

In accordance with the instructions in the biotope mapping manual of the State of Mecklenburg – Western Pomerania, gravel, coarse sand and shell biotopes in the Bay of Greifswald are protected as part of the "Bodden waters with terrestrialisation zones", without any minimum area being specified. In outer waters, these must have a minimum area of 1,000 m² (cf. application document, Part F.01, Chapter 8.2.4.1, p. 96). This is also the standard for classifying the areas of the "Species-rich gravel, coarse sand and shell layers" protected biotope, which is also laid down in the following as the basis for being placed under the protection of Section 39 BNatSchG.

Gravel, coarse sand and shell areas to the east of the Darss Sill in the Baltic Sea are macrophyte-free and only species-poor infauna are present, dominated by polychaeta. Prominent characteristic species are the polychaeta *Ophelia rathkei* and *Travisia forbesii*, which, east of the Darss Sill, have only been found at the "Plantagenetgrund". Other typical species are the polychaeta *Hediste diversicolor* and *Pygospio elegans* (cf. application document, Part F.01, Chapter 8.2.4.1, p. 96).

During the project developer's mapping, only smaller individual areas of gravel, coarse sand and shell layers (NOK) were found at the eastern edge of the "Boddenrandschwelle", roughly at KP 62 and at a distance of at least 135 metres from the Nord Stream 2 pipeline trench. Consequently, no direct use will be made of any area of the "Species-rich gravel, coarse sand and shell layers" protected biotope, due to the distance between the Nord Stream 2 route and the biotope areas of at least 135 metres to the pipe trench.

Based on the technically-delimited impact areas in the landscape conservation and management plan of 25 metres each side of the pipe trench for sedimentation and 50 metres each side of the pipe trench for turbidity (cf. application document, Part G.01, Chapter 10.1.1, p. 251), it can be assumed that these project impacts will not reach the "Species-rich gravel, coarse sand and shell layers" protected biotope at a distance of approximately 135 metres from the pipe trench. In terms of the impacts of turbidity plumes and sedimentation beyond the technically-delimited impact zones in the "Species-rich gravel, coarse sand and shell layers" protected biotope, the statements made regarding the "Bodden waters with terrestrialisation zones" protected biotope apply accordingly.

Anchor piles and anchor marks are not expected to give rise to any relevant impairment of the "Species-rich gravel, coarse sand and shell layers" protected biotope.

In summary, it can be assumed that no significant or lasting impairment of the "Species-rich gravel, coarse sand and shell layers" protected biotope will be caused when laying the Nord Stream 2 pipeline, either by the pipe trench itself or by turbidity plumes and sedimentation.

B.4.8.5.2.5 "Seagrass meadows and other marine macrophyte populations"

Seagrass meadows and other marine macrophyte populations are biotope types characterised by submerged aquatic flowering seabed plants and/or larger algae under the influence of light (cf. application document, Part F.01, Chapter 8.2.5.1, p. 97). The marine biotope mapping manual of the State of Mecklenburg – Western Pomerania defines the "Seagrass meadows and other marine macrophyte populations" protected biotope as cohesive, in places loose, populations on sandy bottoms dominated by Zostera marina seagrass (coverage greater than 10%). Seagrass grows on the outer coast a depth of some 0.5 to 0.6 metres. Locally (e.g. Rerik), seagrass has been found at depths up to 11 metres. Seagrass meadows of an area greater that of 500 m² are protected by law (cf. application document, Part F.01, Chapter 8.2.5.1, p. 98). Underwater video assessments of the underwater footage shot by the project developer during the mapping in the autumn of 2015 identified very rare individual plant specimens of the common seagrass *Zostera marina* exclusively in water depths between 1.7 and 5.4 metres at the landfall site at Lubmin (cf. application document, Part F.01. Chapter 5.1.3.1, p. 41 in conjunction with Part D2.06, map 1). Due to the low extent of cover by *Zostera marina* in the survey area, the criteria regarding the degree of coverage and the area covered for proving the "Seagrass meadows and other marine macrophyte populations" protected biotope were not met. The corresponding biotope type "Seagrass meadow (NBZ)" was therefore not found in the survey area (cf. application document, Part D2.06, map 1).

The term "Other macrophyte populations" is mainly a grouping of large-leaved marine macrophytes such as sugar wrack kelp (saccharina latissima, synonymous with Laminaria species) and dead man's rope, also known as zottige meersaite (halosiphon tomentosus) Red and brown algae populations, shown predominantly in association with reefs in the survey area, are not included under the term "Other macrophyte populations" and are counted as phytobenthos. Flowering plants and ferns, mosses and charophyceae are counted as macrophytes (Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie [Saxony State Office for the Environment, Agriculture and Geology], 2011). Algae species such as red and brown algae do not therefore belong to the macrophytes.

Occurrences of the "Seagrass meadows and other marine macrophyte populations" protection biotope can therefore be ruled out for the Nord Stream 2 pipeline system survey area.

B.4.8.5.2.6 "Tidal mud flats"

The project developer found the biotope type "Exposed windwatt with sand and gravel from the inshore coastal waters of the Baltic Sea east of the Darss Sill" in the route area of Nord Stream 2 pipeline directly off the coast at the Lubmin landfall site, and can be allocated to the "Tidal mud flats" protected biotope. On the offshore side, this protected biotope is bounded by a sublittoral sandbank.

The "Tidal mud flats" protection biotope is not directly affected by use, since this section of the route crosses it underground in a microtunnel and therefore no use can take place. The offshore end of the microtunnel is at kilometre point 83,800 and

336 m from the coastline (cf. application document, Part C.03). The offshore boundary of the "Tidal mud flats" protected biotope (NIX) as shown is some 150 metres from the coastline (cf. application document, Part D3.02, map 1). There is therefore a distance of at least 186 metres between the end of the microtunnel and the "Tidal mud flats" protected biotope.

Therefore, this protected biotope can at most be affected by turbidity plumes and sedimentation resulting from the construction of the Nord Stream 2 pipeline. Based on the technically-delimited impact areas in the landscape conservation and management plan of 25 metres each side of the pipe trench for sedimentation and 50 metres each side of the pipe trench for turbidity (cf. application document, Part G.01, Chapter 10.1.1, p. 251), it can be assumed that these project impacts will not reach the "Tidal mud flats" protected biotope at a distance of approximately 186 metres from the pipe trench or microtunnel target pit. In terms of the impacts of turbidity plumes and sedimentation beyond the technically-delimited impact zones in the "Species-rich gravel, coarse sand and shell layers" protected biotope, the statements made regarding the "Bodden waters with terrestrialisation zones" protected biotope apply accordingly.

Since the pipeline route runs in a microtunnel off the coast up to the pig receiving station, the windwatt off the beach used intensively by tourists is unaffected. Impairments to the "Tidal mud flats" protection biotope can therefore be ruled out.

B.4.8.5.2.7 "Semi-natural forests and bushes in xerothermic locations" and/or "Forests and bushes in xerothermic locations"

The protected biotopes "Semi-natural forests and bushes in xerothermic locations" (Section 20 subsection 1 no. 2 NatSchAG M-V) and/or "Forests and bushes in xerothermic locations" (Section 30 subsection 2 no. 3 BNatSchG) are present in the project-specific survey area for the Nord Stream 2 pipeline system as the "Bushes in xerothermic locations" biotope type (BLT) (cf. application document, Part F.01, Chapter 8.4.1.3, p. 102). According to Annex 2 NatSchAG M-V, the following minimum sizes apply to "Semi-natural forests and bushes in xerothermic locations" for statutory protection: forests: 5,000 m², bushes: 100 m².

For simplification, in the following only the term "the protected biotope "Semi-natural forests and bushes in xerothermic locations"" will be used for the biotope "Semi-natural forests and bushes in xerothermic locations", Section 20 subsection 1 no. 2 NatSchG M-V and/or "Forests and bushes in xerothermic locations", Section 30 subsection 2 no. 3 BNatSchG.

The bushes mapped by the project developer have established themselves predominantly to the south and east of the planned pig receiving station, closely intermeshed with ruderal areas and pioneer forests on the fallow areas of the former nuclear power station. The mapped bushes were dominated by common sea buckthorn *(Hippophae rhamnoides)* and common broom *(Cytisus scoparius)* (cf. application document, Part F.01, Chapter 8.4.1.3, p. 102).

These are found exclusively outside areas affected by soil erosion or habitat loss through removal of vegetation as a result of construction work or structures. The

erection of a construction side fence around the pig receiving station operating area and areas used for the duration of the construction work, as provided for by protection measure S3 (B.4.4.1.9), also prevents impairments to biotope structures by construction vehicles or access on foot. Furthermore, the project developer no longer intends to use the planned area south of Deutsche Ölwerke as a car park and construction site offices. This will greatly reduce the construction site traffic on the road that leads directly past parts of the "Semi-natural forests and bushes in xerothermic locations" protected biotope

There is no need for concern about potential impairments to the protected biotope through emissions of air pollutants (SO_2, NO_x, particulates, CO_2). Sulphur dioxide as a pollutant is only calculated for offshore areas, and plays no role in relation to the onshore area under consideration here (cf. application document, Part I2.03, Chapter 6.2. p. 16). The calculation of particulates only refers to the construction sites themselves. Furthermore, the additional deposition resulting from the construction work is regarded as negligible (cf. application document, Part I2.04, Chapter 8.3, p. 51).

TA Luft lays down immission values for nitrogen oxides of 30 µg/m³, averaged over a period of one year, for the protection of ecosystems and vegetation. These will only be exceeded on the planned construction site during the construction of the Nord Stream 2 pipeline and pig receiving station (cf. application document, Part F.01, Chapter 8.4.1.3, p. 103). Regarding the deposition of nitrogen during the construction of the Nord Stream pipeline and the pig receiving station, during the first year of construction the additional deposition on land only exceeds the existing inputs from prior pollution at the construction site area. At a distance of 2 to 5 km on the land side, the additional inputs only amount to 0.1 kg/(ha*a) (cf. application document, Part F.01, Chapter 8.4.1.3, p. 103) which are negligible. In addition, the bushes in xerothermic locations (BLT) occurring in the survey area, which consist predominantly of secondary established common sea buckthorn (*Hippophae rhamnoides*), have a low sensitivity to nitrogen inputs. The pre-commissioning will lead to an input of nitrogen slightly in excess of the limit value, which in light of the short duration of the emissions will not result in any significant or lasting impairments to the "Semi-natural forests and bushes in xerothermic locations" biotope.

The dewatering measures will also not bring about any impairment to the "Semi-natural forests and bushes in xerothermic locations" protected biotope, as the drawdown cone will have a maximum size of 189 metres (cf. application document, Part I1.05, Annexe 6, p. 4, Fig. 2) and the more distant areas of the biotope will consequently not be affected. Moreover, the sensitivity of the biotope to water table drawdown is decisive for the assessment of impact intensity. The tree population around the pig receiving station is rooted in anhydromorphous sandy soils and is not sensitive to water table drawdown. Impairments to the "Semi-natural forests and bushes in xerothermic locations" can therefore be ruled out.

To summarise, it can be assumed that no project-related impairments to the protected biotopes "Semi-natural forests and bushes in xerothermic locations" (Section 20 NatSchAG M-V) and/or "Forests and bushes in xerothermic locations" (Section 30 BNatSchG) are possible.

B.4.8.5.2.7 "Semi-natural field hedgerows"

According to the project developer's mapping, a "young hedgerow" (BJH) with shrub species such as common dogwood (*Cornus sanguinea*), hawthorn (*Crataegus spec*.) and common broom (*Cytisus scoparius*) runs along the noise and visual screening wall north of the planned pig receiving station, which is to be allocated to the "Semi-natural field hedgerows" protected biotope (Section 20, subsection 2, no. 4, NatSchAG M-V) (cf. application document, Part F.01, Chapter 8.4.2.2, p. 105). According to Annex 2 NatSchAG M-V, a minimum length of 50 metres applies to "Semi-natural field hedgerows" for the protected biotope.

Potential impairments to the "Semi-natural field hedgerows" protected biotope through emissions of air pollutants (SO_2, NO_x, particulates, CO_2) can be ruled out. The remarks about the "Semi-natural forests and bushes in xerothermic locations" protected biotope apply here (see above). Due to the short duration of the nitrogen emissions, no significant or lasting impacts on the hedgerows biotope at the noise barrier have been calculated, which overall have a low sensitivity to nitrogen inputs.

Impairments to "Semi-natural field hedgerows" can be ruled out, due to the large water table depths under the ground surface of some 3 to 4 metres.

To summarise, it can be assumed that no project-related significant or lasting impairments to the "Semi-natural field hedgerows" protected biotope are possible (Section 20 NatSchAG M-V)

B.4.8.5.2.8 "Reed beds and reeds“ or "Reed beds"

A reed bed (Phragmites australis) (VRL) is located in a wet depression in the south of the project-specific survey area for the Nord Stream 2 pipeline system (cf. application document, Part F.01, Chapter 8.4.3.2, p. 107). This is to be allocated to "Reed beds and reeds" (Section 20 NatSchAG M-V) or "Reeds" (Section 30 BNatSchG). According to Annex 2 NatSchAG M-V, the following minimum sizes apply to "Semi-natural field hedgerows"" for statutory protection: 100 m².

Concerns regarding impairments to the protected biotope through emissions of air pollutants (SO_2, NO_x, particulates, CO_2) can be ruled out. The established reed beds in the south of the survey area are not bound to low-nutrient locations and have a low sensitivity to nitrogen inputs. Due to the short duration of the emissions, no lasting impacts on the "Reed beds and reeds" biotope (Section 20 NatSchAG M-V) and "Reeds" biotope (Section 30 BNatSchG) are to be expected. Furthermore, the remarks about the "Semi-natural forests and bushes in xerothermic locations" protected biotope apply here (see above).

The dewatering measures cannot have any negative impact on the "Reed beds and reeds" or "Reeds" protected biotopes. This protection biotope is situated outside the drawdown cone of the groundwater extraction measures (cf. application document, Part I1.05, Annexe 6, p. 4, Fig. 2). Reeds colonise a wide spectrum of habitats anyway, so any water table drawdown during the construction period would be tolerated.

To summarise, it can be assumed that no project-related significant or lasting impairments to the "Reed beds and reeds" (Section 20 NatSchAG M-V) and "Reeds" (Section 30 BNatSchG) protected biotopes are possible (Section 20 NatSchAG M-V)

B.4.8.5.3 Precautionary examination of the elements of exceptions

Based on the repressive prohibition subject to exemptions as set out in Section 30 subsection 2 sentence 1 BNatSchG, which is intended to preclude any reasonable likelihood, if not possibility, of an impairment to the protected biotope, the plan approval authority has, as a precaution, checked whether the elements that constitute an exception under Section 30 subsection 3 BNatSchG exist.

Under Section 39 subsection 3 BNatSchG and Section 20 subsection 3 NatSchAG M-V, exceptions may be permitted upon application in individual cases if impairments to the biotope or geotope can be compensated, or if the measure is necessary in the overwhelming public interest. If the biotopes and geotopes are sites of community importance (SCI) or selected or established European bird sanctuaries under Section 21 subscection1 BNatSchG, exemptions are only permissible if the requirements of Section 34 sections 1 to 5 of the Bundesnaturschutzgesetz are met. Exemptions that are necessary for the overwhelming public good are subject to the provisions of Section 15 subsections 2 and 6 BNatSchG on compensation and substitution measures. Compensation measures within the meaning of the intervention regulations must be designed in terms of quality to bring about a condition in the affected landscape area which perpetuates the previous condition in the same way, and with the same impact (BVerwG, judgement of 16/03/2006, 4 A 1075/04, BVerwGE 125, 116 et seq., juris margin no. 532). This condition has already been achieved with the implementation of the restoration and mitigation measures as laid down and listed. There are no biotopes protected by law significantly affected in the region of the surface-laid pipeline.

If the criteria from the intervention regulations ("HzE marine") are taken as the basis for compensation under biotope protection legislation, a compensation deficit of 126.08 ha KFÄ results (taking into account the biotopes marked with an * in Tables 10 and 11), which would be covered by the offsetting eco-account. A further legal precondition under Section 20 subsection 3 NatSchAG and Article 67 subsection1 BNatSchG is that the exception or exemption is necessary in the overwhelming public interest. This is confirmed with reference to the project's public interest aspect, and the fact that avoidance and mitigation measures have been exhausted. Due to their temporary nature, the impacts are not serious enough to make granting an exception untenable. No further discretionary aspects that could impede an exemption are identifiable.

B.4.8.6 Natura 2000 areas

The compatibility of the measures in the present proceedings with derived European law has also been checked. The result is that the project impact on the Natura 2000 areas that it affects does not cause any significant or lasting impairment to their essential elements for conservation objectives or protective purposes, individually or in combination with other plans and projects, and the project is admissible as far as

Natura 2000 habitat protection is concerned (Section 34 subsection 1 BNatSchG, Section 4 subsection 4 sentence VRL).

A compatibility test regarding possibly-affected Natura 2000 areas has been carried out in Section B.4.5. Reference is herewith made to this. The FFH compatibility studies presented by the project developer contain all the information necessary for this test (cf. application document, Part E)

StALU Vorpommern points out in its expert statement of 12/06/2017 that the assumption that the pipeline laying has an entirely temporary impact may require concretisation. The assumption disregards the change in the geological strata sequence below the top 30 cm of the seabed that will be restored (introduction of technical equipment, backfilling the pipe trench with embedding and other backfilling material), which has already been forecast in the UVS and in other documents. In contrast, it cannot be assumed beyond doubt from the sedimentary structures sub-criterion in the above-mentioned assessment scheme that the undisturbed natural diversity is limited exclusively to the so-called bioactive soil horizon. For precautionary reasons at least, the introduction of technical equipment, and possibly the resulting change in grain size from bringing back filling material below the top 30 cm of the seabed, should therefore be regarded as a gradual change in the conservation status at the pipe trench.
The plan approval authority based its evaluation on the fact that the colonisation depth of macrozoobenthos in the sediment in the Pomeranian Bight and the inshore coastal waters of Vorpommern depends on the oxygen penetration depth, as hydrogen sulphide is generally toxic for invertebrates. It is therefore limited to a few centimetres for most species. Only tube-forming species and mussels with long siphons can colonise anoxic sedimentary regions. The colonisation depth of these species has been studied intensively as part of the GOAP ecosystem research projects (University of Greifswald) and TRUMP (IOW) and in several dissertations at the universities of Rostock and Greifswald during the year (e.g. Kube 1996[112] and Zettler 1996). Soft-shell clams and Baltic clams settle in the Bay of Greifswald and the Pomeranian Bight at depths of up to 10 - 15 cm. The two large tube-forming polychaeta, hedist and marenzelleria, burrow and produce tubes up to 20 and 30 cm deep. As regards polychaeta of the genus marenzelleria, it should be noted that this is an invasive species, in other words a non-indigenous species (LACKSCHEWITZ ET AL. 2015)[113]. According to Wulfert et al. (2016)[114] alien species can be ruled out as characteristic species, since the protection of habitat types is not intended to protect and conserve these species. The result is that the "depth limit" to be taken into

[112] Kube, J. (1996): Spatial and temporal variations in the population structure of the soft-shell clam, Mya arenaria, in the Pomeranian Bay (Southern Baltic Sea). J. Sea Res. 35: 335-344.

[113] Lackschewitz, D., Buschbaum, C., Reise, K. (2015): Neobiota in deutschen Küstengewässern - Eingeschleppte und kryptogene Tier- und Pflanzenarten an der deutschen Nord- und Ostseeküste 2014. (Non-indigenous species in German coastal waters - introduced and cryptogenic animal and plant species at the German North Sea and Baltic Sea coasts). Commissioned by the LLUR.

[114] Wulfert, K., Lüttmann, J., Vaut, L., Klußmann, M. (2016): Berücksichtigung charakteristischer Arten der FFH-Lebensraumtypen in der FFH-Verträglichkeitsprüfung. (Taking characteristic species of the FFH habitat types into account in the FFH compatibility test) Leitfaden für die Umsetzung der FFH-Verträglichkeitsprüfung nach § 34 BNatSchG in Nordrhein-Westfalen. (Guidelines for implementing the FFH compatibility test under Section 43 BNatSchG in North-Rhine Westphalia) Final report (19.12.2016). Commissioned by the Ministerium für Klimaschutz, Umwelt, Landwirtschaft, Natur- und Verbraucherschutz (Ministry for Climate Change, Environment, Agriculture, Nature and Consumer Protection)

account at habitat types 1110, 1160 and 1170 is reduced to the burrow depth of 20 cm as the maximum burrow depth of the polychaeta of the genus hediste. All other endobenthic species of macrobenthos and meizoobenthos in the detailed examination area (sands with low organic content) are limited in that they occur in the top 5 cm of the sediment.
Areas with glacial till sediment allocated to habitat type 1170 represent a substrate which is almost impossible to colonise due to its high material density, high clay content and the continuous abrasive action by currents. This applies equally to the infauna and the sessile epifauna. Nor can macrophytes gain any foothold in marl. Instead, the hard substrate fauna colonises the sedimentary residues (coarse sand, gravel, stones, boulders). Under mitigation measure M3 (Section B.4.4.1.9.1), the sedimentary residues will be replaced completely by imported autochthonous drift of comparable quality. According to LUNG (2011)[115], marl can only be colonised by burrowing polychaeta species such as the ragworm hediste diversicolor with a maximum burrow depth of 20 cm, when in its eroded condition, in which case temporary colonisation is to be assumed.
Therefore, gradual substrate changes (gravel instead of sand, or gravel instead of glacial till in habitat type 1170) below the colonisable soil horizon, or the laying of a pipeline in a trench with a covering of at least 50 cm, should in no way be regarded as a permanent or gradual impairment to the conservation status of the marine FFH habitat types 1110, 1160 and 1170 in the detailed examination area of the Natura 2000 areas to be examined.

In terms of the selection to be made and the weighting of the selected indicators and the parameters (FFH habitat type 1160), an explanation must be given as to why the hydrography, bathymetry and sediment parameters were weighted at a total of 55% to describe the loss of function, while the benthocenosis describing the impairment and restoration is given as 45%. It is clear, however, that the main criteria "completeness of typical habitat structures" and "completeness of the typical species mix for the habitat" are basically of equal importance when determining the conservation status using the assessment scheme standards. The classification of the indicators (cf. application document, Part E.03, Chapter 4.1.3, p. 41, Table 4-1) could in principle produce another allocation to the above-mentioned main criteria.
The weighting of abiotic parameters results from the general marine ecological fact that the species composition of the biocommunity of a marine habitat type is primarily dependent on these parameters, and biotic factors are seldom proximate (exception: biogenic reefs, dense macrophyte growth - kelp forests, seagrass meadows). The quantification of the gradual loss of function over time is consequently based on current scientific knowledge for modelling the populations of benthic invertebrates in the German Baltic Sea (ZETTLER, M. L., ET AL. (2013), GOGINA, M., ET AL. (2009); Gogina, M., et al. (2010)). This assessment also corresponds to the evaluation of marine habitat types by the BfN: "The evaluation of habitat structures is generally based on the sediment structure and hydromorphological characteristics of the areas. Attention should be paid here as to whether the sediment composition and distribution, the salinity, the temperature and the exposure determine the characteristic species mix of the area. Many marine habitat types are characterised by the high natural dynamics of the

[115] LUNG (2011): Anleitung für die Kartierung von marinen Biotoptypen und FFH-Lebensraumtypen in den Küstengewässern Mecklenburg-Vorpommerns (Guidelines for mapping marine biotopes and FFH habitat types in the coastal waters of Mecklenburg – Western Pomerania).

geomorphological, hydrophysical and hydrochemical processes. A favourable conservation status can generally only be achieved here if the natural processes are allowed to take their course with as little interference as possible as part of their natural dynamics."
The high significance of abiotic parameters for the distribution of benthic marine species and the assessment of anthropogenic interventions was the trigger for the intensive habitat modelling of German offshore areas, which continues to the present day, since the promotion of wind energy at sea (e.g. IFAÖ & AWI 2008, and above). Many studies on anthropogenic changes in marine biotopes resulting from short-term interventions (e.g. excavations, dumping) show that those that permanently change oceanographic or sedimentary parameters can cause gradual impairments (e.g. Harff 2006[116], Krause 2002[117]). However, changes in marine biotopes resulting from short-term anthropogenic interventions (e.g. killing of animals) are frequently reversible (Nord Stream Offshore Monitoring 2011, p. 171 et seq., p. 309 et seq., p. 346 et seq., p. 410 et seq.; Nord Stream Offshore Monitoring 2012, p. 170 et seq., p. 317 et seq., p. 366 et seq., p. 456 et seq.; Nord Stream Offshore Monitoring 2013, p. 109 et seq., p. 252 et seq., p. 334 et seq., p. 432 et seq.; Nord Stream Offshore Monitoring 2014, p. 64 et seq.; Nord Stream Offshore Monitoring 2016, p. 57 et seq., p. 110 et seq.). It therefore seems necessary in the case of short-term (construction-related) impairments to give priority to checking whether these can cause lasting gradual changes to abiotic parameters.

StALU Vorpommern also points out in its expert statement of 12/06/2017 that the further sub-classification of the indicators into the stated parameters needs explaining, alongside their weighting, taking the assessment scheme into account. For example, the extent to which the nutrient, pollutant and sediment pollutant content parameters are suitable, on the basis of the intervention characteristics, for describing the gradual impacts, together with regeneration, must be explained, particularly as these are not relevant for evaluating the two main criteria mentioned above. The assessment scheme, which was developed for the project developer's expert assessor to evaluate possible temporary impairments (cf. application document. Part E.03, Chapter 4, p. 61 et seq.) and (cf. application document, Part E.08, Chapter 4, p. 32 et seq.) claims, on the basis of the method developed for the AWZ for assessing the significance of impairments as part of the statutory biotope protection under Section 20 BNatschG (BfN (2012)[118] / Bernotat (2013), to be usable for universally testing temporary impairments of marine habitat types in MV. Accordingly, chemical sediment parameters (nutrients, pollutants) are also relevant to the assessment. This applies in particular to the Nord Stream 2 project, when several million cubic metres of seabed will be temporarily relocated during construction work. The pollution situation of the excavated material is therefore a decisive criterion for the pipeline route, as is the condition of the marine interim storage site.

[116] Harff, J. (Hrsg.) 2006[116]: Project: DYNAS Dynamik natürlicher und anthropogener Sedimentation; Vorhaben: Sedimentationsprozesse in der Mecklenburger Bucht, Phase II, Abschlußbericht. (DNAS Dynamic natural and anthropogenic sedimentation; Sedimentation Processes in the Bay of Mecklenburg project, Phase II, final report). Research project of the Bundesministeriums für Bildung und Forschung (Federal Ministry of Education and Research).

[117] Krause, J. (2002): The effects of marine sediment extraction on sensitive macrozoobenthic populations in the southern Baltic Sea. Dissertation, University of Rostock).

BfN (2012): Methode zur Bewertung der Erheblichkeit von Beeinträchtigungen im Rahmen des gesetzlichen Biotopschutzes nach § 30 BNatSchG in der AWZ, Stand 27.02.2012.

StALU Vorpommern notes the following in its expert statement of 12/06/2017: The classification of grain size, silt content and organic content cannot be derived from the assessment scheme. Ultimately, the sedimentary structures subcriterion (natural diversity of the sediments) cannot be further differentiated, so that regardless of the weighting applied to the sedimentary parameters, complete regeneration cannot be attested until the third year. Nor would an earlier regeneration of sub-fractions necessarily lead to an improvement in the conservation status, according to the assessment scheme standard.
It should be stated first that the estimate of the impairment intensity and resulting reduction in functions (temporary and gradual loss of functions) according to BfN (2012) depends very much on each individual case and is a matter for the expert assessor. The plan approval authority is of the view that this has been done to a sufficient extent and in a way that can be traced. The objection fails to consider that endobenthic invertebrates use soft-bottom habitats not just for habitation, but also seek their food there (cf. IFAÖ and AWI, 2008). For filter feeders, the grain size and water content parameters are of primary relevance (tube construction, movement, depth of the redoxcline). Silt content and organic content, on the other hand, are far more important for substrate feeders (algae and bacterial growth on small particles). For example, the organic content can have different effects when in different forms. A lower content means less nutrients for oligochaetes, but good oxygen conditions for sensitive species (generally the endangered species as a result of the current eutrophication). A higher content, on the other hand, means a good supply of nutrients for oligochaetes together with an increased risk of a lack of O_2 for sensitive species. Pollutants can also trigger species-specific effects (for example, antifouling paints containing TBT, and "grazing" snails). A differentiated way of looking at the autecologically-relevant sedimentary parameters is therefore required.

According to the expert statement by StALU Vorpommern of 12/06/2017, a distinction between characteristic species and benthic zones does not completely coincide with the assessment scheme. In the latter, the principle criterion "Completeness of species mix typical of the habitat" is divided into macrophyte and macrozoobenthos species such as fish and avifuana. This distinction should also reflect the the project developer's present concept. The concept in the application documents leads to an over-assessment of the characteristic species ("presence" in particular), which cannot be represented by the assessment scheme.
Characteristic species are those plant and animal species that characterise the specific characteristics of a habitat and its favourable conservation status in a specific area and not just a habitat type in general (BVerwG, 06.11.2012, 9 A 17/11, BVerwGE 145, p. 40 et seq., juris margin no. 52). The assessment scheme of the BfN in the profiles for the status of marine habitat types in Natura 2000 areas therefore only takes into account species that are typical to the habitat. As a rule, due to the number of species (frequently more than 500 species per habitat type in marine protected areas) and the concomitant different continuity of species in a specific area, the remaining species mix is not practicably verifiable. The assessment scheme for the State of Mecklenburg-Western Pomerania in the profiles of the status of marine habitat types in Natura 2000 areas (for example in habitat type 1160, https://www.lung.mv-regierung.de/dateien/ffh_sb_lrt_1160.pdf, retrieved on 15/11/2017) is more wide-reaching in the light of the comparatively low number of species regionally (less than 500 species in the entire territorial waters of Mecklenburg-Western Pomerania), and includes populations of other species in the

assessment. The assessment scheme, which was developed for evaluating possible temporary impairments (cf. application document. Part E.03, Chapter 4, p. 61 et seq.) and (cf. application document, Part E.08, Chapter 4, p. 32 et seq.) takes this State-specific method into account and gives this indicator the highest significance with a weighting of 25%.

StALU Vorpommern also notes in its expert statement of 12/06/2017 that, in places, the proposed evaluation system departs from the standards laid down in the assessment scheme. Since no generally accepted concept has been available up to now for assessing the favourable conservation status, although binding standards would be appropriate, the existing standards of the State should be taken as guidelines for the sake of forecasting accuracy
The assessment scheme, which was developed for evaluating possible temporary impairments (cf. application document. Part E.03, Chapter 4, p. 61 et seq.) and (cf. application document, Part E.08, Chapter 4, p. 32 et seq.), takes all the criteria for assessing the status of marine habitat types in Mecklenburg-Western Pomerania into consideration, in accordance with the State's own profiles. It only differs from these in that it replaces the descriptive assessment catalogue with a quantifiable assessment catalogue based on parameters measurable in situ. The plan approval authority finds this course of action objective and understandable.

Whether the regeneration of the benthocenosis will actually be completely finished after four years and whether a period of 30 years can be taken as a lasting impairment (relevant for deriving the degree of temporary impairment), will depend on the choice of basic methodological assumptions. For example, lasting impairments that cannot be compensated according to the criterion of "HzE 1999" are assumed to have a duration of 25 years. Furthermore, the regeneration period of four years is a forecast.

The examination by the plan approval authority has shown that the result for all FFH areas and all habitat types when applying a period of 25 years under "HzE 1999", and when assuming a regeneration period of 5 years, remains unchanged. This also applies when taking cumulative projects into account (50Hz subsea cable). According to the methodology as further developed by the expert assessors in the context of Nord Stream 2, a period of 30 years seems correct for a lasting impairment. In addition to the guideline value for the absolute loss according to LAMBRECHT & TRAUTNER (2007), the guideline value for the relative loss (there in row 2 of Table 2, p. 34) has been taken into consideration.

Three comprehensive scientific studies in the last 20 years on the regeneration capacity of benthic colonisation in the sea area ofthe Pomeranian Bay are available : (1) TRUMP project by the "Institute für Ostseeforschung (Institute for Baltic Sea Research), Warnemünde" (1993-1997, e.g. Powilleit & Kube 1999), (2) coastal monitoring by LUNG MV (continuous data collection, some 100 benthos samples analysed since 1996), (3) Nord Stream/Nord Stream 2 Monitoring (since 2006, Nord Stream monitoring reports 2010-2014, 2016 follow-up investigation). There are at least two extensive surveys of the Bay of Greifswald from the last 20 years: (1) Monitoring the expansion of the eastern approach to Stralsund by GDWS (WSA Stralsund 2005-2011, IFAÖ 2013), (2) Nord Stream / Nord Stream 2 monitoring (since 2006, Nord Stream monitoring reports 2010-2014, 2016 follow-up investigation) In addition, further applied investigations from the monitoring of sand

extraction from comparable biotopes by the state of Mecklenburg-Vorpommern after partially-similar interventions are available (e.g. IFAÖ 2008). There are also many studies on the impact of interventions with other kinds of lasting impairments (dumping, stationary gravel extraction, e.g. Harff 2006, Krause 2002), which allow indirect general conclusions to be drawn about the regeneration process (key words: sedimentary parameters). In addition, many scientific studies exist from the past 30 years on the regenerational capacity of macrozoobenthos in the western Baltic Sea above the halocline after natural disturbances, with constant sediment ratios (O_2 deficiency, salinity changes due to salt water inflows, sediment redistribution, ice drift), which were already used as the basis for the Nord Stream pipeline planning approval. The detailed monitoring of the Nord Stream project could also completely resolve forecasting uncertainties that for technological reasons are still outstanding in the planning and plan approval for the Nord Stream project. Existing knowledge therefore allows a high degree of certainty in forecasts relating to the marine biotopes impacted by the project, which exceed those for most terrestrial biotopes by a large margin.

In terms of the assessment of project-related impacts on "Reefs" as a biotope protected by law under Section 30 subsection 2 sentence 1 no. 6 BNatSchG (cf. application document, Part F.01, Chapter 8.2.2, p. 81 et seq., Table 8-4; direct or indirect impact, Section 30 BNatSchG "Reefs" extending over approximately 680,000 m²), the use of autochthonous drift should ensure that the surface structures and spatial distribution of colonisable hard substrate is virtually unchanged after backfilling the pipe trench (mitigation measure M3, Section B.4.4.1.9.1). However, the geological strata sequence underneath the restored structures was changed following the objection by StALU Vorpommern. The same applies to the outcropping glacial till, which essentially cannot be restored.
The reef on the Bodenrandschwelle is colonised by approximately thirty species of invertebrates and ten species of small macroalgae (cf. application document, Part E.08, Chapter 4.3.1, p. 45 et seq.). Very few sessile species only colonise sedimentary residues. Soft-bottom species live in embedded sand. Outcropping glacial till, which occurs in places on the Boddenrandschwelle, is not colonised by either animals or plants (c.f application document D1.01, Chapter 5.5.1.3, p. 208 et seq.), since it is subjected to permanent erosion due to its exposure. Boring animal species do not occur in the sea area (the salinity is too low). The function of the glacial till in this sea area in the SCI "Bay of Greifswald, parts of the Strela Sound and the northern tip of Usedom" (DE 1747-301) and "Greifswalder Boddenrandschwelle and parts of the Pomeranian Bight" (DE 1749-302) is therefore restricted solely to shaping the seabed surface: the creation of an exposed foundation upon which sedimentary residues can be colonised by sessile species. This function is not permanently impaired by the Nord Stream 2 project, as it has been shown that it can be completely restored with gravel and sedimentary residues during pipe laying.

- The repeated surveys of the Nord Stream pipeline pipe trench on the "Boddenrandschwelle" show that the bathymetry (exposure) was accurately restored and has not changed since 2010 (cf. application document, Part D3.06, Chapter 4.2.6.1, p. 110 in conjunction with Part D3.06 - Bodenrandschwelle genesis).
- The repeated side-scan sonar surveys of the pipe trench of the Nord Stream pipeline on the Bodenrandschwelle prove that the sedimentary

residues of autochthonous origin applied for the purposes of reef restoration are positionally stable (cf. application document, Part D3.06 - Bodenrandschwelle genesis).

- The colonisation of the restored sedimentary residues is no different to that of the natural outcropping material (cf. application document, Part I3.04, Chapter 4.2.6.1, p. 110 et seq.).

The small-area change in the conditions of outcropping sedimentary residues and glacial till does not represent an impairment to habitat type 1170 in the SCI "Bay of Greifswald, parts of the Strela Sound and the northern tip of Usedom" (DE1747-301) and "Greifswalder Boddenrandschwelle and parts of the Pomeranian Bight" (DE1749-302), as it does not have any impact on the protection purposes or conservation objectives.

StALU Vorpommern points out in its expert statement of 12/06/2017 that taking the assumptions made in Table 4-1 (cf. application document, Part E.03, Chapter 4.1.3, p. 41, Table 4-1) as a basis, which for want of a convention can be seen as technically appropriate in essence, represents a methodological assumption that regeneration to an extent of up to 50% could take place even during the offshore working season (from May to December). This is based on the immediate restoration of the hydrography and bathymetry indicators, and in part also the sediment parameters, a more detailed explanation of which is required regarding the extent to which the parameters of salinity, nutrients and pollutants, each with a weighting of three percent, and the pollutant content of the sediment (five percent weighting) suffer any impairment at all, and are therefore likely to contribute to the quantification of regeneration (to the extent stated).
Furthermore, the assumption of a 50% regeneration would not, contrary to the description of the expert assessor in Chapter 6.2, correspond to the model of a gradual loss of functions for the "CWA network connection" project either. The expert assessor states that the quantification of the annual gradual loss of function for the "CWA network connection" only departs slightly from the assumptions made for NordStream 2 (cf. Table 6.1). The authority cannot agree with this. A 100% loss of function has always been assumed in the year when cables are laid. Nonetheless, the project developer is free to select a different approach. Even a regeneration of 49% (and not 50%) in the year of construction would, under the present approach, result in the guideline values being exceeded in 2018 and as a result, in an incompatibility under Section 34 BNatSchG. Moreover, a check should be made as to whether the repeated hydraulic fill at Lubmin, shown as part of the summation or cumulation, should be taken into account.
The assessment scheme, which was developed for evaluating possible temporary impairments (cf. application document. Part E.03, Chapter 4, p. 61 et seq.) and (cf. application document, Part E.08, Chapter 4, p. 32 et seq.) assesses not the regeneration progress, but a rather gradual loss of functions over the period of one calendar year. As a result, the following ancillary conditions have been defined for the year of construction: "The degree of function loss in each area at the time the construction measures end will be assessed as a function of the impact's quality and intensity. The duration of the construction measures must not exceed six months for this." (cf. application document, Part E.08, Chapter 4.3.1, p. 38). This differentiation is relevant because areas impaired by construction work in the year of construction work can possess three different statuses: no impact before the start of construction,

construction phase, regeneration. The abiotic parameters in the event of technical restoration can only be assessed as "not measurably impaired" if the construction phase lasts for less than six months. This does not apply in the main to biotic parameters (fish constitute an exception in the case of small-scale or linear interventions).
The method of quantifying the gradual loss of function for the "CWA network connection" project selectively considers the macrozoobenthos parameter when assessing the conservation status of marine habitat types (application document for the "CWA network connection", Appendix 10-1 FFH_VU_1747_301, Chapter 5.1.3, p. 63 et seq.). Understandably, the project developer then regarded the methods for the "CAW network connection" project as inadequate. It cannot therefore be compared with the assessment scheme used for the Nord Stream 2 project.

Furthermore, StALU Vorpommern states the following in the expert statement of 12/06/2017 on the compatibility investigation regarding the EU bird sanctuary DE 1747-402 “Bay of Greifswald and south Strelasund” (cf. application document, Part E.10):

The construction dates proposed for both the Greifswald Bodden and the south-west of the Bay of Pomerania are mid-May to the end of December (mitigation measure M6, cf. section B.4.4.1.9.1). Overwintering bird stocks can be expected to increase from November. As an example, we considered what the FFH-VU says about scaups and long-tailed ducks.

Before going any further, we must dispute that scaups do not feed in the open Bay of Pomerania, or that seabird surveys did not find them there (cf. application document part F.07 chapter 6.1.2.1, p. 151 et seq.). Scaups prefer feeding on zebra mussels in the Oderhaff in autumn. As blue mussels do not occur in any useful density in waters less than 8 m deep in the area of the Greifswald Bodden and the bodden escarpment all year round, this species is presumably less important here. From March to May, scaups in the Greifswald Bodden feed mainly on herring spawn (cf. application document, part F.07, chapter 6.1.2.1, p. 154).
Scaups only feed in waters up to 10 m deep. The transport route between the tipping point and pipeline trenches is in waters > 10 m deep and does not affect any scaup feeding grounds.
There are no relevant scaup feeding grounds in the area of the pipeline trench as planned (the reef on the bodden escarpment lies next to the Landtief).
We can definitely rule out any substantial disturbances to overwintering or scaup feeding grounds during construction periods (cf. application document, part F.07, chapter 6.1.2.1, p. 151 et seq.).
As far as scaups are concerned, the first point to note is that long-tailed ducks do not start coming to the Greifswald Bodden to overwinter until December. By December, restoring the reef on the bodden escarpment and the AWTI off Lubmin will be the last construction works offshore and will only involve ships; therefore, there is no question of scaring scaups off to any significant extent (cf. application document, part F.07, chapter 6.1.2.4, p. 164 et seq.).

In its opinion of 12.06.2017, the StALU Vorpommern says the following about scaups and the compatibility test with the EU bird protection area DE1747-402 "Greifswald Bodden and southern Strelasund" (cf. application document part E.10):

The Nord Stream 2 pipeline trench occupies 20-30 ha of the habitats scaups can use. The areas affected by the construction works are not suitable feeding grounds for them, as benthic organisms can be expected to be largely lost in the construction area and in immediate impact areas. The FFH-VU says that "the feeding area affected is very small compared with the total feeding habitat as a whole" (cf. application document part E.10 chapter 4.2.2.1, p. 42). A precise quantitative statement in terms of the total scaup habitat is needed here to make the forecast more reliable. They say that they gather from the FFH-VU on p. 42 (cf. application document part E.10, chapter 4.2.2.1, p. 42) that "scaups … could only be frightened off by construction in November-December." In any case, the specialist species protection contribution regards these project impacts as liable to cause a considerable disturbance to the conservation status of the (local) population. They therefore find that the construction time window must be adjusted to suit the overwintering periods. Alternatively, an expert could say why this is not necessary.
In response to this, we would say that the potential impacts on the scaups' feeding habitats on the pipeline route are limited to an uneven mussel growth in the area of a reef in the immediate vicinity of the bodden escarpment, right next to the Landriff shipping channel for one or two years. As far back as 2013, thirty months after the construction work was complete, Nord Stream monitoring found that the length to frequency distribution of blue mussels on the bodden escarpment for the stock component eligible as food for scaups showed no differences between the pipeline trench and reference areas (Nord Stream offshore monitoring 2013, p. 331 et seq.). The areas which will be lost temporarily due to the project may therefore be specified as follows and considered in relation to the habitat space of the scaup in the SPA as a whole:
The pipeline trench will occupy 8.5 ha in all of the FFH habitat type reefs in the SCI "Greifswald Bodden, parts of Strelasund and northern tip of Usedom" (DE1747-301) (cf. application document part C.01 chapter 3.1.2.4, p. 55, Tab. 3-4), comprising approx. 6.5 ha on the eastern flank of the bodden escarpment (block and stone grounds/till outcrops), 0.4 ha on a short section of route with till outcrops in 9 m of water west of the bodden escarpment and 1.6 ha on debris grounds in approx. 5 m of water west of Schumachergrund (cf. application document chapter 4.3.3, p. 89 et seq.). The FFH habitat type 1170 occupied represents 0.1% of its total area in the protected area (7,504 ha according to the standard datasheet, cf. application document 4.3.3, p. 89 et seq.).
In the SCI "Greifswald Bodden escarpment and parts of the Bay of Pomerania" (DE1749-302), the FFH habitat type will occupy reefs over an area of 0.5 ha in total (cf. application document part C.01 chapter 3.1.2.4, p. 55, Tab. 3-4), of which approx. 0.25 ha each is on the eastern flank of the bodden escarpment and the Idunagrund (block and stone grounds in each case). The proportion of the FFH habitat type 1170 used amounts to approximately 0.006% of its total area in the protected area (8,957 ha according to the standard datasheet, FFH-VU SCI DE1749-302 chap. 4.3.1, p. 45 et seq.)

In its opinion of 12.06.2017, the StALU Vorpommern says the following about the long-tailed duck on the compatibility test with the EU bird protection area DE1747-402 "Greifswald Bodden and southern Strelasund" (cf. application document part E.10):

"The Nord Stream 2 pipeline trench occupies approximately 20-30 ha of habitats long-tailed ducks could use." In conclusion, the FFH-VU finds that, "while the

pipeline trench occupies a small part of habitats suitable for long-tailed ducks, the benthos will regenerate so quickly that long-tailed ducks will be able to use the surface of the pipeline trench completely once again after two years, and the fact that the feed supply is reduced temporarily is not important." (p. 44). Here, again, a precise quantitative statement should be made in terms of the long-tailed duck's habitat as a whole.
The AFB thought the project would be liable to disturb the conservation status of the (local) population considerably. It should therefore be found that the construction time window should be adjusted to suit the overwintering times. Alternatively, an expert could say why this is not required. The FFH-VU argues analogously for other species.
We must dispute that long-tailed ducks which overwinter in the Greifswald Bodden feed mainly in the adjacent Bay of Pomerania. The Greifswald Bodden does not become important until the herrings start spawning (cf. application document part F.07 chapter 6.1.2.4, p. 165), when the birds can eat not just mussels but fish spawn as well, increasing their energy take-up. Telemetric surveys of long-tailed ducks in the Baltic have shown that these birds feed over >1,000 km² over the winter (studies as part of the plans for the Fehmarn Belt Tunnel). Unlike large (stationary) eider ducks, small (mobile) long-tailed ducks can overwinter in areas of the Baltic which ice over temporarily.
Nord Stream 2's planned construction time window also reflects the scope of the offshore construction work planned, which will be largely finished by November.

On the aggregate effects of the compatibility study with EU bird protection area DE1747-402 "Greifswald Bodden and southern Strelasund" (cf. application document, part E.10) and on the compatibility study of the Nord Stream 2 project to the EU bird protection area DE1649-401 "Western Bay of Pomerania" (cf. application document, part E.11), the StALU Vorpommern says in its opinion of 12.06.2017:

"We cannot rule out [that the project to connect the offshore wind farm clusters "Western Adlergrund" (CWA) and Arkona-See (project developer: 50Hertz)] may interact with Nord Stream 2." (p. 75). To be professionally verifiable and certain in law, any assessment of the aggregate effects of these projects must be based on specific area considerations of the habitats of the species of birds concerned.
On the compatibility study of the Nord Stream 2 project with the EU bird protection area DE 1649-401 "Western Bay of Pomerania" (cf. application document, part E.11) the StALU Vorpommern says that the statements above also apply analogously to the EU bird protection area "Western Bay of Pomerania", and in particular to the species groups loons and sea ducks concentrating in the winter half-year (long-tailed ducks, common and velvet scoters).
It should be said that to stop the Nord Stream 2 and 50Hertz projects having a cumulative effect on benthophage sea ducks (in this case feeding habitats), all that has to be done is to quantify the overwintering stocks of these species in the area of the pipeline/cable trenches. The environmental compatibility study (cf. application document part D1.01 chap. 5.5.5.2, p. 314 et seq.) includes stock data for the DSA of the Nord Stream 2 route as planned (route approx. 50 km long, 3 km on either side = 300 km²), which can be converted to density values (individuals/km²). These density values in winter 2015/2016 on average and/or at most were as follows (pre-rounded off) (cf. application document part D1.01 chapter 5.5.5.1, p. 314 et seq.):

- Long-tailed ducks: approx. 5/30 individuals/km² (cf. application document

part D1.01 chapter 5.5.5.1, p. 318 Tab. 5-70)

- Common scoters: approx. 10/15 individuals/km² (cf. application document part D1.01 chapter 5.5.5.1, p. 321 Tab. 5-71)
- Velvet scoters: 5/15 individuals/km² (cf. application document part D1.01 chapter 5.5.5.1, p. 323 Tab. 5-72)

The Technical Explanatory Report says that the pipeline trench area planned in the coastal waters of M-V is barely 1.5 km² (cf. application document part C.01 chapter 3.1.2.4, p. 55 Tab. 3-4). Even assuming that the whole course of the route in M-V coastal waters were a suitable feeding habitat for all three sea duck species (which it is not, as common and velvet scoters do not overwinter in the Greifswald Bodden and also largely avoid the old Oder bed, due to the shipping there), losing their feeding habitat temporarily for two overwintering periods would affect less than 50 individuals of each species; and, considering all the six cable runs that 50Hertz is planning, even if they were all built at the same time and the route was a suitable feeding habitat (which it is not, as the marine cables run in the Bay of Pomerania west of the Nord Stream 2 route, in an area of the Bay of Pomerania which few sea ducks use), losing their feeding habitat temporarily would affect up to fifty individuals (common and velvet scoters) and/or up to 100 individuals (scaups) at most.

Average sea duck stocks in the German part of the Bay of Pomerania in winter 2015/2016 (cf. application document part D1.01 chapter 5.5.5.1, p. 314 et seq.; bearing in mind that the counting area does not count all German waters) were as follows:

- 250,000 to 300,000 long-tailed ducks
- 150,000 to 250,000 common scoters in migration times, 10,000 to 20,000 in midwinter
- 100,000 velvet scoters

These therefore corresponded to the values which are known from the 1990s and 2000s. According to the standard SPA datasheet as of July 2015, the overwintering stocks of sea ducks (scaup, velvet scoters, common scoters) in the bird protection area SPA "Western Bay of Pomerania" (DE1649-401) were as follows:

- Long-tailed ducks: 55,000
- Velvet scoters: 2,000
- Common scoters: 5,000

Any cumulative effect on benthophage sea ducks can therefore definitely be ruled out, as losing feeding habitat temporarily will not affect many individuals at all.
No data for the density of food-seeking individuals could be found for scaups, as this species only feeds in swarms at night; but assuming the species-specific diving depth (<10 m) and the food options theoretically available on the route (blue mussels with shells 5 to 15 mm long length, herring spawn), we can quantify the feeding habitats theoretically available on the Nord Stream 2 and 50Hertz routes. This is something less than 10 ha for Nord Stream 2 (see statements above). Much the same applies to the 50Hertz routes; therefore, we can definitely rule out this species being affected substantially, as even assuming a density of 250 food-seeking scaups per km² (a very high density for food-seeking benthophage duck species, cf.

application document part D1.01 chapter 5.5.5.1, p. 314 et seq.), up to fifty individuals would be affected temporarily at most.

As for the StALU Vorpommern's opinion of 13.12.2017, we would refer to section B.4.5.2.3.

In its opinion of 14.06.2017, the *Biosphärenreservat Südost-Rügen [Southern Rügen Biosphere Reservation* (BRASOR) objects as follows:
From the compatibility test documents, we may conclude that any substantial impact on the SCI "Greifswald Bodden, parts of Strelasund and northern tip of Usedom" (DE1747-301) (cf. application document part E.03) in respect of the material factors for its conservation goals or protective purpose by the Nord Stream 2 project can definitely be ruled out.
In principle, the compatibility test is required to examine the material factors of the SCI in accordance with the Natura 2000-LVO M-V.
The compatibility test failed to consider the harbour porpoise (*Phocoena phocoena*), even though it is also one of the material factors of the SCI. The documents do not say why it was not considered, so this compatibility test must also be submitted.
As far as the harbour porpoise (*Phocoena phocoena*) in the SCI "Greifswald Bodden, parts of Strelasund and northern tip of Usedom" (DE1747-301) is concerned, it should be noted that it was first included in the standard datasheet for this area when that was updated in May 2016. The mere fact that harbour porpoises are rare in the Greifswald Bodden (found once or twice a year) means any impacts can be ruled out. Also, the specialist species protection study shows that it cannot be affected (cf. application document part F.07 chapter 5.1.1.2.1, p. 44 et seq.).

In its opinion on the FFH compatibility test for SCI DE1648-302 "Coastal landscape of south-east Rügen" of 14.06.2017 (cf. application document part E.12), the *Biosphärenreservat Südost-Rügen* (BRASOR) also objects that there is no reason why the harbour porpoise was not considered. BRASOR itself says that the distance, that is, the SCI DE1648-302 "Coastal landscape of south-east Rügen", is never less than 1.5 km from the Nord Stream 2 route (cf. application document part E.12 chapter 2.2.1 p. 16); therefore, it may be assumed that there is no way the Nord Stream 2 project can impact the harbour porpoise substantially in the SCI above. The planning authority agrees.

Recognised nature conservation and other associations and/or their representatives have presented a number of opinions, which also presented interests in the compatibility of the Nord Stream 2 project in terms of compatibility with Natura 2000 areas. These are the letter from the Federal State anglers' association [Landesanglerverband M-V e.V.] of 22.05.2017, the NABU/NABU Mecklenburg-Vorpommern's opinions of 31.05., 16.11., 20.12.2017, attorney at law Kremer on behalf of WWF Germany, WWF Baltic office, BUND Mecklenburg-Vorpommern of 31.05., 20.11., 19.12.2017, BUND Mecklenburg-Vorpommern of 31.05., 16.11.2017. These interests are considered in section B.4.9.8 of this planning approval decision. In conclusion, it may be deduced from section B.4.9.8 that the NABU's, BUND's and the WWF's claims to the contrary in terms of the Nord Stream 2 project with Natura 2000 areas may be dismissed.

B.4.8.7 Species protection

Taken as a whole, the planning authority concludes that there are no grounds for refusal in respect of any species in Annex IV (a) to Directive 92/43/EEC, any European bird species or such species as are named in any regulations issued pursuant to section 54 para. 1 (2) BNatSchG under section 44 para. 1 BNatSchG section 44 para. 5 sentence 2 (1) BNatSchG (section B.4.6).

Concerning the opinions received from the StALU Vorpommern and BRASOR, which also refer to the impact on particularly and strictly protected species under section 44 BNatSchG, we would also refer to section B.4.8.6 of this planning approval decision. In its opinion of 14.06.2017, BRASOR also objects that the project developer's statements are regrettable in that it uses different units (dB re 1µPa or dB re 1µPa² s) when discussing noise levels (continuous and pulsed noise); therefore, the values are not comparable, particularly as far as the harbour porpoise's response threshold is concerned. The statements on noise and how it is propagated in the species datasheet on the harbour porpoise are not specific enough and must therefore be improved. It may be countered that the planning documents as submitted do not involve any piledriving offshore. Sheet pilings may only have to be driven if any repairs are necessary in shallow coastal sections (cf. application document part C.01 chapter 4.4.5.5.3, p. 213). Experience from the existing Nord Stream 2 pipeline indicates that no such repairs are to be expected. It is also a fact that harbour porpoises only frequent these shallow waters very rarely; therefore, there are no grounds for refusal under species protection law due to pulsed noise.

In its opinion of 13.06.2017, the lower nature conservation authority (UNB) of the rural district of Vorpommern-Greifswald objects that the Nord Stream 2 project could be expected to damage or destroy breeding and overwintering sites of woodlarks and stonechats as defined in section 44 para. 1 (3) in conjunction with para. 5 BNatSchG. As far as the woodlark is concerned, the project is not expected to damage or destroy any breeding or overwintering sites as defined in section 44 para. 1 (3) in conjunction with para. 5 BNatSchG, as it will not occupy any relevant territorial areas (cf. section B.4.6). Having examined the matter and drawn on expert opinions, the planning authority finds the lower nature conservation's assumptions otherwise are unproven. The same applies to stonechats (cf. section B.4.6).

The UNB objects that mitigation measure AFB VM5 provides for noise mitigation measures for the noise-intensive pre-commissioning phase if this is to happen while bats and birds are breeding. Action sheet AFB VM5 (cf. section B.4.4.1.9.1) did not describe this measure, but merely made verbal statements in principle. It says the action sheet must describe how these measures are to be implemented (technical details). It says that the evidential procedure for ensuring the 47 dBA limit is assured must be presented and what areas are to be used and presented for this. We would counter this as follows:
The Nord Stream 2 project timetable (cf. application document part C.01 chapter 4.3, p. 188 et seq.) proposes keeping pre-commissioning outside the bat and bird breeding season (01 April to 15 July); therefore, no separate noise reduction measures are to be provided other than safety at work guidelines. If pre-commissioning must be done while bats and birds are breeding (01 April to 15 July), the implementation plans could devise noise reduction measures for the specific type of compressor then selected. The noise predictions are based on corresponding

technical measures (cf. application document part I2.07). Ancillary provision A.3.8.1 says that the competent nature conservation authority must be informed in good time (at least two weeks) before construction is due to start. The project developer must also notify the lower nature conservation authority for the rural district of Vorpommern-Greifswald of any timetable changes as far as onshore construction is concerned.

As far as the CEF measures proposed are concerned (CEF1 and CEF2, cf. section B.4.4.1.9.1), the lower conservation authority for the rural district of Vorpommern-Greifswald objects that it would have to be shown that the measures described work. This is met by ancillary provision A.3.8.17. Ancillary provision A.3.8.18 also lays down that it must be reported when the CEF measures are completed, and that the lower nature conservation authorities and the Stralsund Office of Mines must officially accept the measures once they are completed.

The UNB's demand in its opinion of 13.06.2017 that the conflict avoidance/mitigation points described in the measures datasheets should be included as separate conditions in the planning approval decision is not granted. The measures' datasheets are laid down in the plans and must be implemented as described in the application documents in any case. The demand for environmental construction monitoring is met by ancillary provision A.3.8.6.

The other interests the UNB presents on the impact on particularly and strictly protected species under section 44 BNatSchG can be dismissed. Overall, the planning authority concludes that there are no grounds for refusal in respect of any species as listed in Annex IV (a) to Directive 92/43/EEC, European bird species or any species named in any regulations issued pursuant to section 54 para. 1 (2) BNatSchG under section 44 para. 1 BNatSchG section 44 para. 5 sentence 2 (1) BNatSchG (cf. section B.4.6).

Recognised nature conservation and other associations and/or their representatives have presented a number of opinions, which also presented interests on species protection (impact on particularly and strictly protected species under section 44 BNatSchG) in respect of the Nord Stream 2 project in terms of compatibility with Natura 2000 areas. These are the letter from the Federal State anglers' association [Landesanglerverband M-V e.V.] of 22.05.2017, the NABU/NABU Mecklenburg-Vorpommern's opinions of 31.05., 16.11., 20.12.2017, attorney at law Kremer's opinion for WWF Germany, WWF Baltic office, BUND Mecklenburg-Vorpommern of 31.05., 20.11., 19.12.2017, BUND Mecklenburg-Vorpommern of 31.05., 16.11.2017. These interests are considered in section B.4.9.8 of this planning approval decision. In conclusion (cf. also section B.4.9.7), it may be deduced that the NABU's, BUND's and WWF's claims to the contrary in terms of the Nord Stream 2 project's impact on particularly and strictly protected species under section 44 BNatSchG may be dismissed.

B.4.8.8 Prevention of water pollution

B.4.8.8.1 Prevention of water pollution in general

The project will affect coastal waters, trench 60, and groundwater at the Lubmin site (cf. application document, Part D1.01, Section 6.2.2.2). The project will particularly affect water management issues during the initial works phase, for which the following water legislation permits (cf. Section A.1.2) or notifications to the authorities and official decisions are required (cf. Section A.1.5):

- The water legislation permit in accordance with Section 8(1) WHG in conjunction with Sections 9(1)(4) and 9(1)(5) WHG for the water uses related to the project (cf. Section A.1.2 and Section B.4.8.8.1.1).
- The decision based on the report of the soil profile pits in accordance with the first and second sentences of Section 49(1) WHG and Section 33 LWaG M-V (microtunnels).
- The approval of an exception to the prohibitions and restrictions on usage applicable to the beach (landfall) in accordance with the first sentence of Section 87(4) LWaG M-V.
- The decision on the notification of the construction of structural works on the coast (landfall) in accordance with Section 89(1) LWaG M-V.
- The decision on the handling of water pollutants in accordance with Section 20 LWaG M-V.

B.4.8.8.1.1 Water legislation permit

The water legislation permit in accordance with Section 8(1) WHG in conjunction with Sections 9(1) (4) and 9(1)(5) WHG allows the following water uses:

- Dewatering by ditches or wells

  Where the pipeline is laid on land (microtunnel entry pits, anchor blocks or anchor winches), depending on seasonal conditions, the water table may need to be drawn down by means of ditches or wells for the excavation pits required for the foundations to be laid. In light of the above, 30 days are required for the initial works, and 240 days for the construction phase. (The amount of water to be pumped is estimated to be approx. 34 l/s, with a total of approx. 180,000 m³ of groundwater and approx. 36,000 m³ of residual and surface water).
- Discharge of the pumped ground water as part of the construction of the launch shafts for the microtunnel and the excavation pits, for the anchor blocks/winches, the surface water accumulating in the pits (36,000 m³), the subsurface water as part of the introduction of product piping in the microtunnel (5,000 m³, already contained in the discharge quantity of 180,000 m³ of groundwater), and the water added by the pipeline pressure test (5,000 m³) in trench 60.
- Reinfiltration or discharge of unpolluted rainwater into the groundwater from paved areas (roof areas, streets, paths, etc.) at the Pig Receiving Station via troughs and trenches (discharge quantity approx. 155 l/s referred to a total area of approx.: 10,500 m², impervious area of approx.: 9,400 m² and a rainfall rate of 162.4 l/s*ha).

- Discharge of substances into coastal waters (installation of pipelines, dredging and interim storage of dredged excavated material on the Nord Stream 2 terminal off Usedom, and backfilling of the trench with interim dredged material and foreign material).

Permits to use the water were to be granted because the above-mentioned requested uses in conjunction with the ancillary provisions in A.3.6 comply with the requirements of sustainable water management and the requirements of the bodies of water as part of the natural environment, as a source of life for humans, as a habitat for flora and fauna, and as usable good to be protected, in the sense of Section 1 WHG and Section 31 LWaG. There are no grounds for refusal under Section 12 and the first sentence of Section 13a para 1) WHG. In its letter of 07/12/2017, the StALU (Federal State office for agriculture and the environment) Western Pomerania granted the agreement required under Section 19(3) of the WHG to issue the water-related legal permit in accordance with Section 8(1) WHG ; the conditions attached by the StALU Western Pomerania to the agreement were fulfilled by the inclusion of appropriate ancillary provisions (see ancillary provision A.3.6).

According to Section 12(1)(1)(2) WHG, the permission is to be denied if the intended use is deemed to be harmful or if ancillary provisions result in unavoidable water changes or changes that cannot be compensated for or if other requirements under public regulations are not fulfilled. According to Section 3(10) WHG, harmful water changes are changes of water features that affect the welfare of the general public, in particular the public water supply, or that do not meet requirements arising from the WHG or are issued due to the WHG or other legal water regulations. Any impairment of the common good is to be determined based on the nature of the affected interests and the degree to which they are affected. Water management issues are not the only factor that plays a role in determining the above. Consideration shall be given to avoiding any adverse effects on the management objectives in accordance with Sections 27, 44, 45a and 47 WHG.

The measures, for which water legislation permits have been applied for and granted, do not adversely affect the welfare of the general public in accordance with Section 12(1)(1)(2) WHG; any threat to the public water supply in particular can be objectively ruled out. These are based on the following grounds:

Dewatering: The removal, extraction, channelling, and discharge of about 180,000 m³ of groundwater is balanced out over the course of the year due to the short period of removal or lowering and does not affect the usable groundwater supply. The water levels will quickly revert to their natural state once the water retention measures are completed, so there will be no change in water quality in this regard. Ancillary provisions A.3.6.1, A.3.6.6, and A.3.6.10 ensure that the concrete statements on the respective use of groundwater have been coordinated with the responsible UWB and the planning approval authority prior to construction. In cases where land is drained by lowering groundwater, the extracted water will be protected from contamination and, as far as reasonable and advisable for water management, returned to the groundwater. River basin level management issues within the meaning of Section 7 WHG are not affected by the temporary measures, specifications in management plans remain unaffected. The requirements of the water authority and other requirements for groundwater removal and discharge were met with the ancillary

provisions contained in Section A.3.6 of the decision. This complies with the requirements for the treatment of objections according to Section 74(2) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania).

Discharge of groundwater: Trench 60 is rated as suitable for receiving water (cf. application documents, Part I1.05, Annex A, Chapters 4 and 7). In particular, the channelling of the surface water into the receiving water requires that suitable settlement equipment (such as a settlement container) be used for separating suspended solids. The short-term lowering of groundwater is performed according to the current state of knowledge up to max. -6.30 m above sea level (cf. application documents, Part I1.05, Annex A, Chapter 6). The plant's (terrestrial) pipe system is subjected to a pressure test in accordance with DVGW worksheet G469, test method D2/VdTÜV-sheet 1060 using water. The water to be used for the pressure test is taken from the drinking water network, fed into pipeline system whose pressure is to be tested, and held there. The pressure test water originating from the pipeline system is introduced into trench 60 after the pressure test. Water is discharged into trench 60 via a settlement container holding bales of straw, so that impurities can be filtered out. The amount of water to be discharged is about 5,000 m³ (cf. application documents, Part I1.05, Annex B).

The likelihood of occurrence of accidents and disasters that could, due to the nature of the project, affect the groundwater can reasonably be ruled out due to safety precautions taken (cf. Section B.4.8.21.8.5). The water to be discharged into trench 60 from the lowering of the groundwater, the pressure test, and the inner bay water inflow is non-contaminated water. Contamination or adverse changes in the nature of the groundwater can be ruled out (cf. application documents, Part D1.01, Chapter 6.2.2.2.2).

Discharge of rainwater: The precipitation water to be discharged is sewage from roof areas and low-traffic areasa commercial area with light air and surface loads. Therefore, no additional rainwater treatment is required for the discharge of the precipitation water collecting here via the pipe rigging/trough infiltration systems, including the ground passage. The rainwater can be classified as "slightly polluted" due to the low load (roads are little used – for maintenance work only; runoff from roof surfaces), so no additional rainwater treatment plants are required. Water pollution due to the discharge of received and accumulated rainwater was assessed in accordance with the regulations of the German Association for Water, Wastewater and Waste (DWA) "Sheet DWA-M 153, Recommendations for the Handling of Rainwater", Aug. 2007. The relevant ancillary provision, A.3.6.12, obliges VT to retrofit any required rainwater treatment systems if the change in land use results in a cleaning requirement. The wastewater systems are to be built, operated, and maintained according to the generally accepted rules of engineering.

Channelling substances: the discharge and channelling of substances into the aquatic environment by release from sacrificial anodes takes place to such a small extent that it does not lead to any lasting change in water quality.

Furthermore, VT must ensure that certain parts of the dredged material (peat, silt) are not allowed to be brought to the folding point (cf. ancillary provision A.3.6.2)

The management objectives according to Section 27, 44, 45a, and 47 WHG are not affected (for more information, see WFD and MSRL, Sections B.4.8.7.2 and B.4.8.7.3).

It also does not appear that there is any violation of other public regulations due to the above-mentioned use of water resources (for more information, see WFD and MSRL, Sections B.4.8.7.2 and B.4.8.7.3 below).

Grounds for refusal according to Section 13a WHG are not relevant.

StALU (Federal State office for agriculture and the environment) Western Pomerania has granted the consent required under Section 19(3) of the WHG for issuing the water rights permit in accordance with Section 8(1) WHG in its letter of 7/12/2017 on the condition that grounds for refusal pursuant to Section 12(2) WHG (e.g. nature conservation, fisheries, tourism, and preservation of monuments) and the water management conditions, requirements, reservations, and references named by StALU Western Pomerania are included in the decision. These items were incorporated according to their content (cf. ancillary provision A.3.6).

B.4.8.8.1.2 Notification obligation for soil profile pits (Section 49(1)(1) 1 WHG, Section 33 LWaG M-V)

There is no need for the water legislation permit described in Section 49(1)(2) in connection with Section 8(1)(9)(1)(4) WHG (required for the discharge of substances into the groundwater by earthworks which penetrate so deep into the ground that they directly or indirectly affect the movement, level, or quality of groundwater and, at the same time, that the penetration may have a detrimental effect on groundwater quality). It is sufficient to issue a notification in accordance with Section 49(1)(1) WHG that work will take place that will penetrate so deeply into the ground that it may directly or indirectly affect the movement, level, or quality of the groundwater.

It has been stated (cf. Section B.4.8.21.8.5) that the likelihood of occurrence of accidents and disasters which could, due to the nature of the project, affect the groundwater can reasonably be ruled out by the safety precautions taken. The water to be discharged from the lowering of the groundwater, the pressure test, and the incoming inner bay water is non-polluted water. Contamination or adverse change in the nature of the groundwater in the sense of Section 49(1)(2) WHG can be ruled out (cf. application documents, Part D1.01, Chapter 6.2.2.2.2, pp. 512 et seq.).

B.4.8.8.1.3 Other national licensing requirements for coastal protection pursuant to Section 87(4)(1), Section 89(1) LWaG M-V, and Section 79 LWaG M-V)

The exemption from the prohibitions of Section 87(1) to (3) LWaG M-V on drilling on the beach and thus possibly impairing the interests of coastal protection was granted, since the interests of coastal protection as a public task will not be affected by the project, specifically by the work associated with creating the microtunnel.

A derogation from use restrictions on the beach in accordance with Section 87(6) LWaG M-V was allowed under the conditions contained in the ancillary provisions

under A.3.6 of this planning approval decision and the decision to provide notification of the construction of facilities on the coast pursuant to Section 89(1) LWaG M-V was made under the conditions contained in the ancillary provisions under A.3.6 of this planning approval decision, since the interests of coastal protection as a public task are not impaired by the identified project, and the project is compatible with those interests.

According to the rules of coastal protection Mecklenburg-Western Pomerania (Ministry of Agriculture, Environment and Consumer Protection MV 2009, p. 49: Design flood at Lubmin 2.95m over NHN; Ground level >5 m NHN; cf. application documents, Part C.03), the above-ground pig receiving station and other transfer and safety facilities are not located in a flood-prone area.

The StALU (Federal State office for agriculture and the environment) Western Pomerania letter of 3/11/2017 states that not all the excavated material is to be stored or deposited. This is justified by the fact that the exception requirements according to GÜBAK[119] have not been met. This would mean that dredged material with elevated concentrations of heavy metals would have to be brought ashore. The transfer of part of the dredged material (peat, silt) ashore on a spoil ground is also subject to authorisation. This is only followed to the extent that the corresponding material cannot be transferred to the marine interim storage facility (cf. ancillary provision A.3.6.2). Furthermore, the corresponding responsibility of the planning approval authority is not given. The spoil ground unquestionably concerns another project and another project manager, so that a corresponding permit is to be obtained elsewhere or is already available in the case of an approved spoil ground. In particular, compatibility with the objectives of the WFD is to be considered separately.

B.4.8.8.1.4 The decision on handling water pollutants in accordance with Section 20 LWaG M-V

Pursuant to Section 62 (1) sentence 1 of the WHG, facilities for storing, filling, producing, and treating water-polluting substances and facilities for using substances hazardous to water must be designed and constructed, maintained, operated, and decommissioned so as to avoid adversely affecting the properties of bodies of water. Pursuant to Section 20(3)(1) 1 LWaG M-V, systems pursuant to Section 62(1) WHG are to be installed, set up, maintained, repaired, operated, and cleaned so that leaks cam be ruled out during normal operation and easily and reliably detected in case of failure. Pursuant to Section 20(3) Sentence 2 LWaG M-V, in installations under Section 62 WHG and in systems for handling substances hazardous to water, it must be ensured that substances hazardous to water cannot reach beyond the safety area ofthe plant.
In connection with the leak test of the piping system, the handling, storage, and use of diesel fuel are required for the operation of the required generators and pumps and of the temporarily diesel-driven air compressor stations (cf. application documents, Part C.01, Chapter 4.1.2.1, p. 162; Chapter 4.1.2.3, p. 167; Chapter 4.1.3.4, p. 178). For the supply of the corresponding systems with diesel storage and day tanks (including two 120 m^3 tanks) are set up or provided for diesel fuel. The

[119] Common transitional provisions on handling dredged material in coastal waters (GÜBAG) (2009)

diesel is to be delivered by tanker. Diesel fuel is a substance classified in the Water Hazard Class (WGK) 2. The installation of a condensate tank is also planned (cf. application documents, part C.01, Chapter 4.1.3.4, p. 178).

In its statement dated 12/6/2017 (p. 45 et seq.), StALU (Federal State office for agriculture and the environment) Western Pomerania did not raise water management concerns about the project-related construction and use of facilities for dealing with substances hazardous to water, provided that the ancillary provisions listed in the above-mentioned comments care included in the Plan Approval Decision. The Planning Authority fully complies with this requirement by including the ancillary provisions in A.3.6.15, A.3.6.16, A.3.6.17 and A.3.6.18.

This means that, in order to avoid adverse effects to the quality of the water, the handling, storage, and use of diesel fuel from VT must be organised and implemented in such a way that no substances hazardous to water can enter the body of water. The storage and handling of water-polluting substances in connection with the required generators, pumps, and the temporarily diesel-driven air compressor station should be operated with particular care. Damaging effects on the groundwater caused by substances hazardous to water, and measures that can have an adverse effect on the groundwater, are to be ruled out. In the event of accidents involving substances hazardous to water (diesel fuel), safeguarding measures must be taken immediately and any contamination eliminated (cf. Section 20 para. 5 LWaG M-V). In accordance with Section 20 (6) LWaG M-V, these activities must be reported immediately to the lower water authority or the nearest police station.

B.4.8.8.2 Water Framework Directive (WFD)

B.4.8.8.2.1 Surface water

Above-ground bodies of water (according to Section 27(1) WHG) and coastal waters (according to Section 44(1) WHG and Section 7(5)(2) WHG), if they are not classified as artificial or significantly changed, are to be managed in such a way that (1.) a deterioration of their ecological and chemical status is avoided, and (2) a good ecological and chemical status is maintained or achieved. Seaward of the line mentioned in Section 7(5)(2) WHG, Section 27(1) WHG applies according to Section 44(2) WHG in coastal waters if a good chemical status can be achieved. These federal regulations implement the WFD and the standardised prohibition of deterioration and the obligation to improve (cf. Berge (German Federal Administrative Court), ruling of 17/1/2007, 9 A 20.05 – deepening of the River Elbe).

With the above-mentioned regulations, the WHG implements the requirements of Directive 2000/60/EC of the European Parliament and of the Council of 23/10/2000 establishing a framework for Community action in the field of water policy (OJ L 327/1) of 23/12/2000, the so-called EU Water Framework Directive (WFD), in national law. The Surface Waters Ordinance (OGewV) of 20/6/2016 (BGBl. I p. 1373) is also to be taken into consideration. With the OGewV, the requirements of Annexes II and V of the WFD and Directive 2008/105/EC of the European Parliament and of the Council of 16/12/2008 on environmental quality standards in the field of water policy and the amendment and subsequent repeal of Council

Directives 82/176/EEC and others (OJ EU No. L 348/84) of 24/12/2008 (UQN-RL) are uniformly applied throughout Germany in national law. The UQN-RL refines the provisions of the WFD for the protection of surface waters. Other relevant environmental quality standards (UQN) to be taken into account are Directive 2006/118/EC of the European Parliament and of the Council of 12/12/2006 for the protection of groundwater against pollution and deterioration (OJ EU No. 372/19) of 27/12/2006, the so-called Groundwater Directive, which complements the WFD, and Council Directive 98/83/EC of 3/11/1998 on the quality of water intended for human consumption (OJ EC No. L 330/32) of 5/12/1009, the so-called Drinking Water Directive (98/83/EC).

The Nord Stream 2 pipeline crosses the following WFD-relevant offshore surface water bodies:

- Greifswalder Bodden (DE_CW_DEMV_WP13)
- Pomeranian Bay, northern part (DE_CW_DEMV_WP18)
- 1 to 12 nautical mile zone (DE_CW_DEMV_WP20)

The examination of the compatibility of the project with the objectives of the WFD was carried out in the technical paper on the Water Framework Directive (cf. application documents, Part H.01) and differentiated according to the water bodies to be considered. For this purpose, VT has described the current ecological and chemical status of the affected surface water body based on the information in the current management plan for the affected Warnow/Peene river basin district (management plan according to Section 83 WHG or Section 13 of Directive 2000/60/EC for the Warnow/Peene river basin district for the period from 2016 to 2021, as of December 2015) and updated it on the basis of further data made available by LUNG M-V and other current, available data (cf. application documents, Part H.01, Chapter 1.5.2, p. 30 et seq.). The description of the methodology and the rating systems used are set out in the application documents, Part H.01, Chapter 1.5. The planning approval authority has examined the assessments made in the context of the preparation of the technical paper on the Water Framework Directive (cf. application documents, Part H.01) and the methodology underlying the technical contribution, taking into account external expertise. This is method-appropriate. The planning approval authority therefore follows VT's estimates.

B.4.8.8.2.1.1 "Greifswalder Bodden" Coastal Water Body (DE_CW_DEMV_WP13)

According to the current management plan (management plan under Section 83 WHG or Section 13 of Directive 2000/60/EC for the river basin district Warnow/Peene for the period from 2016 to 2021, as of December 2015), which was extended and updated by VT with current data from the LUNG M-V (cf. application documents H.01, Chapter 3.1.1, p. 58 et seq.), the "Greifswalder Bodden" coastal water's ecological status is unsatisfactory and its chemical status poor. The reason for the classification of the ecological status as not good is the assessment of the phytoplankton environmental quality component as unsatisfactory; the classification of the chemical status is based on the fact that levels of the priority substance mercury in biota uniformly exceed the environmental quality standard (cf. application documents, Part H.01, Chapter 3.1.1 and Chapter 3.1.1.1, p. 58 et seq.). A detailed description of the current status of the biological, hydromorphological,

physicochemical and chemical quality components as well as the chemical status substances and the causal factors for the baseline pollution of the coastal waters are given in the application document, Part H.01, Section 3.1.2, 3.1.3.

B.4.8.8.2.1.1.1 Ban on deterioration (ecological and chemical status)

In view of the construction-related effects, the project is expected to have a spatially very limited, temporary influence with regard to the ecological status in the "Greifswalder Bodden" water body, one which does not lead to a deterioration within the meaning of Section 44(10 in conjunction with Section 27(1)(1) WHG, because no quality component deteriorates by one class or more, and quality components that are already in the lowest class do not deteriorate in a relevant manner. An impact is not relevant if it is so small that any impairment of the water body's functions can be safely ruled out and the effects of the project are therefore neutral for the water body (cf. application documents, Part H.01, Chapter 1.3.2). p. 22 et seq.), as is the case here.
With regard to effects on the biological quality components, in particular on phytoplankton, large algae, and angiosperms, there will be no deterioration of status due to the fact that the deterioration of one of the biological quality components by one condition class can be ruled out (cf. application documents, Part H.01, Chapter 4.1.1, pp. 129 et seq., Chapter 5.1.1, p. 178). Deterioration of hydromorphological quality components as a result of the project can also be ruled out; the project is neutral with regard to hydromorphological quality components (cf. application documents H.01, Chapter 4.1.2, pp. 137 et seq., Chapter 5.1.1, p. 178). Due to the small size and the reversibility of the project-related effects, it can already be assumed that there will be no deterioration of the ecological status of the body of coastal waters. Project-related deterioration of the current state can also be reliably ruled out, since there will be no significant, permanent changes to the biological quality component values resulting from the project (cf. application documents, Part H.01, Chapter 4.1.1, pp. 129 et seq. and Chapter 5.1.1, p. 178).

Project-related deterioration of the chemical and physicochemical quality components and of the chemical status of the coastal water body can also be ruled out (cf. application documents, Part H.01, Chapter 4.1.3, pp. 140 et seq., Chapter 5.1.1, p. 178). The construction-related remobilisation of contaminants from the sediment and the operational release of substances from sacrificial anodes in the "Greifswalder Bodden" (cf. application documents, Part H.01, Chapter 4.1.3, pp. 140 et seq., and Chapter 4.2.3, pp. 161 et seq.) are very low and will not result in the Environmental Quality Standards (UQN) being exceeded. Due to the remobilisation of mercury, whose biota UQN has already been exceeded in the water body, no further deterioration is expected due to the nature of the project. A detectable accumulation in biota by uptake via the food chain is excluded. Any deterioration in the chemical status of the coastal water body as a result of the project can be ruled out; the project-related effects on the chemical status of the water body, in particular on the entry of river-area-specific pollutants according to Annex 6 OGewV and chemical status substances according to Annex 8 OGewV and the effects on visibility, temperature conditions, oxygen balance, salinity, and nutrient ratios are neutral (cf. application documents, Part H.01, Chapter 4.1.3, pp. 140 et seq., 151 et seq. and Chapter 5.1.2, p. 179).

B.4.8.8.2.1.1.2 Improvement requirement (ecological and chemical status)

The goal of achieving good ecological and chemical status in the "Greifswalder Bodden" body of water is not influenced by the project. The prevailing conditions in the "Greifswalder Bodden" body of water will return after completion of the construction work. There are no irreversible effects with regard to biological quality components. Since the programme of measures for the Greifswalder Bodden coastal water body does not itself provide for any measures to improve the ecological and chemical status within the water body, such measures cannot be affected by the project. Planned measures can also be implemented unchanged during the construction phase (cf. application documents, Part H.01, Chapter 5.2, p. 179). As a result, there are no adverse project-related effects on the management objectives (cf. application documents, Part H.01, Chapter 5.2, p. 179). The project thus jeopardises the timely achievement of neither a good ecological nor a good chemical status for the "Greifswalder Bodden" coastal water body.

B.4.8.8.2.1.2 Coastal water body "Pomeranian Bay, northern part" (DE_CW_DEMV_WP18)

According to the current management plan (management plan according to Section 83 WHG or Section 13 of Directive 2000/60/EC for the Warnow/Peene river basin district for the period from 2016 to 2021, as of December 2015), which has been supplemented with current LUNG M-V data (cf. application documents, Part H.01, Section 3.1.1, pp. 58 et seq.), the "Pomeranian Bay, northern part" coastal water body's ecological status is unsatisfactory and its chemical status poor. The reason the ecological condition is evaluated as not good is the evaluation of the large algae and angiosperm environmental quality component as unsatisfactory; the classification of the chemical status is based on the fact that values for the priority substance mercury in biota universally exceeded the environmental quality standard (cf. application documents, Part H.01, Chapter 3.1.1 and Chapter 3.1.1.2, pp. 58 et seq.). A detailed description of the current status of both the biological, hydromorphological, physicochemical and chemical quality components as well as the chemical status substances and the causal factors for the baseline pollution of the coastal waters are given in the application document, Part H.01, Section 3.1.2, 3.1.3.

B.4.8.8.2.1.2.1 Ban on deterioration (ecological and chemical status)

In view of the construction-related effects, the project is expected to have a spatially very limited, temporary influence with regard to the ecological status in the "Pomeranian Bay, northern part" coastal water body and not to result in deterioration within the meaning of Section 44 in conjunction with Section 27(1)(1) WHG (cf. also Section B.4.8.8.2.1.1.1). The "large algae and angiosperms" and "benthic invertebrate fauna" biological quality components will deteriorate due to construction work in 0.15% of the total area of the "Pomeranian Bay, northern part". After completion of construction work, benthic communities are expected to regenerate completely. Deterioration in the status of the biological quality components concerned can be ruled out, since none of the above-mentioned biological quality

components or the phytoplankton quality component is degraded by a condition class as a result of the project (cf. application documents, Part H.01, Chapter 4.2.1, pp. 152 et seq.). Nor will turbidity plumes or substance lead to measurable permanent effects on species composition and frequency of flora and fauna (cf. application documents, Part H.01, Chapter 4.2.1, pp. 152 et seq.). The project has a neutral impact on the hydromorphological quality components (cf. application documents, Part H.01, Chapter 4.2.2, pp. 159 et seq.). Due to the small size and the reversibility of the project-related effects, it can already be assumed that there will be no deterioration of the ecological status of the body of coastal waters. Project-related deterioration of the current state can be ruled out, since there will be no significant, permanent, project-related biological quality component value changes (cf. application documents, Part H.01, Chapter 4.2.1, pp. 129 et seq. and chapter 5.1.1, p. 178).

There will be no project-related deterioration in the status of the chemical and physicochemical quality components or the chemical status of the coastal water body (cf. application documents H.01, Chapter 4.2.3, pp. 161 et seq., Chapter 5.1.1, p. 178). The construction-related remobilisation of pollutants from the sediment and the operational release of substances from sacrificial anodes in the "Pomeranian Bay, northern part" will be very low and will not cause the relevant UQN to be exceeded; deterioration of the chemical status can therefore be ruled out (cf. application documents, Part H.01, Chapter 4.1.3, pp. 140 et seq. and Chapter 4.2.3, pp. 161 et seq.). Due to the remobilisation of mercury, whose biota UQN has already been exceeded in the water body, no further deterioration is expected due to the nature of the project. A detectable accumulation in biota by uptake via the food chain is excluded. Any deterioration in the chemical status of the coastal water body as a result of the project can be ruled out; the project-related effects on the chemical status of the water body, in particular on the entry of river-area-specific pollutants according to Annex 6 OGewV and chemical status substances according to Annex 8 OGewV, and on the visibility, temperature conditions, oxygen balance, salinity, and nutrient ratios are to be considered neutral (cf. application documents, Part H.01, Chapter 4.2.3, pp. 161 et seq., and Chapter 5.1.2, p. 180).
In summary, there will be no project-related deterioration of the biological, hydromorphological, chemical, or physicochemical quality components of the coastal water body.

B.4.8.8.2.1.2.2 Improvement requirement (ecological and chemical status)

The objective of achieving good ecological and chemical status in the "Pomeranian Bay, northern part" water body will not be influenced by the project. The prevailing conditions in the "Pomeranian Bay, northern part" water body will return after completion of construction work. There are no irreversible effects with regard to biological quality components. Since the programme of measures for the "Pomeranian Bay, Northern part" coastal water body does not itself provide for measures to improve the ecological and chemical status within the water body, such measures cannot be affected by the project. Planned measures can also be implemented unchanged during the construction phase (cf. application documents, Part H.01, Chapter 5.4, p. 180). Consequently, there will be no project-related impact on the management objectives (cf. application documents, Part H.01, Chapter 5.4, p. 180). Thus, the project endangers the timely achievement of neither a good

ecological nor a good chemical status for the "Pomeranian Bay, northern part" coastal water body.

B.4.8.8.2.1.2 1 to 12 nautical mile zone (DE_CW_DEMV_WP 20)

In the "1 to 12 nautical mile zone" water body, no good chemical status has been reached so far; the water body's current chemical status is assessed as "not good" (cf. application documents Part H.01, Chapter 3.1.1.3, p. 61). A detailed description of the current status of both the biological, hydromorphological, physicochemical and chemical quality components and the causal factors of the coastal waters are given in the application document, Part H.01, Section 3.1.2, 3.1.3.

B.4.8.8.2.1.2.1 Ban on deterioration (chemical status)

Since the sediments to be relocated during the dredging work are only slightly anthropogenically polluted and only an insignificant amount of substances from sacrificial anodes will be released (cf. application documents, Part H.01, Chapter 4.3.1, pp. 169 et seq.), any project-related increase in UQN, and thus any permanent, detectable project-related influence on the chemical status, can be ruled out. The project-related effects on the already-exceeded UQN for mercury are to be classified as neutral; no impairment of water function will result (cf. application documents, Part H.01, Chapter 4.3.1, pp. 169 et seq.).

B.4.8.8.2.1.2.2 Improvement requirement (chemical status)

Project implementation will result in no lasting negative impact on the UQN and will neither hamper nor prevent necessary measures to improve the chemical status. There is therefore clearly no project-related impact on the requirement for improvement in this water body (cf. application documents, Part H.01, Chapter 5.6, p. 181).

B.4.8.8.2.2 Groundwater

The groundwater is to be managed in accordance with Section 47(1) WHG so that (1.) worsening of its quantitative and chemical status is avoided; (2) all significant, persistent trends towards increasing pollutant concentrations due to the impact of human activities are reversed; (3) good quantitative and chemical status is maintained or achieved; in particular, a balance between groundwater recharge and groundwater removal is part of a good quantitative status. This federal regulation implements the WFD and the standardised deterioration prohibition and improvement obligation (cf. Berge (German Federal Administrative Court), ruling of 17/1/2007, 9 A 20.05 – deepening of the River Elbe).
In the area of groundwater, the Ordinance on the Protection of Groundwater (GrwV) of 9/11/2010 (BGBl. I p. 1513), which was last amended by Article 1 of the Ordinance of 4/5/2017 (BGBl. I p. 1044) is to be consulted as supplementary information. The GrwV implements both the requirements of Directive 2006/118/EC of the European Parliament and of the Council of 12/12/2006 for the protection of

groundwater against pollution and deterioration (OJ EU No. L 372/19) of 27/12/2006, and the groundwater-related requirements of the WFD. Specific questions on the management of groundwater and the quantitative and chemical status are presented in the application documents, Part H.01, Chapter 1.4. The planning approval authority accepts the information listed therein.
In order to assess the compatibility of the project with the objectives of the WFD, the VT has described the current ecological and chemical status of the affected groundwater body on the basis of the information in the current management plan for the affected Warnow/Peene river basin district (management plan pursuant to Section 83 WHG or Section 13 of the Directive 2000/60/EC for the Warnow/Peene river basin district for the period from 2016 to 2021, as of December 2015) and updated it with current groundwater monitoring data provided by LUNG M-V (cf. application documents, Part H.01, Chapter 1.5.2, pp. 30 et seq.). The methodology and the rating systems used are set out in the application documents, Part H.01, Chapter 1.5. The planning authority has also examined the estimates made with regard to groundwater assessment and the methodology based on external expertise, and considers them – as is the case with regard to surface water bodies – to be appropriate and plausible and therefore follows the estimates of VT detailed below.

In the course of the project, he Nord Stream 2 pipeline crosses the WFD-relevant "Ryck/Ziesebach" groundwater body (DE_GB_DEMV_WP_KO_5).

The "Ryck/Ziesebach" groundwater body is in a good quantitative and chemical condition. Consequently, the groundwater body currently fulfils the requirements for a good overall condition (cf. application documents, Part H.01, Chapter 3.2.1.1, pp. 120 et seq., Chapter 3.2.2, p. 124). Accordingly, the management objective for the "Ryck/Ziesebach" groundwater body remains the prohibition of deterioration and the maintenance of a good quantitative and chemical water body status.

B.4.8.8.2.2.1 Ryck/Ziesebach groundwater body (DE_GB_DEMV_WP_KO_5) – Deterioration prohibition (quantitative and chemical status)

Project-related effects on the above-mentioned groundwater body can at worst arise within the framework of the construction and operation of the receiving terminal and the construction of the microtunnel. The individual impact factors are listed in Tables 4-15 of the application documents, Part H.01, Chapter 4.4, p. 174. With regard to the quantitative state, according to the results of the test carried out in the above-mentioned document, there will be only a local change in groundwater recharge due to system-related sealing or partial sealing of areas on the premises of the pig receiving station, which is not relevant for the usable groundwater supply. Nor does the water table drawdown planned as part of the water retention measures for the launch pits and the anchor blocks of the Nord Stream 2 pipeline have any impact on the usable groundwater supply, since groundwater extraction over the course of the year is compensated for by groundwater recharge and groundwater inflow. The project-related temporary groundwater extraction will also not lead to deterioration of the quantitative status of the groundwater body (cf. application documents, Part H.01, Chapter 4.4.1, pp. 174 et seq.). From the perspective of the planning authority and the environmental experts consulted, this result is not objectionable.

A project-related salt water intrusion-relevant substance inputs, and an associated increase in indicator parameters can be ruled out because the microtunnel, whose construction could potentially cause the aforementioned entries, is impervious to water, and it has also ensured that the aforementioned effects will not occur. Deterioration of the chemical status because of the project can therefore also be ruled out (cf. application documents, Part H.01, Chapter 4.4.2, pp. 176 et seq.).

B.4.8.8.2.2.2 Ryck/Ziesebach groundwater body(DE_GB_DEMV_WP_KO_5) – Improvement and trend reversal requirement (quantitative and chemical status)

Currently, there are no obligations for a status improvement in the groundwater body considered. The project does not conflict with the principle of improvement and trend reversal, since it does causes no negative trends in terms of material loads on the groundwater body or long-term groundwater levels (cf. application documents, Part H.01, Chapter 5.8, p. 181).

B.4.8.8.2.3 Conclusion

Overall, none of the water bodies are likely to suffer deterioration in the status or obstruction of improvement due to construction, plant, or operational effects. The project therefore does not contradict the objectives of the WFD. This was confirmed by LUNG M-V (expert statement on the application documents dated 31/05/2017) and StALU (Federal State office for agriculture and the environment) Western Pomerania (expert statement on the application documents dated 16/06/2017).

On the basis of the above-mentioned explanations in the technical paper on the Water Framework Directive (cf. application documents, Part H.01), the planning authority concludes that the management objectives according to Section 44 in conjunction with Section 27 and Section 47 WHG do not conflict with the project.

B.4.8.8.3 Marine Strategy Framework Directive (MSFD)

According to Section 45a (1) WHG, marine waters are to be managed in such a way that any deterioration of their condition is avoided (deterioration prohibition) and a good condition maintained or reached by 31/12/2020 (conservation and improvement requirement). According to Section 45b(1) WHG, the state of the marine waters is the state of the environment in marine waters taking into account (1) the structure, function, and processes of the individual marine ecosystems, (2) the natural physiographic, geographical, biological, geological, and climatic factors, and (3) the physical, acoustic, and chemical conditions, including conditions that arise as a result of human activity in the area and outside it. Good of marine water condition is the status of the environment in marine waters, which are ecologically diverse, dynamic, non-polluted, healthy, productive, and sustainably exploited, taking into account their specific characteristics, whereby (1) the individual marine ecosystems function without restriction and are resistant to anthropogenic environmental changes, balancing the various biological components of marine ecosystems, (2) marine species and their habitats are protected and human-induced decline in biodiversity prevented, and (3) man-made biodiversity inputs of substances and energy, including noise, into the marine environment have no

adverse effects on marine ecosystems, biodiversity, human health, or the permissible use of the sea. Pursuant to Section 45a (2) WHG, in order to achieve the management objectives under Section 45a (1), in particular (1) Protecting and conserving marine ecosystems and restoring them in areas where they have been damaged; (2) Incrementally avoiding and mitigating man-made inputs of substances and energy, including noise, into the marine waters with the aim of ruling out significant adverse effects to marine ecosystems, biodiversity, human health, and the permissible use of the marine environment, and (3) maintaining or creating existing and future opportunities for sustainable marine use.

The central object of the assessment is therefore the impact of the project on the status of the marine waters. According to Section 45b (1) WHG, this object takes into account the structure, function and processes of the individual marine ecosystems; natural physiographic, geographical, biological, geological, and climatic factors; and physical, acoustic, and chemical conditions, including conditions arising as a result of human activity inside and outside the area concerned. There are still no prescribed methods of testing whether project-related deterioration of the environmental status can occur (deterioration prohibition) or if the attainability of the good environmental status is influenced (improvement obligation). So far, there is no coordinated operational assessment procedure for marine waters. The approach developed by the technical consultants was followed up by the planning authority and determined to be appropriate. The stipulations according to Section 45a et seq. WHG are taken into account insofar as the indicative lists according to Annex III Tables 1 (Characteristics) and 2 (Encumbrances) of the MSRL to the initial assessment (Article 8) and the description of the good environmental status by descriptors according to Annex I of the MSFD (Art. 9) and environmental objectives (Article 10 MSFD) were included in the assessment.

On the basis of the defined characteristics, pressures, and descriptors with the appropriate criteria according to COM Decision 2010/477/EU on the assessment of the good environmental status of marine waters, the question of whether marine water environmental status deterioration caused by the project (deterioration prohibition) and a threat to attainability of environmental objectives for the marine waters can be ruled out (conservation requirement) is examined. In interpreting these facts, the remarks made by the ECJ and the BVerwG (German Federal Administrative Court) on the WFD and the exclusion of water framework legislation stipulated in Section 27(1) WHG and the requirement for maintenance or improvement can be used. Based on the statement of the law, Section 45a WHG assumes the regulatory structure of Section 27 WHG (cf. BT pressure. 17/6055, p. 18).

According to the European Court of Justice, there is a violation of the WFD 's deterioration prohibition "as soon as the condition of at least one quality component within the meaning of Annex V of Directive [2000/60/EC] deteriorates by one class, even if this deterioration does not lead to a deterioration in the classification of the WFD surface water body as a whole. "(ECJ, ruling of 01/07/2015, C-461/13, Juris margin no. 70, in addition to BVerwG (German Federal Administrative Court), decision of 09/02/2017, 7 A 2.15, Juris margin no. 479 in addition to decision of 11/08/2016, 7 A 1/15, Juris margin no. 160). On this basis, in the absence of quality components in MSFD, the ban on deterioration in the MSRL and Section 45a (1)(1)

WHG would be violated if the project results in a negative deviation from the actual state of the marine waters beyond a proportionality threshold.

On the other hand, the ECJ has not explicitly stated its position on the interpretation of the WFD conservation or improvement requirement (however, see ECJ ruling of 1/7/2015, C-461/13, Juris margin no. 51). According to the BVerwG (German Federal Administrative Court), the critical element of a violation of Section 27(1)(2) WHG is "whether the consequences of the project can with reasonable probability actually lead to a frustration of the management objectives [...]." (cf. BVerwG, judgement dated 09/02/2017, 7 A 2.15, Juris margin no. 582, similarly to decision of 11/08/2016, 7 A 1/15, Juris margin no. 169). This means that Section 45(1)(2) WHG precludes projects which are sufficiently likely to jeopardise the preservation of the target state or any improvement of the actual status towards the desired status. The target status is the good status of the marine waters in accordance with Section 45b (2) WHG, which, as described, is determined by the descriptors according to Annex I of the MSFD (Article 9) and the environmental objectives (Article 10 MSRL).

B.4.8.8.3.1 Deterioration prohibition (Section 45a (1)(1) WHG)

According to the technical consultant, only the placement of the pipeline on the seabed and thus the introduction of hard substrate and release of substances from sacrificial anodes will lead to local, permanent changes in physical and chemical properties. However, the extent of these effects in terms of land use and amount of substance release, and thus the impact on physical, chemical, and biological characteristics, is relatively low, so that measurable effects on the structure, function, and processes of marine ecosystems can be ruled out (cf. application documents, Part H.02, Chapter 6.1, pp. 76 et seq.). A project-related adverse increase in the existing loads on the Baltic Sea can be ruled out. Although there are permanent effects on "physical loss", "temperature" and "contamination by hazardous substances", the technical consultant says that they have no measurable negative effect on marine ecosystems, biodiversity, permissible use of the sea, and thus on the status of marine waters (cf. application documents, Part H.02, Chapter 6.2, pp. 132 et seq.) All other effects considered in the survey are reversible and have no adverse effect on the characteristics and existing pollution of marine waters. According to the technical consultant report, the current environmental status of the German Baltic Sea will not deteriorate. The planning authority has gone over this reasoning and shares the views expressed in the expert report.

B.4.8.8.3.2 Target achievement requirement (Section 45a (1)(2) WHG)

Regarding the project-related influence on the qualitative descriptors, there are minor influences on D1 (biological diversity), D4 (food web), D5 (eutrophication), D6 (seabed), D8 (pollutants) and D11 (introduction of energy). Overall, however, these influences are too local and short to have a relevant effect on the good environmental status captured in the descriptors (cf. application documents, Part H.02, Chapter 6.3, pp. 147 et seq.). The project does not hinder or prevent the attainability of the good environmental status of the German Baltic Sea. An examination of the effects shows that the project neither conflicts with the seven environmental objectives defined for the German Baltic Sea nor affects the

implementation of measures to achieve the objectives (cf. application documents, Part H.02, Chapter 7, pp. 158 et seq.).

B.4.8.8.3.3 Conclusion

Overall, no deterioration of the current status or project-related impairment of the good environmental status and the environmental objectives is to be feared in the Baltic Sea. This was confirmed by LUNG M-V (expert statement on the application documents dated 31/05/2017) and StALU (Federal State office for agriculture and the environment) Western Pomerania (expert statement on the application documents dated 16/06/2017).

On the basis of the technical paper, the planning approval authority concludes that the Nord Stream 2 pipeline project will not result in any changes that lead to deterioration in the status of the environment or endanger the environmental objectives. The project does not preclude the implementation of management objectives for marine waters.

B.4.8.9 Agriculture

Agricultural issues will remain unaffected by the construction and operation of the pipeline itself.

Since the compensation requirement is covered by a recognised eco-account, there is also no concern for agriculture. Insofar as the Polder Bargischow measure is implemented by the Landgesellschaft within the framework of the compensation obligation it has assumed, this is done in agreement with the landowners and also on areas which, due to their nature, can be used only to a limited extent by agriculture. No unacceptable effect on agriculture is therefore apparent. The Farmers' Association objections to the use of agricultural land on Rügen have thus been dispatched.

If the Mecklenburg – Western Pomerania Farmers' Association generally objects that the planned compensatory measures for nutrient reduction are not suitable to compensate for the intervention caused by the construction and operation of the Nord Stream 2 pipeline, its logic cannot be followed, since the project will cause no nutrient release. The construction of the Nord Stream 2 pipeline will result in no significant release of nutrients. However, the marine biotopes will be affected in other ways, such as dredging work to build the laying trench. Currently, the biotopes that will be affected by the construction of the Nord Stream 2 pipeline are affected by high nutrient loads (cf. application documents, Part G.01, Chapter 11.2.1, p. 281). The reduction of nutrient inputs, in particular of nitrogen, leads to a reduction in phytoplankton production and thus to an increase in the visibility in the waters affected by the intervention and thus in hydrologically connected bodies of water. Increasing visibility leads to an expansion of macrophyte vegetation. Higher macrophyte density increases the diversity and biomass of phytophagous epibenthic invertebrates. The reduction in pelagic primary production leads to a decrease in the macrozoobenthos filtering species and thus to a decrease in the risk of long-lasting hypoxia/anoxia of the benthic zone, conditions which cause the death of marine invertebrates in marine biotopes and large dead biomasses of macrozoobenthos

filtering agents which exacerbate hypoxia/anoxia. Nutrient reduction supports the regeneration of marine biotopes and restores impaired functions of the natural environment.

Agrarian concerns are no basis for objections to the project. Large-scale agriculture will remain unaffected. With the debit of ecopoints allocated in the budget sufficient to compensate for the intervention works (see Section B.4.8.4), there will be no use of agricultural land on Rügen.

B.4.8.10 Woodlands and forestry

The project itself will involve the use of forest areas in the vicinity of the pig receiving station and their transfer to another type of use.

Forest conversion concerns the following sections (cf. application documents, Part G.03, p. 9):

- permanently: Station area: about 5.5 ha of high-grade forest and about 0.4 ha of unstocked forest,
- during construction: Storage and assembly areas, construction office, parking spaces, starting pits: about 0.8 ha of high-grade forest and about 0.7 ha of unstocked forest,
- adjacent: 0.3 ha without loss of timber and 0.6 ha of non-woody soil without loss of vegetation.

The clearing of forest or the transfer of forest to another type of use (conversion) requires approval according to Section 15(1) LWaldG M-V. As part of the preparation of B-Plan No. 1, forestry issues have already been taken into account, and the relevant forestry authorities have been involved.

Pursuant to Section 15(5) LWaldG M-V, VT is to compensate for adverse consequences of conversion by in the form of replacement afforestation and/or the implementation of other protective and design measures. According to the stipulations of the compensation ratios of 1:3 for high-grade forest and 1:1 for unstocked forest land, there is a total legal requirement for compensation of 21.45 ha. The replacement or compensation required by forestry legislation and the nature conservation intervention regulations for landfall for Nord Stream 2 will be provided by the afforestation of 27.8862 ha of forest already recognised by the responsible forestry authority with a view to the implementation of the relevant B-plan and implemented by the previous owner of the land ("EWN reserve pool"). This was confirmed by the competent forestry authority in its statement of 31/5/2017. Furthermore, the assignment of the size of the area in question to the "Nord Stream 2" project also meets the requirements of the State Forestry (see letter of 28/11/2017, ancillary provision A.3.8.8). VT must document the Forestry's power of disposal over the compensation value of the reforested area.

In its opinion pursuant to Section 20 LWaldG concerning protection against the dangers of blowdowns and forest fire, the Mecklenburg-Western Pomerania State Forestry requested that certain buildings be constructed at least 30 metres from the forest. VT provided for the shifting of building containers for the temporary

accommodation of persons in a letter of 14/11/2017; these plans are identified with the amended plans (cf. application documents, Parts C.06, C.07). Shifting the building containers and clearing of the construction site of the directly adjacent project area of the Lubmin 2 natural gas receiving station, will maintain the required 30 metre distance. Ancillary provision A.3.9.2 also ensures a distance to the forest of 30 metres is maintained.

With the indication of the beginning of the forest conversion, cf. ancillary provision A.3.9.1 of the decision, it is verifiably ensured that the stipulated conditions of the decision are realised as a prerequisite for the fulfilment of the approval requirements. Ancillary provisions A.3.9.5 to A.3.9.7 serve to protect the forest and ensure proper forest management.

The interests of woodland and forestry are therefore not contrary to the project.

B.4.8.11 Fisheries

In terms of plant and operational conditions, there is unjustifiable no impact on fishery concerns. VT explicitly confirmed at the time of the debate that there are no restrictions on trawling or gillnet fishing in the area of the 12 nautical mile zone due to the pipeline on the seabed (see minutes dated 26/9/2017, pp. 189, 447). The experience with the Nord Stream pipeline already in operation and VT's record shows that the pipeline being launched is even over-exploited, with no conflict between pipeline and trawling (see word protocol of 26/09/2017, p. 190). During the construction phase, small-scale, temporary restrictions may occur. Only in areas of stone ballast and free pipeline spans should trawling be avoided, since trawl nets might get caught on the pipe in the worst case (cf. application documents, Part C.01, Chapter 5.3.2, p. 226). Since, in the worst case scenario, the construction of a maximum of only two rock piles per installed pipeline (cf. application documents, Part C.01, Chapter 3.2, p. 72, Table 3-6) and a maximum of 4 additional rock piles will protect the submarine cable systems crossing the pipeline, and free spans only occasionally appear in short sections of less than 30 m, according to the Nord Stream pipeline already in operation (cf. application documents, part C.01, Chapter 3.3.8, p. 135), only a restriction near stone ballast and free spans is expected here. This restriction is small and thus justifiable. In order to avoid endangerment of trawling in the area of stone ballast and free pipeline spans, Nord Stream 2 AG also intends to inform the relevant occupational groups about possible dangers by means of information events. In addition, Nord Stream 2 AG identifies and monitors any critical erosion by means of regular inspections and will take appropriate action to counter the such occurrences (cf. application documents, Part C.01, Chapter 5.3.2, p. 226). All plant-related restrictions on fisheries are negligible in relation to the total catchment area. Ancillary provisions A.3.2.1 and A.3.2.2 also ensure that fishermen are informed of the laying work in a timely manner.

The fish stock itself is not affected by plant or operations. Neither permanent spawning areas nor fish habitats are significantly affected. In the interest of avoiding influence on herring spawning, the submitted plan, limits the construction period in Greifswalder Bodden and in the south west of the Pomeranian Bay from 15/05 until 31/12 (cf. application documents, Part G.02, Chapter 2.6, p. 13).

Fisheries are only slightly affected by the short-term laying work, so that no threat to the existence of individual fisheries that might jeopardise the approval of the project is to be feared. Despite the public participation, no fishery company has registered in the proceedings. Within the framework of association participation, no fishery association has made any statement.

The Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety, and Fisheries complains that the application documents for the "Sassnitz trench", as an important trawling area, are not addressed, claiming and this area will have to be considered again with regard to possible negative effects by the construction of the Nord Stream 2 pipeline. This claim is rejected. The submitted EIS and Fisheries Surveys assessed and evaluated the pipeline route-related fishing areas and activities in ICES Rectangles 37G3, 38G3, 38G4, and 37G4. The "Sassnitz trench" is a part of these areas and was thus considered. In addition, the route of the Nord Stream 2 pipeline crosses the "Sassnitz trench" at its narrowest point and, as shown in the application documents, it is eminently possible to tow the pipeline with demersal trawls (cf. application documents, Part I3.01, Chapter 5.2, p. 40).

The Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety, and Fisheries also said in its statement of 31/5/2017 that project-related permanent loss of fishing areas or fishing restrictions are to be expected. This objection must be rejected since the pipeline is largely buried in the 12 nautical mile zone. Only a small part of the pipeline will be merely laid in the 12 nautical mile zone. A total of 3,943 m of the pipeline will be laid in the section of the 12 nautical mile zone (cf. application documents, Part G.01, Chapter 10.1.1, Table 10-2, p. 248), or 4.7%. The Nord Stream 2 pipeline lying on the seabed will be entered into the nautical charts and may be fished over during operation with demersal trawls, as described earlier. As described by the Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety and Fisheries, if demersal trawl nets are not used, plant-related interruptions of the undersides may occur (cf. application documents, Part I3.01, Chapter 5.2, p. 40). However, the trawl can be partially withdrawn (cf. application documents, Part I3.01, Chapter 5.2, p. 40), resulting in only a minor effect due to the plant. The low plant-related impairment is considered acceptable.

The objection of the Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety, and Fishery regarding the possible impairment of trap fishery was taken into account by ancillary provision A.3.2.2. In addition, VT has entered into a contractual agreement with the affected trap fishermen (VT e-mail dated 13/12/2017). During pipeline construction, it is contractually agreed that the affected trap fishermen in the planned route area will suspend trap fishery from June to October and receive compensation. After the pipeline has been completed, it will still be possible, as already stated, to practice trap fishing (see minutes of 26/9/2017, p. 189, 447).

The Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety, and Fisheries also argued that the offshore migration herring should also be considered and that a weather-related adjustment of the construction time limit should be taken into account. The Office also claims that it is unclear whether the most up-to-date data was used for herring considerations in the application documents. This does not make sense from a nature conservation point of view. In the application documents, the spawning of the herring from 1/1-15/5 (cf. application documents, Part G.01,

Chapter 10.1.1, Table 10-2, p. 248) was taken into account. No significant migration of herring to the spawning areas before 1/1 is to be expected, which is why the considerations in the application documents are sufficient. The monitoring results for the construction of the Nord Stream Pipeline show that the construction time constraints at the same time and of the same scope construction from influencing the spawning event. It is therefore sufficient to set the same construction time restrictions for the construction of the Nord Stream 2 pipeline. The use of Kanstinger's dissertation (2014) means that current data were used as the basis for considering herring (cf. application documents, Part D1.01, Chapter 6.2.4.2.4, p. 564).

The demand by the Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety, and Fishery that angling be taken into account cannot be justified. On the one hand, it is not possible to quantify angling as recreational use since no data is available. Secondly, the restrictions imposed by pipeline construction in the form of a moving construction site are short-lived for the sections concerned. Also, the demand by the Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety and Fisheries that VT appoint a fisheries coordinator cannot be complied with. Ancillary provisions A.3.2.1 and A.3.2.2 ensure sufficient coordination between the VT and the fishing industry concerned. Likewise, there is no requirement that fishing with active and passive fishing gear be possible across the entire pipeline route of the Nord Stream 2 pipeline (as the State Office demands). As already mentioned, the ancillary provisions ensure that only minor restrictions on the fishing industry can be expected from the construction of the Nord Stream 2 pipeline, as there would be even without these provisions (cf. application documents, Part I3.01, Chapter 5.2, p. 41).

The Mecklenburg-Western Pomerania State Agency for Agriculture, Food Safety, and Fisheries claims in its statement that fishing should be considered traditional use with a "high" evaluation level. This cannot be followed. The assessment is based on a holistic evaluation of the route both in the Greifswalder Bodden and beyond in the Baltic Sea. From this assessment comes a holistic assessment of "medium". Moreover, explanations are given in Section B.4.4.1.8.

The Mecklenburg-Western Pomerania State Agency for Agriculture, Food Safety and Fisheries demands that the eel be considered not potentially present, but present all year round, in the project area. This cannot be followed. In the EIS, the European river eel (*Anguilla anguilla*) is described as having been detected in the project area (cf. application documents, Part D1.01, Chapter 5.5.4.2, p. 310). The quoted statement comes from the fisheries technical consultant report and refers to a potentially possible presence of the eel directly in the area of the route (cf. application documents, Part I3.01, Chapter 3.1, p. 10). The Mecklenburg-Western Pomerania State Office for Agriculture, Food Safety, and Fisheries demand for an explicit assessment of the importance of the project area for fisheries cannot be accepted, either. The fisheries technical consultant carries out these evaluations (cf. application documents, Part I3.01, Chapters 4.1 and 4.2, pp. 33 and 34). The Mecklenburg-Western Pomerania State Agency for Agriculture, Food Safety and Fisheries states that the Atlantic sturgeon (Acipenser oxyrinchus) is to be regarded as documented and that there is a ban on fishing. This cannot be followed. The Atlantic sturgeon (Acipenser oxyrinchus) could not be detected by VT in the conducted fish fauna mapping efforts in 2015 and 2016 (cf. application documents,

Part F.07, Chapter 5.2.2.1, p. 139). Any effect can be ruled out anyway because the sturgeon will avoid the Nord Stream 2 pipeline construction area in good time due to the sound propagation. No catch during construction is likely.

The Thünen Institute of Baltic Sea Fisheries in its objection of 30/5/2017 contradicts the intended restriction of construction activities in the Greifswalder Bodden and on the Bodden bay threshold to the period between 15 May and 31 December. In the statement by the Thünen Institute, requests at least one construction period restriction between 01 February and 31 May. This is justified by the sediments that were raised by the construction work in the herring nursery area, which could lead to increased larval mortality and thus poor herring stocks. The stocks of macrophyte necessary for spawning should not be affected by suspended matter. The Greifswalder Bodden is one of the main spawning areas for spring-spawning herring, and its herring population is of economic importance.

No expansion of the construction time limit can be granted. On the one hand, the turbidity monitoring for the construction of the Nord Stream pipeline showed that the turbidity that occurred did not exhibit any major spreads and was difficult to differentiate from the naturally occurring background pollution with suspended particles from the Greifswalder Bodden (cf. application documents, Part D1.01, Chapter 6.2.2.2. 1, p. 500). The turbidity monitoring for the construction of the Nord Stream pipeline results in a maximum expansion of the turbidity plume less than 500 m away from the dredging work (cf. application documents, Part D1.01, Chapter 6.2.2.2.1, p. 500). It should be noted here that, unlike the construction of the Nord Stream, the trench for the Nord Stream 2 pipeline in the Greifswalder Bodden will be dug by backhoe dredgers, which will cause up to 50% less turbidity in the Greifswalder Bodden (cf. application documents, Part D1.01, Chapter 6.2.2.2.1, p. 469). This suggests that the effect of construction work on the Nord Stream 2 pipeline on larvae and juvenile fish will not be severe.

Furthermore, hardly any macrophytic stands will be affected in the pipeline route (cf. application documents, Part D3.02, Map 1-2). The possibly significant herring spawning grounds in the immediate vicinity of the Lubmin 2 landing point will be less affected by the use of a micro-tunnelling approach to the coastal crossing than by an open-trench crossing. Crucially, the monitoring of the Nord Stream pipeline construction exhibited no negative effects on the spawning activity of spring-spawning herring, and a high number of herring larvae was recorded in the year of the Nord Stream pipeline construction compared to the period since 2004 (cf. minutes dated 26/9/2017, p. 193 in connection with annexes to the minutes, 170717_Nord Stream 2_EOT_Diverses_Transboundary, Slide 24). After weighing the concern, there remains a slight effect on spawning which does not justify delaying construction until June. Postponing the start of construction in the herring spawning areas into June is not reasonable due to the technical construction process, as this would lead to an extension of the construction activity. This would result in greater environmental impact than in the current, optimised, and already heavily limited planned construction time.

The Thünen Institute of Baltic Sea Fisheries also demands that the investigations into the occurrence and abundance of herring larvae which have been conducted since 1977 (as part of the Rügen Herring Larvae Survey) not be hampered by the construction of the Nord Stream 2 pipeline. Ancillary provision A.3.2.3 will ensure

that there is no impact on these investigations during the construction of the Nord Stream 2 pipeline. In addition, the Thünen Institute of Baltic Sea Fisheries demands that the pressurised test water not be discharged into the Greifswalder Bodden. Only the water from the pressure test in the area of the pig receiving station (dry section) is to be discharged into the Greifswalder Bodden. This is untreated water which can be safely channelled through the outlet canal into the Greifswalder Bodden (cf. application documents, Part H.01, Map 148). Water is discharged into trench 60 via a settlement container holding bales of straw, so that impurities can be filtered out. The amount of water to be discharged is about 5,000 m³ (cf. application documents, Part I1.05, Annex B, Chapter 3, p. 3). In addition, the Thünen Institute of Baltic Sea Fisheries demands that the Nord Stream 2 pipeline be buried in the deep water area between Oderbank and Adlergrund. This cannot be accepted, since there are no relevant plant-related restrictions on trawling, as mentioned above. However, the disadvantages caused by the construction project are justified by their inevitability and their temporary nature, which is limited to one season and rather low in character. Ancillary provision A.3.2.2 also establishes coordination between the fishing industry and VT.

The Landesanglerverband MV e.V., a Mecklenburg-Western Pomerania fishers' association, in its statement of 22/5/2017 demands that angling be among the considerations in the application documents. As stated above, angling as a form of recreational use cannot be quantified because no data is available. The limitations associated with constructing the pipeline in the form of a moving construction site are short-lived for the relevant sections which are important for angling. The Landesanglerverband MV e.V. also asserts that in addition to the spawning of herring, other fish species will also be affected by the Nord Stream 2 project. The construction period limitation during herring spawning time (01/01-15/05) also reduces the impact on other spawning events of the garfish, pike, zander, and perch species. As a result, none of the spawning time is affected by construction activities. In addition, the species mentioned do not have the same great importance as herring.

The impact of construction on the construction of the Nord Stream 2 pipeline on the more important flatfish species is also negligible. Flatfish spawn at great depths, but the pipeline will be laid at water depths of more than 17.5 m (cf. application documents, Part C.01, Chapter 2.2.3.4, p. 38), which means a much smaller impact on flatfish spawning. Added to this is the pelagic nature of the spawning of flatfish species, whose floating and distributing properties further reduces the impact of the construction of the Nord Stream 2 pipeline.

The Landesanglerverband MV e.V. doubts the projected low impact of the project on the protected resource of water. In particular, the association is concerned about plant-related effects due to the release of substances from the sacrificial anodes leading to deterioration of water quality. These concerns are not sufficiently substantiated, so the objection cannot be accepted. From an environmental point of view, no significant adverse project-related effects on the protected water can be expected. The application documents are also conclusive and substantiated in this respect. The substances the sacrificial anodes primarily release in large quantities are aluminium and zinc. Aluminium will be present as inert aluminium hydroxide after release due to the pH of 7 to 8.5 of the seawater in the area affected by the construction of the Nord Stream 2 pipeline (cf. application documents, Part D1.01,

Chapter 6.2.1.2.1, p. 477)) and thus has no negative effect on the water or fish. Due to the anoxic conditions in the seabed, the released zinc will form the inert compound zinc sulphide (cf. application documents, Part D1.01, Chapter 6.2.1.2.1, p. 477) and thus also have no negative effects. An increase in the concentration of heavy metals in the vicinity of the Nord Stream pipeline could not be demonstrated (cf. application documents, Part D1.01, Chapter 6.2.2.2.1, pp. 509 et seq.). As comparable sacrificial anodes are planned Nord Stream 2 pipeline, no increase in the concentration of heavy metals in the vicinity of the pipeline is expected for this pipeline with respect to the sacrificial anodes, either.

Department 4 – State Development – of the Mecklenburg-Western Pomerania Ministry of Energy, Infrastructure, and Digitalisation demands that the excavation and backfilling of the trench (construction-related turbidity plumes and sediment deposits, for example) take particular account of the needs of inshore fishing and the conservation of fish species and habitats. As has already been stated, only minor effects from the formation of turbidity plumes during construction of the Nord Stream 2 pipeline is expected. A limitation of the construction times also leads to a mitigation of the effects on spawning events, especially of herring.

The interests of the fishing industry are therefore not contrary to the project.

B.4.8.12 Nuclear law matters

Nuclear law concerns are not contrary to the project.

According to the statement by the Nuclear Waste Management Plant dated 24/05/2017, a "hazard analysis" is to be prepared which describes the accident "explosion/blast wave" and its consequences. It must be verified whether a risk to the location of the EWN GmbH, in particular on systems in which radioactive material is located, is to be obtained. This cannot be followed. The note from the responsible authority (Unit 250 of the Mecklenburg-Western Pomerania Ministry of Interior) of 16/5/2017 states that on the basis of safety calculations in the OPAL procedure alone, which were carried out by external experts, the Ministry of the Interior can have no objections to the construction and operation of the natural gas OPAL pipeline and the landfall station with respect to radiation protection. Conservative assumptions in particular have been used to consider the potential explosion pressure at the North Intermediate Storage Site (ZLN); in addition, even at that time, the relevant f Nord Stream plans (diameter, pressure, quantity, location, etc.) were taken into account (see opinion dated 8/5/2008). The landfall and compressor station is located east of the Lubmin industrial harbour at a distance of about 1,400 m to the ZLN. The construction of the Nord Stream 2 natural gas reception facility is planned west of the industrial port and has an even greater distance of about 2,000 m to the ZLN.

Therefore, taking into account the same system parameters, but a much larger distance, unacceptable repercussions can be ruled out.

B.4.8.13 Monuments

In the offshore project area, there are known or suspected ground monuments. The modification or elimination of ground monuments is to be approved according to Section 7(3)(2) DSchG M-V if an overriding public interest demands the measure. Here, the pipeline laying requires intervention regarding monuments.

As shown in the application documents (cf. application documents, Part D1.01, Chapter 3.2.10, p. 120), parts of a ship barrier from 1715 are located in the route corridor of the Nord Stream 2 pipeline in the area of the Bodden bay threshold. Close coordination with the competent authorities in dealing with the wrecks is provided for in the submitted plan (cf. application documents, Part D1.01, Chapter 3.2.10, p. 120). Ancillary provision A.3.5.1 also ensures consideration of the shipwreck barrier in the construction processes for the Nord Stream 2 pipeline.

All other ground monuments in the route area of the 12 nautical mile zones are taken into consideration on a contractual basis between the VT and the Mecklenburg-Western Pomerania State Office for Culture and Heritage Preservation (cf. application documents, Part D1.01, Chapter 5.8.1, p. 455). Ancillary provision A.3.5.2 ensures that any other ground monuments discovered during the construction of the Nord Stream 2 pipeline will be taken into account. Discoveries are to be reported and secured accordingly. The Mecklenburg – Western Pomerania State Office for Culture and Heritage Conservation, in its statement of 29/5/2017, calls for the measures described in the application documents for the protection of cultural heritage (cf. application documents, Part J01, Chapter 10.9.2.1, pp. 466 et seq.) to be expanded to include additional measures. Ancillary provision A.3.5.3 takes this requirement into account.

In a further letter from the Mecklenburg – Western Pomerania State Office for Culture and Heritage Conservation dated 17/10/2017, the State Office announced that it maintained its previous position, and if significant ground monuments such as the lost "Vineta" trading post are discovered, they can be secured by the archaeological measures.

The requirements of the lower monument protection authority of the Western Pomerania-Greifswald district were met by ancillary provision A.3.5.2.

The agreement of the State Office for Culture and Historic Preservation according to Section 7(6) DSchG MV has been granted (see Section A.1.1.4). Given measures to safeguard the historic preservation concerns, the interest in the implementation of the pipeline and the associated interest of the general public in a secure gas supply is the deciding factor. The corresponding approval was therefore to be granted as part of the planning approval.

Concerns regarding monument protection are therefore not contrary to the project.

B.4.8.14 Municipal matters

The project does not violate any municipal concerns. Due to the chosen route and the planned and fixed replacement measures, municipal planning is neither entirely

prevented nor fundamentally impeded (see BVerwG (German Federal Administrative Court), judgement of 21/3/1996, 4 C 26/94, juris).

Local issues are not affected by the offshore part of the Nord Stream 2 pipeline. The smallest distance between the offshore part and residential areas of a locality is 1,300 m for Lubmin and 2,000 m for the village of Thiessow (community of Baabe) (cf. application documents, Part I2.06, Chapter 3, p. 4). The Lubmin marina is located about 900 metres away. Impairments due to sound and light imissions are excluded under consideration of avoidance measures. Also, the onshore part does not lead to any impairment of municipal interests. The crossing of the coast to the Pig receiving station is carried out by microtunnel. An impairment of the beach of the seaside resort submission is excluded; The ancillary provision A.3.10.19 is used purely as a precautionary measure for the corresponding marking above the tunnel construction site (cf. application documents, Part B.01, Chapter 8.2.1.3.1, p. 312). The Pig receiving station is being built to a legally binding development plan, B-Plan No. 1 "Lubminer Heide Industrial and Commercial Park". The project does not contradict the stipulations of the development plan (cf. application documents, Part G.01, Chapter 8.3, p. 233). Also surrounding building areas are not affected. In particular, the area for the construction of the Pig receiving station is shielded by an existing noise protection wall, thereby avoiding conflicts with other types of use secured by planning.

If construction planning concerns are raised against the real compensatory measures on Rügen, they have been resolved in the course of the compensatory measures set out in this decision, which are or will be implemented outside the areas for which objections have been raised.

Municipal concerns are therefore not contrary to the replacement measures.

B.4.8.15 Securing raw material

The route of the project runs at approx. 0.1 km distance to the commercial deposit "Landtief". According to LEP, this is a marine reserved area for securing raw material, which is a regional planning principle. The distance to the marine priority area coastal protection "Prorer Wiek", which represents an objective of regional planning, amounts to approx. 0.22 km (see in each case map to LEP M-V 2016, application documents, Part D2.01, p. 1). The course of the pipeline route also affects the permit area "Oderbank KW new" for the exploration of hydrocarbons, which extends from Lubmin and off the island of Usedom in a north-easterly direction to the Pomeranian Bay.

According to no. 8.7(1) LEP M-V 2016, in a marine reserved area, the securing of raw materials shall be "given special emphasis in territorial waters in conjunction with the possibility of extracting raw materials. This must be taken into consideration when considering other space-related plans, measures, projects, functions and uses." With regard to the retention area, it should be noted that neither the construction nor the operation of the pipeline will significantly affect the extraction of raw materials. The western corner of the area is close, but outside the route and the safety corridor; however, possible extraction must be in accordance with the safety requirements of the pipeline operator. This can mean that a safety margin between the pipeline and the extraction boundary has to be observed. However, taking into

account the size of the deposit, this does not lead to unreasonable restrictions on the use of the deposit. Regarding the permit area "Oderbank KW new" it can be stated that so far, no exploration operating plan exists and the route of the Nord Stream 2 pipeline only occupies a very small area of the entire exploration area. However, taking into account the size of the permit area, this does not lead to unjustifiable restrictions on the use of the permit area for future exploration work.

According to No. 8.6(2) LEP M-V 2016, in a Marine Priority Area Coastal Protection "overriding other public importance (...), the degradable marine deposits should be given priority over other land-use claims for coastal protection and protection against storm surges in the medium term. Insofar as spatially significant plans, measures, projects, functions and uses in these areas are incompatible with the function of the coastal protection priority area, these are to be excluded. (Z)". With regard to the priority area, it should be noted that the mining of raw materials will not be affected during the construction or operation of the pipeline. The southern corner of the area is outside the route and the safety corridor; a recovery would only be affected in terms of shipping traffic during the laying work and it would be necessary to coordinate with the line operator. However, taking good marine practice into account, this does not result in restrictions on the use of the deposit.

As a result of the weighting, it should be noted that the interests of securing the raw materials do not conflict with the project.

B.4.8.16 Infrastructure

B.4.8.16.1 Intersection structure with 50Hertz

In the section from KP 50,703 to KP 51,203 there is an intersection with a planned route for six three-phase submarine cable systems for grid connection of offshore wind parks. Among other things, these six submarine cables will connect the offshore wind parks "Arkona Basin South-east" and "Viking" with the mainland. The operator of the grid connection is 50Hertz Transmission GmbH (hereinafter referred to as 50Hertz). By the decision of 09/07/2015, at the request of 50Hertz Offshore GmbH through the Ministry of Energy, Infrastructure and Rural Development Mecklenburg-Western Pomerania (EM MV), the construction and operation of six cable systems for grid connection of the offshore wind park cluster "Westlich Adlergrund" and "Arkona Lake" will stretch from the beginning of the 12 nautical mile boundary to the Lubmin landing point (sea route), (VIII 667-00006-2015/005-004). So far, a submarine cable system (cable 281) has been laid. According to the 50Hertz planning status, the second cable system (cable 282) is in the installation phase (see also the letter of the EM MV dated 29/11/2017), whereby it has already been laid in the expected crossing area. In this case, cable 281 has been laid on cable 262 approved route and cable 282 on the approved route for cable 281. In addition, 50Hertz plans to install another third cable system (cable 261) east of the two cables already laid and, in the route planned for cable 261, which may be completed before 01/09/2018, but a later laying date cannot be excluded due to risk of delays. The cable laying period for cable 261 can thus not be determined with certainty at the time of this planning approval.

For the purpose of weighting, it must first be stated that 50Hertz is affected in its legal status as a grid connection in accordance with Section 17d EnWG (German Energy Industry Act) and, if applicable, compensation for damages under Section 17e EnWG is obligatory for transmission grids within the meaning of Section 3 no. 10. In addition, the considerable public interest in a timely grid connection of wind turbines at sea and their contribution to facilitating the sustainable development of energy supply in the interests of climate and environmental protection (see Section 1 EEG) is to be acknowledged for their position. It has not been shown that 50Hertz Transmission GmbH is also the owner of the plan approval decision issued on 09/07/2015 to 50Hertz Offshore GmbH. 50Hertz Offshore GmbH is a wholly owned subsidiary of the transmission system operator 50Hertz Transmission and thus legally independent, although it is controlled by the parent company. Due to the close corporate connection due to the sole ownership of 50Herz Transmission GmbH, 50Hertz assumes that it can assert the rights and interests of 50Hertz Offshore GmbH, also from the planning approval decision of 09/07/2015, for the following consideration.

50Hertz refers in the comments of 07/04/2017 and in the remarks in the discussion, specifically to their obligation as transmission system operators for grid connection of wind turbines at sea in accordance with Section 17d EnWG (German Energy Industry Act). 50Hertz fears that it will be obliged to pay compensation to the operators of offshore wind energy plants if the grid connection for offshore wind parks connected to the transmission network via Lubmin is not completed at the binding time due to a delay in the planned project. 50Hertz emphasises that it is the operator of not only the three 220 kV cable systems (cables 281, 282 and 261) in the German territorial waters, but also three further 220 kV cable systems in the German territorial waters ("CWA 2.0") as well as further "future" offshore connection lines in the German territorial waters (e.g. "OST-2-4"). When laying the planned 220 kV cable systems, in particular cable 261, in addition to the pure laying times, the preliminary and subsequent work must be taken into account in the coordination with the construction work for the Nord-Stream 2 line. During this period, the line should be fully accessible to 50Hertz. It is also mandatory that cable 261 be laid before the Nord Stream 2 pipeline. In particular, at the time of the discussion, it is stated that a transfer of this so-called third cable after the relocation of the Nord Stream 2 pipeline involves licensing and technical problems. As a result, Nord-Stream 2 cannot start laying work in the intersection area until September 2019, unless 50Hertz clears the intersection earlier. "Route preparation and laying activities" for two additional cables approved with the planning approval decision of the EM MV from 09/07/2015 would take place between 2018 and 2021 and for another cable between 2018 and 2022. 50Hertz stated in the letter of objection: *"The actual construction process as well as the sequence of the realisation of the cables OST-2-1, OST-2-2 and OST-2-3 cannot be predicted accurately, as this depends to a significant degree on the outcome of the second offshore tender by the Federal Network Agency in accordance with the requirements of WindSeeG taking place at the beginning of April 2018. If Nord-Stream 2 cannot be completed in the crossing area with the submarine cables OST-2-1, OST-2-2 and OST-2-3 by the end of December 2019, the laying of these three cables would first have to be put on hold, unless 50Hertz specifically releases the crossing area for further periods. 50Hertz must be - literally "free to be able to lay one or more of the OST-2-1, OST-2-2 and OST-2-3 cables as of January 2020".*

In practical terms, 50Hertz believes that only one building window will be available from October to December 2019 for the relocation of the Nord Stream 2 pipeline. As an additional consideration 50Hertz also highlights the OST-2-4 project named in the second draft of the O-NEP 2030 with a start of implementation in 2024 and a planned completion in 2029 as well as the existing public interest. The laying order given by 50Hertz for the planned submarine cable would thus correspond to the technical design provided in the application documents for the planning approval, according to which Nord-Stream 2 runs above cables 281, 282 and 261 and below cables 285, 286 and 262. Due to the issues raised by 50Hertz in the process and the PD's intention to relocate the Nord Stream 2 pipeline in the intersection between September and December 2018, the PD has submitted documentation on another technical intersection option, according to which the Nord Stream 2 Pipeline is buried at the intersection with cable 261 and cable 261 runs above the Nord Stream 2 pipeline. In addition, discussions were held between the PD and 50Hertz on how to balance the interests of 50Hertz and the PD in the event of approval of the project. This is what 50Hertz and the PD reported in an interview in the EC on 06/12/2017, in which the planning approval authority participated. An intersection contract has not yet been concluded. In principle, 50Hertz adheres to its primary petition of a general priority of the planned grid connection project.

The planning approval authority has commended the entire presentation and is weighing it up. First of all, it should be noted that there is no explicit legal provision requiring that the laying of submarine cable connections at sea, whether planned or foreseen, should generally take precedence over other later identified projects. Since both the submarine cables and the planned project Nord Stream 2 are priority use within the meaning of Section 8 (7) sentence 1 no. 1 ROG, neither of the two projects is excluded as an "other spatial use" in the marine pipeline route priority area affected by the intersection area in accordance with No. 8.2(1) LEP MV. For this reason, the conflict of interest between submarine cable laying and the establishment of the planned project is subject to consideration in accordance with Section 43(4) EnWG (German Energy Industry Act).

It should be borne in mind that the 50Hertz cable routes crossing the PD's project have already been planned. In principle, this leads to a temporal priority of the plans of 50Hertz which have not yet been implemented, which means that, when weighing up the conflicting interests, the planned cable routes mentioned above must be given more weight than any potential conflicting interests of the PD. This also implies that a "new" planning must take greater account of other planning, which has the temporal "lead" (BayVGH, judgement dated 12/12/2016, 22 A 15.40038, juris margin no. 31 citing further case law). This priority principle is expressed in the ancillary provision A.3.10.1. Even if, therefore, the priority principle represents a - albeit important - weighting criterion (BVerwG (German Federal Administrative Court), B. dated 05/11/2002, 9 VR 14.02, Buchholz 407.4 Section 17 FSTRG No. 171 p. 133 citing further case law), other matters that are relevant to the project may be so significant that they overcome other concerns such as the principle of priority by way of consideration (BVerwG, B. dated 25/05/2005, 9 B 44/04, juris margin no. 16).

Pursuant to Section 17d (1) and (2) EnWG (German Energy Industry Act), the obligatory transmission system operator has to erect and operate offshore connection lines in accordance with the requirements of the offshore grid development plan and from 01/01/2019 in accordance with the grid development

plan and the area development plan pursuant to Section 5 WindSeeG. Section 17d EnWG (German Energy Industry Act) specifies the obligation to implement the offshore grid development plan and, together with Section 17b EnWG, forms the core of the system change to a connection claim within the scope of the planned capacity (*Broemel*, in: Britz/Hellermann/Hermes, EnWG (German Energy Industry Act), 3. 2015 edition, Section 17d margin no. 1). Pursuant to Section 17b (2) sentence 1 EnWG (German Energy Industry Act), the offshore grid development plan contains information on the planned completion date for all measures pursuant to Section 17b (1) sentence 2 EnWG and stipulates binding deadlines for the start of implementation. In accordance with the requirements of the network development plan and the area development plan pursuant to Section 5 WindSeeG, the transmission system operators must start to implement the grid connections of offshore grid development plans as of 01/01/2019 and to speed up the construction of grid connections for wind turbines at sea. The obligatory transmission system operator commissions the offshore connection line in good time so that the completion dates are either within the calendar years specified in the Offshore Grid Development Plan or, from 01/01/2019, are those listed in the land development plan. In any case, they shall not commission the offshore connection line until the suitability of an area to be connected by them for the use of wind energy at sea has been determined in accordance with Section 12 WindSeeG. EnWG (German Energy Industry Act)Pursuant to Section 17e(2)(1), the operator of the wind turbine at sea may claim compensation if it is not possible to feed it from a ready-to-operate wind energy plant at sea, because the grid connection is not completed by the binding completion date of the connection line according to Section 17d A(2)(9) EnWG. The completion date corresponds to the estimated completion date announced by the transmission system operator pursuant to Section 17d (2)(4) EnWG (German Energy Industry Act) and becomes binding 30 months prior to the scheduled completion in accordance with Section 17d (2)(9) EnWG.

All 50Hertz projects listed above have been confirmed by the Federal Network Agency or are included in the current draft O-NEP 2030. Thus, cables 281, 282 and 261 were declared by the Federal Network Agency with confirmation of O-NEP 2013 from 19/12/2013 as required. In the second draft of the O-NEP 2030 published on 02/05/2017, these three cables are listed under the designation OST 1-1, OST-1-2 and OST-1-3 as part of the so-called start network with a completion in 2018 (OST-1-1) and 2019 respectively (OST-1-2 and OST-1-3). The other three cables under the designation OST-2-1, OST-2-2 and OST-2-3 have been found to be necessary by the Federal Network Agency with confirmation of O-NEP 2025 of 25/11/2016. At the beginning of the implementation, the year 2018 has been designated for all three cables and 2021 for the planned completion with regard to the cables OST-2-1 and OST-2-2 and 2022 for the cable OST-2-3.

In the objection of 30/05/2017, 50Hertz assumes that cable 261 in the intersection area will not be laid before September 2018 according to its current planning status. For the relocation of the other currently planned submarine cable systems (OST-2-1, OST-2-2 and OST-2-3), 50Hertz will designate the year 2019, depending on the tender results and the negotiations with the cable supplier, (see letter from the Ministry of Energy, Infrastructure and Digitalisation Mecklenburg-Western Pomerania dated 29/11/2017). The relocation of these three cables would therefore, according to current planning, only take place after the deployment of the Nord Stream 2

pipelines. Nevertheless, a timing clash of the laying activities with the lines of the PD cannot be ruled out from the outset, as at least one cable (261) will be laid in 2018.

A crossing agreement between 50Hertz and the PD has not yet been concluded. In September 2016, however, a selective agreement was reached on the laying depths of cables 281, 282 and 261 in the intersection area. This so-called "Cable Lowering Agreement" of 20/09/2016 provides that 50Hertz will try to reimburse the resulting costs of achieving a laying depth of up to 3m below the bottom of the sea floor. Furthermore, 50Hertz has submitted documents on possible changes to the cable routes within the project "Grid Connection Cluster Westlich Adlergrund" based on the talks already held with the PD (ref.: VIII-667-00006-2013/005-004 Seetrasse: "Scenarios of the 50Hertz Route Gradients in the Intersection with the Nord Stream 2 Pipeline"), which will be considered in subsequent discussions.

For the intersection of the submarine cable routes 281, 282 and 261 two scenarios are possible: Either the Nord Stream 2 pipeline is laid *after* the laying of the submarine cable 261 in the intersection area is completed; this is referred to below as scenario 2018a. Or, the North Stream 2 pipeline is laid *before* the submarine cable 261 is laid in the intersection area; this is referred to below as scenario 2018b. In scenario 2018a, cable 261, as well as cable 281 and 282, would be placed in the intersection at about three metres below the seabed and then crossed by the Nord Stream 2 pipeline. For this purpose, the Nord Stream 2 pipeline will be laid on both sides of the intersection area on the seabed in accordance with the possible curvature. The distance to overcome the necessary height difference from the regular depth of burying to the surface of the seabed extends for the Nord Stream 2 pipeline on both sides of the intersection area to each 150 m. 25 to 50 m of this is reserved for the protection corridor of the submarine cable, in which the pipeline still runs 25 to 50 m on the surface of the sea floor (see the cover document "Scenarios of the 50Hertz Route Grades in the Intersection Area with the Nord Stream 2 Pipeline")., see: VIII-667-00006-2013/005-004 Seetrasse, p. 10). In the case of the deployment scenario 2018a, the submarine cable would have already been incorporated into the seabed during the laying of the Nord Stream 2 pipeline, so that the planned route can be used as a route. In this case, it would run parallel to the already laid submarine cables 281 and 282 on the considered section between KP 30 +800 and KP 34 +000.

If, on the other hand, the submarine cable 261 is laid after the installation of the Nord Stream 2 pipeline (scenario 2018b), the Nord Stream 2 pipeline would be routed on both sides to the intersection with the already laid submarine cables 281 and 282, depending on the possible curvature, until it reaches the intersection distance of 25 to 50 m on both sides of the intersection on the surface of the seabed (see the covering document "Scenarios of the 50Hertz Route Grades in the Intersection with the Nord Stream 2 Pipeline", see: VIII-667-00006-2013/005-004 Seetrasse, p. 11). In order to overcome the necessary height difference from the surface of the sea bottom to the regular burying depth, the Nord Stream 2 pipeline requires 150 m on both sides of the crossing area due to the physical property of the pipe and the associated immersion angle. 25 m to 50 m of this is reserved for the protection corridor of the submarine cables, in which the pipeline still runs 25 to 50 m on the surface of the seabed. In this scenario, cable 261 could only be placed at this distance from the Nord Stream 2 pipeline next to the route of the already laid submarine cable 281. At the intersection, the submarine cable would be laid on the

seabed, protected by concrete mattresses on the top and bottom, or possibly rock piles above the cable, thus crossing the Nord Stream 2 pipeline. The route selected for this scenario would take a straight course between KP 30 + 800 and 34 + 000, shortening the length of the route by approximately 30m compared to Scenario 2018a. This results in an effective distance from submarine cable 261 to 281 in the intersection area KP 32 + 400 of 230 m. This route of submarine cable 261 is currently not planned.

From the point of view of the planning approval authority, even after completion of the construction work for the Nord Stream 2 pipelines, it is possible to lay the cable 261 in the crossing area in such a timely manner without jeopardising the announced completion date (June 2019). It is therefore reasonable for 50Hertz, in view of its commitment to timely network connectivity, and in view of the PD's equally legitimate interest in implementing the Nord Stream 2 pipeline and the related public interest in securing gas supply, if 50Hertz agrees with the ancillary provisions under A.3.10.3, to keep the crossing area free for 2 months (September and October 2018) for the relocation of the Nord Stream 2 pipelines. It is therefore not an error of judgement by the planning approval authority that, considering the expected weather conditions, this is a good time for the relocation and, in the worst case, a relocation of cables in November, December 2018 is no longer possible. For the September/October 2018 period, 50Hertz would be available to lay cable 261 outside the intersection and, if cable 261 could not be laid in the intersection before the end of August 2018, there would still be an opportunity in the spring of 2019 to lay the cable in the intersection area and to ensure a timely network connection in June 2019. In addition, if only two months are available for pipe-laying and the backfilling of the trench in the intersection area, the PD shall be deemed to have a season in which it is likely that the weather conditions will be adequate.

In view of the fact that the PD and 50Hertz - the latter, in the case of approval of the project - have agreed to the ancillary provisions catalogue in A.3.10.1 et seq., it can also be assumed that it adequately satisfies the interests of both the PD and 50Hertz.

As far as the period after 2018 is concerned, the following considerations are decisive: According to Section 118(20)(1) EnWG (German Energy Industry Act), the offshore grid development plan for the target year 2025 (O-NEP 2025) contains all necessary measures to ensure sufficient competition among existing projects under the tender in accordance with Section 26 WindSeeG. According to the data specified by the Federal Network Agency in its confirmation of O-NEP 2025 of 26/11/2016 (p. 33) on the start of implementation of further network connections, additional cable systems will not be commissioned before 2018, which means it is not possible for further relocation of other cable systems to take place before 2019 due to the order times for ships and submarine cables (see also letter from the Ministry of Energy, Infrastructure and Digitalisation Mecklenburg-Western Pomerania dated 29/11/2017). At the present time, an estimated completion date has not been announced for cables OST-2-1 to 2-4. A deployment of the Nord Stream 2 pipeline in the period September/October 2018 would therefore not conflict with this.

A decision on any other or subsequent processes for pipeline laying after October 2018 remains reserved for a later decision of the planning approval authority in accordance with Section 74(3) VwVfG MV (German Administrative Procedures Act

for Mecklenburg-West Pomerania) (ancillary provision A.3.10.7). Accordingly, a final decision is to be reserved in the plan approval decision, insofar as this is not yet possible; the project sponsor must be given the task of submitting missing documents specified by the planning approval authority in good time. For a permissible reservation, the planning approval authority must be able to exclude, without any trade-off error, that a solution to the problem under discussion is called into question by the findings already made. Basically, the time of the planning approval decision is decisive. At this point in time, the knowledge required to tackle the problem must be obtained without appropriate effort. Even then, a reservation is only declared admissible if the planning authority can assume that the conflict that has not yet been resolved will be dealt with at the time of the plan implementation in another procedure in accordance with its own planning decision. That condition is satisfied if, in the circumstances of the case, problematic regulation can reasonably be expected to be objective. In addition, the matters not covered by the reservation may not have such weight, so that the planning decision may later appear unbalanced. The reservation presupposes, therefore, that there will be at least an outline assessment of the conflict situation which will be settled later (BVerwG (German Federal Administrative Court), decision dated 31/01/2006, 4 B 49/05, NVwZ 2006, 823, Juris margin no. 21; BVerwG (German Federal Administrative Court), judgement 21/02/1992, 7 C 11.91, BVerwGE 90, 42 et seq.).

According to 50Hertz, it is currently unclear when they plan to or must make use of the plan approval regarding cables OST-2-1 to 2-3. A commissioning by the obligatory transmission system operator takes place only if an offshore wind park is actually to be connected (see Section 28 WindSeeG). This depends on whether - apart from the Viking (Iberdrola) and Arkona Basin South East (E.ON) offshore wind parks under construction, which are to be connected to cables 281 and 282 and partial capacities of cable 261 - further wind parks added by surcharge under the terms of the invitation to tender pursuant to Section 37(1) WindSeeG, are entitled to a subsidy in the form of the market premium in accordance with the EEG and grid connection and grid connection capacity. A final clarification of the installation scenarios at the time of the plan approval is therefore not possible. The conflict situation after October 2018 is likely to be similar and also similar in the intersection area as is the case with the construction of the Nord Stream 2 pipeline in September/October 2018. In this respect, it cannot be seen that a later problem settlement could be unbalanced in this respect.

As already stated, the legal position to be considered in the weighting is that which follows from the planning approval of the grid connection. Pursuant to Section 75(1)(1) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania), the plan approval determines the admissibility of the project, including the necessary consequential measures to other facilities, with regard to all public interests affected by it; in addition to the planning approval, other official decisions, in particular public-law approvals, awards, permits, authorisations, approvals and plans are not required. The planning approval regulates all public-law relations between the project sponsor and those affected by the plan (Section 75(1)(2) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania)). The exclusion and toleration effect that this entails increases the protection of the planned project - in this case the grid connection - against subsequent claims of third parties. It finds its justification in the fact that the legislator with the respective planning laws normalises a public interest in the realisation and operation of the

special planning projects (*Deutsch*, in: Mann/Sennekamp/Uechtritz, VwVfG, 1st 2014 edition, Section 75 margin no. 92). The exclusion and toleration effect ensures that the plan-approved project cannot be questioned after being able to be challenged by defence claims by third parties, even if the circumstances subsequently change. This does not mean that planning approval decisions can no longer be subsequently adjusted, changed or even cancelled (*Deutsch*, in: Mann/Sennekamp/Uechtritz, VwVfG, 1st 2014 edition, Section 75 margin no. 92). This is already apparent from Section 75 (2) sentence 2 VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania). The planning approval authority does not ignore the fact that the regulation of a necessary consequential measure at other facilities may indeed be the subject of a planning approval decision and that the term of the identified plan is not limited to the actual project, but in principle covers the entire decision. However, the competence-expanding effect of Section 75 (1) sentence 1 VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania) with regard to the regulation of consequential measures is limited to conflict resolution only. The existing exceptional responsibility of the planning approval authority to regulate measures at other facilities is therefore only extends as far as the requirements of the conflict management. Thus, consequential measures have to be taken in order to solve the problems arising from the project for the functioning of the other installation (BVerwG (German Federal Administrative Court), B. dated 13/07/2010, 9 B 103/09, NVwZ 2010, 1244, juris margin no. 4). They may not significantly exceed connection and adaptation (BVerwG (German Federal Administrative Court), B. dated 03/05/2016, 3 B 5.16, Juris margin no. 8th; B. dated 13/07/2010, 9 B 103.09, Juris margin no. 4 and judgement dated 19/02/2015, 7 C 11.12, BVerwGE 151, 213 margin no. 31). Even if an adjustment is unavoidable, other plans cannot be completed which require an individual comprehensive planning concept of another planning authority. If necessary adaptations to other systems require a comprehensive original planning concept, they are permissible, however, if the original responsible planning authority has already developed such a concrete and consolidated concept sufficiently and the planning takes this concept into consideration.

The adaptation of the planning approval for the grid connection, which was made in this planning approval decision, dispelled the approval risks cited by 50Hertz and the fears over conflicts between the two planning approvals. These are typical necessary consequential measures at other facilities within the meaning of Section 75(1)(1) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania). The extension of the planning competence to necessary follow-up measures at other plants serves the requirement for problem solving. Consequential measures have to be taken to solve the problems that the project causes for the functioning of the other installations. However, the problem solving mandate, as stated, does not justify doing other things, although they require their own comprehensive planning concept. A change in the planning concept is not connected to the consequential measures defined here. These are merely small-scale adaptations of the planned cable routes. The consequential measures that have been identified therefore do not go much beyond connection and adaptation.

Otherwise, the ancillary provisions are based on Section 74(2)(2) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania). Accordingly, the planning approval authority must impose on the project sponsor measures or the establishment and maintenance of facilities that are

necessary for the general good or to avoid adverse effects on the rights of others - here the holder of the plan approval of 09/07/2015 for the grid connection. In particular, the legal position of the project sponsor mediated by the planning approval decision, strengthened by the exclusion and toleration effect, must also be taken into account in the (complete or partial) suspension or amendment of a plan approval decision (Deutsch, in: Mann/Sennekamp/ Uechtritz, VwVfG, 1st 2014 edition, Section 75 margin no. 92 citing further case law). As a first concrete and confirmed planning, the network connection project established by decision of 09/07/2015 can thus demand consideration of the subsequent competing pipeline planning (BVerwG (German Federal Administrative Court), decision dated 26/03/2007, 7 B 73/06, juris margin no. 9). From the point of view of the planning approval authority, the ancillary provisions in A.3.10.1 et seq. to be taken by the planning approval decision (here 50Hertz) ensure compliance with the pipeline planning for the grid connection project. The period available for the realisation of the pipeline in the intersection area only affects a very small part of the period available for the laying of the cable, even in view of the time limit prescribed by Section 17d EnWG (German Energy Industry Act). The comments on the evaluation of the interests of the TSO liable for the connection are correspondingly applicable.

As far as the specific processes of coordination and information are concerned with regard to cable 261 to be laid in 2018, from the point of view of the planning approval authority, an appropriate balance of interests takes place through the stipulated ancillary provisions. The planning approval authority has examined these ancillary provisions and the changes to the plan approval from 09/07/2017 for the grid connection and determined them after consideration.

Details can be managed through the 50Hertz execution plan. Insofar as there are significant constraints on the pipe-laying (limited to September and October 2018) in the ancillary provisions, the PD will have to adjust at very short notice (within one month) to find not two, but three routed cables and the pipeline above, or must bury the pipeline, so that cable 261 can be laid above it; this is to be done with the express consent of the PD. Further restrictions on planning freedom of the PD are disproportionate as far as the planning approval authority is concerned. An already strong restriction with regard to the laying period in the intersection area would not be offset by any significant advantage for 50Hertz.

The other objections are essentially taken into account by the ancillary provisions in A.3.10.3 et seq. In doing so, the planning approval authority also took up the proposals of 50Hertz and the PD, examined them and, as far as they are appropriate, under A.3.10.1. et seq. In addition, as a consequential measure, the grid connection plan adopted by decision of 09/07/2015 will be adapted, insofar as this is necessary for the realisation of the planned project. Thus, the conflicts between the two projects mentioned by 50Hertz are brought into a fair balance of interests. A regulation - as 50Hertz requires - with regard to further projects such as OST-2-4 cannot be made due to a lack of sufficient planning law consolidation of such further projects. In this respect, it is sufficient for the planning approval authority that the scenarios envisaged in the offshore grid development plan remain technically possible, something that 50Hertz does not call into question.

The rejection of any further objections and the exclusion of proposals for ancillary provisions is due to the following reasons: The requirement that *"construction*

schedules cannot be endangered by Nord Stream 2" cannot be met in this generality because the construction times in the report are currently still unclear and thus not sufficiently consolidated in the objection. If 50Hertz could provide concrete information on construction times, the planning approval authority could also take this into account and weigh it up even more precisely with the issues involved in the realisation of the project. However, this is not the case, so the planning approval authority can only consider and weigh up the legitimate interest in the realisation of the grid connection project identified by the decision of 09/07/2015 as described above.

If any non-transportable ordnance that has been found has to be blown up, this cannot be demanded by the PD, if there are other options for excluding risks from ordnance, such as a small-scale re-routing. Should such a case occur, the necessary procedure according to Section 76 VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania) is to be carried out, in the course of which, the interests of 50Hertz have to be reassessed.

Otherwise, it is reasonable for the PD to allow a representative of 50Hertz access to one of the laying vessels during the construction work in the intersection area. However, for security reasons and for the accountability of the PD's captain or contractor, it is unreasonable or appropriate for the representative to interrupt the work or to give any other instructions that may affect the installation process. Otherwise, the representative is free to make the necessary findings on board for subsequent proof.

Insofar as 50Hertz wishes to make the commencement of the project dependent on a written agreement or approval of the detailed design, it must be pointed out that the planning approval authority has the final decision competence pursuant to Section 75 (1) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania) as to whether or not the project in question may be executed and the conditions under which this has to be done. The interests of 50Hertz must be considered sufficiently and with the weight they deserve. This has been done by ancillary provisions A.3..1 et seq., to the extent necessary to protect the interests of 50Hertz and deemed reasonable for the project developer. The planning approval authority considers that it is not compatible with the public interest and interest of the project developer if it ultimately depends on 50Hertz's decision as to whether the project can be carried out. The fact that the additional costs incurred by the subsequent planning for the preliminary planning are to be borne by the PD of the subsequent project is an expression of the requirement for considerateness and also the expression of the principle in Section 74(2)(2)(3) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania), according to which, in the case of non-compliance of precautionary measures or investments required to avoid adverse effects on the rights of others, the person concerned is entitled to adequate compensation in cash. However, this only applies to costs that arise in the implementation of the planning approval and not beforehand. In the event of discrepancies regarding the reimbursement capacity, the planning approval authority reserves the right to make a final decision pursuant to Section 74(3) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania).

B.4.8.16.2 Transport infrastructure

In its statement of 26/05/2017, the Road Construction Authority Stralsund calls the functionality of infrastructure facilities such as federal and state roads, street greening and drainage facilities is ensured through the rehydration measures of the compensation concept. As no area compensatory measures are provided on Rügen, the suggestions have been completed. Otherwise, the construction of high-rise buildings near state and federal highways is not provided for by the proposed compensation concept.

B.4.8.17 Public/Technical Security, Fire and Civil Protection

According to Section 49(1) EnWG (German Energy Industry Act), energy systems are to be constructed and operated in such a way that technical safety is guaranteed. Subject to other statutory requirements, the generally accepted rules of technology are to be observed. According to Section 2(1) GasHDrLtgV, high-pressure gas pipelines have to meet the requirements of Sections 3 and 4 GasHDrLtgV and be constructed and operated according to the state of the art in such a way that the safety of the environment is not impaired and damaging effects to human beings and the natural environment are avoided. The authority responsible can allow exceptions and deviations from the state of the art insofar as the same degree of safety is guaranteed in a different way (Section 2(3) GasHDrLtgV). Therefore, adherence to the state of the art is particularly important in order to ensure secure construction and operation. The GasHDrLtgV is the benchmark for safety-related assessment in relation to the state of the art in the range of the 12 nautical mile zone, the landfall and on land.

Pursuant to Section 43c EnWG (German Energy Industry Act) in conjunction with Section 75 VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania), the procedure for checking and objecting or non-objection to a notice pursuant to Section 5 GasHDrLtgV must be carried out in the planning approval procedure. The planning approval procedure must take into account the requirements of GasHDrLtgV and demonstrate the safe operation of the pipes and the prevention of hazards to third parties and employees. The standard for this proof is defined in the regulations for the notification procedure according to Section 5 (1) GasHDrLtgV.

The PD submitted the indication in accordance with Section 5 GasHDrLtgV on 01/12/2017. In addition to the documents required for the assessment of safety, the expert's opinion of the expert Berger dated 30/11/2017 was attached, showing that the envisaged design and operation of the high-pressure gas lines complies the requirements of Section 2 and 3 GasHDrLtgV through the observation of specific measures. These requirements have been imposed as ancillary provisions in Section A.3.13 of the project developer.

The standard DNV-OS-F101 can be regarded as a technical set of rules which specifies the state of the art in the field of offshore pipelines according to Section 2(1) GasHDrLtgV. The state of the art for this project is represented exclusively by the DNV regulations DNV-OS-F101, the regulations to DIN EN 14161 and the DVGW regulations and thus also meets the requirements of the Section 49(1) EnWG (German Energy Industry Act). Further requirements were not to be made, a departure from the state of the art was not allowed.

After examining the documents, the planning approval authority does not object to the construction of the high-pressure gas pipeline (Section 5(2) GasHDrLtgV).

By ancillary provision A.3.13.15, the PD and others were obliged to submit the advance certification and the further proof pursuant to Section 6(1)(1) and (2) GasHDrLtgV to the Stralsund Mining Authority immediately at the given time. The final examination according to Section 6(2) GasHDrLtgV is to be carried out within 12 months after issuing the advance certification. This ensures that the construction and operation of the natural gas high-pressure line correspond to the state of the art.

The State Office for Central Tasks and Technology of the Police, Fire and Civil Protection points out in its statement of 17/05/2017 that there are no concerns from the point of view of the country-relevant security in fire and civil protection. It is pointed out that the entire Baltic Sea area has been contaminated with ordnance, and munitions have already been found in the project area. Weapons investigation and ordnance clearance are described in detail in the application documents, Part C.01, Chapter 3.3.2 et seq., p. 85 et seq. Extensive research was carried out as part of the preparation of the ordnance investigation, as shown in the application documents, Part D1.01, Chapter 3.2.9, p. 119. However, with regard to unforeseeable ordnance or suspected ordnance objects, the usual due diligence requirements and reporting channels must be observed. This principle has been taken into account with the relevant ancillary provisions. However, the PD also has its own interest in relocating and operating the Nord Stream 2 pipeline in a corridor free of ordnance. In this sense, he has made a request to the State Office; the answer of 24/11/2017 stated that for the terrestrial acquisition area there is currently no need for exploration and action and there is no particular concern with regard to the execution of construction work; a survey of potentially hazardous points is already taking place in the German sector (see commissioning of SeaTec GmbH by the State Office of 11/10/2017).

The PD has undertaken to prepare operational troubleshooting instructions, contingency plans and alarm and hazard prevention measures before commissioning the line (cf. application documents, Part C.01, Chapter 5.2.5.4, p. 225). Appropriate ancillary provisions ensure that, in accordance with the requirements of the KatSG MV and the BrSchG MV, an alarm and hazard prevention measure as well as a fire protection plan must be drawn up and agreed with the competent district authorities.

Public safety and fire and civil protection issues therefore do not stand in the way of the project.

The occupational safety concerns were complied with in accordance with the legal provisions with the ancillary provisions in A.3.14, these are therefore not contrary to the project.

B.4.8.18 Shipping and waterways

B.4.8.18.1 Shipping

B.4.8.18.1.1 Legal basis

The planning approval authority must comply with all legal provisions that are relevant for the planned project and that apply to the decisions taken. Strict requirements or prohibitions, which result from the applicable law, are also valid in the plan approval per se. They cannot - to the extent that the relevant specialist law does not have a different regulation - be reduced to mere weighting items (BVerwG (German Federal Administrative Court), judgement of 16/03/2006, 4 A 1078/04, Juris margin no. 440). These regulations include Section 10 WaStrG and Section 31 WaStrG. In accordance with Section 10 WaStrG, any equipment and apparatus situated in, above or below a federal waterway or its shores shall be maintained and operated by its proprietors and owners in such a way that neither the maintenance of the federal waterway, nor the operation of the shipping facilities belonging to the federal government or the navigation signs, nor any shipping activities are impaired. The Federal Government is the owner of the federal waterways and manages these through its own authorities (Sections 87, 89 GG), namely by the Federal Waterway and Shipping Administration. According to Section 2(2) SeeAufgG, the Federal Government is responsible in the field of maritime shipping inter alia for the prevention of risks to safety and the ease of traffic and the prevention of maritime shipping risks and harmful environmental impacts within the meaning of the BImSchG on the sea waterways (maritime police). Pursuant to Section 3(1)(1) and (2) SeeAufgG, the authorities of the Federal Waterways and Shipping Administration may, at their reasonable discretion, take the necessary measures to avert danger and harmful environmental impacts, including the elimination of safety hazards and ease of traffic inter alia on the sea waterways. Harmful environmental impacts within the meaning of the BImSchG are imissions that are liable in their nature, extent or duration to bring about dangers, considerable disadvantages or considerable nuisances to the general public or the neighbourhood (Section 3(1) BImSchG). Imissions within the meaning of this Act are air pollutants, noises, vibrations, light, heat, radiation and similar environmental impacts on humans, flora and fauna, the soil, the water, the atmosphere as well as cultural and other material goods (Section 3(2) BImSchG),

Pursuant to Section 31(1)(1) WaStrG, the construction, modification and operation of installations, including laying, alteration and operation of submarine cables in, above or below a federal waterway or on their shores, must be subject to power and maritime police approval by the Waterways and Shipping Office, if the intended measure is expected to impair the state of the Federal Waterway required for shipping or the safety and ease of transport. According to Section 31(4) WaStrG, the permit may be granted subject to certain terms and conditions that prevent or compensate for an impairment of the condition of the federal waterway as required for shipping purposes or a compromise of the safety and ease of passage of the shipping traffic. The power and maritime police approval required under Section 31(1) of the WaStrG may only be refused pursuant to Section 31(5) WaStrG if the intended measure is likely to impair the state of the Federal Waterway or the safety and ease of traffic required for shipping which cannot be prevented or compensated by conditions and requirements. If such terms and conditions cannot be imposed, the permit may nevertheless be granted for the reason of benefiting the common good.

In a letter dated 31/05/2017, the Directorate-General for Waterways and Shipping (GDWS) expressed its reservations about the relocation of the Nord Stream 2

pipelines. According to this, the *"condition of the federal waterway and the safety and ease of transport are affected by the proposed project in several respects".* Laying and operating the piping system would severely compromise the safety and ease of traffic. The work units with the escort and service vehicles would represent a large-scale and a slow-moving navigational obstacle. There is an inherent danger that other vehicles will not avoid the construction site in time or only partially and approach the construction site areas in a dangerous manner or collide with the work units or the pipeline or possibly run aground. The choice of route should be checked. Due to necessary closures, there would be time and economic disadvantages for the shipping companies concerned and for the seaports. From the point of view of the WSV, variants that do not have multiple intersections of shipping lanes and fairways are preferable to avoiding the dangers inherent in the safety and ease of traffic. The chosen route requires a large number of ancillary provisions, which are specified by the GDWS. This also applies with regard to the planned interim storage facility or the need to use the Drigge spoil ground.

Regarding the operational phase, the GDWS states that laying the pipeline is not compatible with the safety and ease of shipping. Already due to the mere presence of several piping systems, large traffic areas at sea have been deemed as no longer for use as anchor areas over several decades. In the case of emergency anchorages, there is a risk of snagging by anchors, especially in areas where the pipelines are not buried. Snagging by anchors could burst the pipeline Even if this does not happen, if the anchored vessel is stuck or the anchorage is broken, the obstacle effect or the drift of a ship unable to manoeuvre could endanger the surrounding shipping. Risks could also arise for fishing vessels when trawl gear get caught in the pipeline. A so-called "net hook" can in extreme cases, result in the capsizing and sinking of a fishing vessel.

B.4.8.18.1.2 Shipping safety and ease

The objections are - as explained below - partially followed and partly not met. An impairment, in particular for the operation and the effect of shipping facilities and signs, does not depend on the laying and operation of the high-pressure gas lines since there are no shipping facilities and signs in the area of the pipeline routes. The use of the shipping lanes and shipping itself are not affected by the project. Proper shipping, operated according to the rules of good seamanship, is also possible after installation and commissioning of the pipelines. The inclusion of the ancillary provisions in Section A.3.1 can ensure the maintenance of safety and ease of transport.

The approval according to Section 31 WaStrG only takes into account the preservation of the waterways as a mode of transport and the safety and ease of shipping traffic (BT pressure. 5/352, p. 26). Other aspects of project approval, such as nature conservation, water conservation or military security, are not covered here, but must be considered elsewhere in the planning approval process. The aim of protecting safety and ease of transport is to ensure that no transport user is endangered (safety) or is hindered or inconvenienced by the circumstances (ease) more than is inevitable. Security is therefore concerned with averting dangers to traffic and in this respect, the provision of as unhindered flow of traffic as possible (VG Würzburg, judgement dated 04/09/2012, W 4 K 12.364, juris margin no. 44).

The safety of shipping is therefore impaired if the traffic flow does not comply with maritime regulations or if the traffic flow causes hazards to life, health or other individual legal assets for transport users or other external parties. The ease of shipping is impaired if the traffic flow is no longer guaranteed (*Friesecke*, WaStrG, 6. 2009 edition, Section 30 margin no. 4).

An impairment of the condition of the federal waterway as required for shipping purposes or the likelihood of compromising the safety and ease of passage of the shipping traffic within the sense of Section 31 (5)(1) WaStrG does not apply if the condition of the federal waterway causes damage to shipping, e.g. an accident or a loss of earnings due to downtime. Rather, it applies to any type of detriment to shipping which is due to the condition of the waterway, e.g. the need for increased attention of the skipper. No impairment occurs if the federal waterway is only slightly affected as a mode of transport, so that it is not necessary to adapt the project to the requirements of the transport route or shipping. The impairment is expected to occur when there is a reasonable likelihood of adverse consequences, which usually results from a conscientious examination under recognised science and technology rules that the overwhelming majority of reasons speak in favour of the consequences. Although Section 31 WaStrG does not presuppose a threat as defined by the river police, the prognosis of whether impairment is to be expected can also be based on the principles by which the imminence of a hazard is determined (*Friesecke*, WaStrG, 6th 2009 edition, Section 31 margin no. 13 et seq.; *Schmälter* in: Danner/Theobald, Energy Act, 93rd EL June 2017, Section 31 WaStrG, margin no. 33 et seq. citing further case law). In case-law, a "overwhelming probability" or greater is required to pose a threat to safety and ease of transport (OVG Saxony-Anhalt, judgement of 27/02/2017, 2 L 147/15, BeckRS 2017, 105614, margin no. 20).

B.4.8.18.1.3 Construction phase

According to the available documents and statements, it can be assumed that impairment of safety and ease cannot be completely ruled out in the construction phase. However, the adverse effects on the safety of shipping can be excluded by the ancillary provisions proposed by the GDWS and essentially to be included in the planning approval (under A.3.1.). As far as impairments to the ease of shipping is concerned, it is unlikely that it will be possible to avoid it completely by ancillary provisions, e.g. with regard to the necessary (short-term) closures. Insofar as ancillary provisions (A.3.1.6, A.3.1.11), e.g. for the short-term clearing of the fairway, can be used to ensure that adverse effects are avoided as far as possible, the conditions are met in any case that the authorisation to Section 31(5)(2) WaStrG can be issued for reasons of the public good.

The project serves the well-being of the general public, in particular to secure the natural gas supply in Germany and Europe (see B.4.1). In deriving the route, the PD has stated that - even taking into account other issues - no sensible alternative route is available, which may have less impact on the safety and ease of shipping (see B.4.3). The risk analysis of the DNV-GL for the laying phase of 30/06/2017 confirms that based on the qualitative and quantitative analyses carried out, there is an increased risk potential during the construction work for individual areas of the route of the Nord Stream 2 pipeline in the examined area. However, according to the

results of DNV-GL's consideration of the selected modelling, the risk profile of construction activities and uninvolved shipping is reduced to such an extent that an impairment of the safety of shipping is no longer to be expected in the application of the risk reduction measures defined for these areas the first sentence of Section 31(5) WaStrG. The GDWS has postponed its concerns with regard to the deployment phase following the DNV-GL risk assessment for the deployment phase of 30/06/2017, which is why the planning approval authority has no reason to obtain an impairment of safety or an unacceptable impairment of the ease of shipping.

Concern about the impairment of the condition of the federal waterway required for navigation or the safety and ease of traffic as well as the possible restriction of the port control system of Świnoujście was taken into account with ancillary provisions A.3.1.8. The installation and operation of the soil tipping area also does not affect shipping traffic, taking into account the relevant ancillary provisions (A.3.1.4). The short-term increase in shipping traffic to and from the soil tipping area during the construction period requires safety and information measures, which are stipulated by the relevant ancillary provisions (A.3.1.7 et seq.). Also, taking into account the position of the soil tipping area, the maximum effect of the project e.g. 4 m in the marine area, the location of the bearing and the natural flattening process due to the water current, the soil remaining in the soil tipping area does not represent a restriction to navigation.

B.4.8.18.1.4 Operating phase

The ease of navigation in terms of traffic flow is not affected by the pipeline lying on the seabed. The mere fact that the pipeline is recorded in nautical charts and insofar as there is an anchor ban in accordance with Section 32(1)(1)(2) SeeSchStrO does not affect the ease of movement, but at best the safety of shipping. This also applies with regard to the fairway, in which, according to Section 32(1)(1) SeeSchStrO, anchoring is prohibited anyway. Regarding the safety of shipping, the GDWS's letter of 31/05/2017 shows risks from the pipeline on the seabed. However, in the letter of 20/10/2017, it seems as if GDWS had a question of proportionality as to whether, as requested, the pipeline could be laid in sections on the seabed or whether burial could be required as an appropriate risk-minimising measure and it would only be possible to reach a final conclusion by considering the consequences of a snagged anchor. In this context, it should first be pointed out that excavation in areas in which the pipeline has been laid on the seabed so far should not be regarded as a risk-reducing measure that might be imposed on the project developer according to Section 74(2) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania). Rather, this would require a rescheduling in the sense of a "conceptual change" (OVG MV, ruling of 22/03/2012, 5 K 6/10, NJOZ 2012, 2033, 2053 et seq.).

Furthermore, according to the documents submitted by the PD, it can be assumed that impairment of the safety of shipping within the meaning of Section 31(5)(1) WaStrG will not be expected after conscientious examination according to the recognised rules of science and technology and the risk of damage occurring is so small that burying and the associated redeployment cannot be demanded even within the scope of the weighting according to Section 43(4) EnWG (German Energy Industry Act). As a baseline, it should be noted that, contrary to the assumption of

the GDWS, the consequences of a snagged anchor were taken into account as far as the DNV-GL is concerned in its risk study of 13/12/2016. The underlying acceptance criterion ("ALS") is designed to exclude precisely the loss of pipeline integrity assumed by the DNV-OS-F101 as the worst case.

In this context, it is legally significant and established by the highest court of justice that residual risks are not subject to consideration because they are beyond the threshold of practical reason (BVerwG (German Federal Administrative Court), judgement of 26/06/2014, 4 C 3/13, Juris margin no. 24 with reference to BVerfG, Acc. 08.08 1978, 2 BvL 8/77, BVerfGE 49, 89, 137 et seq., 143). Nothing else applies to the energy law and the safety concept on which the construction of natural gas high-pressure lines is based (according to the technical rules of the DVGW for the onshore area, to which the rules of DNV OS F 101 correspond offshore). This has been recently demonstrated by the OVG NRW (judgement dated 04/09/2017, 11 D 14/14.AK, juris margin no. 92 et seq., 125 et seq.; 145 et seq.; 186 et seq.) (even for the environment of residential use): After that it no further determination, description and assessment of effects on the object to be protected, which could not be caused in normal operation, but in accidents or incidents was necessary - on the premise that the state-of-the-art gas pipeline is safe. Rather, the determination of the facts must be limited to the reasonably foreseeable. This corresponds to the formula developed for the purpose of weighing the pros and cons, that as materials for consideration include interests which must be adjusted according to the circumstances of the weighting. Behind this is the general recognition that the requirement to fully grasp the effects of certain changes in an ecosystem would come up against not only practical limits due to the complexity of the relationships, but also the limits of scientific knowledge (see BVerwG (German Federal Administrative Court), judgement 25/01/1996, 4 C 5.95, BVerwGE 100, 238, 246 et seq. = Juris margin no. 26).

The safety concept of the Gas Industry Association is therefore based on the gas line itself, in that rules are provided that ensure high technical safety equipment of the line itself and effectively protect the line from the effects of third parties. The rules are primarily designed to prevent the occurrence of serious hazards that can arise from the transported substance when it is released, catches fire or explodes. This concept finds its confirmation in Section 3(1) GasHDrLtgV, which lays down requirements for the quality of high pressure gas lines, in Section 3(2) GasHDrLtgV, after which a protective strip must be established, as well as in Section 3(3) GasHDrLtgV, which calls for the protection of the pipeline against external influences. The safety concept is therefore based primarily on a primary protection of the system. The pipeline itself must be built so securely that it will, with reasonable probability, not cause accidents or dangers in the course of its operation in accordance with existing technical knowledge (OVG NRW, judgement dated 04/09/2017, 11 D 14/14. AK, juris margin no. 125).

If the planned project complies with the technical safety requirements in accordance with Section 49(1)(1) EnWG (German Energy Industry Act), this is not called into question by the fact that accidents cannot be excluded with absolute certainty. Rather, technical security is guaranteed if there is sufficient probability that damage to persons and property will not occur. Thus, no factually impossible risk-free condition is assumed, but rather a minimisation of risk that is sufficient according to factual criteria of acceptability or reasonableness, based on a balancing of the

potential extent of the damage, probability of occurrence and minimisation of risk. The greater the threat of damage, the more the probability of the onset of danger must be lowered according to the general principles of hazard prevention law. This connection between the magnitude of the risk of damage and the requirements for precautionary measures is taken into account in a variety of ways in the technical regulations pursuant to Section 49(2) EnWG (German Energy Industry Act) (see Säcker/König, in: Berliner Kommentar Energy Law, 3. 2014 edition, Section 49 EnWG (German Energy Industry Act), margin no. 16; Görisch, in: Kment, EnWG (German Energy Industry Act), commentary, 2015, Section 49 margin no. 6, each mw N.; Bourwieg, in: Britz/Hellermann/Hermes, EnWG (German Energy Industry Act), comment, 2. 2010 edition, Section 49 margin no. 5). These requirements are met here by complying with the relevant technical rules.

The planning approval authority was able to refrain from establishing further protective measures already laid down by the ancillary provisions (A.3.1.13, A.3.1.23 to A.3.1.27) as well as from determining the effects of a damage scenario. On the basis of the assessment which could not be objected to on legal grounds that the occurrence of a claim would be ruled out if all provisions are observed - if not with absolute certainty - there was no need for a special survey for a perfect weighing up of the pros and cons of the security interests of the population with the relevant interests of the realising the project which might cause a claim which occurs in spite of all the safety precautions.

Nor are the events identified by the GDWS so likely that they should no longer be included in the general life risk. The concept of “risk” differs from the concept of “danger” both in the significantly lower degree of probability of occurrence as well as the differentiated societal evaluation. Whereas dangers arising from constitutional law, namely the fulfilment of state protection obligations (the first sentence of Section 2(2) GG in particular), are unacceptable and therefore require state security measures, on the other hand risks can be socially accepted (so-called general risk to life or general social risk). The burden of risk then proves to be socially acceptable and tolerable when a sector-specific analysis and evaluation reveals that its entry is precluded by the standard of practical reason. Uncertainties beyond this threshold of practical reason are caused by limits of human cognitive faculty; they are to be borne by all citizens as socially acceptable burdens (see BVerfG, resolution of 08/08/1978, 2 BvL 8/77, BVerfGE 49, 89,143). Therefore, the acceptance of a tolerable risk according to this standard in the operation of a natural gas pipeline is compatible with the constitutional protection obligations. Irrespective of the question whether the "residual risk" concept under atomic energy law can be simply transferred to the consideration of risks posed by gas pipelines C(cf. OVG Niedersachsen (Lower Saxony Higher Administrative Court), decision of 29/06/2011, 7 MS 72/11, juris margin no. 58), it cannot be doubted that in the case of installations under the EnWG (German Energy Industry Act), there can also be minimal hazards for high-pressure gas pipelines that ultimately can never be excluded and thus can no longer be specified, which are inherent in any technical equipment that can be tolerated as socially acceptable. However, this also means that within the scope of the EnWG (German Energy Industry Act), a safety standard is to be demanded of such a nature that comprehensively takes into account the requirement of a “dynamic protection of fundamental rights”, which corresponds to the high ranking of the fundamental right to life and physical safety. It follows from the foregoing that the executive has to use all scientifically and technically justifiable findings within the framework of its

prognostic assessments (BVerwG (German Federal Administrative Court), decision of 22/03/2012, 7 C 1.11, Juris margin no. 26; decision 19/01/1989 loc. cit. margin no. 19). In addition, the assessment of damage probabilities should not rely solely on available engineering experience, but protective measures should also be considered on the basis of "merely theoretical" considerations and calculations in order to reliably exclude risks due to uncertainties or gaps in knowledge. Uncertainties in the determination and assessment of risk must be taken into account in accordance with the resulting potential for concern by means of sufficiently conservative assumptions (BVerwG (German Federal Administrative Court), decision of 22/03/2012, 7 C 1.11, Juris margin no. 26; decision 19/12/1985, 7 C 65/82, BVerwGE 72, 300, 315 et seq.; decision 13/07/1989, 7 B 188.88, Buchholz 451.171 AtG no. 31, p. 87, 89). Moreover, there is no need to consider the impact of damage scenarios provided that they are beyond the threshold of practical reason. Apart from that, there is no need to investigate, describe and evaluate any additional impacts that could be caused by accidents or incidents outside normal operation if the gas pipeline is considered to be state-of-the-art. Rather, the determination of facts must be limited to the reasonably foreseeable; therefore, the determination of the effects of a damage scenario can omitted (see also in detail under B.4.8.18.2.2 as well as OVG NRW, decision of 04/09/2017, 11 D 14/14.AK, Juris margin no. 92 et seq., 125 et seq.; 145 et seq.; 186 et seq.).

In the Federal Republic of Germany, there are no normative requirements for determining a social adequacy of damage risks, which can result from damage to offshore natural gas pipelines by the activities and behaviour of third parties. The corresponding analysis and evaluation is thus incumbent on the energy planning law of the planning approval authority itself (see *Breuer*, Plant Safety and Incidents, NVwZ 1990, pp. 211, 213 and *Appel*, Levels of Risk Defence, NuR 1996, pp. 227, 229, 231 et seq.; see BVerwG (German Federal Administrative Court), judgement dated 16/03/2006, 4 A 1075/04, Juris margin no. 241; BVerwG (German Federal Administrative Court), decision 19/12/1985, 7 C 65/82, BVerwGE 72, 300, 315 et seq.; BayVGH, decision 19/02/2014, 8 A 11.40040 et al., Juris margin no. 541; HessVGH, decision 25/03/1997, 14 A 3083/89, Juris margin no. 160 et seq.; OVG Hamburg, ruling 27/01/1995, Bs III 236/94, REG 1995, p. 93; OVG Berlin, ruling 29/03/1994, 1 S 45.93, NVwZ 1995, p. 1023, 1024 et seq.; VG Berlin, ruling 07/05/1993, 14 A 167.93, NVwZ-RR 1994, p. 150, 152; VG Karlsruhe, ruling 19/09/1997, 7 K 873/97, Juris margin no. 9; *Wahl*, Risk Assessment of the Executive and Judicial Control Density, NVwZ 1991, p. 409 et seq.; *Breuer*, plant safety and incidents, NVwZ 1990, p. 211, 222; Di Fabio, Risk decisions in the rule of law, p. 462 et seq..). In doing so, the planning approval authority has to use science and, if necessary, weigh up different points of view by basing its decision seq.as an authority on a sufficient database and not take any irrelevant, arbitrary considerations into account (see in particular the Federal Constitutional Court, decision 19/12/1985, 7 C 65/82, BVerwG (German Federal Administrative Court) 72, 300, 316, VG Schleswig, decision 17/03/1980, 10 A 512/76, NJW 1980, p. 1296 et).

If it is reasonable to exclude a risk, the legal consideration of the GDWS on the legal concept of danger ("the greater the extent of the damage, the lower the likelihood of damage occurring") is irrelevant. Accordingly, there is no need for (further) consideration of the impact of snagged anchor scenarios as long as they are beyond the threshold of practical reason, which is the case here.

The following observations should be considered: In the area of the German territorial waters, the pipeline is buried except for the section in the old Oder bed (gate 4 according to the risk study of the DNV-GL from 13/12/2016) and a very short piece on the border to the EEZ (gate 2). From the point of view of the GDWS, therefore, only a review is needed here. Gate 2 (territorial waters) has a contact probability of 5.73 $x10^{-5}$ (just under 6 contacts in 100,000 years) with an acceptance criterion of 6.6 $x10^{-5}$ (considerably more than 6 contacts in 100,000 years). In Gate 4, there is a 6.03 $x10^{-5}$ (6 contacts in 100,000 years) anchor-pipeline contact probability with a 7.3 $x10^{-5}$ acceptance criterion (a good 7 contacts in 100,000 years). This is already regarded as a negligible risk because it complies with the acceptance criteria of the DNV-OS-F101 standard.

The regulations DNV-OS-F101 is an internationally recognised standard for the design of offshore pipelines. Designed specifically for underwater pipelines over the past several decades, this set of rules has become a mature standard used as the state of the art technology worldwide. It was revised in October 2013, taking into account the current state of technology in the construction and operation of large pipelines. There is no other technical standard that could better cover and assess the issues to be assessed here. Having the DNV as editorial organisation and the specified procedure for issuing a standard also ensures that the standard is based on sufficient expertise. Like the German standard DIN EN 14161 it is harmonised with ISO 13623.

The GasHDrLtgV applicable in the territorial waters does not follow anything else. GasHDrLtgV makes technical demands on the construction and operation of high-pressure gas pipelines. Accordingly, high pressure gas pipelines must first meet the requirements of Section 3, 4 GasHDrLtgV (Section 2(1) GasHDrLtgV). These contain various requirements for the construction (e.g. corrosion protection, sealing, course marking, see Section 3 GasHDrLtgV) and the operation of the lines (e.g. monitoring duties, accident systems, documentation requirements, see Section 4 GasHDrLtgV). Furthermore, high-pressure gas pipelines have to be operated according to the state of the art in such a way that the safety of the environment is not impaired and damaging effects to human beings and the natural environment are avoided (Section 2(1) GasHDrLtgV). The orientation to the state of the art in Section 2(2) GasHDrLtgV is in this respect lex specialis to the alignment with the generally accepted rules of technology as Section 49(1)(2) EnWG (German Energy Industry Act) requires only "subject to other legislation" (see OVG Lüneburg, Resolution of 29/06/2011, 7 MS 73/11, Juris margin no. 44; see the subsidiarity of the requirements of Section 49(1)(2) EnWG (German Energy Industry Act) also *Görisch*, in: Kment, EnWG (German Energy Industry Act), 2015, Section 49 margin no. 7 et seq.). Compliance with the state of the art is presumed, provided the DVGW regulations are adhered to (Section 2(2)(1) GasHDrLtgV). Under certain conditions, however, the authority can either demand compliance with other procedures (Section 2(2)(2) GasHDrLtgV) or even permit deviations from the state of the art (Section 2(3) GasHDrLtgV). Accordingly, the DVGW regulations do not necessarily have to be complied with (see *Rienen/Wasser*, in: Danner/Theobald, Energy Act, 93rd EGL. January 2017, Section 49 margin no. 42et seq., 45). His observation triggers only an easing of the burden of proof serving as a presumption of conformity (see *Lang*, in: Säcker, energy law, 3rd 2014 edition, Section 2 of the High Pressure Gas Pipeline Ordinance margin no. 4). The standard DNV-OS-F101 can be also regarded as a technical set of rules which specifies the state of the art in the field of offshore pipelines according to Section

2(1) GasHDrLtgV. It refers to standards, regulations, and guidelines for considering pipeline interactions with external events or loads. Guides include Recommended Practice DNV-RP-F107 (as of October 2010), which gives examples of possible external events and describes the approach to taking such events into account when applying the DNV-OS-F101 technical standard. Among other things, the DNV-RP-F107 guideline points out that in addition to risks in the vicinity of an offshore facility, other risks such as emergency anchor manoeuvres must also be taken into account in planning (see DNV-RP-F107, Chapter 6). A consideration of relevant accident events was made in the AIS risk assessment (application document, material volume - Part 3 A, I3.07, p. 9 et seq.). In particular, according to DNV-RP-F107, deterministic load calculations were carried out for "accidental loads" (anchor impact on the pipeline, application document, material volume - Part 3 A, I3.07, pp. 19 et seq.). The maximum loads received were then used in the subsequent risk assessment according to DNV-OS-F101 in order to check the necessity of protective measures on the basis of acceptance criteria (probability of a pipeline failure) (cf. application documents, Material Volume - Part 3 A, I3.07, p 34). In the sense of a most deterministic approach, DNV-RP-F107 does not offer any other or more suitable methods for deriving a tolerable risk. In order to demonstrate the potential of further probabilistic analyses, various sensitivity analyses were carried out (such as the memo event tree on VTG Adlergrund). The acceptance criterion according to DNV-OS-F101 is also sufficiently conservative, which is shown by the comparison with other regulations: an offshore wind park is assessed as capable of approval if the collision probability of vehicles with the wind turbines is not higher than one event in 100 years (BT pressure. 17/14305, p. 9).

According to the risk matrix of the BSH "Construction" standard 2015, an occurrence probability H $<10^{-3}$ per year is defined as "extremely rare" (http://www.bsh.de/de/Produkte/Buecher/Standard/index.jsp). Even if further acceptance criteria beyond the DNV-OS-F101 regulations were required, these would be complied with. In the risk literature it is assumed that no further risk-reducing measures have to be considered in the area "Frequency $<10^{-6}$" (Layer of Protection Analysis, Centre for Chemical Process Safety, American Institute of Chemical Engineers, 2001, ISBN 0- 8169-0811-7, p. 135, Table 8.1). On its website, the German Institute for Nuclear Safety quotes from the German risk study on nuclear power plants to give the value of the probability of a meltdown in the Biblis B reactor block at $3.6 * 10^{-6}$, once in 280,000 operating years (https://www.grs.de / concept-the-week-German-risk study nuclear power plants). Taking into account the factors that in the VTG Adlergrund so far no accident has been registered by the WSA Stralsund, an emergency anchor manoeuvre initiated by the watch officer after good seamanship after prior inspection of the nautical chart in which the pipeline is registered, and ships of size class 1, i.e. less than 10,000 GT, are equipped with anchors of 3,000 kg and the anchor sizes in this category, the integrity of the pipeline remains intact, because these anchors have only a 0.6 m gap with a 40 ° folding angle and a fluke length of 1150 mm and cannot therefore snag a pipeline with an external diameter of 1.41 m (see Chapter 6.3 of the risk study of 13/12/2016, Application Document, Material Volume Band - Part 3 A, I3.07, p. 21 et seq.); the DNV-GL calculated in the letter dated 20/11/2017 even for the VTG Adlergrund, that a large-scale integrity violation of the pipeline (demolition), with a probability of only $P = 4.95 \times 10^{-9}$, could occur less than once in 100 million years. If, in addition, as described in the further letter from DNV-GL of 20/11/2017, it is implied that even a demolition of the pipeline does not necessarily lead to a shipwreck, but that other

factors have to occur, then the occurrence of damage can also be excluded for laid pipelines in the context of practical reason.

B.4.8.18.1.5 Methodology of evaluation

The other concerns of the GDWS in the letter of 31/05/2017 against the procedure of the DNV-GL in the risk study of 13/12/2016 are not justified. In particular, the GDWS questioned the resilience of the key messages and conclusions. For example, there is no acceptable justification that anchors with a mass of up to approx. 3,000 kg are pulled over the upper part of a pipeline lying on the seabed or that conventional anchors will not catch on it. The study was not likely to fully assess the effects of the project on the safety and ease of transport, because it dealt only with the likelihood of a snagged anchor, not with the consequences. There is also a lack of presentation and assessment of the cumulative impact of the existing Nord Stream pipeline on shipping. The aforementioned risks exist in particular in the highly frequented traffic separation area Adlergrund which is within the EEZ.

The classification of the fluid (natural gas) made in the risk assessment of the DNV-GL of 13/12/2016 (p. 34 et seq.), the location class of outside an area that is constantly frequented by humans, the resulting "safety class" and the derived upper limit of the acceptable general life risk (medium, > 10^{-4}, i.e. below one in 10,000 years or 10^{-5} per km in areas where damage can be caused by local factors) are acceptable and compliant. Incidentally, the inclusion of the above-mentioned factors would even comply with the acceptance criterion that would result, according to DNV-OS-F 101, from assessing against location class 2 (period of regular residence of humans) (a minus-ten power higher). The possible future development of shipping traffic was also properly taken into account by extrapolation. The maritime transport forecast 2030 of the Federal Ministry of Transport, Building and Urban Development of 15/08/2014 does not provide a suitable basis for this, because it draws its conclusions on the increase in shipping from the port and hinterland logistics. This is not appropriate for determining the increase in maritime traffic above the pipeline, as explained in Chapter 8.3 of the DNV-GL Risk Assessment of 13/12/2016. Likewise, the alternative use of the AIS data analysis for the years 2006 to 2015 did not yield any additional insight because it did not show a significant increase in shipping and possibilities for extrapolation over this period.

With respect to the concerns of the fishery, it should be noted that, in the offshore area, fishing is predominantly with gillnets which are not an obstacle to pipelines. In areas where trawling is practised, the pipelines, when laid on the seabed, present a new underwater obstacle. Extensive testing has shown trawl nets can run over the pipeline. Hooking between trawl boards and the pipelines was rated as highly unlikely. Representatives of the affected fishery associations of all affected Baltic Sea states were invited to the model trials. Since commissioning the first leg of Nord Stream pipelines 6 years ago, not a single net has intervened along the route from Russia to Germany. Monitoring results shows that the pipelines are not restrictive for fishermen and that bottom trawling is practised over the pipelines in the same way as before the construction of the pipelines. The forces that act on the line are taken into account in the planning and do not lead to damage to the pipeline.

B.4.8.18.1.6 Conclusion

In summary, therefore, it can be stated that, taking into account the relevant ancillary provisions, the project does not restrict the safety and ease of shipping in the area of the German coastal sea, does not adversely affect the maintenance of the federal waterway, the operation of the federal shipping facilities or the navigation marks and shipping and the granting of the power and maritime police approval do not preclude any grounds for refusal.

B.4.8.18.2 Marine waterway

The project runs in the area of the 12 nautical mile zone and on the sea floor of the Baltic Sea, which is a federal waterway (waterway according to Section 1(1)(2)(2) WaStrG). The construction and operation of the Nord Stream 2 pipeline requires continuous use of this federal waterway.

Federal waterways are private property, as is expressly clarified in Section 8(1)(1) of the Act on the Property Relations of the Federal Waterways (WaStrVermG), which are the property of the Federal Government (Section 1 WaStrVermG, Section 89 GG) and by federal authorities ((GDWS). The private law nature of the ownership of the federal waterways means that they are subject to civil law (see BGH, judgement 25.061968, V ZR 275/56, BGHZ 28, 34, 37; judgement 24/11/1967, V ZR 172/64, NJW 1968, 598). Consequently, the owner, in this case the Federal Government, is in principle entitled to dispose of the federal waterways, Section 903 BGB (Faßbender, in: Landmann/Rohmer, Environmental Law, 84. EGL. July 2017, Section 4 WHG margin no. 4). At the same time, the public-law dedication places the federal waterways under the special rule of public law, which override the provisions of the Civil Code (Schmalte, in: Danner/Theobald, Energy Act, 94th EGL. July 2017, 134a margin no. 18 citing further case law). The Federal Government does not possess the full legal private autonomy over the federal waterways since these are public things. Water ownership thus differs in content and scope from the property of other elements by a much greater restriction of content, including the right to exclude others from any influence. In particular, the water property is not fundamentally excluded from use for an infrastructure project that also serves the common good, as the present one does. Rather, such a project is to be tolerated by the owner of the water if this does not affect the purpose of the water property. Whether this is the case is to be examined and decided by the planning approval authority as part of the technical planning consideration (see Section 43(4) EnWG (German Energy Industry Act)). Specialist planning law permits the use of property insofar as the ownership is necessary for the execution of the identified plan (Section 45 EnWG (German Energy Industry Act)). This applies not only to private property but also to land dedicated to public purposes (BVerwG (German Federal Administrative Court), judgement of 27/09/1961, IC 37.60, BVerwG, judgement of 29/03/1968, IV C 100.65, BVerwG, judgement dated 04/03/1983, 4 C 9.80). In that regard, the situation is in principle no different from that found in connection with the use of private land.

The utilisation of the water property for the planned natural gas pipeline also represents a special use in accordance with Section 31(1) WaStrG which requires power and maritime police approval according to Section 31 WaStrG. This approval is granted by this planning approval decision. The planning approval authority has

determined after detailed examination that the conditions for granting the permit pursuant to Section 31 WaStrG are met, because the project does not affect the intended use of the waterway property and thus also the shipping (see above) Section B.4.8.18.1).

After thorough consideration, the planning approval authority comes to the conclusion that the utilisation of the water body, even considering the interests of the waterway administration, is fundamentally permissible and necessary for the execution of the plan-approved project and thus to be tolerated by the Federal Republic of Germany.

In addition, the ancillary provisions in A.3.1 and A.3.7.1 serve to ensure the safety or ease of traffic on the Federal Waterway as well as the obligation of the PD to inform the competent authorities.

B.4.8.19 National defence

The Nord Stream 2 pipeline is to run in the area of the territorial waters through the Navy "Pomeranian Bay" artillery shooting range as well as through the training areas ED-D47A and ED-D47B of the Air Force. The training areas are used by both the German Armed Forces naval craft and the German Air Force. Underwater exercises do not take place in this area. These training areas are used by of the Navy and the Air Force for sea and aerial target shooting exercises. In addition, multinational firing exercises with alliance and other training partners are held there. These are target practice exercises relating to sea or air targets, targets located either on the water surface or in the air. Shooting exercises are not undertaken on underwater targets.

In the statement of 30/05/2017 (p. 19 et seq.) and the objection of 30/05/2017 (p. 17 et seq.), the Federal Office for Infrastructure, Environmental Protection and Services of the German Armed Forces - Competence Centre for Construction Management Kiel merely explains that the German Armed Forces relies on the unrestricted use of their practice shooting ranges; a "blatant" restriction is therefore unacceptable there.

B.4.8.19.1 Military security as a major concern

Insofar as the Federal Office for Infrastructure, Environmental Protection and Services of the German Armed Forces points out, the importance of military security and the unrestricted use of the training areas, this is considered by the planning approval authority to be of major importance, which must be taken into account in the technical planning consideration of the planning approval authority (Section 43(3) EnWG (German Energy Industry Act)). With Section 87a(1)(1) GG and other constitutional provisions subsequently added, the constitutional authority has taken a fundamental constitutional decision for effective military defence (BVerwGE 145, 245). Institutions and functionality of the German Armed Forces have constitutional status (see only BVerfG, judgement of 24/04/1985, 2 BvF 2/83 et al., BVerfGE 69, 1, 21, BVerfG, decision of 28/04/2007, 2 BvR 71/07K 3, NVwZ-RR 2008, 330, 331; OVG MV, judgement dated 22/03/2012, 5 K 6/10, Juris margin no. 95; Hömig, in: ditto/Wolff, GG, 11. 2016 edition, Section 87a margin no. 4). In order to fulfil the mission of national defence, measures are necessary which are suitable for ensuring the functioning of the armed forces (BVerfG, judgement of 30/07/1958, 2 BvF 3,

6/58, BVerfGE 8, 104; 13/04/1978, 2 BvF 1/77 and others, BVerfGE 48, 127, decision dated 08/12/1982, 2 BvL 12/7 9, BVerfGE 62, 354, decision dated 14/12/2000, 4 C 13.99, ZfBR 2001, 195, 199; OVG MV, judgement dated 22/03/2012, 5 K 6/10, Juris margin no. 95). This also includes exercises that help to maintain readiness for action at all times (BVerwG (German Federal Administrative Court), judgement of 14/12/2000, 4 C 13.99, ZfBR 2001, 195, 199; OVG MV, judgement dated 22/03/2012, 5 K 6/10, Juris margin no. 95).

Neither the EnWG (German Energy Industry Act) nor Sections 72 et seq. VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania) provide for an explicit reservation in favour of the Federal Republic of Germany, as far as the concern of the national defence is concerned. In particular, the EnWG (German Energy Industry Act) and Sections 72 et seq. VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania) do not contain provisions that weight the security of the national and alliance defence as a "non-controversial" issue that must not be impaired (OVG MV, judgement dated 22/03/2012, 5 K 6/10, Juris margin no. 97).

B.4.8.19.2 No restriction/impairment

The aforementioned training areas of the German Armed Forces and their specific use as training areas for sea and aerial target shooting are not restricted or impaired by the operation of the pipelines according to the current state of knowledge and state of affairs at the time of the plan approval according to the findings of the planning approval authority.

The technical planning consideration dictates that the planning approval authority should include all issues that need to be adjusted according to circumstances. In addition, it must recognise the importance of the interests involved and balance them in a manner that is in proportion to the objective weight of individual concerns (for the whole BVerwG (German Federal Administrative Court), see judgement of 24/11/2011, 9 A 23.10, juris). Generally, in particular, and also with regard to national defence, it follows first of all from the requirement to weigh the pros and cons that all matters pertaining to the project must be appropriately determined by the planning approval authority. This is based on the actual circumstances. Future, unforeseeable or theoretically conceivable developments which, however, have not been consolidated or substantiated at the time the plan was approved, are generally not considered in detail (see BVerwG (German Federal Administrative Court), judgement dated 22/03/2012, 7 C 1/11, BVerwGE 142, 159 margin no. 28; OVG S-H, decision of 19/06/2013, 4 KS 3/08, Juris margin no. 111; OVG R-P, decision of 01/07/1997, 7 C 11843/93, Juris margin no. 168).

Even after laying and commissioning the pipelines, the training areas can be used spatially and permanently by the German Armed Forces. The regular training exercises of the German Armed Forces according to the applicable service regulations is still possible without any restrictions on the way it has been practised over many years. The project developer has not requested any possible restrictions, nor have they been determined in any other way in the planning approval procedure as requiring regulation.

Rather, the evaluation of the existing information on the previous and planned exercises of the German Armed Forces in the affected areas introduced into the procedure and to the planning approval authority shows that the exercises do not pose a risk, because the direction of fire for both sea target shooting and aerial target is exclusively from the South to the North (as is already the case in the Nord Stream procedure, see the OVG MV, judgement dated 22/ 03/2012, 5 K 6/10, NJOZ 2012, 2033, 2052). A subsequent change to the situation has not been presented by the Federal Office and is otherwise not apparent. Since both forms of training previously and in the future will only shoot from south to north, the possible target area for sea target shooting is completely outside the 12 nautical mile zone, i.e. outside the area to be considered here. From this it follows that the vast majority of the training exercises in the form of sea target shooting does not pose a risk to the Nord Stream 2 pipeline in this area. In addition, taking into account the direction of fire from south to north, which is also applicable to aerial target shooting, only a very short, southwestern section of the Nord Stream pipeline can possibly be in the 12 nautical mile zone and in a potential target area for aerial target shooting, if at all (OVG MV, judgement dated 22/ 03/2012, 5 K 6/10, NJOZ 2012, 2033, 2052). In addition, the exercises are currently being designed by defining a so-called safety corridor in the pipeline area (objection dated 30/05/2017, p. 22, 33), so that a threat to the pipelines is virtually ruled out. The Federal Office itself assumes that a "moderate widening of the safety corridor triggered by the existing Nord Stream pipeline at a distance of no more than 2 nautical miles, including protection zones to the existing Nord Stream pipeline, "does not already significantly exacerbate existing restrictions". This is followed by the planning approval authority with regard to all other relevant aspects. Furthermore, the German Armed Forces must, in any case, from the point of view of the Federal Office, take specific precautions relating to a gas pipeline with regard to the Nord Stream pipeline already in place and with regard to its authorisations to the German Armed Forces, because of bundling in the same or immediately adjacent area. The area to be considered by the Nord Stream 2 pipeline for definition of safety requirements for "compliant exercises" is, in the view of the zoning authority, at 0.8 to 1.6% of the area of the practice areas too low to be considered unacceptable or that it would affect the exercises. It is precisely the purpose of the regional planning and the bundling provided by the PD, to avoid re-drawing areas with possibly conflicting uses and to reconcile conflicting interests of use.

B.4.8.19.2.1 Construction phase

For the construction phase, short-term restrictions of the exercises may be possible. However, these are to be taken into consideration, taking into account the uniqueness and the short-term nature of the German Armed Forces. The Federal Office for Infrastructure, Environmental Protection and Services of the German Federal Armed Forces pointed out in the statement of 30/05/2017 (p. 52) and in the objection of 30/05/2017 (p. 48 et seq.) that the construction times are to be agreed in good time with the corresponding military installations. The impairment of the exercises by the laying work is acceptable to the German Armed Forces since the ships being used for the laying work will only be using the maritime space for a short period of time and this is therefore comparable to general ship movements. A corresponding voting requirement was given to the PD as ancillary provision A.3.12.1, A.3.12.2. If the planned laying work infringes on military practice areas, the

PD has to provide the system control centre of the Air Force and the Naval Command with timely coordination and notifications.

B.4.8.19.2.2 Operating phase

As just stated during the construction phase, the project will not have any detrimental effects on the relevant training site in the above-mentioned training areas even in the operational phase.

This also applies if, as a precautionary measure and purely as an alternative, and in contradiction to the information provided by the Federal Office itself regarding future exercises (see above: Shooting over the existing pipeline) this is based on unforeseeable, theoretical shooting behaviour, which may take place without regard to the existing and planned line contrary to the existing training concept (so-called "unrestricted rule-compliant exercise"). These are based on the following considerations:

From the point of view of the planning approval authority, it can be assumed that the risk of damage occurring can reasonably be ruled out for the German Armed Force's "unrestricted rule-compliant practice". The concept of “risk” differs from the concept of “danger” both in the significantly lower degree of probability of occurrence as well as the differentiated societal evaluation. Whereas dangers arising from constitutional law, namely the fulfilment of state protection obligations (the first sentence of Section 2(2) GG in particular), are unacceptable and therefore require state security measures, on the other hand risks can be socially accepted (so-called general risk to life or general social risk). The burden of risk then proves to be socially acceptable and tolerable when a sector-specific analysis and evaluation reveals that its entry is precluded by the standard of practical reason. Uncertainties beyond this threshold of practical reason are caused by limits of human cognitive faculty; they are to be borne by all citizens as socially acceptable burdens (see BVerfG, resolution of 08/08/1978, 2 BvL 8/77, BVerfGE 49, 89,143). Therefore, the acceptance of a tolerable risk according to this standard in the operation of a natural gas pipeline is compatible with the constitutional protection obligations.

Irrespective of the question whether the "residual risk" concept under atomic energy law can be simply transferred to the consideration of risks posed by gas pipelines (cf. OVG Lüneberg (Lüneberg Higher Administrative Court), decision of 29/06/2011, 7 MS 72/11, juris margin no. 58), it cannot be doubted that in the case of installations under the EnWG (German Energy Industry Act), minimal hazards can exist for high-pressure gas pipelines that ultimately can never be excluded and thus can no longer be specified, but which are inherent in any technical equipment that can be tolerated as socially acceptable. However, this also means that within the scope of the EnWG (German Energy Industry Act), a safety standard is to be demanded of such a nature that comprehensively takes into account the requirement of a “dynamic protection of fundamental rights”, which corresponds to the high ranking of the fundamental right to life and physical safety. It follows from the foregoing that the executive has to use all scientifically and technically justifiable findings within the framework of its prognostic assessments (BVerwG (German Federal Administrative Court), decision of 22/03/2012, 7 C 1.11, Juris margin no. 26; decision 19/01/1989 loc. cit. margin no. 19). In addition, the assessment of damage probabilities should not rely solely on

available engineering experience, but protective measures should also be considered on the basis of "merely theoretical" considerations and calculations in order to reliably exclude risks due to uncertainties or gaps in knowledge. Uncertainties in the determination and assessment of risk must be taken into account in accordance with the resulting potential for concern by means of sufficiently conservative assumptions (BVerwG (German Federal Administrative Court), decision of 22/03/2012, 7 C 1.11, Juris margin no. 26; decision 19/12/1985, 7 C 65/82, BVerwGE 72, 300, 315 et seq.; decision 13/07/1989, 7 B 188.88, Buchholz 451.171 AtG no. 31, p. 87, 89). Moreover, there is no need to consider the impact of damage scenarios provided that they are beyond the threshold of practical reason. Apart from that, there is no need to investigate, describe and evaluate any additional impacts that could be caused by accidents or incidents outside normal operation if the gas pipeline is considered to be state-of-the-art. Rather, the determination of facts must be limited to the reasonably foreseeable; therefore, the determination of the effects of a damage scenario can omitted (see also in detail under B.4.8.18.1.4 as well as OVG NRW, decision of 04/09/2017, 11 D 14/14.AK, Juris margin no. 92 et seq., 125 et seq.; 145 et seq.; 186 et seq.).

In the Federal Republic of Germany, there are no normative requirements for determining a social adequacy of damage risks caused by damage to offshore gas pipelines by activities and behaviour of third parties, in particular the use of the military training ammunition at issue here. The corresponding analysis and evaluation is thus incumbent on the energy planning law of the planning approval authority itself (see *Breuer*, Plant Safety and Incidents, NVwZ 1990, pp. 211, 213 and *Appel*, Levels of Risk Defence, NuR 1996, pp. 227, 229, 231 et seq.; see BVerwG (German Federal Administrative Court), judgement dated 16/03/2006, 4 A 1075/04, Juris margin no. 241; BVerwG (German Federal Administrative Court), decision 19/12/1985, 7 C 65/82, BVerwGE 72, 300, 315 et seq.; BayVGH, decision 19/02/2014, 8 A 11.40040 et al., Juris margin no. 541; HessVGH, decision 25/03/1997, 14 A 3083/89, Juris margin no. 160 et seq.; OVG Hamburg, ruling 27/01/1995, Bs III 236/94, REG 1995, p. 93; OVG Berlin, ruling 29/03/1994, 1 S 45.93, NVwZ 1995, p. 1023, 1024 et seq.; VG Berlin, ruling 07/05/1993, 14 A 167.93, NVwZ-RR 1994, p. 150, 152; VG Karlsruhe, ruling 19/09/1997, 7 K 873/97, Juris margin no. 9; *Wahl*, Risk Assessment of the Executive and Judicial Control Density, NVwZ 1991, p. 409 et seq.; *Breuer*, plant safety and incidents, NVwZ 1990, p. 211, 222; Di Fabio, Risk decisions in the rule of law, p. 462 et seq..). In doing so, the planning approval authority has to use science and, if necessary, weigh up different points of view by basing its decision seq.as an authority on a sufficient database and not take any irrelevant, arbitrary considerations into account (see in particular the Federal Constitutional Court, decision 19/12/1985, 7 C 65/82, BVerwG (German Federal Administrative Court) 72, 300, 316, VG Schleswig, decision 17/03/1980, 10 A 512/76, NJW 1980, p. 1296 et).

The decision taken by the Planning Authority complies with these principles. On the whole, there is a differentiated risk assessment based on the principle of proportionality.

When assessing the risk of damage to pipelines by the legally compliant training exercises of the German Armed Forces, the planning approval authority, after a comprehensive examination, relies on the expert opinion of DNV-GL from 23/12/2016 (W-PE-HSE-OFG-REP-826- MLTRSKGE-03, GLO-16-13179, Rev. 3),

updated under 04/10/2017 (W-PE-HSE-OFG-REP-826-MLTRSKGE-04, GLO-16-13179, Rev. 4). The data underlying this expertise were previously provided by mutual agreement of the German Armed Forces. Based on the calculations and analyses of the realistic scenarios considered taking into account the relevant boundary conditions and sequences of events, it can be assumed that the projectiles currently used by the Navy and the Air Force do not represent a reasonable risk for the pipelines and therefore - according to DNV-GL - there are no restrictions on exercises conducted by the German Armed Forces during the operational phase of the pipeline when using the munitions discussed. The expert opinion is thus transparent and clear. The opinion is based on the proper use of the training ammunition under the guidelines of the German Armed Forces. The risk assessment conservatively examines the risk of possible damage to the Nord Stream 2 pipeline through training projectiles of the German Armed Forces, taking into account mechanical damage and its probability of occurrence.

The bullets used by the German Armed Forces are exclusively training ammunition without explosives/hard core. Information on munitions from other states during international target practice could not be included in the actual data or in the assessment due to the lack of sufficient specific information. The planning approval authority shall determine the appropriate safety standard by reference to the generally applicable safety standards for the project. In any case, the safety analysis requires an assessment of conceivable events and related event probabilities as well as the consideration of questions of future development. Details of practice munitions of larger calibre are to be included in the risk assessment only if and as far as it is likely in the sense of a foreseeable development that these training munitions will be used in the future in the area in question. In this context, the period for which the Nord Stream 2 pipeline is to receive an operating license is to be adjusted according to the application, i.e. for the period of 50 years (see BVerwG (German Federal Administrative Court), judgement of 22/03/2012, 7 C 1.11, Juris margin no. 28). The consideration of training ammunition of a calibre of 155 mm and larger could be omitted according to the current edition, since their use is not considered due to low water depths in the artillery shooting area.

None of the scenarios examined in the expert opinion of DNV-GL came to the conclusion that there is a reasonable risk of damage to the pipelines. Rather, such a risk could be excluded.

According to current knowledge, damage to the high pressure gas pipelines in question by the training activity of the German Armed Forces in military practice areas is excluded. Any remaining theoretical risk lies on the basis of today's empirical principles and simulated processes beyond the threshold of practical reason and is therefore to be accepted as socially adequate according to the legal model (see Section 74(2)(2), and Section 75(2)(2) VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania)). In the study presented by DNV-GL on the probability of the occurrence of exercise-related damage to the pipelines (Risk assessment of 23/12/2016, p. 14 and dated 04/10/2017, p. 15), a loss of integrity of the pipeline after being hit by 76 mm calibre munitions used by the German Armed Forces in the territorial waters is considered to be excluded. By contrast, the kinetic energy of the 127 mm munitions (not yet used by the German Armed Forces) is large enough to jeopardise the integrity of the pipeline (Risk assessment dated 23/12/2016, p. 14 and dated 04/10/2017, p. 15)).

The probability of occurrence for these two integrity-critical scenarios is based on the original assumptions 3.18E-4 (updated: 2,29E-4). This means that over a period of 10,000 years approximately 3 to 4 (updated: 2 to 3) incidents of this kind could occur. The comparison of this calculated annual probability of occurrence of 3.18E-4 (2.29E-4) for an integrity-endangering event yields an 8.35E-6 (6.02E-6) probability of occurrence relative to the 38.107 km length of the pipeline through the practice area per year and pipeline kilometre. According to the internationally recognised DNV Pipeline Code DNV-OS-F101, Section 2, Table 2-5, for "level medium", "other risks", the value for "Accidental Limit State" is given as a probability of occurrence of an incident which would endanger the integrity of the pipeline of 1E-5 per annum and pipeline kilometre, which should not be exceeded. With a probability of occurrence of 8.34E-6 (6.02E-6) per year per pipeline kilometre, this value is clearly maintained. This low probability of occurrence thus lies beyond the threshold of practical reason. The technical standard used in practice provides a larger value for the relevant maximum probability of occurrence (i.e. a larger tolerable probability of occurrence). Thus, if the probability of occurrence is set at 1E-5 and less per annum per kilometre of pipeline in terms of risk, then more rarely occurring incidents are beyond what is considered reasonable. Since the likelihood of occurrence according to the result of the risk assessment considered appropriate by the planning approval authority lies beyond the threshold of practical reason, there is no need to look beyond this threshold of damage scenarios.

Insofar as the Federal Office considers a special situation in crisis and defence cases and risks from enemy projectiles (Opinion p. 48 et seq.), from the point of view of the planning approval authority this is not a scenario which can be taken into account in the context of the approval of technical installations because, in view of modern weapons technology, this risk cannot be excluded at any location in the territory of the Federal Republic of Germany and inclusion of this risk would generally lead to the inadmissibility of plants with dangerous potential in Germany. It is also not a risk that is attributable to the operating risk arising from the investment (see BVerwG (German Federal Administrative Court), judgement of 10/04/2008, 7 C 39/07, NVwZ 2008, p 1012).

Insofar as the Federal Office for Infrastructure, Environmental Protection and Services of the German Armed Forces assesses the project developer's methodology for determining the risk as "methodically incorrect" in the statement of 30/05/2017 (p. 30), this has not been adopted. In Germany, there is no standardised concept of a risk assessment for dangerous plants and similar facilities (HessVGH, decision dated 15/01/2009, 11 B 254/08.T, juris margin no. 348), but concrete risk analyses and assessments have been produced in specific cases such as when assessing the safety of railway systems and their facilities.

The decision made here meets these principles. It is based on comprehensible reasons (see *Di Fabio*, Risk decisions in the rule of law, p. 462 et seq.). Overall, there is a differentiated risk assessment based on the principle of proportionality.

Pipeline resilience has been assessed by DNV-GL based on DNV-RP-F107 Recommended Practice for Risk Assessment of Pipeline Protection, including DNV-OS-F101. To calculate the trajectory of the projectiles, the physical principles of parabolic flight were used, taking into account atmospheric friction. In the further execution of the calculation, the fall angle, impact velocity on the water and the

kinetic energy on impact were calculated. The following effects were not considered: Air and water friction due to the spin of the projectiles as well as a possible destruction of the projectiles when hitting the water surface. Ignoring these effects in the calculation of the kinetic energy of a projectile led to a conservative calculation. Thus, essential factors that further reduce the probability of the occurrence of a hit or a loss of integrity were ignored. This concerns, for example, the fact that the majority of all currently available projectiles tumble when submerged in the water and thus lose kinetic energy. Also, the sand coverage of the pipeline has been reported as water coverage in the calculation, although sand has a higher viscosity than water. Likewise, the risk analysis ignores the fact that many practice bullets can destroy themselves when they hit the water or after a given flight time has expired. The risk assessment assumes a uniform distribution of the training projectiles when hitting the water and it is assumed that a projectile always hits the pipeline at right angles and thus with the highest possible energy input. However, glancing blows or rebounds with a lower energy input are obviously more likely.

The standard DNV-RP-F107 mentioned above was used to estimate from and calculate the damage effects the impact of a projectile on the pipeline. This policy has been developed to detect the effects of accidentally dropped objects on a pipeline on an offshore platform. The Federal Office for Infrastructure, Environmental Protection and Services of the German Armed Forces in the opinion of 30/05/2017 (pp. 42, 47) and in the hearing (see Protocol p. 270) expresses the view that, to reach a proper assessment, it is necessary to investigate the possible effects or consequential damage of an impact through experimental investigations (by "empirical firing tests"). So far, there is no valid consideration of the question of the safety of the pipeline or its vulnerability to impacts in the context of an unrestricted rule-compliant practice firing exercise by the Navy. This has not been adopted. According to the statements of the Ernst Mach Institute in the hearing (Protocol p. 270), a methodology proposed by the German Armed Forces is available, but a consideration of ballistic events of this kind is "a very complex matter in terms of the experimental setup" (see also slide 17 EÖT protocol: "Hydroballistic behaviour of spin-stabilised and wing stabilised projectiles is the subject of scientific investigations, extremely complex and difficult to instrument"), so that the first results would not be expected before the end of 2018. An experimental phase of at least 1½ years considerably exceeds the scope customary for the preparation of expert reports for a permission process and therefore a proportionately reasonable framework (see OVG Niedersachsen, ruling of 01/12/2004, 7 LB 44/02, juris margin no. 184 ae). Section 49 (1) sentence 2 of the EnWG (German Energy Industry Act) also requires that technical safety requirements be aligned with the generally accepted rules of technology.

It is neither the task of the authorities nor of the administrative courts to decide scientific disputes, nor to enable or promote such a decision by granting research contracts (see BVerwG (German Federal Administrative Court), judgement dated 07/04/2016, 4 C 1/15, BVerwGE 154, 377). Even the justification of a mere check of verifiability can be dispensed with, in particular, when relevant scientific knowledge and standards have evolved, to the extent that a particular method or risk assessment has established a certain scale and contrary opinions cannot be considered more justifiable (BVerwG (German Federal Administrative Court), judgement dated 07/04/2016, 4 C 1/15, BVerwGE 154, 377; see also BVerwG, judgement dated 21/11/2013, 7 C 40/11, Buchholz 406.25 Section 6

BImSchG No. 6 = NVwZ 2014, p. 524). The assessment that the precautionary measures against damage, which are required according to the state of the art in science and technology, is based on knowledge, assumptions and estimates based on sufficient data and based on technical and scientific expertise are reasonably substantiated. The applicable DNV-OS-F101 regulations are an internationally recognised standard for the design of offshore pipelines. This set of rules has been developed specifically for underwater pipelines over the past several decades. It was revised in October 2013, taking into account the current state of technology in the construction and operation of large pipelines. The application of the DNV-RP-F107 regulations, which depicts kinetic forces and their damaging effects from accidentally falling loads on a pipeline on an offshore platform, is also appropriate and rather conservative. There is no other technical standard that could better cover and assess the issues to be assessed here. Having the DNV as editorial organisation and the specified procedure for issuing a standard also ensures that the standard is based on sufficient expertise.

The report of DNV-GL itself is neither contradictory nor convincing for other reasons. The Federal Office was also unable to show that another expert has new or superior research or more experience. Likewise, the result of the DNV-GL could not be seriously affected by the Ernst-Mach-Institut lecture at the discussion date, which the German Armed Forces adopted as its own (see BVerwG (German Federal Administrative Court), B. dated 26/06/1992, 4 B 1 -11.92, NVwZ 1993, p. 572, 578). The risk analysis, which was created by DNV-GL and whose expertise and objectivity are not questioned, is comprehensible in terms of its methodological foundations, approaches and individual findings, derivations and conclusions. In them, the safety of the pipelines in the ongoing German Armed Forces exercises using training munitions are comprehensively and rigorously justified. Attacks on the findings and assessments of DNV-GL in the sense of mere counter-arguments do not already call into question their exploitability; rather, this is only the case, if it can be deduced from the substantiated arguments of a party to the proceedings, that the assumptions and assessments and the underlying statements of DNV-GL appear to be refutable with regard to the state of science and technology (see BVerwG (German Federal Administrative Court), p. judgement dated 22/10/1987, 7 C 4.85, BVerwGE 78, 177, 182).

Another report commissioned by the PD for evaluating the process of the DNV-GL risk assessment (Veenker, expert report - evaluation - process evaluation of the DNV-GL risk investigation on potential pipeline damage in training areas of the German Armed Forces dated 15/12/2017, project no.: 39617/04/1) comes to the conclusion that the report prepared by DNV-GL is comprehensible and plausible. The report also indicates that a deterministic approach in assessing the safety of offshore pipelines with regard to possible impacts from munitions parts alone is not expedient and therefore a probabilistic assessment is required (Veenker, loc. cit., p. 10). In this assessment, not the impact, but the likelihood of occurrence of the special loading is determined and compared with a limit value. The principles of these evaluation steps are described in detail in DIN EN 14161 ("Petroleum and natural gas industry - pipeline transport system, German version EN 14161: 2001 + A1: 2015", version 07/2015). According to the further remarks of the report (Veenker, loc. Cit., p. 26), the evaluation by the DNV-GL provides a sufficiently reliable statement on compliance with the risk acceptance value for the critical likelihood of

impacts with training ammunition and thus for the integrity or external safety of the pipeline impacted in the training area of the German Armed Forces.

The number of shots provided by the Federal Office were - as far as they can be taken into account - correctly set in the risk analysis. However, the updated information provided by the Federal Office on numbers of shots is sometimes contradictory. In addition to the information provided in the scoping, the Federal Office in its statement (p. 26) asserted that the number of shots had increased by one third compared to 2013. By letter dated 05/07/2017, the Federal Office has presented a "forecast on number of shots with large-calibre munitions in the Pomeranian Bay firing range"; the number of shots contained therein includes all artillery firing ranges, so that in view of the express reference in the letter of 05/07/2017 and the corresponding lecture by the Federal Office in the hearing, in the future, only 50% of all artillery shooting activity in the Pomeranian Bay artillery firing range would take place or be "relocated" or 50% of the number of shots included in the relevant consideration,. Thus, in terms of 76 mm calibre, this is an increase in the number of shots of approximately 128% (2,501 versus 1,093 in 2013), but a reduction in the number of shots of the 127 mm calibre by 35% (800 vs. 1,296 in 2013). This information was also included in the calculations by DNV-GL (updated risk assessment dated 04/10/2017). Since new information on the distribution of the number of shots between aerial target shooting and sea target shooting is not provided by the Federal Office, the planning approval authority considers it appropriate to assume a proportionate split based on the number of shots communicated in 2013. Other information was not available to the planning approval authority and therefore could not be taken into account. As long as the Federal Office prohibits the transfer of specific information on numbers of shots and the relevant evidence to the PD and the experts commissioned by it, it is not possible for the PD to have the studies performed which are required from the point of view of the Federal Office. Otherwise, the acceptance criteria are adhered to, assuming the numbers of shots provided by the Federal Office are updated numbers.

B.4.8.19.2 Conclusion

The planning approval authority thus comes to the conclusion that the project does not affect the security of the military security, namely the execution of the exercises in the military training areas mentioned above, after a comprehensive assessment and evaluation of the facts. This is already apparent from the fact that the actual exercises carried out cannot reach the project and thus are not affected by the project (shooting direction from south to north, shooting on 'the existing pipeline'). Even if, as a precautionary measure and as an alternative, the usual exercises are not carried out but instead a theoretical "unrestricted practice-compliant exercise", nothing else applies. For, as the expert opinion of DNV-GL available to the planning approval authority shows, in this case too there would only be a risk of damage to the pipeline, which must be accepted as a general, socially adequate risk to life.

Incidentally, no so-called Above Water Tie-ins (AWTI - pipe sections without concrete coating) are laid in the Pomeranian Bay Firing Range within the 12 nautical mile zone to be considered here (cf. application documents, Part C.01, Chapter 3.2, p. 71 et seq.; Chapter 2.1.8, Fig. 2-12, p. 26), so that in this respect no other risk assessment was necessary.

Furthermore, it can certainly not be estimated in this situation whether legal liability could or would lead to a threat to the budget. National defence interests therefore do not preclude the project, even taking into account the stipulated ancillary provisions (see A.3.12.1, A.3.12.2).

B.4.8.20 Building law

Building law concerns are not opposed to the project.

The area of responsibility for the urban development planning of the district of Western Pomerania-Greifswald raises objections in the comments of 14/06/2017 and 29/08/2017. A concrete site plan for the connection is not attached to the documents and therefore must be submitted. The exact location of the natural gas receiving station Lubmin 2 cannot be found in the application documents. This cannot be followed. The location of the Pig receiving station is described several times in the text of the documents (cf. application documents, Part C.01, Chapter 2.2.4.2, p. 39, Part D1.01, Chapter 1.2.1.2, pp. 30 et seq.) and in maps (cf. application documents, Part C.02, C.03, C.06, C.07 and C.08). The location of the natural gas receiving station is also described several times in textual terms (cf. application documents, Part C.01, Chapter 2.2.4.2, p. 39, Part D1.01, Chapter 1.2.2, p. 39 et seq.) and shown in maps (cf. application documents, Part C.06, Part D1.04).

In the opinion of the specialist urban development planning of the district of Western Pomerania-Greifswald, a site plan is to be submitted in accordance with the Building Regulations Ordinance (BauVorlVO MV), which proves that the stipulations of the development plan No. 1 "Industrial and commercial area Lubminer Heide" are met by the natural gas receiving station Lubmin 2. This cannot be followed. A comparison of the planned facilities of the Pig receiving station of Nord Stream 2 with the stipulations of the development plan No. 1 "Industrial and commercial area Lubminer heath" of the coastal community of Lubmin, in the version of the 4th amendment, was carried out in the Environmental Impact Study of the application documents (cf. application documents, Part D1.01, Chapter 7.2, p. 759).

As a condition of admissibility, a declaration of commitment in accordance with Section 35 (5) BauGB is to be submitted. This does not comply, because Section 29 et seq. BauGB and also Section 35 BauGB are not applicable to the planned project according to Section 38 BauGB. In addition, the project lies on the land side within the planned interior according to Section 30 BauGB.

It should also be a statement by the verifier pursuant to Section 14 (1) of the Building Regulation Ordinance Mecklenburg-Western Pomerania (BauVorlVO MV) pursuant to Section 66(1)(2)(2) of the State Building Regulations Mecklenburg-Western Pomerania (LBauO MV) on the preparation of the structural evidence at the latest by the start of construction (Section 72(7)(2) and (9)(1), Section 62(5)(2) of the State Building Regulations Mecklenburg-Western Pomerania). This is taken into account by ancillary provision A.3.11.8.

An examination of the stability certificate for the new construction of the workshop building as a steel construction before the start of construction was necessary. This is followed by the ancillary provision A.3.11.3 to A.3.11.6.

For a permit, the registration of a construction is also required. This requirement is met by ancillary provisions A.3.11.1 and A.3.11.2.

The building inspectorate should be informed of the responsible site manager/expert, the start of construction, and the start of use. The ancillary provision A.3.11.10 takes this requirement into account.

The applicant or another person authorised to certify should confirm with the advertisement for the intended use, the construction work in accordance with the fire protection certificate. This requirement is met by the ancillary provision A.3.11.8.

A.3.11.10 Together with the notification regarding the intended beginning of use, the construction manager / qualified person must present a declaration stating that the building activities were carried out in accordance with public building law, the current technical building rules and the approved construction project. This requirement is followed by ancillary provision A.3.11.9.

The opinion of the Nuclear Waste Management Plant (EWN) criticises the fact that the submitted construction documents should have been signed. In addition, the fencing was not included in the application documents. The proof according to Section 14(1) BauVorlVO MV for the fire protection in the operations building and in the workshop building is missing. With regard to the regular crossing of the level crossing for road access, it should be examined whether this permanent form complies with the requirements of the General Railway Act (AEG). When crossing external lines, the noise barrier and the railway track by microtunnel, the relevant technical regulations should be observed. Before the start of construction, the consent of EWN to the construction measures had to be obtained.

This only complies in part. The original folders with the construction templates have been submitted to the Stralsund Mining Authority in triplicate with signatures. The fencing of the Pig receiving station is described in the application documents in Part I1.04, Chapter 2.6, on p. 12. It is a legal requirement that the fire protection certificate according to Section 11 BauVorlVO MV has to be submitted by the project developer in time. This obligation of proof is addressed by ancillary provision A.3.11.8. Ancillary provision A.3.10.18 ensures compliance with the requirements of the AEG. The proper crossing of external lines and the railway track is ensured by the ancillary provisions A.3.10.17 and A.3.10.18, as well as the participation of EWN in the construction execution planning. A crossing of the noise barrier by means of a microtunnel at a depth of at least 6 m is to be regarded as harmless.

B.4.8.21 Cross-border environmental impacts/concerns

Cross-border environmental effects due to construction-related, operational or plant-related impact factors in the area of the 12 nautical mile zones in the territories or Economic Exclusive Zones of other states do not occur (see sections B.4.4, B.4.5, B.4.6 and B.4.7 of this decision). Cross-border interests of shipping or fishing are also not opposed to the project (see sections B.4.8.11, B.4.8.18 of the decision). Furthermore, all objections that do not concern the sub-project in the German 12 nautical mile zone and its possible adverse effects are rejected in their entirety.

A cross-border consultation with public authorities and the public was carried out (Section 8, 9a UVPG). In this respect, reference is made to the comments in Section B.2.2 and B.3.4 of the decision.

B.4.8.21.1 Russian Federation

In the Russian Federation, the Espoo Report and Atlas (cf. application documents, Part J in the national language) has been published on the internet, interpreted and sent to the interested public, government agencies and non-governmental organisations on digital media upon request. A hearing was held in Kingfisher on 01/06/2017. The responsible ministry received comments from the public, non-governmental organisations, municipalities and specialised agencies, as well as ministries. A letter from Greenpeace Russia was directly received. However, the comments contained therein only concern aspects that are not relevant to the approval of the section in German sea areas. Russia itself has indicated in its reply to the consultation of 30/11/2017 that during the public hearings no additional potential cross-border environmental impacts have been identified/detected beyond those mentioned in the documentation.
There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.2 Republic of Finland

In the Republic of Finland, too, the public and competent authorities had the opportunity to comment on the Espoo Report and Atlas (cf. application documents, Part J in the national language). Information events were held for the public in Kotka on 03/05/2017, in Helsinki on 09/05/2017 and in Hanko on 10/05/2015. The Environmental Impact Assessment Agency in Uusimaa has received a total of 15 opinions from public authorities and other bodies. However, the comments almost exclusively concern aspects that are not relevant to the approval of the section in German sea areas. However, in its letter of 30/06/2017, Finland attaches great importance to the protection of the Baltic Sea, being a major concern of the government. In particular, the importance of the Natura 2000 areas and the mitigation measures presented are to be fully taken into account in the permitting process. This was complied with by this decision.
There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.3 The Kingdom of Sweden

The Kingdom of Sweden has carried out a consultation with the public and the administration which includes the possibility of commenting on the Espoo Report and Atlas (cf. application documents, Part J in the national language). An information event was held on 02/05/2017 in Stockholm. The Swedish Environmental Protection Agency (Naturvardsverket) has received 24 opinions from public authorities, municipalities, scientific institutes, non-governmental organisations and private individuals. A summary of these opinions in English was sent with the response to the consultation of 30/06/2017. A large number of comments criticise the general

effects of the pipeline, which also apply to the section on the German continental shelf, e.g. the immediate vicinity of the planned pipeline to important bird habitats and IBA areas, which should be taken into account in the relocation and necessary work. However, the main disturbances would occur during landings in Germany and Russia in connection with work on the seabed (trenches). The planned works in Swedish, Danish and German waters would have a negative impact on resting and wintering birds and their habitats, which could affect the entire Baltic Sea. As has already been stated, there are to be no cross-border effects from the project section in the German 12 nautical mile zone (see Section B.4.7). The comments thus almost exclusively concern aspects that are not relevant to the approval of the section in German sea areas. The requirement to establish appropriate monitoring is complied with in this decision.
There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.4 The Kingdom of Denmark

In the Kingdom of Denmark, the Espoo Report and Atlas (cf. application documents, Part J in the national language) were subject to public consultation. The seven opinions submitted as part of the consultation were forwarded on 30/06/2017. Neither the public nor the competent authorities expressed any significant concerns about the pipe-laying in German sea areas. On the island of Bornholm, a public hearing was held in Ronne on 29/08/2117.
There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.5 Republic of Estonia

The Republic of Estonia has carried out a consultation on the Espoo Report and Atlas (cf. application documents, Part J in the national language) with the public, the authorities and nature conservation organisations, during which a hearing was organised on 24/05/2017 at the Estonian Ministry of the Environment. The reply sent to Germany was based on the four comments received as part of the consultation of 30/06/2017. In it, the Estonian Ministry of the Environment raises mainly issues concerning the Gulf of Finland, climate and demand-related comments and general concerns, as expressed by Poland. The objections are rejected. By way of justification, reference is made to the comments on Poland's objections below and the explanatory memorandum of the decision. After receiving the comments received in Germany, Estonia was not required to hold consultations. Reference is also made to the answer in the above letter of 31/08/2117 to Denmark.
There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.6 Republic of Latvia

In the Republic of Latvia, the Espoo Report and Atlas (cf. application documents, Part J in the national language) has been distributed to relevant ministries, environmental bodies and the public. A hearing took place on 06/06/2017 in Riga. In its response to the consultation, Latvia delivered a summary opinion on 30/06/2017.

It raised objections and demands, but these primarily relate to the sections of the pipeline adjacent to or near the Latvian EEZ in the Swedish EEZ or the Gulf of Finland. An additional public procedure was organised for the Danish consultation.
There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.7 Republic of Lithuania

The Republic of Lithuania has also received a number of opinions as part of the consultation with authorities, non-governmental organisations and the public regarding the Espoo Report and Atlas (cf. application documents, Part J in the national language) and issued a summary opinion to the countries of origin on 07/07/2017. A public hearing was held on 08/06/2017 with the participation of representatives of national authorities, public and private institutions, and universities. It covers many aspects, including the EU energy market, environmental impacts, alternative routing over land, effects on Latvian fisheries, Natura 2000, safety and response in emergencies, compensation for ecosystem damage and monitoring; some were also argued by other states. The objections are rejected. In support of this, reference is made to the below remarks on Poland's objections and the explanatory memorandum of the decision. After receiving the comments received in Germany, Estonia was not required to hold consultations.
There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.8 Republic of Poland

As part of the cross-border involvement of the authorities, inter alia, in the Espoo Report and Atlas (cf. application documents, Part J in the national language), the Republic of Poland objected to the planned project in a letter of 30/06/2017. The Republic of Poland was invited to take part in the discussion on 21/07/2017 in Stralsund by letter of 03/07/2017. A discussion regarding cross-border environmental impacts was held on 21/07/2017. By letter of 27/09/2017, the minutes of the discussion of 26/09/2017 was sent to the Republic of Poland. The Republic of Poland sent a further statement in the letter of 18/08/2017 with a request for a consultation under Section 5 of the Espoo Convention. After translation of further documents, a joint letter from the Stralsund Mining Authority and the Federal Maritime and Hydrographic Agency of 17/10/2017 rejected additional claims from the Polish side with notification that they had been sent in the legally required manner. By letter of 13/11/2017, the Republic of Poland was invited for consultation pursuant to Section 5 of the Espoo Convention and Section 7 of the German-Polish EIA Agreement for 05/12/2017 (see Letter from the Federal Ministry of Transport and Digital Infrastructure (BMVI) and the Ministry of Energy, Infrastructure and Digitisation of the state of Mecklenburg-Western Pomerania (EM MV) dated 13/11/2017). The consultation took place with the participation of, inter alia, German Federal Ministries, the two German permitting authorities, the Polish Ministry of the Environment and the PD (see letter and draft protocol of the BMVI dated 08/01/2018).

The objections raised by letter of 30/06/2017 will be rejected unless they have been complied with in this decision. With regard to the objections to the quality of the

water, reference is made in advance to the comments in section B.4.8.8 of this decision. Specifically, this is to be done as follows:

B.4.8.21.8.1 Completeness and methodology of the documentation

The requirement to assess environmental compatibility only when it is possible to identify all the consequences for the environment (objection 1.1) has been fully complied with in the current Environmental Impact Study (cf. application documents, part D1.01). A revision and preparation of a final version was not required. The environmental compatibility of the project was determined. In this respect, reference is made to sections B.4.4, B.4.5, B.4.6 of the resolution.

The objections (1.1) concerning insufficient documentation with respect to the presentation and effects of the project:

- Representations of the pipeline route, technical data and information on the claimed area,
- Type and distribution of munitions in the context of protection of fauna,
- Archaeological assessment of the impact on the affected areas,
- Description of the minimisation or monitoring of the negative environmental influences,
- Cumulative impact with other projects,
- Comprehensive assessment of impacts on the ecosystem of the Baltic Sea and adjacent areas,
- Impact on Natura 2000 areas and the entire protected area network and
- Decommissioning once the pipeline has reached the end of its operating life

are rejected.

The documentation contained in the national application documents and the Espoo Report characterises all sources of potential impacts (cf. application documents, Part J.01, Chapter 8), identifies the basic characteristics that these sources affect, classifies them according to their meaning and by sensitivity to impact (cf. application documents, Part J.01, Chapter 9) and assesses the potential environmental impact of the project, including the proposed mitigation measures (cf. application documents, Part J.01, Chapter 10). These surveys were carried out in accordance with the general method described in Chapter 7 (including detailed methods e.g. models, explorations included in the annexes). The analyses and surveys for the application are based on the requirements of the BSH (beyond the HELCOM requirements) for the investigation of environmental issues in the German marine sector (Stralsund Mining Authority & BSH 2014, Guidelines of the Standard Analysis Concept of the Federal Maritime and Hydrographic Agency, BSH 2013) and other national requirements, e.g. the instructions for the shipment of dredged material with regard to chemical analyses (GÜBAK 2009). The methods used are compiled in a separate volume of material (cf. application documents Data Basis and Methods of Investigation: I1A + volume of materials: I1.03). Other chapters of the report include: Project description, key alternatives and their environmental requirements, as well as the reasons for choosing a preferred option, information gaps and uncertainties, their implications for the assessment and a non-technical summary. Uncertainties, e.g.

due to lack of information, were highlighted and an appropriate approach was chosen in the assessment according to the precautionary principle. This method is in line with EIA best practices and in line with the requirements of EIA Directive 2011/92/EU (including Annex IV) and the Espoo Convention (including Section 4 and Annex II). The selection of the type and scope of the investigations in a systematic scoping procedure (see Espoo Report, Chapter 8, 10) and according to the respective relevant different location factors (source, receptor, interaction) is explained and seems appropriate. The report thus provides a well-founded analysis and results, which among other things informed the mining authority about the environmental impact of the project implementation and helped to decide whether the project is environmentally sound and justified.

The iterative approach of Nord Stream 2 AG serves to create a safe route corridor for pipeline construction and subsequent operation and to integrate environmental concerns, technical options and mitigation measures into the route selection process. Extensive explorations of possible routings were carried out on a step-by-step basis which involved a great deal of effort in terms of personnel, time and costs. Such iterative modifications are necessary and common within the scope of a large-scale project. The approach includes the preliminary exploration phases for the entire large-scale route and detailed exploration of the selected route. Not all studies and information are needed for an informed evaluation neither are they all made available to the general public. The Espoo report is based on the environmental impact assessments of the five countries that run the pipeline, and the studies also reflect the differences in the specific methods required by national authorities for regulatory compliance. Although lack of information is detailed in Chapter 19 of the Espoo Report, it is also noted that they have no implications for the validity of the assessment because all the uncertainties that could have impacted on the results were subject to the precautionary principle.

The assessment of the effects of ordnance clearance (limited to Finnish and Russian waters) in the Espoo report is based on the assumption of the PD of a maximum munitions explosion at a location where the route is closest to the protected areas, i.e. assuming the worst case scenario of impact (worst case) (see application document Espoo Report, p. 318 et seq.). Further studies will either confirm this level of impact or find that the impact is lower than assumed in the Espoo report. This approach is therefore consistent with the precautionary principle. At the same time, it provides a sufficient basis for decision-making under the EIA Directive and the Espoo Convention and therefore does not lead to an incomplete study (cf. application documents, Part J.01, Chapter 10.6.6). On the basis of the available data, there are no indications in the German area of responsibility for the presence of munitions, neither in the area of the pipeline route, in the area of the anchor corridor, nor in the area of the Pig receiving station (see also statement of the State Office for central tasks and technology of the police, fire and civil protection dated 17/05/2017, letter dated 24/11/2017 and commissioning of SeaTerra GmbH by the State Office dated 11/10/2017). Otherwise, reference is made to Section B.4.8.17 of the decision.

Not all heritage items have been identified, but Nord Stream 2 AG has undertaken to implement a random sampling process and demonstrated that its introduction will make it possible to avoid significant impacts on cultural heritage. This approach is an international archaeological standard because, due to its subterranean nature, objects cannot be fully determined before construction begins. It will ensure that

cultural heritage is adequately protected. The absence of complete data on the cultural heritage sites thus does not constitute the EIA or the Espoo report are incomplete, moreover, the impact on such finds in Polish areas is highly unlikely.

For the majority of offshore areas, general standard mitigation measures are implemented (as opposed to site-specific measures for certain activities), in particular for ships, such as monitoring of emissions and air quality and discharges into the water. These measures include a range of proven techniques. It can be assumed with certainty that 'with mitigation' predicted environmental results can be achieved. For these measures, therefore, no detailed technical data is listed. Where appropriate, the measures should be adapted to the specific activities of the Nord Stream 2 project and their effects in accordance with the ancillary provisions. The assessment presented in the Espoo report does not cover new or very specific measures that may require a detailed specification to prove their effectiveness (for example, if the project had to resort to unproven alternative methods of disposal). The effectiveness of recognised and field-proven measures need not be demonstrated in detail (e.g. limiting pollutant discharges from ships into waters). The presentation of the minimisation approach of the PD is therefore consistent with the required 'description of the measures to avoid, reduce and, as far as possible, offset significant adverse effects', as in Section 5 (3) (b) and Annex IV No. 6 of the EIA Directive and a similar requirement in Annex II (e) of the Espoo Convention. The minimisation approach also complies with best practice guidelines and precedents, which demonstrate the effectiveness of these measures. Appropriate monitoring must be implemented (cf. application documents, Part J.01, Chapter 11.3, 16.2, 18.1).

The assessment of the potentially significant impact of Nord Stream 2 on Natura 2000 areas in Polish territorial waters was presented in the German Environmental Impact Study and is summarised in the Espoo Report. These assessments found that the designated areas are too far from the pipeline route and the protection of the areas is not affected by the construction or operation of the pipeline. There was therefore no need to consider these areas in the Natura 2000 assessment process. All studies in the EIA process state that there is no potential for significant impact on the integrity of the protected sites of the Polish Natura 2000 areas (see section B.4.5 of the Decision). There is no violation of the Espoo Convention guidelines. As far as possible at the time of writing, the Espoo Report also documents these findings and assesses existing uncertainties conservatively in accordance with the precautionary principle (see also Annex II (g) Espoo Convention). It is not an “premature” assessment, but it allows those involved to have a fair estimate of the potential impact and be effectively involved in subsequent approval and Espoo consultation processes. This applies to the individual areas, such as the coherence of the network as a whole. Therefore, VT is not required to provide further analysis of the impact on the Natura 2000 network or to re-consult.

Pursuant to the second sentence of Section 60 (3) of the Convention (UNCLOS/UN Convention on the Law of the Sea), all abandoned or obsolete installations or structures must be disposed of to the extent necessary for the safety of navigation and as required by generally recognised international standards as determined by the competent international organisation. At the time of the final decommissioning of the plant, this must be decided on the basis of the rules applicable at the time. Accordingly, information on this is also not included in Section 4 (1) in conjunction

with Annex II of the Espoo Convention. Incidentally, the currently valid recognised standards of the International Maritime Organisation (IMO) in resolution A.672 (16), point 2, also allow plants to remain after examination and, in certain cases, on the seabed even after final decommissioning.

The objections (1.2) concerning the

- general description of examination methods and the different and selective approaches used in the investigations carried out, and that therefore a review of the EIA documentation in terms of type, scope and relevance is not possible, as well as
- differences in the scope and accuracy of the information provided for each area section

are rejected.

The content of the Espoo Report and the studies has already been discussed in objection 1.1 (1). The report contains sound and robust analysis that meets the requirements of Annex II of the Espoo Convention. The Espoo Report, which is fully translated into the languages of the countries directly and indirectly concerned, contains all the information in Section 4 (1) of the Espoo Convention, and therefore fulfils the requirement to provide sufficient information for public consultation in accordance with Section 2 (2) and (6), Section 3 (8) and Section 4 (2) of the Convention.

In addition, the Republic of Poland has received further documents in the national language (see section B.2.2 of the decision). Moreover, Poland was comprehensively informed and involved in accordance with the provisions of the Espoo Convention - as well as the Contract Law on the German-Polish Environmental Impact Assessment Agreement (see in particular Section 3, 11 German-Polish EIA Agreement). This included, among other things, the notification of the project to Poland (08/04/2013), the dispatch of the scoping document to Poland with a request for comment (09/04/2013), the information on the preliminary survey scope following the joint scoping date on 26/06/2013 (15/07/2014), the mutual transmission of comments from the public consultation with the affected states (30/06/2017), the discussion date in the planning approval procedure in Stralsund (Section 73(60 VwVfG MV (German Administrative Procedures Act for Mecklenburg-West Pomerania)) (21/07/2017) and the consultation with the Federal Ministry for traffic and digital infrastructure (05/12/2017). An effective exercise of procedural rights was therefore possible. Various bodies of the Polish Government as well as Polish institutes and organisations have also participated in the procedure with written and oral comments. Additional requirements - e.g. in the form of the additional translation of further national approval documents or a repeated discussion - do not exist. Consultation discussions scheduled for the period *following* the completion of the documentation (Section 5 Espoo Convention) have already taken place.

There are also gaps in the study, contrary to Polish concerns, regarding the taxonomic structure, population and biomass of plankton and zooplankton, and the taxonomic composition and biomass of phytobenthos. Assessment of the impact on zooplankton and phytobenthos in the Espoo report notes that there are no significant effects on the functioning and survival of these taxa, or indirectly on the higher

species to whose food chain they belong. Therefore, it is not necessary to monitor the status of the plankton and benthos using the mentioned parameters. Bioindicators: the measured values from the monitoring and consequently the indicators and data for monitoring can only be defined if two conditions are met: Nord Stream 2 AG has developed appropriate monitoring programs in consultation with the national authorities of the parties of origin concerned and taking into account the comments received, and the authorisation lays down the conditions for monitoring.

The differences in the modelling of the environmental impacts (e.g., resedimentation, underwater emissions due to the clearance of explosive ordnance, dredging, landfills) with regard to the individual sections of the area ultimately result from the different natural and basic conditions at the different sites. Similarly, modelling the mitigation/mitigation measures is geographically different because the environmental context and activities are different and, consequently, the impacts on the different sites differ.

B.4.8.21.8.2 Plan justification and variant check

The objection (2.) concerning the plan justification and variant examination

- there is currently no need for additional capacity and therefore it is unfounded to impose costs and environmental risks on the Baltic Sea States;
- the alternative of a land route had not been sufficiently investigated and evaluated; moreover, the analysis of the zero variant was difficult to understand;

is rejected.

Securing the energy supply through suitable measures, such as the construction or expansion of energy plants, is a public task of utmost importance (Section 1(1) EnWG (German Energy Industry Act)). Its fulfilment is also assigned to companies organised under private law (see Section 2 (1) EnWG (German Energy Industry Act)). Measured against these - also preventive - objectives, the project is necessary and therefore justified. The Espoo Report (cf. application documents, Part J.01, Chapter 2) as well as the German application documents (Part A.01, p. 45 et seq.) provide a detailed and comprehensible explanation of the arguments for additional transport capacity of Russian natural gas to ensure the security of supply of the EU (justification of the project):

- decreasing European production capacities,
- declining export capacities of other sources,
- increased risks in the case of special developments (e.g. cold winters or outages of power plants) due to the tight supply situation and
- insufficient current and future import capacities.

These arguments are based not only on publicly available information but also on studies by third parties, e.g. Prognos AG. The need for additional natural gas is beyond doubt (see section B.4.1 of the decision). The Environmental Impact Study and the Espoo Report show that the project does not lead to "massive environmental impacts", as adopted in the Polish Opinion. There are no significant effects to be

expected; most of the implications are minor or negligible, meaning they are not significant. There is no apparent evidence of costs and environmental risks being imposed on other states.

The objection regarding inadequate consideration of possible alternatives (including an overland route (onshore variant), the abandonment of the project (zero variant) and the use of existing infrastructure) is unfounded. The project developer has invested significant financial and human resources in the selection of the pipeline route. According to Chapter 5 of the Espoo Report, extensive runway variant checks were performed at various times, starting with the North Transgas 1995 project on the development of Nord Stream and subsequently on Nord Stream 2 (cf. application documents, Part D.01, Chapter 9p,. 768 et seq.). The areas in which the pipeline must be buried specifically result from the risk analysis of the DNV-GL, which follows that of the PD (cf. application documents, Part I3.07). The previously tested alternatives form the basis for the route, which was ultimately chosen and requested by the project developer. The Espoo report contains "an overview of the main other possible solutions explored by the promoter and the main selection criteria with regard to the environmental impact" as required by Section 5 (3) and Annex IV (2) of the EIA Directive; Description of acceptable alternatives" and 'the environment likely to be significantly affected by the proposed activity and its alternatives", as required by Section 4 and Annex II (b) and (c) of the Espoo Convention. It thus meets the requirements of both the EIA Directive and the Espoo Convention with regard to the discussion of alternatives.

The documents also assess the "zero variant" (cf. application documents, Part J.01, Chapter 0.5, Part D.01, Chapter 4.1, p. 121). Chapter 9 of the Espoo Report contains an analysis of this variant. Chapter 9 contains an analysis of the zero variant (initial state - initial environmental situation) - a description of the relevant aspects of the initial environmental situation (initial state) without implementation of the project. Chapter 10 assesses the potential impact on each 'receptor' (EIA) and compares it with the descriptions in Chapter 9 to determine the significance of each impact. As such, the evaluation of the project compares the situation of the implemented project with the zero variant or the baseline situation and is therefore in line with European regulations (note: the Polish references refer to Annex IV, para Directive 2014/52/EU, but Directive 2011/92/EU applies to Nord Stream 2 before its amendment, see Section 39 and Section 3(2)(b) Directive 2014/52/EU). Apart from that, the explanations/presentations, especially in the German application documents (cf. application documents, part B.01), are considered sufficient for the test carried out (see section B.4.3).

The submitted alternative test complies with the test standards of the UVPG, the Espoo Convention as well as the sectoral planning law and the Natura 2000 Habitats Protection and Species Protection Law. The Espoo Convention requires consideration of reasonable alternatives in terms of route and technology. Justifiable intrusive alternatives or those which come into serious consideration. In addition, planning alternatives that are no longer considered after a rough analysis at an earlier planning stage may be withdrawn for the further detailed examination and thus also for the formal environmental impact assessment. Furthermore, nature conservation regulations do not necessarily require that the ecologically most favourable planning alternative is chosen. These planning principles correspond to the application documents. Basically, it can be assumed that a land-based (onshore)

connection, measured by the objectives of the project (offshore connection between Russia and Germany), is not an alternative at all but an alias to the proposed project. Nevertheless, this possibility was presented in the application documents, but was excluded from further planning after a rough analysis for justifiable reasons (reasons: additional environmental and socio-economic impacts (e.g. impact of settlements, traffic routes (road, rail, water), agricultural areas and numerous ecosystems), lower efficiency with regard to gas transport (e.g. the need for compressor stations to maintain pressure)).

B.4.8.21.8.3 Dismantling

The objection (3) concerning the impact factors of the project on the environment, taking into account all phases of the project, including decommissioning (with reference to Annex IV, point 5a in conjunction with Section 5 (1) of the EIA Directive), is rejected.

The Polish Opinion refers to Annex IV (5) (a) of the EIA Directive 2014/52/EU, which requires a description of the likely significant environmental impact, including the relevant demolition (deconstruction). However, for Nord Stream 2, Directive 2011/92/EU will apply before its amendment (see Recital 39 and Section 3(2)(b) Directive 2014/52/EU). The technical life of the pipeline is at least 50 years. Chapter 12 of the report states that the proposed de-commissioning programme would be developed during the operational phase to take account of new or changing regulatory frameworks and guidance available at the time, as well as to reflect good international industrial practice (GIIP) and improved technical know-how including how to draw on the best practices and best available technology. This is followed by the Stralsund Mining Authority as the planning approval authority - at this point in time, the competent authority at the time will have to decide on the further course of action, taking into account the current valid legal provisions (cf. ancillary provision A.3.15.9).

B.4.8.21.8.4 Shipping

The objection (4) on restrictions and safety in shipping, collision risk is rejected.

The ports of Świnoujście and Szczecin can still be reached via shipping lane no. 5 "Odermündung" (approaching the harbour from the west), shipping lane No. 20 "Swinemünde-Ystad" (approaching the harbour from the north), as well as from the north-east. The Nord Stream 2 pipeline crosses shipping lanes No. 5 and No. 20. There is no reason to assume a navigation restriction by the current burying or laying on of a (further) pipeline (see section B.4.10 for objector 133, also section B.4.8.18). The risk for contact with the pipeline was taken into account in the risk assessment by the DNV-GL (cf. application documents, Part I.03). The maximum draught of ships operating in the relevant area was the fundamental output parameter for determining the minimum water depth from which the pipeline would have had to be buried. In the area of shipping lane no. 5 (territorial waters), the water depth is between 15 and 16 meters. According to the AIS data, ships with a draught of 13.5 m traverse this shipping lane. In this area, the risk assessment showed that the pipelines should not protrude above the seabed (KP 42.9 to KP 50.2). The planned

coverage of the pipeline in this area is 0.5 m. Under these conditions, the available water depth remains unchanged (see Espoo Report, Chapter 10.9.5.2, p. 478, cf. application documents EIS, Chapter 6.6.4, p. 737). In the area of shipping lane no. 20 (continental shelf not in the jurisdiction of the Stralsund Mining Authority) the water depth is between 18.0 and 18.1 meters. In this area, the pipeline will be laid on the seabed. This corresponds to the results of the risk analysis of DNV-GL (north approach (shipping lane No. 20/Gate 2) and the Espoo report, Chapter 5.2.2, p. 63 et seq.). With an outside diameter of the pipelines of 1.5 m, this leaves a water column of at least 16.5 m above the pipelines. Therefore, ships with a maximum draught of 14.5 m operate in the waters above the Nord Stream 2 pipelines. The analysis of the AIS data again showed that ships heading for the ports of Szczecin and Świnoujście via the northern access road had a maximum draught of 12.9 m. If one considers this maximum draught, a keel clearance of 3.7 m would remain. There are no documents regarding larger ship draughts. Reliable and meaningful forecasts for the future development of ship sizes cannot be made at present and thus cannot be regarded as an objection to the project.

The objection of a possible restriction of future development possibilities, in particular of the port of Świnoujście, by the project crossing shipping lane No. 20, also does not apply. In the planning approval procedure, all public and private interests are to be included in the comprehensive assessment of the interests involved (see Section 43 p. 4 EnWG (German Energy Industry Act)). The effects and interactions of the project with regard to other projects in the Baltic Sea can also be included in this analysis. However, this does not apply to unsubstantiated indications of hypothetical economic exploitation possibilities. Uncertain future plans are not worth considering, but consideration of assumed future developments presupposes that their realisation can be expected with reasonable certainty in the foreseeable future.

The objection that only by burying the pipeline in the area ofshipping lane No. 20, will there be sufficient depth in the approach to harbours to allow future vessels with a draught of up to 15.4 m is largely based on unsecured assumptions regarding the development of ports. An extension of the shipping lane has not been applied for, for either the German or the Polish Exclusive Economic Zone (EEZ). A cross-border Environmental Impact Assessment (EIA) for any expansion project has not yet taken place. There are no concrete plans or time frames for such an expansion project of the ports or the shipping lane. According to the Polish Ministry of Maritime and Inland Navigation, extension is currently the subject of public debate. In addition, there are no specific indications that without the extension of shipping lane No. 20, the viability of the ports would be impaired or that this extension (in terms of size) or of the access route was the only option for enlarging the ports. The approval of such a hypothetical project is by no means safe in view of the associated extensive dredging work in Natura 2000 areas (at present the ports of Świnoujście and Szczecin can only be accessed by vessels with a maximum draught of 13.20 m or 9.15 m). The approval of current infrastructure projects, however, does not stand in the way of projects whose implementation - in both practical and legal terms - is completely uncertain.

The pipelines also have sufficient positional stability through the concrete casing or burial, which is to be monitored. It is not to be expected that 'sudden pipeline shifts' could occur and cause or increase the risk of collision mentioned above. The requirements for the dimensions and weight of the pipelines for adequate positional

stability have been determined according to recognised procedures (DNV-RP-F109, cf. application documents, part C.01, chapter 2.2.3.4, p. 36 et seq.) and are checked by independent experts (cf. application documents, Part C.01, Chapter 5.2.1, p. 217, Chapter 5.2.2, p. 220). In addition, there will be no dredging on the seabed, but the intermediate storage with a precision of ± 50 cm will be revisited, so that there is no risk of damage from any soil tipping of waste (cf. application documents, Part D.01, Chapter 1.6.4.2, p. 68, Chapter 7.1, p. 747). Other accidental risks also seem unlikely (cf. application documents, Part I3.07, Chapter 10, p. 49 et seq.; cf. application documents, Part C.01, Chapter 5.2.5.4, p. 225; cf. application documents, Part A.01, Chapter 5.4. 3.3.1, p. 118 et seq.).

B.4.8.21.8.5 Accidents

The objection (5) to analyse potential emergencies, including the possible gas leakage resulting from a collision with ships, corrosion, seismic activity and sabotage and the vulnerability of the nearby Nord Stream pipeline and its environmental impact, has been rejected.

The minimum distance between Nord Stream and Nord Stream 2 avoids both interference between the lines during construction and common causes for the simultaneous failure of Nord Stream and Nord Stream 2 during operation (e.g. a sinking vessel or dragging anchors jeopardising both pipeline systems). Nord Stream is part of the base scenario for all ratings. The Espoo report considered the existing Nord Stream and Nord Stream 2 in terms of water depth, seabed surface, hydrography, benthic flora and fauna, fish and protected areas. Effects from ships and sacrificial anodes were considered to be low. Specifically, the risk for contact with the pipeline was taken into account in the risk assessment by the DNV-GL (cf. application documents, Part I.03). Seismic risks have already been assessed by Nord Stream using a Probabilistic Seismic Hazard Assessment (PSHA) along the entire route corridor. As a result, it was found that the seismic danger along the entire pipeline line is minimal. The validity of these results for the project has been reviewed and confirmed by experts, and the results are fully applicable to Nord Stream 2 (cf. application documents, Part J.01, Chapter 9.2.1, p. 162).

The possible risk accidents (e.g. mechanical defects or natural hazards) as a consequence of the construction method of the pipeline (cf. application documents, Part J.01, Chapter 6.6, P. 104, C.01, Chapter 5.2.1, pp. 217 et seq.) and of the inspection, monitoring and maintenance systems are considered to be negligible (cf. application documents, Part J.01, Chapter 13, pp. 563 et seq.). The Espoo Report (cf. application documents, Part J.01, Chapter 13) provides an overview of the risk of environmental accidents (risk assessment). Chapter 13.3.2 (Assessment of operational risk) states: The risk of gas release caused by corrosion, mechanical defects and natural hazards is considered as negligible due to the design of the pipeline and due to the planned inspection and maintenance programme. This conclusion is not based on an assumption, as suggested in the Polish letter, but on the statistical analysis of pipeline accidents and an analysis of natural catastrophe hazards along the pipeline route, including the probability of seismic events. The construction and operation of the pipeline are state-of-the-art. Proof of this has already been provided by the PD with the notification pursuant to Section 5 GasHDrLtgV as a prerequisite, in particular for construction in the area of the

German 12 nautical mile zone. The pipeline is thus to be considered as safe. In this respect, reference is made to the comments in Section B.4.8.17 of the resolution. In addition, the PD with the relevant ancillary provision was instructed to draw up an alarm and security plan in accordance with the applicable national law. The responsibility for safe operation of the pipeline lies with the operator. The measures already taken by the PD (e.g. obligation to emergency preparations, provision for oil spills from project ships) and planned actions (e.g. establishment of contingency plans in line with the HELCOM requirements for oil spills and other environmental accidents such as contact with munitions or ship collisions) are appropriate for the identified hazards. There is no need to make arrangements for unrealistic scenarios. Otherwise, proof provided by independent technical experts must always be available to the German authorities that there are no safety-related concerns with respect to the planning, commissioning and operation of the pipeline and that the relevant regulations have been taken into account. Emergency preparations and response are described in detail in Chapter 13.5 of the Espoo report to the satisfaction of the Stralsund Mining Authority.

B.4.8.21.8.6 Wartime legacies

The objection (6) concerning the risks of wartime legacies

- to specify the information on the methodology used to localise conventional munition,
- to consider the presence of chemical warfare agents in Adlergrund in Swedish (not only Danish) waters as well,
- to consider in the analysis not only the potential occurrence of chemical warfare agents, but also contamination from the decay of toxic war legacies in soil tipping sites,
- to analyse the risk of attrition of the marine environment,

is rejected.

The corridor along the proposed pipeline route has been profoundly studied for compound properties (including conventional munitions) that could pose a risk to the pipeline or the environment during construction and operation, with the help of the subsequent steps/studies. It is an iterative process of preliminary and detailed exploration.

Preliminary investigations were made for the entire possible route corridor (corridor width up to 5 km) with a special exploration boat (collection of bathymetric data - November 2015 to May 2016). A detailed survey was conducted for the two possible routes identified as possible (corridor width 130 m) using an underwater vehicle in Denmark, Sweden and Finland (collection of bathymetric data - April and May 2016). To further reduce the risk to the pipeline from the dynamic character of the munitions on the seabed, further exploration is underway, including exploration immediately before pipe-laying to search for new objects on the seabed. This includes the entire corridor for the construction of the pipeline (width 16.5 m), a safety corridor with a width of 70 m in the Gulf of Finland, where secondary sources indicate a high munitions density and all intervention areas on the seabed where rock bedding or trenching is planned. Finally, a correspondingly larger corridor will be investigated for residual munitions legacies when excavating the trench for laying the pipe,

depending on the trench width. The results of these ordnance investigations are further evaluated by experts within and from outside the PD.

The goal was and is to create a safe route corridor for the construction of the pipeline and its subsequent operation and to integrate environmental concerns, technical possibilities and mitigation measures into the route selection process. It was considered by the PD that the munitions could be moved by demersal trawls, dredging sand and trenches, and storms. Regular inspections during operation and life of the pipeline will also be carried out. Geophysical surveys were conducted throughout the route corridor, including the Adlergrund area and Swedish waters. Thus, both chemical and conventional explosive ordnance were investigated on the seabed within the route. Detailed investigations of the chemical warfare agents and decay products of chemical warfare agents have been carried out in the seabed sediments along the Danish section of the route, as the route runs close to the designated munition dump sites of the Bornholm shallows. The distance from the pipeline route to the soil tipping area in Swedish waters is much further (more than 9 km), as well as to the Adlergrund area. Therefore, no comparable measures have been taken in the seabed sediments. In addition, the Adlergrund area is not a designated soil tipping area, but probably at most comparatively slightly burdened by warfare agents due to unintentional transport losses. It is not clear that there are deficiencies in the investigation (cf. application documents, Part J.01, Chapter 9.14.1, 13.5).

Dealing with found munitions has no significant impact on Polish waters. Blasting operations are to be excluded by the PD (see ancillary provision A.3.14.4), and any found remains of munitions are to be lifted or recovered. Alternatively, the course of the pipeline route is slightly adjusted to counteract the corresponding dangers (see ancillary provision A.3.15.1, note A.4.3). In coordination with the competent Danish authorities, it is planned to maintain a sufficient distance from chemical weapons found in Danish waters.

A (cross-border) impact of the release of warfare agents or their degradation products on benthic and pelagic organisms is excluded. The release of warfare agents was determined based on the measurement of the concentration of 29 different CCPs / decay products in the 121 sediment samples (HANS SANDERSON & PATRIK FAUSER, 2016, "NORD STREAM 2 - ADDITIONAL RISK ASSESSMENT OF WARFARE AGENTS", AARHUS UNIVERSITY). The release rates of the sediment were estimated based on the worst case scenario. It has been shown that CCP concentrations are well below the threshold of the estimated non-effect concentration (PNEC) and thus do not affect benthic and pelagic organisms. Also, the possible concentrations of salts of 1.4-dithiane, such as mustard gel hydroxyl and mustard chloride, which may form under certain redox conditions, are likely to reach concentrations of the order of magnitude estimate of µg/l in the water at best and are thus not dangerous for flora and fauna. The detection of higher concentrations of chemical warfare agents than the PD's investigations into Nord Stream (2009) may be due to improved methods for detecting lower concentrations and more efficient extraction of chemical agents from the sediment. Greater releases of chemical warfare agents in the recent past, as brought into play by the Polish Institute of Meteorology and Water Management, are likely to be an explanation in the opinion of the analysis laboratory (Söderström, M., Hakala, U., Kostiainen, O., Pettersson, A. & amp; Vannins, P., 2016: Assessing the effects of changes in the method of chemical analysis of chemical warfare agents

dumped in the sea. VERIFIN draft report, VER-MS-0319, 17/06/2016). Additional investigations are therefore not indicated.

As mentioned above, there are no indications of the existence of munitions in the German area of responsibility, neither in the area of the pipeline route nor in the anchor corridor (see section B.4.8.17). Neither researching the routes to the soil tipping sites nor the investigation of soil samples provides evidence of the presence of warfare agents. Along the pipeline route, the area near Bornholm is considered to be that with the greatest potential danger from chemical munitions. Therefore, the area has undergone a more detailed examination: The evaluation of the Nord Stream project has already come to the conclusion that along the affected route the total risk from chemical weapons for the fish stocks is minimal. Trawling is also allowed in this area (although first-aid gas equipment on fishing vessels is required). Since no danger from chemical munitions could be detected in this area, as is the case in other areas such as the German 12 nautical mile zone, this can be reasonably excluded. Consequently, no cross-border impacts from this will occur.

If, contrary to expectation, during the construction phase explosive ordnance or explosive substances are found, the PD is obliged to take the necessary measures to coordinate with the munitions recovery service of the state of Mecklenburg-Western Pomerania as the competent authority for the disposal of explosive ordnance. However, since no explosives or warfare agents were found despite intensive investigations, a purely hypothetical consideration of possible environmental effects of an ordnance clearance in the German jurisdiction is not required and incidentally also not possible.

B.4.8.21.8.7 Baltic fauna and flora

The objection (7) concerning the description of the impact on Baltic fauna and flora, including birds and marine mammals and protected areas,

- there is insufficient representation of the Natura 2000 areas "Pomeranian Bay" (PLB990003), "Stolpe Bank" (PLB990001) and "Pomeranian Bay Refuge" (PLH990002),
- a reduction to the argument concerning the distance in the exclusion of effects and the context of the spatial and functional connection between German and Polish areas is insufficient.
- there were no references in the spatial and functional relationships of the German and Polish protected areas to migrations by, for example, the harbour porpoise

is rejected.

The PD has carried out appropriate FFH pre-tests and/or, if necessary, full FFH compatibility assessments for the existing or planned Natura 2000 areas affected by the project in accordance with the requirements of the Habitats Directive. These include the conservation objectives or protective purposes for which they were identified, the propagation characteristics of the impact factors that may arise from the project and to which the areas could be sensitive, and the location of the protected area. Investigations were carried out as to whether the protected areas could potentially be affected by the construction or the operation. The PD has

submitted corresponding screening assessments/reports in the national application documents (cf. application documents, Part E.16). As far as possible at the time of writing, the Espoo Report also documents these findings and assesses existing uncertainties conservatively in accordance with the precautionary principle (see also Annex II (g) Espoo Convention). It is not an “premature” assessment, but it allows those involved to have a fair estimate of the potential impact and be effectively involved in subsequent approval and Espoo consultation processes. This applies to the individual areas, such as the coherence of the network as a whole. Therefore, VT is not required to provide further analysis of the impact on the Natura 2000 network or to re-consult.

The Stolpe Bank area (PLB990001) is obviously too far removed from all the measures planned for the Nord Stream 2 project to be affected by them. Therefore, this area was not the subject of a Natura 2000 or FFH preliminary examination. An FFH preliminary examination was carried out (for the German Natura 2000 areas and also) for the two Polish areas PLB990003 and PLH990002. In these tests, it was concluded that, neither the integrity of the individual sites mentioned would be affected nor the conservation objectives would be endangered specifically as a result of the distance to the pipeline route (more than 21 km) or to the interim storage facility for sediment excavation (more than 24 km) due to the fact that the areas have been included in the Natura 2000 network of protected areas. The impact assessments also took into account species whose area of action (range of grazing or area) is large (sea birds, marine mammals). The scope of the impact factors and the location of the protected areas were also taken into account. The impact assessments were documented in a separate report, which forms part of the permit application for Germany (cf. application documents, Part E.16).

The analysis of the effects of disturbances on migratory species also includes an assessment of possible effects beyond the boundaries of individual Natura 2000 areas based on the analysis of the spatial and temporal spread. This also includes the neighbouring Polish protected areas in the Pomeranian Bay (cf. application documents, Part E, Part J.01, Tab. 9-17). In particular, the fact that the pipeline is predominantly buried does produce a barrier effect. It is therefore more than unlikely that the project can influence migration patterns. With regard to the high level of protection and endangerment of the harbour porpoise, medium (avoidance response) to large-scale (disruption of behaviour and masking of acoustic signals) effects of low to high intensity with regard to the harbour porpoise are projected for the noise emissions from the construction equipment which will not have a significant impact due to their short duration. Due to the knowledge of underwater noise caused by (dredging) ships, behavioural reactions for marine mammals can occur at a distance of up to approx. 500 m from to the noise source. The underwater noise is perceived up to a distance of several kilometres. Creatures may adapt their behaviour to the effects of the construction process. In the worst case scenario, avoidance of the large-scale construction field (route with corresponding impact zone, shifting of hunting activities) is to be expected during the construction phase. As the harbour porpoises' migrations in the affected sea area are sporadic and the effects will only exist temporarily during the construction phase ("moving" construction site, construction progress between 0.5 and 1 km/d in the German area, in the other areas typically between more than 2.5 km/d), no adverse effects are predicted.

In addition, there are no studies on migratory behaviour of porpoises and the routes currently used in the Baltic Sea region. However, tracking porpoises using satellite technology in the adjacent waters of the Beltsee, Kattegat and Skagerrak has not resulted in specific migration routes between areas or seasons. It was also not possible to identify similar migration routes for the grey seal. This fact also leads to the conclusion that influencing migratory behaviour of harbour porpoises and grey seals as a result of the construction measures for Nord Stream 2 can be considered very unlikely. Upon completion of the construction work, a corresponding regeneration monitoring will be implemented (cf. application documents, part D1.01, p. 773).

Effects on species of sea birds occurring along the pipeline route of the Pomeranian Bay have also been adequately studied (cf. application documents, Part F.07, E.16, Section B.4.6). Half of the bird species mentioned in the statements are bird species that occur in the Pomeranian Bay in the area of the pipeline route, and the other half are species that do not occur there. The application documents only considered the species that could be affected by the project. Nord Stream's monitoring data collected by the project developer show that site traffic can only increase the potential disruption to sea birds in the Pomeranian Bay by 15%. This disruption is only temporary as due to the daily progress of construction. The sets of digital photos completed since 2016 also confirmed that in the operational phase with buried pipeline no change of the sea bird occurrence is to be found; where existing pipeline is in less than 20 m depth of water, there is even an increased occurrence of fish- and shell-feeding birds in the area of the pipeline.

As a result, it can be stated that there will be no cross-border impact on Natura 2000 areas in the Republic of Poland and other countries from the area of the project in the German 12 nautical mile zone.

B.4.8.21.8.8 Sediments and pollutants

The objection (8) concerning the disturbance of the sediments and potential release of impurities from them and the corrosion of the pipeline is rejected.

The pollutant levels released during construction were based on the pollutant concentrations measured in the sediments along the proposed route and on the modelling of sediment upwelling and the resulting suspended sediment concentrations in the water phase during dredging, piling after burial, aggregation and ordnance clearance (cf. application documents, Part I3.06). The release of sediment has not been investigated in terms of dredging, contrary to the objections of the Polish Institute of Oceanography of the National Academy of Sciences. On the basis of the investigations carried out by the PD, cross-border effects on the Polish waters can be explained by the sedimentation of sediment and corresponding release of substances into the water column (cf. application documents, Part I3.06) as well as a worsening of the water quality (cf. application documents, Part H.01, H.02) in general. No further analysis of sediment-bound substances, modelling of particle transport or comparisons of different pollutant limit values are required. The limitation of the investigated sediment sizes (to those below 0.125 mm) is objectively justified as a result of the deposition of larger particles in the vicinity of the intervention.

For the sediment movement or also relevant turbidity in the area of the German pipeline route section, a modelling of the resuspension was carried out on the basis of the status quo investigations of the actual sediments in the route course. The digitisation of the seabed movement was carried out with the help of a mesh version of the hydrodynamic (HD) MIKE 3 model package for the three-dimensional modelling of flows, water levels and the transport of suspended matter. The model was a further development of the existing DHI model from the Baltic Sea Region, which was calibrated and validated in the Danish Belts and Sounds and in the Western Baltic. The MIKE 3 PT particle transport digital model was used to model the transport of sediment and released pollutants during the construction phase, based on the hydrodynamic results obtained from the MIKE-3-HD model in terms of flow velocities and water column height. The results obtained with MIKE 3 PT were independent of the calculation grid of the MIKE 3-HD model and they were stored in a finer grid than the hydrodynamic input, which was necessary to detect the turbidity plumes in the resolution. The parameters and results on which the model is based are sufficiently and comprehensibly documented in the relevant turbidity modelling document (cf. application documents, Part I3.06). A comparison of the modelling results with the PD monitoring results for Nord Stream demonstrates the conservative approach of the models for the project.

Part of the subsequent sediment chemical investigations were extensive pollutant analyses for the evaluation of the dredged material on the basis of the "common transitional provisions for handling dredged material in coastal waters" (GÜBAK 2009, from van Veen grab samples), which is to be used for dredging and backfilling in Germany and in accordance with Technical Rules No. 20 of the Country Working Group (LAGA, on vibrocorer cores) (cf. application documents, Part I3.02A, Chapter 3). Sediments can also provide excellent transport for pollutants. Due to their low organic content (<2%), the sediments in the pipeline route can be regarded as virtually unencumbered. Ingested dredged material with organic admixtures > 3% (silt and peat) is transported to a suitable spoil ground/tipping area to avoid temporary eutrophication of the seawater ashore. Likewise, cohesive boulder clay is sent for land utilisation. Extensive chemical investigations of sediment in accordance with the requirements of the GÜBAK and LAGA showed that the sediments intended for interim storage at the soil tipping area north of Usedom are virtually unencumbered with regard to nutrients, heavy metals and organic pollutants (cf. application documents, Part I3.02A, Chapter 3.5)., These are mainly sands with an organic content of 1 to 2%.

The pipeline route has been chosen to avoid siltation and to create sediments with a low level of organic pollutants (cf. application documents, Part D.01, p. 131 et seq.). The modelling shows that no cross-border effects are to be expected due to sediment upheavals (DHI (2017)). Only a small part of the sediment gets into suspension and can stay there for one to two days (turbidity plumes), while the majority of the particles sink again immediately adjacent to the site of the construction work. The results of the investigation (including monitoring of turbidity plumes in anchored and dynamically positioned construction vessels) confirm that the increase in the mean concentration of suspended solids is not significant and only locally limited. In the case of anchor surveys in Finland, for example, at a distance of 50 m from the route, no excess of the regional background concentration

was observed for anchored construction vessels and no increase in suspended matter concentration at 800 m distance.

For the Pomeranian Bight (SIEFERT ET AL., 2008, KOHLS ET AL., 2004), the sedimentation rate ranges from 0.1 to 0.0001 cm / s for "fluff" sediments, or 0.5 cm/s for fine grain sand. On the basis of the turbidity modelling carried out, it can be assumed that appreciable turbidity will only occur in the immediate vicinity of the soil tipping area. The model results show that the concentrations of suspended solids in the vicinity of the dredgers can rise to several hundred mg/l. At a distance of 500 m from the work, the surface concentrations are still around 30 mg/l. A few days after completion of the dredging operations, the concentrations approach the natural suspended solids in this area again. The sediment deposits show different patterns in open waters and in the Greifswalder Bodden. In open waters, the deposit is even and covers a larger area near the trench. This layer is very thin and generally does not exceed 25 g/m². In the Greifswalder Bodden, where the water current is weaker, the deposition takes place in a smaller area in the immediate vicinity of the ditch. The deposit can reach up to 3,000 g/m² near the trench. The dredged material is temporarily stored at the Usedom marine storage facility east of the ditch. Effects of soil tipping were modelled over a 24 hour period. The model shows very high sediment concentrations at the time of soil tipping. These high concentrations are of very short duration and decrease rapidly after completion of the deposit. The type of release of the sediments leads to an uneven distribution of the sediments. This sediment is available for later sediment transport and/or renewed resuspension (cf. application documents, Part I3.06, Chapter 5).

Part of the technical planning is the adherence to limits of turbidity in dredging and backfilling, which provide that the concentration of particulate material at a distance of 500 m around the suspension source may not exceed on average 50 mg/l and in the short-term a maximum 100 mg/l in addition to the background turbidity (cf. application documents, part D1.01, chapter 7, measures WA1, WA2, part G.02, measure 5). To maintain these values, turbidity values are continuously monitored for the duration of the construction work. Mitigation measures will be applied as soon as the requirements are exceeded.

Pollutant concentrations in the Southern Baltic Sea after dredging, post-lay trenching, rock tipping and ordnance clearance at the respective intervention sites exceed the Non-Effect Concentrations (PNECs) and Environmental Quality Standards (EQS) for a limited time only (maximum of a few days). The vast majority of the southern Baltic Sea, however, is not affected by these seabed works, so that generally much lower values can be expected there (cf. application documents, Part I3.02). In any case, the channel is not affected by the limited spreading of the sediments.

The release of heavy metals also does not have a cross-border impact on the Polish waters more than 13 km away from the project. There is a rapid redeposition of exposed metal fractions. In deeper areas with increased metal concentrations in the sediments (e.g. Bornholm Basin), the sediment spreading is also limited to the laying. Further activities on the seabed (burial, rock tipping, etc.) are not planned there. Further, conservative assumptions regarding possible release into the water column have been made, in particular with regard to possible mercury releases.

Demands for further or more detailed information are therefore unfounded (cf the release of chemical warfare agents already above).

It can therefore be assumed that cross-border effects due to turbidity, sedimentation or pollutant transport will not take place.

B.4.8.21.8.9 Cumulating impacts/cumulative effects

The objection (9) concerning the cumulating impacts or incomplete consideration of cumulative effects is rejected.

In this context, reference is made to sections B.4.4.2.9, B.4.5 of the decision. The impact of Nord Stream 2 on other current and planned projects in the Baltic Sea Region has been assessed in the context of the National Environmental Impact Study (cf. application documents, Part D1.01) and the Espoo Report (cf. application documents, Part J.01). The PD deals sufficiently and comprehensibly with the compatibility of the project with current projects and - if possible and in view of the probability of realisation or the realisation status where appropriate and possible - with planned projects in the Baltic region. The methodology of defining the parameters used to assess the cumulative impact is fully understood and fully described in Chapter 14.2 of the Espoo Report (p. 585 et seq.). The same applies to the cumulative effects, including the interaction with the existing Nord Stream pipeline.

The pipeline route has been determined in coordination with the marine strategic planning of the competent national authorities - also in preparation - taking into account marine uses (e.g. shipping, military activities or cable lines) and restrictions such as protected areas (cf. application documents, part J.01, Chapter 10 (in particular 10.6.6, 10.6.7, 10.9.8) and 11). In addition, it will be as close as possible to the existing Nord Stream pipeline to minimise space requirements and avoid potential cumulative impacts of the two pipelines on other (planned) projects.

At the same time, the minimum distance between the Nord Stream 2 pipeline and the Nord Stream pipeline is such that interference between the two pipelines will be avoided during construction and that the same event during operation (e.g. a sinking vessel or a tow anchor damaging both pipeline systems) does not lead to defects and failure on both Nord Stream and Nord Stream 2. The existing Nord Stream pipeline was considered part of the starting point for all Nord Stream 2 assessments. The combined presence of Nord Stream and Nord Stream 2 is therefore considered in the Espoo Report for the seabed surface, water depth, hydrography, benthic flora and fauna, fish and protected areas. Due to the nature of the impact and its very narrow local limitation, no cumulative effects of pollutant release from the anodes of the pipeline during the operational phase are also projected. For the probable scenario of leaving the pipelines in place after de-commissioning, lasting effects may be lower than during the operational phase (cf. ancillary provisions, Part J.01, Chapter 12, Supplement A.3.15.9). This also applies to the release of metals from the sacrificial anodes: Under certain circumstances, these accumulate in an increased concentration at intersections of the two pipeline systems. However, this increase will be limited to the immediate vicinity of the pipes, will not degrade the sediment and faunal status (resulting chemical compounds are inert and non-

bioactive) and will decrease over time due to consumption (cf. application documents, Part J.01, Chapter 14)).

As a result, outside the German 12 nautical mile zone, in particular in Poland, material adverse effects on material goods or Natura 2000 areas in their constituents relevant to the conservation purpose, which have their cause in cumulating impacts or cumulative effects, can be excluded (cf. application documents, Part D1.01, Chapter 6.5.2, Part E, the project developer's Opinion on FFH-VU after the Hearing Procedure, November 2017). Submission of additional documents is not required.

B.4.8.21.8.10 Avoidance and mitigation measures

The objection (10) concerning the precise identification of mitigation and mitigation measures, including construction time restrictions, which avoid and reduce the negative impact on the environment, is rejected.

The PD is committed to mitigation measures where identified negative impacts must be minimised. The necessary measures are - in accordance with the legal requirements (Annex II e) of the Espoo Convention, cf. also Section 5 (3) (b), Annex IV (6) EIA Directive) - provided in particular in Chapter 10 of the Espoo Report cf. application documents, Part J.01) and are summarised in Chapter 16. In addition, the measures described in the national application documents (cf. application documents, Part D1.01, Chapter 7, Section B.4.4.1.9.1), which were imposed on the project developer for implementation (see Section A.3.8.2), are considered sufficient. Contrary to the objections, it is not necessary to require detailed proof of the effectiveness of the measures in question if they are recognised and proven measures (e.g. limitation of pollutant discharges from ships into waters). The approach taken by the project developer to mitigate negative environmental effects is in line with the requirement "to provide a description of measures designed to avoid, reduce and, where possible, eliminate significant adverse effects;" as stated in Section 5 (3) (b). and Annex IV (6) of the EIA Directive and a similar requirement set out in Annex II (e) to the Espoo Convention. Effects of the project from the German 12 nautical mile zone on Polish tangible assets or the Polish environment are not expected, so there is no need to submit further documents (note: the Polish references refer to Section 5(1)(c) and Annex IV, paragraph 7 of Directive 2014/52/EU; however, for Nord Stream 2, Directive 2011/92/EU will apply before its amendment; see. Recital 39 and Section 3(2)(b) Directive 2014/52/EU). A construction period restriction in the Swedish EEZ and within the proposed Natura 2000 area SE0330380 cannot be taken into account within the project subsector considered here. As explained in the Espoo Report (cf. application documents, Part J.01, Chapter 10.6.3), the blasting of munitions - limited to Finnish and Russian waters - is the only source with a noise level that could potentially harm fish (hearing damage to the hearing aid) or lead to fish mortality. However, such an assessment cannot be the subject of the German planning approval procedure.

B.4.8.21.8.11 Monitoring

The objection (11) concerning the further coordination of the monitoring programme within the HELCOM working groups is rejected.

Conceptually, the monitoring programme has been set out in Chapter 18 (cf. application documents, Part J.01). With the corresponding additional provision (see ancillary provision A.3.8.5), the PD was given the task of carrying out this monitoring and to submit an implementation plan based on the concept before the start of the construction work and to coordinate it with the national technical authorities. The need to consult international working groups is not apparent. A final examination lies with the Stralsund Mining Authority as competent national authority.

The concerns regarding a sufficient presentation of the intended monitoring measures are also unfounded. The PD sets out the experience of monitoring the construction and operation of the Nord Stream pipelines (extensive investigations from 2006 to 2016 including sediment samples, turbidity, flora and fauna) as well as the national monitoring requirements of the transit countries crossed by the project (cf. application documents, Part J.01, Chapter 18). This complies with the requirements of the Espoo Convention, which does not contain specific requirements for the design of the monitoring approach, but merely "*provides, where appropriate, an overview of the monitoring and management programs and any plans for post-implementation analysis*" (see Annex II letter h) Espoo Convention). Possible specifications are provided only as part of the public participation and consultations of the parties after the completion of the Espoo documentation by corresponding stipulations in the authorisations (Sections 5, 7, Annex V Espoo Convention, see also Sections 9, 11 (1) No. 5 of the Contract Law on the German-Polish EIA Agreement). The previous lack of differentiated monitoring elements described in the Espoo Report is therefore harmless (cf. application documents, Part J.01, Chapter 18, also Annex II, g, Espoo Convention). Further public participation in their supplementation is not required. This applies in particular to the monitoring of Polish waters, for which no significant environmental impact is detected anyway.

B.4.8.21.8.12 Fishery

The objection (12) concerning missing information on possible restrictions or impediments to fisheries is rejected. Reference is made to the comments in section B.4.8.11 of the decision. Effects on fisheries from the project in the German 12 nautical mile zone cannot be expected either nationally or across borders.

B.4.8.21.8.13 Maritime spatial planning

The objection (13) concerning the factual and clear (no different interpretations) reference to comments and doubts of the Polish Ministry of Energy for Maritime Spatial Planning is rejected. The issues were described by the PD in the Espoo Report (cf. application documents, Part J.01, Chapters 10.6.6, 10.6.7, 10.9.8). The spatial planning issues were given sufficient weight, in particular in the consideration (see section B.4.8.1 of the resolution); however, a referral to individual planned infrastructure projects was not required in this context. Effects on maritime planning from the project in the German 12 nautical mile zone cannot be expected either nationally or cross-border.

B.4.8.21.8.14 Climate

The objection (14) concerning the incomplete analysis of the direct and indirect environmental effects on the climate is rejected. The effects on the protected asset, the climate, have been sufficiently considered for construction, plant and operational reasons (see section B.4.4.2.6 of the decision). It is incomprehensible how the pipeline, as a pure transport infrastructure, should produce CO_2 emissions of 106 million t/a, as given in the Polish statement. As a pure transport infrastructure, the project does not influence the energy requirements within the EU but contributes to the security of supply. The energy-economic justification of the project has been explained (see section B.4.1 in detail). In addition, as a substitute source for energy from coal, gas continues to play a key role in reducing CO_2 emissions, even as renewable energy is increased. In addition, the project has proven to be more efficient and less polluting than sea transport of heavy oil or alternative gas import options (e.g. land-based pipelines) (cf. application documents, Part J.01, p. 38 et seq.). Impacts on the climate from the project in the German 12 nautical mile zone cannot be expected either nationally or cross-border.

B.4.8.21.8.15 Subsequent information/objections

The information sent after the discussion on 26/09/2017 concerning the monitoring of porpoises in Polish marine areas, chemical and conventional munitions dumped in the southern Baltic Sea and the development of Polish seaports is detailed in the contributions and also in the objections in the letter dated 18/08/2017 whose content corresponds to the objections in the letter dated 30/06/2017. The contents of the above points were referred to in the letters dated 26/09/, 09/10/2017 to Denmark. In this respect, reference is made to the above statements.

B.4.8.21.8.16 Saltwater inflow

Regarding a possible barrier-related effect on the site, it was argued during the discussion (see Word Protocol, p. 475) that this could affect the sporadic saltwater inflow from the North Sea to the Baltic Sea, with corresponding impacts on species/biodiversity and between Bornholm and Gotland Basins. The objection is rejected. This question has no relation to the planned route section of the Nord Stream 2 pipeline in the German 12 nautical mile zone. The pipeline route in Germany lies outside of the Greifswalder Bodden in water depths between 15 and 30 m and thus completely above the halocline, which lies at the Bornholmbecken at depths of 50 to 60 m. Salt water from the North Sea always flows below the halocline due to its higher density. The fears expressed are therefore unfounded for the section to be planned in the German 12 nautical mile zone.

B.4.8.21.8.17 Russian, Finnish and Swedish protected areas

As far as objections are raised by the Polish side regarding Russian, Finnish and Polish protected areas, these objections are rejected (see minutes p. 462, 474 et seq.).

The project in the German area has no significant impact on either the Russian protected area in the Narva Bay area or on Finnish Natura 2000 areas - nor does the project lead to any significant damage in Swedish European protected areas. The Espoo report provides a sufficient and appropriate basis for assessing the potential impact on these areas. For details, please refer to Sections B.4.5, B.4.6, and B.4.7.

B.4.8.21.8.18 Harbour porpoises

Objections of the Polish side concerning harbour porpoises are rejected.

The harbour porpoise has been adequately considered in the application documents, including with regard to its high level of protection and endangerment, with respect to its preservation and behaviour (cf. application documents, Part D.01, p. 352 et seq.). No expulsion of living beings nor high energy losses due to avoidance strategies are to be expected. Concerns of this nature by the Polish Ministry of the Environment regarding insufficient analysis of the impact of the project on harbour porpoises are unconvincing. For details, please refer to Sections B.4.5, B.4.6, and B.4.7.

B.4.8.21.8.19 Fish population

Objections of the Polish side concerning the fish population are rejected.

The project will not significantly affect the fish population. The documentation proves this in a comprehensible way and on a sufficient data basis (enquiries with national institutes and International Council for the Exploration of the Sea (ICES)), so that contrary to the objections no further requirements to the description of the habitats along the pipeline route, the quantification of the effects or the monitoring of the population stock are required. For details, please refer to Sections B.4.5, B.4.6, and B.4.7.

B.4.8.21.8.20 Demands from the German-Polish consultation

Any points declared as remaining by the Polish side in the Polish-German consultation on 05/12/2017 and concretised by the Deputy Director-General for Environmental Protection of 12/12/2017 to the BMVI, are rejected, unless they are accepted by stipulations in this decision. Specifically, this is to be done as follows:

1) The Polish side (Directorate-General for the Environment) must be informed of any changes/corrections to the pipeline route of the Nord Stream 2 pipeline in its German part affecting the environment, specifically with regard to the variant named in the Espoo report and the documents submitted to the Polish side as part of the cross-border EIA.
2) The permit to carry out the Nord Stream 2 project shall take into account the plans of the Republic of Poland for the development of the ports of Świnoujście and Szczecin and the safety issues of navigation in the area of the northern harbour approach by ensuring that after pipelaying, the water depth above the top of the pipe in the crossing area of the pipeline with the shipping lane to the harbour approach is not less than 17.5 m over a width of 3 nautical miles (approx. 6 km).

3) The operator shall be required to investigate sediments for the presence of chemical warfare agent derivatives prior to commencing work on the seabed, in particular near the shipwreck sites on the Nord Stream 2 pipeline route at the Adlergrund and on the Saßnitz-Rönne and Wolgast-Rönne routes, as well as to exercise particular caution in the areas where chemical munitions might be present, e.g. near the sunken wrecks.
4) Pursuant to Article 7 of the Espoo Convention, after consultation with the Polish side as the party concerned, the scope of the analysis/monitoring after execution of the project must be specified:
   a) Since the German side announced that the corresponding data was unavailable at the present time and therefore the final decision would only refer to the need for monitoring and state that the monitoring programme itself should be developed at a later stage, the Polish side demands to be involved as a participant in the development of the monitoring programme. In addition, the Polish side expressly requests that the monitoring results are handed over in their original form (raw data).
   b) In the present absence of any agreement on the participation of the Polish side in the development of the monitoring programme, the Polish side announced that it would submit detailed demands within a few days on the aspects to be taken into account in the Nord Stream 2 monitoring programme.

Re 1) Section 73(8) VwVfG M-V (German Administrative Procedures Act for Mecklenburg-West Pomerania) regulates how to proceed in the case of changes to the plan prior to issuing a decision; the fourth sentence of Section 9(1) UVPG, old version, (valid until 01/06/2017) stipulates in which cases a new public participation may be waived in the event of a change in the documents under Section 6 UVPG old version (valid until 28/07/2017). Section 76 VwVfG M-V (German Administrative Procedures Act for Mecklenburg-West Pomerania) specifies the cases in which, after planning approval, a new planning approval procedure with corresponding cross-border public authority and public participation is to be carried out. Since the cases in which information or involvement of the Polish side has to be take place, i.e. in case of possible cross-border effects of the German project part in Polish territory, are regulated (Section 2(1), Section 1(1) German-Polish EIA Agreement, Section 2(4), Section 3(1) Espoo Convention), no further or separate regulation is required in this plan approval decision.

With regard to 2) as stated above in relation to the Polish objection 4, only sufficiently concrete and consolidated planning intentions can call for consideration compared to possibly conflicting plans (BVerwG (German Federal Administrative Court), ruling of 05/11/2002, 9 VR 14/02, NVwZ 2003, 207, 208; BVerwG, ruling of 26/03/2007, 7 B 73/06, NVwZ 2007, 833). In the opinion of the planning approval authority, there may be such planning in relation to the development of the ports of Świnoujście and Szczecin, but this is not sufficiently true of the concrete implementation and, above all, not with regard to any necessary extension of the shipping lanes. The planning approval authority is also unaware that the Polish side has started public and agency involvement in such specific plans, as required by the Espoo Convention or the EIA Bilateral Agreement. Moreover, the established plan takes sufficient account of the interests of the ports of Świnoujście and Szczecin in

so far as the navigable depth in the shipping lanes to the ports does not change as a result of the project.

With regard to 3) corresponding measures have already been taken by the project developer, as set out in the application documents, Part C.01, Section 3.3.2. Large-scale sediment surveys near unspecified shipwreck sites are not relevant for the assessment of the project (cf. Section B.4.4.2.3). In this respect, there was no need for further commitments in relation to the project developer.

With regard to 4), in accordance with Section 7 of the Espoo Convention, the parties concerned shall, at the request of any of them, determine whether and, if so, to what extent, an analysis shall be made after the execution of the project, taking into account the likely significant adverse cross-border impact of the activity for which: an environmental impact assessment has been carried out in accordance with the Convention. Any analysis carried out after the implementation of the project shall in particular include the monitoring of the activity and the identification of any adverse cross-border effects. Monitoring and detection may be carried out in order to achieve the objectives set out in Annex V. In the EIS (Environmental Impact Study) (cf. Application documents, Part D.01, Section 10), the project developer submitted proposals for project-related monitoring, according to which adequate data for the analysis after implementation of the project are provided in accordance with Section 7 of the Espoo Convention. As a result, no decision need be taken on the scope and extent of any analysis until after the project has been completed. A detailed vote for the monitoring to be implemented with the German authorities was imposed on the project developer, which it is obliged to implement (see ancillary provision A.3.8.5).

There are no significant adverse environmental effects that would be relevant for the assessment in this plan approval.

B.4.8.21.8.21 Other comments

In the context of cross-border participation, the following non-governmental organisations have also submitted comments: Client Earth from Poland regarding the German sections by letters dated 09/06/2017, 16/06/2017 (letter dated 05/07/2017), 28/08/2117, the Federal Office for Infrastructure, Environmental Protection and Services of the German Armed Forces on the Danish section by letter dated 19/09/2017 (Public authorities & representatives of the departments concerned), the NABU Federal Office on the Danish section by letter dated 24/10/2017, and as a follow-up to the discussion with Darłowska Grupa Producentów Ryb i Armatorów Łodzi Rybackich on 24/07/2017. The letters received for the non-German sections were sent to the competent authority. Client Earth expressed concerns about the project in the comments. The main points mentioned were insufficient information regarding the impact on Natura 2000 areas; it was not apparent that the Polish areas 22 km away from the pipeline would not be affected; the documentation would not be complete for climate and air analysis of the states close to the project; the environmental impact assessment in Finland and Russia is inadequate; a permit would be contrary to the Marine Strategy Framework Directive (2008/56 / EEC); it lacks an analysis of the ‘zero variant’; public opinions was generally against the project. These are essentially in line with the objections raised by the Republic of Poland; environmental impact procedures in Finland and Russia

were not examined. Darłowska merely reaffirmed the contributions to the oral discussion. The objections are rejected. In support of this, reference is made to the above remarks on Poland's objections and the explanatory memorandum of the decision.

B.4.9 Balancing the interests of recognised nature conservation and other associations/decisions

Through nature conservation organisations or their representatives, several statements were made. These are the letters from the Landesanglerverbandes MV eV [State Fishing Association of Mecklenburg-Western Pomerania] dated 22/05/2017, the NABU/NABU Mecklenburg-Western Pomerania from 31/05, 16/11, 20/12/2017, the RA Kremer for WWF Germany, WWF Baltic Sea Office, BUND (Friends of the Earth Germany) Mecklenburg-Western Pomerania from 31/05, 20/11, 19/12/2017, and the BUND Mecklenburg-Western Pomerania from 31/05, 16/11/2017. These issues are subsequently treated as topics without explicitly and completely naming all submitters.

B.4.9.1 Justification of plans

NABU, BUND (Friends of the Earth Germany) and WWF question the plan justification under different aspects. The planning approval authority has stated in Section B.4.1 that it considers the project to be justified according to the purpose of the EnWG (German Energy Industry Act). Reference will be made to this. Moreover, the following points should be added to the individual criticisms:

From the point of view of the planning approval authority, the project is also necessary in view of the climate protection targets cited by NABU, by which Germany is bound. Reference is made to section B.4.1. As stated above, the planning approval authority does not share NABU's view that no capacity deficit exists for the project to cover. From today's point of view, a complete electrification of EU economies within the next 30 to 35 years seems technically scarcely feasible and economically unsustainable. This becomes clear when looking at the climate change targets of the Federal Republic of Germany so far achieved, or in most cases, missed (cf. application documents, Part A.01, Sections 5.3.2.3.3.3 to 5.3.2.3.3.5, p. 55 et seq.).

B.4.9.2 Technical safety, maintenance, dismantling, alternatives

As stated in Section B.4.8.17, the project meets the legal and regulatory requirements for technical safety. A risk with regard to the proximity to other pipelines or the facilities of the EWN does not contradict this, as NABU accepts. Of course, terrorist attacks can never be completely ruled out; this risk exists in every location and is not exceptionally higher in Lubmin than if the landfall were situated elsewhere. The necessary information on maintenance and de-commissioning is contained in the technical explanatory report (cf. ancillary provisions, Part C.01, Section 4.4.5.3, 4.4.5.4, Section 4.5, p. 205 et seq., collateral clause A.3.15.9) and is sufficient, meaning that the contrary view of NABU should be rejected. Based on the experiences of the first 6 years of operation of the Nord Stream Pipeline, it is unlikely

that correction of free spans will be required, contrary to BUND's concerns (Friends of the Earth Germany).

The requirement of NABU and BUND (Friends of the Earth Germany) for consideration of an accident case has not been met, because if the pipeline is constructed according to the relevant internationally recognised technical regulations, and taking into account the recommendations of the prepared risk studies, it can be excluded with a probability that such a scenario lies outside every life experience (cf. application documents, Part A.01, Section 5.4.3.3.1, p. 117, Part D1.01, Section 1.6.5, p. 69, Part C.01, Section 4.4.1, p. 193). The precise instructions, operational troubleshooting instructions, contingency plans, and alarm and hazard prevention plans are modelled upon and created based on knowledge of the operation of other pipelines, e.g. Nord Stream. Experience has shown that the above measures and instructions can reasonably exclude accidents and incidents. These instructions are compiled on the commissioning of the pipeline, so that they are available when normal operation is started. Based on the premise that the state-of-the-art natural gas pipeline is safe, there is no further need to investigate, describe and assess impacts that could otherwise be caused by accidents or incidents outside normal operation. This satisfies the purpose of the environmental impact assessment. (...) Rather, the determination of the facts must be limited to the reasonably foreseeable (explicitly: OVG NRW, decision of 04/09/2017, 11 D 14/14. AK, Juris margin no. 92ff).

The requirement of NABU and the WWF for the dismantling is rejected in accordance with the requirement of the WWF and BUND (Friends of the Earth Germany) insofar as the project developer is initially obliged to submit a decommissioning concept (cf. ancillary provision A.3.15.9). At the time of the final decommissioning of the pipeline, the then competent authority will decide, in the light of the then applicable legal and environmental conditions, what measures should be taken. With regard to the dismantling safety demanded by NABU, WWF and BUND (Friends of the Earth Germany), there is currently no definite decommissioning obligation nor an otherwise sufficient legal basis. It also appears disproportionate to the planning approval authority to reserve billions over 50 years for a case when it is not clear whether it will even occur at all.

The document submitted for the alternative examination (cf. application documents, Part B.01) was examined and accepted by the planning approval authority. Reference is made to the summary of the spatial alternative testing in Section B.4.3. From the point of view of the planning approval authority, bundling as much as possible with the existing Nord Stream within a marine reserved area is an appropriate route. The demands of NABU, BUND (Friends of the Earth Germany) and the WWF for further alternative testing are rejected because from the point of view of the planning approval authority, no other alternatives appear better in terms of achieving the described project purpose or, insofar as the German area of responsibility is concerned, of entailing less environmental impact. The route demanded by the BUND (Friends of the Earth Germany) via Rügen is not only clearly disadvantageous, but beyond that unreasonable and incompatible with regulations of area protection (cf. Section B.4.3 and B.4.5.2.3.2). As regards the arguments cited for the alternative at Mukran by BUND (Friends of the Earth Germany), the following should be stated:

The landfall of an offshore pipeline is only possible if the pig receiving station and the natural gas receiving station are present. They are therefore considered together in the alternative examination as a receiving terminal. The space requirement is specified in the alternative test (cf. application documents, Part B.01, p. 53, 330). The space requirement of the individual plant components and thus also the total area requirement of the natural gas receiving terminal in Lubmin can be calculated from the area information in Part D1.01, Section 6.5.3, Table 6-51 and Table 6-52, or by means of Map C.06, and show that there is at least 20 ha. It should be noted that sufficient space (approx. 6 ha) is available for the construction site in addition to the permanently required area. According to the information provided by the planning approval authority, these areas are not available on Rügen.

In terms of planning, greater closeness is only conceivable if pollution protection considerations are not breached during the construction phase or during the operation of the entire system. Based on calculations, it can be assumed that this will be the case at a distance of 800 m at a proportionate cost. The planning approval authority has answered the question of the correctness of the distance data by stating that the distance of about 1.0 to 1.4 km does not refer to the old Mukran site, but rather the new Mukran site. The old Mukran site would be located at a distance of less than 800 m from a receiving terminal in Mukran, so that immissions protection requirements would be met only with disproportionately complex, additional noise protection measures, for which this area has insufficient space. It is true that development plans can be changed, but also that development plans and the planning approval objectives of the regional planning have to be observed (Section 1(4) BauGB, Section 4 ROG). This means that opposing goals of regional planning, such as the settlement of harbour industries, cannot be overcome by weighing up the facts and circumstances, and are in conflict with a gas receiving terminal. With regard to the natural gas receiving terminal of a pipeline, the proximity of a harbour is only of advantage for the delivery of material during the construction period, as also described the paragraph on the alternative test referred to by BUND (Friends of the Earth Germany). Incidentally, as part of LEP 2016 the state of Mecklenburg-West Pomerania has defined what is to be understood as harbour-related in the sense of objective 4.3.1 (3) LEP M-V. The quote from footnote 93 shows that Nord Stream 2 does not fall into this category, because the harbour situation in the medium and long term, and therefore within the planning horizon covered by the State planning, does not entail any significant logistics and transport cost advantages for Nord Stream 2.

Offshore it should be borne in mind that the route proposed by BUND (Friends of the Earth Germany) does not change the fact that the Nord Stream 2 pipeline would cross a German army training area unbundled and outside the area reserved for pipelines shown in LEP M-V. The German army has expressed its view in the run-up to the application that an unbundled route would adversely affect the interests of the German army even more than a parallel pipeline route one to max. 2 nautical miles from the existing Nord Stream pipe (see letter dated 23/03/2016, 26/09/2016 [marked as VS-FOR OFFICIAL USE ONLY]).

The alternative assessment (cf. application documents, Part B.01) contains on pages 214 to 216 an FFH compatibility preliminary investigation for the FFH area DE1547-303. This is already sufficient to predict the risk of a significant construction-related impairment of the habitat type 3150 “Natural Eutrophic Lakes”. Habitat type 3150

would be directly affected by the site area, not by construction areas as stated by BUND (Friends of the Earth Germany). It may not be possible to restore the body of water after completion of the construction, as it is a former peat bog in a bog area. Due to its construction and installation, the pipeline route is very likely to lead to a permanent hydrological change in the small, thin moor, as the trench cuts through the peat body and any underlying soil horizons. Alternatively, the route would have to be run west of the moor through the forest. This would also be associated with a significant impairment of an FFH habitat type: “Hainsimsen beech forest” (habitat type 9110)

As regards the objections to other route sections, reference is made to Section B.4.2. The planning approval authority does not have to decide on alternative routes in the jurisdictions of other states.

B.4.9.3 Ordnance

BUND (Friends of the Earth Germany, WWF and NABU argue that based on available data over the entire length of the planned route, the possibility of occurrence of chemical and conventional munitions in the sediment has to be considered. Explosive munitions lying in the sea could still be capable of being detonated. The development of concrete action plans for the explosion-free disposal of ordnance is therefore essential. Without this, the extent of the intervention cannot be foreseen and assessed. For example, neither the extent of necessary munitions clearances or blasting is known, nor were the required additional excavations and fills were considered in water depths from 17.5 m. The related adverse effects could be relevant to the Natura 2000 area network due to cumulative or additive effects, even if they took place outside these areas.

Before the Nord Stream pipeline was laid, only a very small amount of ordnance had to be recovered and no objects were exploded at sea. The Nord Stream 2 approach will be the same as for the Nord Stream project. Due to the parallel route of the Nord Stream 2 route, a similarly low level of explosive ordnance is expected. In the course of the preliminary planning for the construction of the Nord Stream 2 pipeline, Nord Stream 2 AG once again collated and evaluated all available information on suspected munitions areas, in particular minefields and areas for the disposal of conventional and chemical weapons in the Baltic Sea. The results of this research were considered in the optimisation of the pipeline route. If in the course of the route inspection ordnance is unequivocally identified as safe for handling and transport, its salvage is carried out from the seabed by means of subsea basket. In the event that target objects cannot be identified with absolute certainty or if they are ordnance not safe to handle and transport, the pipeline route will be relocated. For this purpose, taking into account a minimum safety distance to the ordnance and other local conditions, a local re-routing of the pipeline will be carried out (cf. application documents, Part C.01, Section 3.3.2.5, pp. 89 et seq.). Based on the experience of the Nord Stream project, excavations and fills are not to be expected at a water depth of 17.5 m.

B.4.9.4 Marine interim storage site

BUND (Friends of the Earth Germany) raises doubts about the plausibility of the application documents, pointing out that the marine interim storage site near Usedom in the Nord Stream 2 project is smaller by 1 km² compared to Nord Stream. This objection is unfounded. From the point of view of the planning approval authority it is understandable that the marine interim storage site used in the construction of the Nord Stream pipeline comprised a planning area of4 km², of which an area of approx. 3.35 km² could be used for technical and ecological reasons; and during construction an area of 2.86 km² was used in 2010 and 2011 (Nord Stream seabed monitoring 2012, Section 4.6, p. 54 et seq.). The Technical Explanatory Report (cf. application documents, Part C.01, Section 3.3.3.3, p. 96 f) states that the proposed marine interim storage site of the Nord Stream 2 pipeline, inter alia, includes the area already used for the Nord Stream pipeline. In the process, the areas of the Nord Stream interim storage site were re-measured for Nord Stream 2 and reassessed for environmental suitability, with the consequence that not all areas already used by Nord Stream are also available for Nord Stream 2. In addition, the storage area was extended to the east in order to realise the digging of both trenches in the Pomeranian Bay in one season. The dredging work involved in the construction of the Nord Stream pipeline extended over two years, so that the separate ditches were through the Pomeranian Bay were dug in separate years and so the same areas could be used several times for the intermediate storage of suitable backfill material. Because the fill level is limited due to the shallow water depth of the interim storage site, Nord Stream 2 requires an additional area. The estimated area measures a total of 3.1 km². Assuming that this area (only) extends over significant parts of the 2.86 km² area used by Nord Stream, the entire interim storage site is approximately 20% larger than the interim storage site for backfilling material used in 2010 and 2011.

The regeneration of the marine interim storage site was investigated as part of the Nord Stream monitoring in the years 2012 to 2014 and again in 2016. The data documents a nearly identical settlement of storage areas and reference areas within a few years. The fact that the benthic population at all stations investigated differs from the state in 2008 is a consequence of recurring O_2 deficiency events in the area of the old Oder bed since 2010 (cf. application documents, Part D1.01, p. 168). The objection of BUND (Friends of the Earth Germany), in which doubts about the regeneration are raised, is therefore rejected.

The construction-related use of the marine interim storage site will result in a reduction in food availability for approximately 100 long-tailed ducks for the duration of a winter season. These creatures will be able to move easily to other areas of the Pomeranian Bay The winter population of the long-tailed duck is currently 0.25 to 0.5 million individuals. In the 1990s, over 1 million long-tailed ducks wintered in the Pomeranian Bay. The ecological capacity limit of the wintering area is currently no longer exhausted as a result of the stock decline of this species (cf. application documents, Part D1.01, p. 317 et seq.).

With regard to fish-eating seabird species, the use of the marine interim storage site is almost irrelevant since this will be cleared out at the end of November and at this time of year has no significance for fish-eating seabird species in the Pomeranian

Bay. The food supply of overwintering fish-eating seabird species is not affected by the project (cf. application documents, Part D1.01, p. 578).

The Nord Stream turbidity monitoring during the construction phase, the seabed surveys of the areas adjacent to the marine interim storage site with outcropping till by means of multibeam echo sounder and side-scan sonar, as well as the sedimentological surveys on the interim storage itself, have shown that the suspension of dredged material has no adverse effects on the environment of the marine interim storage site (Nord Stream construction monitoring 2010, pp. 81 et seq., Nord Stream seabed monitoring 2012, p.54 et seq., Nord Stream offshore monitoring 2012, pp. 17 et seq.). With regard to the assessment of the intervention resulting from the use of the interim storage site, reference is made to Section 4.8.4.2.

B.4.9.5 Ship movements to and from the marine interim storage site, piledriving

In the opinion of BUND (Friends of the Earth Germany), the necessary extensive ship movements for soil transportation to and from the marine interim stockyard were not properly considered as regards their intervention effects. Furthermore, required piledriving work on the pipeline route would be of far-reaching importance in relation to marine mammals and could devalue the habitats over a period of many weeks and possibly lead to hearing damage.

The objection is rejected, as possible effects of sediment transport in the environmental impact study, where necessary, are considered in detail as regards protected assets, e.g. as part of the impact assessment of resting birds (cf. application documents, Part D1.01, Section 6.2.4.2.5, p. 573 et seq.). No piledriving will be carried out as part of the offshore construction work (cf. application documents, Part D1.01, Section 6.2.4.2.6, p. 582 et seq.).

B.4.9.6 Transfer of organic material, procurement of embedding material

From the point of view of the planning approval authority, there are no insurmountable obstacles to the transfer of organic material extracted outside the water body and the procurement of the material needed to restore the original sediment conditions. The Nord Stream project has shown that the required capacity could be obtained on time. Any market-related changes are hedged by ancillary provisions A.3.8.23 and A.3.8.24. The objections of NABU, WWF and BUND (Friends of the Earth Germany) on this point are rejected.

As shown in the Environmental Impact Study, it is assumed that the marine deposit site from which the embedding material originates must have an approved mining master plan, otherwise no material may be taken. Extensive environmental studies have already been carried out in connection with the framework and master plan procedures, which have been incorporated into comprehensive environmental documentation. As part of the mining legal process, all environmental aspects have already been considered and evaluated. The Nord Stream 2 project does not result in additional environmental impacts beyond the scope of the master plan (cf. application documents, Part D1.01, Section 6.7, p. 741 et seq.).

The extraction of the embedding material is not part of the planned project. The suppliers of the material are responsible for the approval and environmental compatibility of the extraction. For the approval procedure for the Nord Stream 2 pipeline, the environmental impact assessment has been carried out to the extent that this is currently possible (cf. application documents, Part D1.01, Section 6.7, p. 741 et seq.). Ancillary provisions A.3.8.23 and A.3.8.24 ensure that there is an appropriate means of transport or procurement prior to the start of offshore construction activities. Insofar as the corresponding objections of NABU and BUND (Friends of the Earth Germany) are not taken into account by these ancillary provisions, they are rejected.

B.4.9.7 Environment

B.4.9.7.1 Data basis and investigation methods

The objection of BUND (Friends of the Earth Germany) and the WWF that the application is not ready for decision due to a lack of adequate environmental planning cannot be accepted.

A comprehensible overview of the spatial and temporal dimensions of the project can be found e.g. in Section 5.4.3.3.7 'No pollution of the sea', indicating the geographical extent and duration (cf. application documents, Part A.01, p. 123 et seq.), with reference to the Environmental Impact Study. The opinion of NABU that this is not sufficiently presented is not shared by the planning approval authority.

The investigation area is appropriately sized. The contrary presumption of NABU and BUND (Friends of the Earth Germany) is rejected. Depending on the extent of the impact of the project (impact factors, impact areas), the protected assets in question and their functions are recorded and evaluated (cf. application documents, Part D1.01, Section 1.3 to Section 1.6, p. 49 et seq.). The detailed area to be investigated (duB) was derived on the basis of a detailed technical plan, which includes various additional mitigation measures compared to the construction of the Nord Stream pipeline (cf. application documents, part D1.01, Section 1.6.4) as well as concrete measurements of the range of possible adverse effects from the construction phase for Nord Stream (cf. application documents, Part D1.01, Section 1.4, p. 48 et seq.). Impairment of habitats extending beyond 100 m on both sides of the route are demonstrably excluded. In view of this deriving of the duB, it is not clear to what extent a more extensive investigation area could be required.

The objection of NABU that the information in the application on soft-shelled clams is not conclusive, is rejected. The development of the soft-shelled clam population in the Greifswalder Bodden is described in detail (cf. application documents, Part E.03, Section 3.3.1.2, p. 44 et seq.). The population slump 2009/2010 in relation to abundance is shown in Fig. 3-10 (p. 45) and Fig. 3-17 (p. 50) of the above-mentioned application document. It is differentiated depending on the water depth (especially strong effect >6 m, less strong effect <6 m). The Figures for the monitoring by WSA Stralsund were as taken from the original IfAÖ (2013[120]). The

[120] IfAÖ (2013): Monitoring of the benthic communities (macrozoobenthos) at the Strela Sound for the "7.50 metre expansion of the eastern approach to Stralsund" project - Brief report on the

situation of the presented transect data can be seen in Fig. 3-4, p. 40 (cf. application documents, Part E.03, Section 3.3.1.2). Further information can be found in the application documents, Part I3.04, Section 4.1.5.3.1.3, p. 45/46. The development of the soft-shelled clam population in the Pomeranian Bay is described in detail in the Nord Stream monitoring reports 2011 to 2013. The decline in 2010 was also registered as part of the WFD monitoring by LUNG M-V. The recent length-frequency distributions of soft-shelled clams along the pipeline route from 2016 are shown for the Pomeranian Bay (cf. application documents, part D1.01, Section 5.5.3., Fig. 5-47, p. 257 for the EEZ, creatures up to 3 years old, Fig. 5-52, p. 263 for territorial waters, creatures not older than 4 years, in the application documents, Part I3.04 - Offshore monitoring for Nord Stream 2016, Section 4.1.5.3.2.4, Fig. 4-43, p. 56 for the marine interim storage site near Usedom, creatures up to 3 years old) and for the Greifswalder Bodden (cf. application documents, Part I3.04, Section 4.1.5.3.1.4, Fig. 4-33, P. 48, creatures 5-6 years old). In the 1990s and 2000s, the soft-shelled clams in the sea area were larger/older (Kube 1996, Nord Stream application documents 2009). The continuous decline in large soft-shelled clam specimens since 2011 cannot be explained by seasonal hypoxia, as the much more O_2-sensitive cockle has increased significantly over the same period.

NABU believes that a serious methodological error has been made in the investigation methods for amphibians. The numbers of individuals in the amphibious facilities (such as traps, pails) determined in animal data collection are incorrect. For the planning approval authority, the selected examination methods are appropriate and acceptable. The objection is therefore rejected. The trap positions were selected according to the specified investigation area and adjusted if necessary. The minimum standards for animal data collection in accordance with the information on the intervention regulation M-V (LUNG M-V 1999) have been complied with. The drift fence traps were set up in accordance with the specifications in the Leaflet for Amphibian Protection on Roads (MamS) (cf. application documents, Part I1.03, Section 5.9, pp. 78 et seq.). There is no methodological error in the amphibious survey and the data used in the application documents.

The rows of buckets mentioned refer to the permanent amphibian barrier near the investigated alternative landfall point in Vierow. Due to the massive concrete base, it is not possible to get closer to the lock with buckets. This is not the case at the scheduled landfall point Lubmin.

B.4.9.7.2 Nord Stream monitoring

NABU and the BUND (Friends of the Earth Germany) complain that the freely accessible monitoring reports on Nord Stream would only present the results in a highly aggregated form. They do not permit any technical assessment of the methodology or interpretation of the data. This means that the aggregated monitoring report of Nordstream is unsuitable for drawing logical conclusions about the effects of constructing a pipeline. The underlying raw data of the monitoring reports are not publicly accessible. This results in an EIA deficiency.

investigation years 2005 to 2011, on behalf of WSV Stralsund.

This objection is rejected. The data from the comprehensive environmental monitoring of the Nord Stream pipeline are presented and cited at the respective text passage or in the respective context. The texts of the environmental documents, including the findings from the Nord Stream monitoring reports shown, are prepared in such a way for the Nord Stream 2 application documents that a comprehensible evaluation of the planned project is possible. The illustrations and text sections required to understand the line of reasoning in the Nord Stream monitoring reports have been incorporated into the Nord Stream 2 environmental documents, so that public accessibility of the raw data underlying the monitoring reports is not required.

The Nord Stream monitoring reports have also been sent to the competent nature conservation organisations (Stalu Western Pomerania, BfN) and to nature conservation associations recognised in Mecklenburg-Western Pomerania. Raw data would be available on request from Nord Stream. According to the case law, the evaluation of the raw data is the responsibility of the expert, which they then present in their report in a prepared form. Raw data would only be of significance here if grounds were presented or were discernible showing that the data were insufficiently prepared and not in an inappropriate form (see OVG Niedersachsen, decision of 22/04/2016 - 7 KS 27/15 -, Juris, margin no. 298 and 302; OVG NRW, decision of 29/03/2017 - 11 D 70/09.AK -, margin no. 459, Juris). A pertinent defect is therefore not apparent.

The monitoring was carried out professionally and complies with recognised standards. Contrary assumptions, which give rise to corresponding objections by NABU and BUND (Friends of the Earth Germany), are rejected. The Nord Stream Monitoring Germany 2010-2014 was based at least on the standards of the STUK (BSH 2007: Standard - Investigation of the Impacts of Offshore Wind Turbines on the Marine Environment (StUK 3), BSH February 2007: 58 p.). The annual reports present the test results in accordance with the specifications of the responsible permitting authorities for the monitoring concept (G-PE-LFG-SOW-000-MONITGER Nord Stream Monitoring Concept Germany 2010). Other testing methods not included in the STUK usually represented the most advanced measurement techniques (e.g. turbidity measurements using ADCP and aerial image analysis). The monitoring reports also detail the data collection and analysis methods.

The BUND’s (Friends of the Earth Germany) assumption that numbers of birds calculated in the monitoring are incorrect is rejected. Only one species of seabird registered an increase in numbers between 2006 and 2016 during the surveys for the Nord Stream Pipeline and Nord Stream 2 Pipeline projects: Report (Nord Stream Offshore Monitoring 2013, p. 529, cf. application documents, Part D1.01, Section 5.5.5.1, p. 344). In the Nord Stream 2 application documents (e.g. EIS, marine mammals inventory in Section 5.5.6.1), a probable relationship with other fish-eating species was mentioned in this respect, which have a similar distribution pattern in the Pomeranian Bay at the same time of the year in autumn and which were also increasingly encountered (harbour porpoise, grey seal). On the other hand, unchanged stocks have been described for all other species of seabirds (cf. application document, Part D1.01, Section 5.5.5.1, pp. 314 et seq., Nord Stream Offshore Monitoring 2013, pp. 503 et seq.). The causes of the low construction-related scare effects when laying the Nord Stream pipeline were identified in the Nord Stream monitoring reports 2010 and 2011 (Nord Stream construction

monitoring 2010, p. 132 et seq., Nord Stream-Monitoring Seevögel 2011, p. 26 et seq.):

- routing away from important seabird concentration areas,
- routing within areas already heavily affected by shipping,
- pipelaying outside relevant rest periods.

The results of the Nord Stream Regeneration Monitoring are confirmed by other surveys: Three extensive scientific surveys on the regeneration capacity of the benthic settlement in the sea area ofthe Pomeranian Bay have been available from the last 20 years:

- TRUMP Project of the Institute for Baltic Sea Research Warnemünde (1993-1997, for example Powilleit & Kube 1999),
- Coastal monitoring of the LUNG MV (continuous data surveys (since 1996, approx. 100 benthos samples analysed),
- Nord Stream / Nord Stream 2 monitoring (since 2006, Nord Stream monitoring reports 2010-2014, 2016 follow-up).

There are at least two extensive investigations of the Greifswalder Bodden area from the last 20 years:

- Monitoring for the expansion of the eastern approach to Stralsund of the GDWS (WSA Stralsund 2005-2011, IfAÖ 2013)
- Nord Stream / Nord Stream 2 Pipeline Monitoring (since 2006, Nord Stream Monitoring Reports 2010-2014, 2016 follow-up)

In addition, further applied investigations from the monitoring of sand harvesting from comparable biotopes by the state of Mecklenburg-Vorpommern after partially similar interventions are available (e.g. IfAÖ 2008).

There are also numerous surveys on the effects of interventions with other types of permanent impairment (dumping, stationary gravel extraction, e.g. DYNAS projects 2000-2003, Krause 2002), which allow indirect, general conclusions about the regeneration process (keyword: sediment parameters).

In addition, a large number of scientific surveys exist from the past 30 years on the regeneration capacity of macrozoobenthos in the western Baltic Sea above the halocline after natural disturbances at constant sediment ratios (O_2 deficiency, salinity changes due to salt water inflows, sediment redistribution, ice drift), which are already used as the basis for the Planning approval for the Nord Stream pipeline. The detailed monitoring of Nord Stream / Nord Stream 2 confirmed these forecasts and was also able to completely eliminate the technology-related forecast uncertainties existing at that time. The existing knowledge thus enables a very high forecasting certainty for the marine biotopes affected by the project, which far exceeds those for most terrestrial biotopes.

The comparison between reference stations on the backfilled pipe trench and preliminary investigations in 2006 (grain size, silt, organic content, abundance and biomass of the dominant benthos species), the absence of which was noted by NABU, in relation to the offshore monitoring in 2016 has already been carried out,

contrary to the assumption of the NABU (cf. application Document, Part I3.04, p. 57 et seq.). The objection is therefore rejected.

The difference in the proportion of size class 3 mm in the length frequency spectrum between the trench and the reference area (cf. application document, Part I3.04, p. 114) can be explained ecologically from the point of view of the planning approval authority by the different sampling times and, contrary to the objection of NABU, does not represent an assessment deficiency. The proportion of juvenile *Mya arenaria*, which was significantly reduced at the beginning of June (sampling time of the trench) in contrast to April (time of sampling reference area) can be attributed to mortality, predation and growth. Furthermore, immediately after the larval settling stage, a high mobility of the juveniles (bedload sediment transport <2 cm, see also the remarks by NABU) can be assumed. All other size classes show no clear differences, even the maximum measured mussel lengths suggest an otherwise identical age structure of the population.

B.4.9.7.3 Sacrificial anodes, aluminium, zinc

NABU points out that the pipelines lying on the seabed would form an artificial reef that would be colonised by mussels, which in turn would serve as a new food source for long-tailed ducks, amongst others. It should therefore be assumed that the aluminium will accumulate in the mussels and be passed up the food web to accumulate subsequently in the higher consumers. The applicant's assessment, which is based solely on a short-term measurement of concentrations in the water, is not sufficient for the assessment of long-term impacts, in particular of enrichment in different species or the food chain. Cumulations with sacrificial anodes from the existing Nord Stream pipeline or from offshore wind turbines or ships are not considered. ZnS and $AL(OH)_3$ are currently accumulating on sections where the pipeline is covered with sediment (anoxic conditions). The conclusion that significant environmental impacts are not possible lacks reasonable justification, because the long-term impact must also be considered. The applicant indicates that this problem exists should the pipeline be used beyond 50 years and the consumption of 50% of the active material in the sacrificial anodes. However, only a few pages later the applicant qualifies this by stating that a program for de-commissioning will be worked out only in the late years of the operating phase. The fact that dissolved Al^{3+} ions are toxic to plants is critical, as they cause root damage and decrease phosphate uptake; aluminium from mining waste has a detrimental effect on all aquatic biocenoses (aluminium ions would settle on the gills, clogging them with mucus and thus hinder breathing). Aluminium is also a known neurotoxin. It damages the nervous system and depending on the concentration can, for example, lead to the loss of the sense of direction in salmon. The forecast of permanent, insignificant environmental impacts is implausible without adequate investigation results.

The release of substances from the material of the sacrificial anodes is described in the application documents (cf. Part C.01, Section 2.2.3.3, pp. 32 et seq., Part D1.01, Section 6.2.1.2.1, pp. 476 et seq., Section 6.2. 2.2.1, pp. 509 et seq., Part H.02, Section 6.1.1, pp. 76 et seq.) and evaluated in detail. The planning approval authority does not share the views of NABU and BUND (Friends of the Earth Germany) on the adverse effects of sacrificial anodes and therefore rejects the objections. Aluminium is not known as a pollutant in the marine environment. There

is currently no evidence that aluminium is having a harmful impact on the prevailing concentrations in the marine environment. The installation-related effects do not lead to relevant impacts.

The aluminium hydroxide accumulates along the buried pipes in the sediment. An accumulation of aluminium in organisms does not occur, since this naturally very frequent metal is largely insoluble in the pH range of the Baltic Sea (7-8) ($Al(OH)_3$). Al^{3+} is does not occur in the marine environment, as the corresponding acidic pH values cannot arise (Angel et al 2016[121], Golding et al. 2015[122]).

It can be seen from the Nord Stream monitoring (Nord Stream 2013c, p. 31) that there is no measurable increase in the concentration of zinc in open water in the central Baltic Sea in the vicinity of sacrificial anodes at a distance of 1-2 m from reference points. Zn, as Al, is a very common, naturally-occurring metal. The concentration in the sediments along the trenches approximately corresponds to the natural background value for Baltic sediments (Zalewska et al., 2015[123]). The concentration therefore corresponds to a good condition according to the target values of the WFD. In the sediment, the Zn of the sacrificial anodes is presumably predominantly deposited as ZnS. The Zn of the overlying pipelines is mainly oxidised in the water column as ZnO. In addition, Zn forms various inorganic and organic complex compounds depending on salinity, temperature and pH.
Zn is especially of importance as a trace element for planktonic microorganisms. Its toxicity is very low for most marine organisms. The concentration of dissolved Zn in the open water of the Baltic Sea is far below PNEC values. The introduction from the sacrificial anodes does not cause a measurable increase in the concentration of dissolved Zn in open water (Nord Stream monitoring in Finland and Russia, p. 11, 13, 27 et seq. 31 et seq.).

The planning approval authority has tested alternative corrosion protection systems, as requested by NABU, with the result that reliable corrosion protection cannot reasonably be guaranteed otherwise. According to the relevant technical regulations (DNV-RP-F103: 2010 and ISO-15589-2: 2015), corrosion protection in offshore pipelines is achieved by combining a corrosion protection coating (primary, passive) and sacrificial anodes (secondary, active). External current and external current anodes are not suitable and do not meet the requirements of offshore requirements of an active corrosion protection system, because anodes cannot be installed or operated with controllable power sources on offshore pipelines with reasonable technical effort.

B.4.9.7.4 Macrophytes

[121] Angel, BM, Apte, SC, Batley, GE & Golding, LA (2016): Geochemical controls on aluminium concentrations in coastal waters. Environ. Chem. 13, 111-118.
[122] Golding, LA, Angel, BM, Batley, GE, Apte, SC, Krassoi, R, Doyle, CJ (2015): Derivation of a water quality guideline for aluminium in marine waters. Environ. Toxicol. Chem. 34, 141-151.
[123] Zalewska, T., J. Woroń, B. Danowska, M. Suplińska (2015): Temporal changes in Hg, Pb, Cd and Zn environmental concentrations in the southern Baltic Sea sediments dated with 210Pb method. Oceanologia 57, 32-43.

NABU pays no attention to the fact that submerged macrophytes often counteract a negative impact to a certain dimension through different feed-back mechanisms. This makes the point at which a "switch" (i.e. breakdown) occurs difficult to predict. Due to the prior existence of heavy pollution in the Baltic Sea, however, the risk of reaching this tipping point is increased by every further (even only "temporary") deterioration. In the event of large-area collapses, this self-preservation function becomes disturbed and it is extremely difficult to re-stimulate. This can be observed in the disappearance of extensive zostera stock.

This objection is rejected. Nord Stream AGs regeneration monitoring observations show that restored reef structures were already overgrown with macrophytes within one year and that the macrophyte communities had been regenerated after three years (Nord Stream Offshore Monitoring 2011, p. 346 et seq., Nord Stream Offshore Monitoring 2012, p. 366 et seq., Nord Stream Offshore Monitoring 2013, p. 269 et seq.). Sea grass meadows (*Zostera*) do not occur in the vicinity of the planned route. It is very rare to detect only individual plants (cf. application document, Part D1.01, Section 5.5.2.1, p. 249).

B.4.9.7.5 Benthic communities

The benthic communities are classified in accordance with the population evaluation. Assessment using the criteria of “diversity and individuality“, “regional or supraregional importance”, “rarity and endangerment” and “naturalness” formed the basis for the overall assessment of the benthos from the point of view of nature conservation. Accordingly, the contention of the Bund für Umwelt und Naturschutz Deutschland (Friends of the Earth Germany) that an evaluation of “minor importance” is inappropriate cannot be accepted. The macrozoobenthic communities in the Pomeranian Bight (EEZ and 12 nautical mile zone) can be considered minor in respect of the regional or supraregional significance criterion as they represent the dominant community in the coastal regions of the eastern Arkona Sea and the western Bornholm Sea (cf. application document, part D1.01, p. 278). The areas of the Bay of Greifswald [Greifswalder Bodden] studied were also populated by widely dispersed macrozoobenthic communities in the Spring of 2016, so that here the regional or supraregional importance can be classed as minor (cf. application document, part D1.01, p. 278). The classification of importance will therefore not be uprated.

NABU assumes that extraordinarily strong inflows of fresh water in 2011 and 2012 were the cause of the particularly positive development of the benthic communities detected during the Nord Stream monitoring programme. This would not be the case in a period of lower salt water inflows. Regeneration of the benthos lasting for clearly more than ten years, under some circumstances, should then be assumed. This objection is rejected. Salt water inflow events have no influence on the duration of benthos regeneration above the halocline in the Arkona Sea and the adjoining inner coastal waters. The results provided by studies in other benthos study programmes relating to the Pomeranian Bight and the Bay of Greifswald (cf. information regarding Nord Stream monitoring programme in this sector) also confirm the results of Nord Stream monitoring programme under different conditions.

This is also true for the consideration of the soft shell clam. According to the German Institute of Applied Ecology study (2008) on the regeneration of a sand region off

Graal-Müritz in a water depth of approximately 15 m following the extraction of sand for coastal defence, cited in the Notes on the Regulation of Impacts in the Marine Sector (HZE marin) (2017), regeneration of the age structure of the soft shell clam took a maximum of five years (however, no sampling was undertaken in the 3rd to 4th year after sand extraction). The biotope studied was similar to the Nord Stream pipe trench in the Pomeranian Bight. The impact differed from the Nord Stream 2 project in that the adverse effect on the water depth and the seabed surface endured for longer (levelling of the traces left by the suction dredger) and, what is more, it was two-dimensional and not linear. Additionally, the regeneration process off Graal-Müritz was not affected by a lack of O_2, by contrast with Nord Stream. To this extent, the assumption that regeneration will be largely completed after one to two years in the case of Nord Stream or Nord Stream 2 is justified, because then sufficient medium-sized soft shell clams would already be available for bedload import.

Friends of the Earth Germany cannot accept the low classification assigned in the environmental impact assessment to the significance of the macrozoobenthos communities (cf. application document, part D1.01, section 5.5.3.3, p. 279 et seq.) The low valuation is justified by the widespread distribution, which, however, fails to recognise ecological circumstances, as it is just this widespread distribution that secures ecological functions unique to the region which could not be guaranteed in the case of only small area occurrences. The classification of significance should therefore be uprated.

It is the view of the planning authority that this proposal should not be acted upon, as the classification is correct according to the population evaluation methods (cf. application document, part D1.01, section 5.5.3.3, p. 276 et seq.). The macrozoobenthic communities in the Pomeranian Bight (EEZ and 12 nautical mile zone) can be considered minor in respect of the regional or supraregional significance criterion as they represent the dominant community in the coastal regions of the eastern Arkona Sea and the western Bornholm Sea. The areas of the Bay of Greifswald studied were also populated by widely dispersed macrozoobenthic communities in the Spring of 2016, so that here the regional or supraregional importance can be classed as minor. The classification of importance will therefore not be uprated.

B.4.9.7.6 Marine mammals

Friends of the Earth Germany cannot accept the importance of the project area assessed as "medium" in the EIA, particularly for the harbour porpoise. The EIA explains that the criteria of diversity and individuality in the group of marine mammals are not suitable for the assessment because of the low number of species (see application document, part D1.01, section 5.5.6.2, p. 376), however, these criteria were nevertheless listed in the table (see application document, part D1.01, table 5-91, p. 382).

The overall assessment needs to summarise on the one hand the high degree of endangerment of the marine mammal species and, on the other hand, their presence in low densities or the use of the space merely as a feeding or migration region. The value of the area studied in the regional context of other Baltic Sea regions should be taken into consideration in this regard. Accordingly, it is appropriate if the

importance of the sea area under consideration is assessed as "medium" for marine mammals (three species). For the sake of completeness, the Diversity/individuality column in table 5-91 (see application document, part D1.01, section 5.5.6.2, p. 382) is shown, although it makes no contribution to the overall assessment referred to above.

To the extent that NABU proceeds from the assumption in the application documents that the increase in sightings of marine mammals (grey seals, harbour porpoises) is a consequence of the construction and operation of the Nord Stream Pipeline, the application documents have been misunderstood. These merely describe that the frequency of detection of these species has increased since the installation of the Nord Stream Pipeline without, however, establishing any relationship with the construction of the Nord Stream Pipeline. The impact forecast in the environmental impact assessment (see application document, part D1.01, section 6.2.4.2.6, p. 582 et seq.) shows that reliable population data, including the sources referred to by NABU, have been clearly laid out, assessed and taken into consideration in a impact forecast together with the influencing factors. There is, in the view of the planning authority, also no reason to question this, even in terms of the finding. Accordingly, there are also no gaps of this kind in the data or our knowledge of the lifestyle of harbour porpoises/grey seals, which would make it impossible to come to a judgement (see application document, part D1.01, section 5.5.6.1, p. 353 et seq.). The contention in this regard presented by NABU is not accepted.

NABU's assumption that any avoidance behaviour (by grey seals) triggered because of the project should be seen as an impact, has been disregarded. It is rather more the case of an impact on the intensity triggered for the avoidance effect as a result of the project and the susceptibility of the ecosystems concerned. It is thus significant for the planning authority that the construction work is being carried out in a sea region that has previously been used for shipping and the seals are accustomed to shipping along the main traffic routes. It is also significant that they are not being disturbed at the rookeries that are the most important for them. Thus it was possible for Nord Stream monitoring programme, which is being performed alongside construction works, to demonstrate that the seals at the Grosser Stubber rookery were not disturbed (see application document, part D1.01, section 6.2.4.2.6, p. 582 et seq.; Nord Stream construction monitoring 2010, p. 120).

In addition, the objections from NABU, the WWF and Friends of the Earth Germany relating to feared substantial adverse impacts on marine mammals are rejected with reference to the wildlife protection study (section B.4.6).

B.4.9.7.7 Interactions with other projects/developments

The request by NABU for the reappraisal of the consideration of (further) cumulative development proposals is dismissed. Section 6.5 p. 697 et seq. of the environmental impact assessment (see application document, part D1.01) - and the environmental impact assessment in this decision also follows this approach (cf. section B.4.4.2.9) - sets out that planning, plans, and projects which, in interaction with the development proposal under consideration here, could be apt to generate considerable negative environmental impact on features of conservation interest are taken into consideration. The examination is separate for the marine and land environments.

The 1550 m study area is explicitly named for the land environment, which is addressed by NABU. Accordingly, the projects listed on p. 698 are taken into consideration (see application document, part D1.01, section 6.5).

Moreover, NABU points out that a cumulative interaction is not necessarily dependent on spatial overlaps or simultaneous construction work. The criticism is raised that the exclusive consideration of current projects ignores other anthropogenic environmental impacts. Material environmental impacts such as for example inflows from agriculture and daily shipping are not taken into account in such a consideration, which leads to a fundamental misjudgement of the total and cumulative effects.

The planning authority does not share this view and rejects this contention. According to a ruling by the German Federal Administrative Court and the European Court of Justice (ECJ, judgement dated 26.04.2017, C-142/16, juris para. 56 et seq.) other plans and projects must be included in the impact assessment according to section 34 paragraph 1 sentence 1 of the German Federal Nature Protection Act if their effects and thus the extent of the cumulative effect can be reliably foreseen. This is fundamentally only the case if the approval required has been granted. However, the required certainty is lacking if, when the plan approval decision is published, it is not yet foreseeable whether and when the other project will come into being (German Federal Administrative Court, judgement dated 09.02.2017 – 7 A 2/15 –, juris para. 219). A distinction must be made under the law here between projects which have been realised or previous (by which is meant completed) uses, which have already passed into the actual state and must be incorporated into the impact assessment as a environmental impacts, and cumulating projects (German Federal Administrative Court, loc. cit. para. 220). Both types of projects are clearly meant by the "cumulative effects" which are addressed in the citation by Hildebrandt listed by NABU. The consideration of "cumulative effects", on the other hand, need only deal with sufficiently firm projects and plans which have not been implemented, or do not represent a previous use, which have already entered the actual state and have been incorporated into the impact assessment as an environmental impact. Agriculture and shipping, incidentally, are not projects which have to be taken into consideration as cumulative projects. The concept of a "project", which is not legally defined in the German Federal Nature Protection Act and the Habitats Directive is defined in article 1 paragraph 2 item a of the Transboundary Environmental Impact Assessment Directive as the erection of structural or other facilities and other interventions in nature and the landscape (see EU Commission, Natura 2000 - Area management, p. 33; German Federal Administrative Court, judgement dated 09.02.2017, 7 A 2/15, para. 224, juris). The impacts of agriculture and shipping are otherwise mapped as use from time immemorial as part of a pre-existing impact.

This scale is at the basis of the consideration of possible cumulating projects (cf. section B.4.5.2; application document, part E.01, section 6.2, p. 46 et seq. and part E.02).

To the extent that NABU considers it necessary to incorporate further infrastructure projects, especially – in view of the extensive turbidity plumes which would reach as far as Rügen – the planned Fehmarnbelt fixed crossing into the cumulative consideration, we should take account of the fact that the Nord Stream Pipeline lies beyond Rügen when seen from the west, from the direction of the Fehmarnbelt fixed

crossing. Thus cumulative effects must be excluded, even in the view of the NABU. According to the planning procedure documents for the Fehmarnbelt fixed crossing (Femern A/S 2014 with plan extension 2016, Annex 15 (EIA), Annex B, pp. 866, 868) there is an accumulation of drifting sediments in the Arkona basin. Turbidity plumes thus do not reach the Pomeranian Bight.

NABU further objects that the assessment of the OPAL/NEL gas pipe is based on the incorrect assumption that the impact of other projects can only interact with the planned project, if they are located in the immediate neighbourhood. The marine Natura 2000 areas are however three-dimensional habitats, the borders of which are defined by human beings and do not lead to a hermetic closure of the area in situ. This contention must be rejected if only for the reason that effects on the Natura 2000 areas under consideration here can be excluded, since the OPAL/NEL gas pipeline does not cross any marine areas and also has no impact on these. Impacts caused by the facility and the landfall station on the conservation objectives of marine protected areas could likewise be excluded. Impacts arising from construction have no longer been present for some years.

Further projects cited by NABU as cumulating (extension of the marina at Kröslin, Ryck barrage, dumping grounds, Nord Stream Pipeline, Westlicher Adlergrund wind farm clusters and grid connection of the Westlich Adlergrund and Arkona Sea offshore wind farm clusters) have been examined by the planning authority with the outcome that any reinforcement of the effects arising from the approved development proposal from these is not to be feared (see application document, part D1.01, section 6.5.1, p. 697; part E.01, section 6.2, p. 46et seq.; part E.02 and the submission on the FFH compatibility study additionally presented by the project developer after the hearing process).

B.4.9.8 Compatibility with Natura 2000 areas

An impact assessment has been carried out in section B.4.5. in respect of Natura 2000 areas possibly affected, with the outcome that substantial impacts may be excluded. Reference is made to this here. The FFH impact assessments presented by the project developer (see application document, part E) contain all the information necessary for this examination. The contrary assumption by NABU, Friends of the Earth Germany and the WWF is rejected. This is also true of the request by NABU for a different routing, made with reference to the avoidance test carried out by the planning authority as a precautionary measure in respect of the Bay of Greifswald, parts of Strelasund and northern tip of Usedom SCI and the consequential exclusion of other routings (cf. section B.4.5.2.3.2). As far as the impacts on individual valuable species that are the subject of objections as listed in Annex IV of the Habitats Directive, such as harbour porpoises, reference is made to the statements above in this section and the wildlife protection study (section B.4.6).

B.4.9.8.1 FFH areas

<u>Scale of the FFH compatibility study</u>

NABU objects that only the status quo was taken into consideration in the assessment of the current position, comparisons with the natural reference states have been ignored and past anthropogenic influences on the "condition of the ecosystem" have not been taken into consideration. An example of this (perhaps for the poor conservation status of the critical habitat types) are the currently low macrophyte stocks which form a typical component of "Seaweed beds and other marine macrophyte stocks" biotope type. Furthermore, the project developer entirely correctly acknowledges that the "Large shallow inlets and bays (sea bays)" FFH habitat type shows a poor conservation status in the "Bay of Greifswald, parts of the Strelasund and the northern tip of Usedom" FFH area, due to the absence or of macrophytes or their presence being limited to individual plants. It may be deduced from this that no further intervention in the conservation area concerned may be approved because this would be in breach of the prohibition on degradation in Article 6 paragraph 2 of the Habitats Directive.

In this regard it should initially be noted in terms of the law that the scale of the impact assessment carried out here results from article 6 paragraph 3 of the Habitats Directive or section 34 paragraph 1 and paragraph 2 of the German Federal Nature Protection Act and not from the prohibition on degradation of article 6 paragraph 2 of the Habitats Directive. The patchy distribution of habitat types referred to by NABU (see application document, part E.04) in the Bay of Greifswald, which, in NABU's view, is a consequence of increased import of inorganic matter in the 1950s to 1980s, is taken into consideration as a pre-existing environmental impact within the conservation statuses identified in the FFH compatibility study (see application document, part E.03, section 2.2.4.1, p. 22).

According to the measure of article 6 paragraph 3 of the Habitats Directive and section 34 paragraph 1 and paragraph 2 of the German Federal Nature Protection Act, the approved project is – as illustrated in section 4.5 – compatible with the area. There is nothing opposing a restoration of the favourable conservation status of the FFH habitat type 1160 concerned, including improvement of the water quality in the DE1747-301 SCI. Notwithstanding this, the planning authority has examined the preconditions for granting a variance in accordance with section 34, paragraphs 3 and 5 of the German Federal Nature Protection Act purely as a precaution and with the view to preventing substantial impact on habitat type 1160 and has come to the conclusion that the precautionary grant of a variance is possible (see B.4.5.2.3.2). The planning authority thus has the authority to grant the variance as a precautionary measure.

The objections by Friends of the Earth Germany and the WWF referencing the opinion of Advocate General Kokott to judgement C-127/02, Slg. 2004, I-7405, no. 85 against the measure of relevance applied cannot be asserted and are dismissed. Section B.4.5.2 states that it is possible to exclude substantial impacts resulting from the project and this both in respect of characteristic species and also of habitat types. With respect to the habitat types, recognised by case law as orientation values for a substantial impact (German Federal Administrative Court, judgement dated 23.04.2014, 9 A 25/12, German Federal Administrative Court 149, 289-315, para. 66), the de minimis thresholds of the FuE convention (LAMBRECHT & TRAUTNER, Specialist information system and case conventions to determine materiality in FFH compatibility testing, final report on the case convention section, final status as at June 2007) were not achieved. There is no evidence available showing that these de

minimis thresholds cannot also be applied here with the modifications justified in section B.4.5.2.3.1.2, especially since this – as rightly complained by Friends of the Earth Germany and the WWF (cf. German Federal Administrative Court, judgement dated 23.04.2014, 9 A 25.12, German Federal Administrative Court 149, 289 para. 26) – concerns the best scientific knowledge from the point of view of the planning authority. The planning authority also considers the Nord Stream monitoring programme, including the knowledge gained here regarding the development of regeneration, as a critical scientific resource for forecasting and evaluating the probable effects of the project.

The lack of clarity regarding the evaluation of the conservation statuses put forward by the WWF and Friends of the Earth Germany is not justified in the view of the planning authority. In accordance with section 7 paragraph 1 no. 10 e) of the German Federal Nature Protection Act in conjunction with article 1 of the Habitats Directive, the critical conservation status of a natural habitat for the evaluation of effects is the totality of the effects influencing the habitat concerned and the characteristic species inhabiting it and which can have an effect over the long term on its natural distribution, its structure and its function, as well as the survival of its characteristic species in the region specified in article 2. To this extent, it is appropriate if, as part of the methods applied here, consideration is given to what extent a ecosystem again still fulfils, or fulfils again after a period of regeneration, its functions and biological indicators taken from the habitat type fact sheets published by the Federal Agency for Nature Conservation and the Agency for the Environment, Nature Conservation and Geology (LUNG) are drawn upon for this (see application document, part D.03, p. 64 et seq., 68). The definition of the habitat type conservation status according to section 7 paragraph 1 no. 10 e) of the German Federal Nature Protection Act in conjunction with article 1 of the Habitats Directive already means that this has to be a long-term perspective. It is the view of the planning authority that thirty years is a shorter, and hence conservatively judged, period when taking a long-term view, considering that Annex IV of the Transboundary Environmental Impact Assessment Directive makes a distinction, in the description of the possible significant effects on the factors in accordance with article 3 paragraph 1 between short-term, medium-term and long-term, permanent and transitory, positive and negative impacts of the project, that is to say, up to 29 years would give adequate leeway for evaluating impacts as short and medium-term.

Methodology

NABU, WWF and Friends of the Earth Germany criticise the FFH compatibility study assessment process thus: It has been cobbled together from two other methods, resulting in an incorrect under-accounting of the project's impact. The self-created method is based on the dated "Expert Opinion on the Implementation of FFH compatibility studies in Mecklenburg-West Pomerania" from 2006 and the "Environmental Guidelines for Planning Approval and Planning Permission for Railways and Maglev Trains", which were clearly developed neither for pipelines nor for marine ecosystems. The findings were completely distorted as a result of the almost exclusive use of the results of monitoring the Nord Stream Pipeline for the evaluation of the impact, which do not map the normal case of strength of the impacts or the regeneration speed. The determination of the temporary, gradual loss of function, for example, reveals an absolutely unecological approach. The majority of the parameters consulted for the evaluation could cause profound changes to the

biocoenoses on substantial deviation from the normal values. Since, however, each parameter makes only a minimal percentage contribution to an overall evaluation, such impacts have simply been levelled out. This objection is rejected.

The evaluation procedure for examining any impact of Natura 2000 areas is based on generally recognised assessment procedures for the impacts on habitat types or biotopes. The "Expert Opinion on the Implementation of FFH compatibility studies in Mecklenburg-West Pomerania" dated 2006 and the "Environmental Guidelines for Planning Approval and Planning Permission for Railways and Maglev Trains" were used only as a basis for the outline and not for the content. The procedure applied by Nord Stream 2 pipeline for the evaluation of the impact on the habitat type follows the principle of an extrapolation of temporary to permanent function losses. This procedure was developed for the EEZ for the evaluation of the materiality of impacts in the field of legal protection of the biotope in accordance with section 30 of the German Federal Nature Protection Act (Federal Agency for Nature Conservation (2012)/ BERNOTAT (2013)) and is based on LAMBRECHT & TRAUTNER's convention proposal (2007). Because the biotopes evaluated in respect of the extent of their impact correspond to the habitat types relevant for the FFH compatibility study (see application document, part E.03, section 3.3.1, p. 31 et seq.). There is, at present, no more suitable method for the evaluation of temporary impacts on marine biotopes. This is why the State Nature Protection Agency considered the method both plausible and reproducible in its submissions. The view that this is "an absolutely unecological approach" is not shared by the planning authority. Notwithstanding the fact that the evaluation standards applied are generally recognised by the nature conservation agencies in Germany, the FFH compatibility study (see application document, part E.03, section 4.3, p. 72 et seq.) explains in detail and with reference to biological parameters according to which criteria the severity of each impact and its regeneration are evaluated (see application document, part E.03, section 4.1.3, p. 66 et seq.). Furthermore, the choice of parameters results from the criteria for the evaluation of the conservation status of marine habitat types provided by the Federal Agency for Nature Conservation and the Mecklenburg-West Pommerania Agency for the Environment, Nature Conservation and Geology (see application document, part E.03, section 4.1.3, table 4-1). This is by no means – as assumed by Friends of the Earth Germany – a black box. It is derived transparently, initially methodically introduced into the FFH compatibility study for the DE1747-301 SCI (see application document, part E.03, section 4.1.3, p. 35 et seq.) and separately for each FFH habitat type with respect to the concrete possible impacts in section 4.3, page 71ff (see application document, part E.03). The examination for FFH area DE1749-302 (see application document, part E.08) is derived and performed accordingly. Reference is made to previous statements with regard to the doubts as to the applicability of the Nord Stream monitoring programme.

NABU further objects that the LAMBRECHT & TRAUTNER case convention (2007) suggests that there is a substantial impact on a Natura 2000 area if 1% of a habitat is affected by a project. It is assumed that a substantial impact would certainly exist inter alia, if more than 1% of a habitat were to be lost. It is necessary to check for each individual case whether a substantial impact exists if the loss of habitat is below the 1% threshold. According to the convention, for large areas the materiality threshold for impact by area losses would even be considerably lower than 1%, as this criterion has been developed for smaller habitats and species habitats.

To this extent, it should be noted that LAMBRECHT & TRAUTNER's case convention (2007) relates to the direct loss of area of habitats for the bird species of community importance. By contrast, no habitat will be permanently lost by the approved development proposal. The orientation value of "quantitatively relative loss of area" is identical to the 1% criterion and thus is not clearly lower than 1%.

Habitat types

NABU raises the criticism that the Habitats Directive is limited to only a few habitat types in the marine sector and it would be expected that at least this has been comprehensively assessed in an FFH compatibility study and its impact described. The habitat type 1170 is anyway still superficial in the FFH compatibility study for the Greifswalder Bay sandbar and parts of the Pomeranian Bight FFH area (DE1749-302, see application document, part E.08), yet in large parts dealt with inappropriately in section 4.3.1. Habitat type 1110 is only recognised as existing, but is ignored in the further analysis. It remains therefore unclear in what form and to what extent impacts are suffered here.

Habitat type 1110 does not occur in the DSA nor its wider context in the DE1749-302 FFH area. Any impact on this habitat type can therefore be excluded. NABU did not provide any concrete evidence for the view that the 1170 habitat type was dealt with only "superficially" and it is not shared by the planning authority (see application document, part E.08, section 4.3.1, p. 45 et seq.).

NABU, the WWF and Friends of the Earth Germany further object that outcropping boulder clay ("marl cliff") could not be restored. Here it would rather more be replaced by block or rock areas. These however belong to the characteristic biotope at the site. The boulder clay is described in the Reef habitat type fact sheet as a characteristic form. Substantial impact should therefore be assumed. Reefs where there is a proportion of boulder clay present cannot be restored. As reefs etc. occur as habitat types in the Greifswalder Bay sandbar and parts of the Pomeranian Bight FFH area (DE DE1749-302), an FFH exception procedure is likely to be necessary and should be carried out for safety reasons.

The planning authority does not share NABU's view in respect of the alleged impact on the reef habitat type. A total of 8.5 hectares of the reef FFH habitat type in SCI DE1747-301 will be used by the pipe trench (see application document, part C.01, section 3.5.1, p. 155). Of this, approximately 6.5 ha are on the eastern flank of the Bodden sandbar (block and rock areas/outcropping boulder clay), 0.4 ha are on a short route section with outcropping boulder clay in 9 m of water to the west of the Bodden sandbar and 1.6 ha on debris beds in approximately 5 m of water to the west of the Schumachergrund. The relative share required of FFH habitat type 1170 of its total area in the conservation area is 0.1% (7504 ha according to the standard data sheet, FFH compatibility study SCI DE1747-301, section 4.3.3, p. 89 et seq.).

A total of 0.5 hectares of the reef FFH habitat type in SCI DE1749-302 will be used (see application document, part C.01, section 3.5.1, p. 155). Of this around 0.25 ha each are on the eastern flank of the Bodden sandbar and the Iduna shoal (each block and rock areas). The relative share required of FFH habitat type 1170 of its total area in the conservation area is 0.006% (8,957 ha according to the standard data sheet, FFH compatibility study SCI DE1749-302, section 4.3.1, p. 45 et seq.).

Outcropping boulder clay, which occurs at places on the Bodden sandbar, is not inhabited by either animals or plant, since it is subject to permanent erosion because of its exposure. The function of the boulder clay in this sea area and the DE1747-301 and DE1749-302 SCIs is thus limited solely to forming the seabed surface: establishment of an exposed base on which residual sediment can be occupied by sessile species. This function is not permanently impaired by the approved project because it can also demonstrably be fully restored with gravel and residual sediments during the laying operations. Multiple surveys of the pipe trench for the Nord Stream Pipeline on the Bodden sandbar show that it was possible to restore the seabed surface (exposure) accurately and that this has not changed since 2010 (see application document, part D3.06).

The small areal change of the relationship of residual sediment and boulder clay (1 to 2 ha of a total area >15,000 ha) does not represent any impact on the 1170 habitat type in the DE1747-301 and DE1749-302 SCIs, as this does not extend any influence over the protective goals or conservation objectives (cf. section B.4.8.6).

The assumed regeneration durations can be forecast with adequate reliability using the Nord Stream monitoring programme. The objection by NABU in this respect is rejected with reference to the relevant representations in B.4.5.

Cumulation of 50 Hertz

NABU further notes that, in the consideration of the cumulative effect in the DE1747-301 FFH area, it is the view of the project developer that values would only fall short of the habitat orientation value (orientation value for the individual habitat types for the (permanent) absolute quantitative loss of area in accordance with the LAMBRECHT & TRAUTNER convention proposals (2007)) by a small amount in the event of three submarine cables (50 Hz) and the Nord Stream 2 pipeline being laid simultaneously in 2018. The FFH compatibility study for area DE1747-301 determined and evaluated cumulative effects for the project for the installation and operation of six AC systems (220 kV) for connecting to the grid the offshore wind farm clusters at Westlich Adlergrund and Arkona Sea (50 Hertz) to the Lubmin network junction point transformer station (see application document, part E.03, section 6.2, p. 105 et seq.). There has not, however been any detailed study of or differentiation between additive and synergetic effects. Under these conditions, the assessment that the value would fall short of the habitat orientation value is incorrect. There is a risk that the habitat type orientation value will be exceeded in the evaluation of the additive and synergetic impacts. NABU therefore calls for a new calculation with the inclusion of additive and synergetic impacts.

The application documents record that values will fall short of the relevant orientation values, even in a worst case scenario. This is all the more valid now that, as a result of the submission by 50 Hertz by 2018 a maximum of three (instead of six) submarine cables will be laid (cf. Nord Stream 2, submission on the FFH compatibility studies after the hearing dated 15.11.2017). No further effects, whether synergetic or interactive or of any other nature, are known which would have to be considered in the examination.

B.4.9.8.2 Special Protection Areas

The planning authority has examined and taken into consideration NABU's representations regarding the Special Protection Areas that may be affected. It is the view of the planning authority that, contrary to the position taken by the NABU, the construction time restrictions since proposed in terms of space and time with respect to specific species with regard to the resting behaviour of sea bird species within the SPAs to be crossed are adequate for preventing substantial impact on the SPAs. Application of the 1% criterion in respect of the impacts on resting birds is inappropriate, because according to LAMBRECHT & TRAUTNER (2007, p. 9, 33) this criterion is applicable to direct, permanent loss of area, which is not the case here.

The re-evaluation requested by NABU of the risk of death for birds on the basis of the statistics from the Monitoring Documents Results of Environmental and Social Monitoring 2010 (representation dated 31.05.2017, p. 17, footnote 30: Nord Stream AG 2011: Results of Environmental and Social Monitoring 2010, p. 110) is not advisable. The flight numbers are too small to assume a significant risk of death for any species, even after extrapolation in consideration of the unavoidable inaccuracies mentioned. Additionally, the species concerned are exclusively species with a low mortality risk index according to BERNOTAT & DIERSCHKE (2016[124]). Reference is made in the species-specific consideration in the nature conservation section of this decision (cf. section B.4.6) with regard to the species referred to by NABU and Friends of the Earth Germany in the context of nature conservation (scaup, long-tailed duck, common scoter, merganser, horned grebe, great crested grebe, red-necked grebe, loon, guillemot, razorbill, black guillemot). This ensures that the deterrence effects arising from construction only affect a few individuals of a small number of species for a few days in each case. No breach of the prohibitions for protected areas according to section 34 paragraph 1 German Federal Nature Protection Act or the prohibition on degradation according to the Habitats Directive or the European Birds Directive can be established (cf. sections B.4.5.1.1, B.4.5.1.2). The objections in this regard are therefore dismissed.

Contrary to the view held by NABU, resting areas in the Pomeranian Bight special protection area DE1552-401 are not substantially impacted, even in when considering the existing initial level of impact, e.g. resulting from shipping. The corresponding objection is rejected. The construction works will be carried out at a time during the year in which there are no great densities of migrating birds in the DSA. Since the construction works furthermore will be predominantly taking place in a sea area that already is impacted by shipping, any reinforcement of the scare effect which is anyway present is very minor (see application document, part D1.01, section 6.2.4.2.5, p. 573 et seq.). Intra-species interference effects, as cited by NABU, are excluded, as the resting populations at this time of the year, even elsewhere in the region, are far below the capacity limit and thus there are sufficient options for temporary avoidance, if necessary.

Moreover, Friends of the Earth Germany points out that there are permanent or recurrent impacts which have not yet been taken into consideration in the

[124] Bernotat, D. & Dierschke, V. (2016): Übergeordnete Kriterien zur Bewertung der Mortalität wildlebender Tiere im Rahmen von Projekten und Eingriffen., 3rd Revision. dated 20.09.2016, 460 pages (unpublished). http://www.bfn.de/0306_eingriffe-toetungsverbot.html, retrieved on 15.01.2018

documents. These include, for example, the emissions from the sacrificial anodes, any maintenance, inspection and repair works necessary or removal. Relevant permanent impacts resulting from such measures are generally only to be expected in small areas, but they must nevertheless be taken into consideration.

In this context it should be noted that the release of metals from the sacrificial anodes will not lead to any perceptible increase in the concentration of these substances in the pelagic zone or inhabited stratum in the benthic zone. Hence there is no reason to suspect any impact arising from the facilities on the FFH habitat type, species listed in appendix II of the Habitats Directive or bird species covered by the EU Birds Directive as a result of the approved development proposal. Emissions from the sacrificial anodes cause no impact to the protected site. Maintenance and inspection work are not invasive. The requirement for repair work can reasonably be excluded. The pipeline is designed for the duration of its service life.

Friends of the Earth Germany objects that the documents leave unstated from where the sand for backfilling the pipe trench will be taken. So it is not possible to assess the traffic movements required and the environmental impact of the removal of sediment. This would be, however, an imperative requirement for the evaluation of the materiality of the impact on Natura 2000 areas. The dismantling required which should be characterised by the "shortest possible transport routes" (submission dated 31.05.2017, p. 38, footnote 66: EIA, p. 39) and should therefore be carried out in the immediate vicinity of the pipeline has not been taken into consideration in the summation and/or cumulation. Since the dismantling area is not known, or has not been specified, it is furthermore unknown whether the environmental studies and impositions postulated in section 6.7 of the environmental impact assessment have actually been carried out and whether possible compensatory measures are effective. There is not even any specification as to whether dismantling would take place in Germany or in Poland or Denmark, as appropriate. It has been blindly assumed that an operational plan is available for the dumps. Even if such a plan were to exist, it would not provide absolute assurance that the aspects of the dismantling processes of relevance to habitat protection legislation have been taken into consideration.

The precise origin of the bedding material is not relevant for the evaluation of the materiality of the impact on Natura 2000 areas. It should be noted in this regard that the construction traffic, to the dumping site or the filling transport, for instance, does not represent a different, interacting project within the meaning of the Habitats Directive Assessment, but is a component of the proposed development; accordingly it has been taken into consideration in the assessments (see application document, parts E.10, E.11, section 4.2 in each).

Any interaction with the approved development proposal from the impact of dismantling itself can be excluded. As explained in the EIA, the bedding material will be extracted and transported from a suitable external deposit. It is assumed that an approved operational plan is available for the marine deposit, as otherwise it would not be permissible to remove any material. The location of the marine deposit in a Natura 2000 area or other protected area or high-quality habitat can be excluded. Significant detrimental impact on such areas, or the areas under consideration here, can therefore be excluded.

The WWF asserts that the construction measures are in the area of the target excavation for the microtunnel, and hence possible transportation of bentonite into the area of the Sandbank habitat type has not been evaluated. Furthermore, the impacts of the proposed AWTI at the end of the microtunnel (approximately KP 82.900) have not been addressed. These would be located directly in the Sandbank FFH habitat type. The impact would not be merely temporary, but would be permanent as the riprap, concrete mattresses or similar are to remain permanently in the sediment. The impacts on macrophytes as a result of sediment covering and bentonite transport and covering cannot be excluded here.

This objection is rejected. First a correction: no sort of destination excavation will be created at the sea end destination point of the microtunnel (see application document, part C.01, p. 57 et seq.). Instead, the drivage will be halted as soon as the tunnel boring machine has reached its destination. The escape of drilling mud is thus prevented. Since the overburden above the microtunnels decreases in the destination area, the pressure in the drilling mud circuit will be reduced to prevent the escape of drilling mud. Drivage of the microtunnel and the use of bentonite are described in part D1.01, section 1.2.1.2, p. 30 et seq. The residual volumes remaining in the sediment around the bore are classified as negligibly small and cause no negative environmental impact (see part D1.01, section 6.2.1.2.2, p. 483). Bentonite is anyway a natural material and contains no pollutants (see application document, part D1.01, section 6.2.1.2.2, p. 484; part C.01; section 3.3.5, p. 109).

As far as the objection to the AWTI area (KP 82.900) is concerned, it should be noted that the locations of the AWTI are not identical with the terminal points of the microtunnel (KP 83.800). The AWTI area is inside the 1160 FFH habitat type, and hence not in the Sandbank FFH habitat type. The area affected is indicated in the application document, part C.01, section 3.1.2.4, tables 3-4, p. 55, and taken into account in the area balance in the FFH impact assessment (see application document, part E.03, section 4.3.2, p. 80). Ripraps, concrete mattresses or similar only remain in the sediment in the AWTI area, far below the region that may be inhabited by the benthic fauna (macrozoobenthos). Permanent impacts on macrophytes as a result of sediment covering and bentonite transport and covering thus can be excluded.

The WWF's contention that the building process is not adequately described is likewise rejected. The building process is comprehensively described in the application document. Thus part C.01, section 3.2, figures 3-8, p. 75, lists site preparation on the land side including species protection measures as activity no. 3 in the period from 01 January to 31 March of the first year of construction. In a technical sense, clearing of the woodland is to be considered part of site preparation. Furthermore, the clearance operations are described and evaluated in part D1.01, section 6.2.4.3.6, p. 631, and in part G.01, section 8.1.5.3.2, table 8-68, p. 217.

B.4.9.9 Species conservation

Section B.4.6 explains that the development proposal does not embody any wildlife protection prohibitions. The viewpoints arising from objections by NABU, Friends of the Earth Germany and the WWF are also picked up. Reference is thus made to these here.

Injury to and death of marine mammals as a result of explosions - as feared by NABU - can be excluded. The pipelines are being laid and operated in a corridor that is free from munitions (see application document, part C.01, section 3.3.2.1, p. 85). The route will be modified accordingly should munitions be found in the route corridor before or during pipelaying that cannot be disposed of by other means.

The objections submitted by NABU and Friends of the Earth Germany relating to the impact on resting birds or for the radii of disturbance assumed for the development proposal are dismissed. Above all it is appropriate not to transfer disturbance radii known from the field of offshore wind energy to the approved development proposal because there are no disturbances arising from the facility having any influence above the water surface. During the construction phase, the resting activity of sea bird species within the Special Protection Areas to be crossed will be taken into consideration specifically for each species in terms of space and time. This ensures that the deterrence effects arising from construction only affect a few individuals of a small number of species for a few days in each case and thus are not to be considered material for the purposes of the prohibition on disturbance or relevant for the impact on resting sites. The additional criticism from Friends of the Earth Germany regarding the determination of resting birds is likewise unfounded. The EIA's impact forecast is based on whole-year migrant bird surveys from ships and the migrant bird surveys in the Nord Stream monitoring programme 2009-2014. The results of the surveys and digital photos originating from the 2016 monitoring programme represent additional information which firms up the impact forecast (see application document, part I3.04, section 1, p. 11).

B.4.9.10 Water

The requirements of the German Water Resources Act, the Water Framework Directive and the EU Marine Strategy Framework Directive and sections 27, 45a and 47 of the German Water Resources Act were examined in section B.4.8.7 and it was established that they are not in opposition to the approved development proposal. An exception to the management objectives according to section 31 of the German Water Resources Act - as demanded by Friends of the Earth Germany - is not necessary. NABU, the WWF and Friends of the Earth Germany's contentions doubting this are therefore rejected with reference to B.4.8.8.

Water Framework Directive

It is not only the current poor state of the seawater, but also the effects arising from a development proposal and which could possibly lead to (further) degradation that is critical for the evaluation of the effects of the project with regard to pollutants. Following an examination of the evaluation undertaken in the technical paper it is possible to exclude the possibility that the project makes a negative contribution that is relevant for the condition and is measurable (see application document, part H.02, section 6.1, p. 76 et seq. and section 6.2, p. 132 et seq.). Nor is there any evidence that the project is endangering the objective of achieving and maintaining a good condition for the sea water (see application document, part H.02, section 6.3, p. 147 et seq.). There is no evidence of the endangerment of the structure, function and processes in the marine ecosystems and no relevant, enduring impact on the environmental targets (see application document, part H.02, section 7, p. 158 et

seq.). The pollutants contained in the sediment (see application document, part I3.02A, section 3, p. 40 et seq.) and the nutrient content (see application document, part I3.02A, section 3, p. 24 et seq.) were surveyed in full and assessed with regard to their effects (cf. otherwise section B.4.9.7.3, too).

The criticism put forward by NABU of the documents produced here is not shared by the planning authority or is not relevant to the result of the examination (such as, for instance, the inclusion of the project description in the various technical documents or the addition of a precise source). Alternatives do not come into consideration (cf. section B.4.5.2.3.2). Nor is there any impetus for examining alternatives from the point of view of water economy since there is no impact. The cumulative effects are examined under water legislation in the EU Marine Strategy Framework Directive paper (see application document, part H.02, section 6.2.8, p. 143 et seq.), although this is not necessary according to current legislation (German Federal Administrative Court, judgement dated 09.02.2017, 7 A 2/15, para. 594, juris).

NABU's criticism of table 2-4 of the Water Framework Directive study (see application document, part H.01, section 2.4.1, p. 53 et seq.) is likewise not justified in the view of the planning authority. Ultimately this is, as specified, a compilation of the marine influencing factors relevant to the Water Framework Directive on the basis of the EIA which contributes to the examination of the water. The influencing factors are also taken into consideration in full - contrary to NABU's assumption. Section 2.4 table 2-4 considers only the effects of the project according to the environmental impact assessment. There has not yet been any assignment of the quality components concerned. The effects of turbidity plumes on phytoplankton, transparency and oxygen content are dealt with in section 4 (p. 125 et seq.).

Nor is there any reason for complaint if the duration of the "Influence of the sea bed, change of sediment parameters silt content and organic content" or "loss of macroalgae and invertebrates by the creation of the pipe trench" influencing factors are classified as "short-term" (4 months per site of intervention). This objection is rejected. The influence of the seabed is distinguished into temporary changes in the sediment parameters caused by construction and permanent changes in the geological stratigraphic sequence caused by the facility (see application document, part H.01, section 2.4, p. 52 et seq., section 4.1.2, p. 139). The change in the sediment parameters arises from multiple handling of the ground, causing small quantities of silt and organic material to detach from the sediment. The composition of the coarser material does not change. The sediment composition is adjusted or regenerated to the ambient conditions by natural sediment dynamics (including bedload transport and bioturbation) and starts with the conclusion of the construction work. The sediment parameters of the top layer of seabed used for filling are therefore only modified temporarily. Investigations around the Nord Stream project which took place two years after the start of construction showed that the organic content and the silt content in the sediment had completely returned to the ambient conditions (Nord Stream offshore monitoring 2012, p. 48).

The impact on the oxygen content in the column of water is represented properly in the view of the planning authority. The corresponding complaint by NABU should be rejected. Substances consuming oxygen predominantly adhere to fine-grained sediment and organic matter. Muddy areas, in which a higher organic sediment content can be expected were therefore avoided from the outset in planning the

route (see application document, part D1.01, section 6.2.1.2.1, p. 471; part H.01, section 4.1.3, p. 147). A mechanical excavator method will be used in the Bay of Greifswald to reduce losses due to turbidity meaning that the major portion of the fines from the Bay of Greifswald will go into solution in the spoil deposit area. However, only suitable sediment with a correspondingly low organic content will be stored in the marine spoil deposit (see application document, part H.01, section 2.2.1, p. 41). Material excavated from the trench with organic content >3 wt.% will not be returned to the water in order to avoid temporary eutrophication of the sea water after excavation. As laid out in the technical report, the proportion of dredged material which is not suitable for backfilling the trench (cohesive soil and dredged material with organic content of more than 3%), in the Bay of Greifswald is approximately 16% of the excavated material (see application document, part H.01, section 4.1.2 p. 139).

The planning authority has also examined the effects of the turbidity plumes described in the application document (see application document, part D1.01, section 6.2.2.2.1, p. 496 et seq.; part H.01, section 4.1.3, p. 144 et seq. and section 4.2.3, p. 164 et seq.) with the outcome that it does not share the assessment of NABU, the WWF and Friends of the Earth Germany that this examination was deficient or "downplayed" and rejects the objections. The natural content of suspended matter in the water is shown in the environmental impact assessment (see application document, part D1.01, p. 176 et seq.) and in the Water Framework Directive technical report (see application document, part H.01, section 3.1.2.3, p. 82 et seq.). Any risk to photosynthetic processes in the benthic flora as a result of turbidity is out of the question, even for the macroalgae growing on the reef on the Bodden sandbar, as the concentration and duration of the turbidity to be anticipated during the construction phase correspond to the natural variability of the suspended matter content (Nord Stream monitoring programme, Sediment suspension 2010, p. 31).

The intensity of the turbidity plumes consequent on the project has been described appropriately. It is based on the basic data provided in the Water Framework Directive technical report in section 1.5.3, p. 31 et seq. (including a turbidity study, see application document, part I.3.06, p. 7 et seq.; Monitoring the turbidity during construction of Nord Stream, Nord Stream construction monitoring 2010, p. 61 et seq.). The extent of turbidity plumes in time and space was monitored during the construction phase of the Nord Stream Pipeline. Turbidity arises at the location of current construction activity. The specification of 1-2 hours sinking time relates to localised turbidity plumes. Since the excavation of the trench for the pipeline is continually advancing in space, turbidity plumes are not repeatedly generated at the same location, but only in the region of the advancing construction activities (see application document, part H.01, section 4.1.3, p. 146 et seq.).

NABU's objection that the effects of the re-suspension of nutrients has not been adequately taken into consideration, and the reservations shared by the WWF and NABU that the evaluation of nutrient impact resulting from the pipeline by the project developer is erroneous and manipulative are likewise rejected. The nutrient content in the sediment along the route has been examined in expert's reports on the chemistry of the sediment and the results are considered low. The nutrient concentration in the eluate from the dredged material corresponds to the free water nutrient concentration in the Bay of Greifswald, for instance, as is illustrated in the

technical report (see application document, part H.01, section 4.1.3, p. 148 et seq.) Any critical increase in the nutrient content or any reinforcement of existing restrictions in the water with corresponding effects on the phytoplankton and zooplankton is, hence, not to be anticipated.

The evaluation of the impact of mineral oil hydrocarbon leaks requested by NABU is included in the environmental impact assessment (see application document, part D1.01, section 6.2.2.2.1, p. 508). The associated complaint is hence unjustified.

The Landesanglerverband M-V [Angling Association of Mecklenburg-West Pomerania] (submission dated 29.05.2017) objects that materials could be released from the material of the sacrificial anodes or from the concrete coating around the pipes at the welded seams and could enter the water, which would lead to a deterioration in water quality. NABU (submission dated 31.05.2017) also fears negative effects from the release of zinc from sacrificial anodes into the Baltic Sea. This can likewise not be accepted as the minor amount of input is not sufficient to lead to a perceptible increase in the concentration of pollutants in the water column (see application document, part H.01, section 4.1.3, p. 143 et seq., section 4.2.3, p. 163f. and section 4.3.1, p. 172f.). Furthermore, monitoring of the Nord Stream pipeline has not been able to demonstrate any degradation in water quality arising from substance releases from sacrificial anodes, since "no increase in the heavy metals concentration could be measured over the reference points at a distance of 1 to 2 m from the sacrificial anodes (Nord Stream AG 2013, p. 31). Degradation of the water quality in this regard may also be excluded for the case of the Nord Stream 2 pipeline because of the comparable initial conditions.

The sodium bisulphite ($NaHSO_3$), which may be added to the flushing water, if necessary, has no impact in the region for which Germany is responsible because no water is dumped here. Otherwise the impacts are shown in part J01 of the application documents, section 10.14.1.1, p. 533. Sodium bisulphite is a sodium salt which is a conventional food additive used as a preservative, antioxidant and stabiliser in foodstuffs. Modelling of the extraction and propagation of treated pressure test water shows that it is quickly diluted when returned to Russian waters, compensating for the different temperature, different salinity and different oxygen conditions by comparison with the ambient water characteristics with no relevant impacts for nature and/or the water balance.

EU Marine Strategy Framework Directive

In NABU's view, the impact of the project was also relativised and trivialised in the EU Marine Strategy Framework technical report. Nord Stream 2 would consequently lead to a further degradation of what was anyway already a poor condition of the Baltic Sea and would breach at least six of the seven environmental targets (submission dated 31.05.2017). This view is not shared.

As laid out in section B.4.8.7.3, the development proposal in breach of neither the prohibition on degradation nor the instruction to achieve targets in accordance with section 45a paragraph 1 of the German Water Resources Act, not even in consideration of what is partially correctly assessed by NABU as the poor condition of the Baltic Sea waters. It should be stressed that the approved development

proposal is also not in breach of the environmental targets for the Baltic Sea (see application document, part H.02, section 7, p. 159 et seq.).

Re environmental target 1: The development proposal has no influence on the measures incorporated into the programme for the reduction of atmospheric nutrient inputs from ships' emissions. Nord Stream 2 causes pollutant emissions which, according to METCON (2017B), do not exceed the limit values laid down by legislation (see application document, part H.02, section 6.2.6). The systems fitted to vessels in the Nord Stream 2 fleet which give out pollutant emissions comply with the current state of the art. International regulations relating to emissions are observed. The construction and operation of Nord Stream 2 is not contrary to the environmental goal of "seas with no impact from anthropogenic eutrophication".

Re environmental target 2: Completion of the development proposal does not lead to any relevant increase in the inputs of pollutants into the Baltic Sea, according to an evaluation of the impacts (see application document, part H.02, cf. section 6.1.1 and section 6.2.5).

Re environmental target 3: The major part of the area used by the project is only used temporarily during the construction phase. The area permanently occupied by the pipeline lying on the seabed is a very small part of the German Baltic Sea. There is no permanent loss of sanctuaries and rest areas because of the project (see application document, part H.02, section 6.2.1 and 7.3).

Re environmental target 4: As explained in sections 6.1.2 and 6.1.5 (see application document, part H.02.), the benthic ecosystems affected by the project will be reconstructed as far as is possible after the pipeline has been laid and will completely regenerate. Seabed integrity remains at a level that ensures that the structure and function of the ecosystems are safeguarded and benthic ecosystems, in particular, are not adversely affected. The environmental target is not adversely affected.

Re environmental target 7: The effects on physical and hydrographic parameters are laid out in section 6.1.1 and section 6.2.4 (see application document, part H.02.). The assessment is that it is permissible to assume that there are no permanent impacts in respect of this environmental target in the German Baltic Sea arising from the project.

As is shown in section B.4.4, the assessment of the project's impact is also based on a substantial survey of the project's impact. NABU's contrary view in this regard is not justified. The objection submitted by NABU, the WWF and Friends of the Earth Germany, according to which a reasonable estimate of how much nutrient is released by the displacement of sediment and how this further translates into the food web has not been taken into consideration is therefore rejected. The impact on the Bay of Greifswald and Pomeranian Bight, northern section, (nutrients and pollutants) and the 1 to 12 nautical mile zone (pollutants) are dealt with in the technical report under the Water Framework Directive and considered minor on the basis of chemical analyses of the sediment (see application document, part H.02, section 6.1.1, p. 86).

Possible impact on herring spawning behaviour has - contrary to NABU's assumption - been taken into consideration very well and has been reduced by restrictions on construction times and technical measures to a degree such that substantial detrimental environmental impact can be excluded (see application document, part D1.01, section 6.2.4.2.4 p. 563 et seq., section 7.1, p. 749).

Other

The WWF's objections relating to pre-commissioning are rejected as they are not substantiated. First we should establish that pre-commissioning of the offshore pipelines will be carried out independently of the land section (dry section) (see application document, part C.01, section 4.1.1, p. 159 et seq.). Land section pre-commissioning is comprehensively described in part C.01, section 4.1.4, p. 180 et seq. Drinking water will be used for water pressure testing of the land section, and will be drained into drainage channel 60 on completion of the water pressure test. This is subject to an application under water regulations in addition to the pumping and discharge of groundwater (see application document, part I1.05) and to the environmental assessment (see application document, part G.01, section 8.1.2.3, p. 149). This discharge is evaluated in part D1.01, section 6.2.2.2.2, p. 514. The planning authority has followed this up. Reference is made to the statements in this regard in section B.4.8.8. Pre-commissioning of the offshore pipelines with a water tightness test is described comprehensively in part C.01, section 4.1.3, p. 167 et seq. Sea water which be drawn from the Baltic Sea at various points outside German territorial water for this purpose. The volume of 6,500 m³ described in this context has no relationship with pre-commissioning of the land section. Instead it is water that is used for flooding the pipelines and will be temporarily collected at the German landfall. All of the water used for pre-commissioning the offshore pipelines, and thus also the 6,500 m³ referred to above, will be returned to the Baltic Sea at the Russian landfall on completion of pre-commissioning. The evaluation of the discharge of water at the Russian landfall may be found in part J.01, section 10.14.1.1, p. 533, but is not subject to the concluding assessment by the planning authority.

B.4.9.11 Intervention regulations

Reference is made to section B.4.8.4 with regard to the objections by NABU, Friends of the Earth Germany and the WWF regarding intervention regulation. The scope of the intervention, the incorporation of regeneration, the compensation requirement and the compensatory measures laid down along with their individual suitability are described in detail there. The objections in this regard - including those regarding the compensation funds to be determined - are rejected.

The reservations of Friends of the Earth Germany and the WWF because the compensatory measures ultimately to be implemented have only been decided in the planning approval are also rejected. Ultimately it is the role of the planning authority, according to section 43, sentence 4 of the German Energy Industry Act (EnWG), to weigh up a number of possible and legally permissible compensatory measures. The idea that these should be set in stone as early as the filing of the application is not legally required and indeed not possible taking into account the consultation process. In accordance with section 73 paragraphs 2 to 4 of the German Administrative Procedures Act for Mecklenburg-West Pomerania (VwVfG M-V), the plan must be put before the public. The plan consists of the drawings and explanations allowing

identification of the project, the reason for it and the sites and facilities affected by the project. The plan presented is complete in the light of this. As far as the compensatory measures are concerned, these are not in any sense a 'picklist', but rather a comprehensive description of the areas being taken into consideration for compensatory measures and the measures planned for each case. The planning documents identify possible impacts and give - as the objection shows - sufficient impetus for submissions to be put forward in this regard. In accordance with section 17 paragraph 4 sentences 1 and 2 of the German Federal Nature Conservation Act (BNatSchG), the originator of an intervention, in order to prepare for the decisions and measures for the implementation of section 15 of the German Federal Nature Conservation Act, must make available the information necessary for the assessment of the intervention in the scope appropriate for the nature and scope of the intervention. This shall apply in particular to (1.) site, nature, definition and timescale for the intervention and (2.) the measures proposed for the avoidance of, for the compensation of and for the restitution of the impacts on nature and landscape, including information regarding the actual and legal availability of the areas required for compensation and for substitution. The landscape management plan and the documents presented in addition to this contain all this information.

With regard to the request from NABU, WWF and Friends of the Earth Germany for further concretisation of the (originally) planned real compensatory measures, these objections have been resolved because these measures are not subject to planning approval here, but instead the decision has been taken in favour of the satisfaction of the compensation requirement by means of an eco-account or additionally by nature conservation measures which have already been approved elsewhere.

The following may be established in respect of the measures addressed by NABU: It is not possible to identify substantial impacts on resting birds (such as sea ducks, for instance) in the application documents given the construction time restrictions, meaning that no compensation requirement can be established for this species group and thus no compensatory measures are required.

The areas of the Bay of Greifswald with adequate transparency must be repopulated with seagrass. This is currently not looking promising, since first a further reduction in external nutrient inputs and the associated reduction in phytoplankton growth and improvement in the depth of light penetration would have to be progressed for this (Meyer & Nehring 2006[125]).

The planning authority has examined the suggestion by Friends of the Earth Germany to do without land clearance at the landfall site with the result that the project applied for can only be achieved if the areas required are made available. The land used is also justifiable given that the site is within a land-use plan zoned for industrial use and that compensation due under nature conservation and forestry legislation is being provided.

[125] Meyer, T. & Nehring, page (2006): Planting of seagrass areas (*Zostera marina L.*) as an internal measure in the restoration of the Baltic Sea. Rostock University marine biology articles, issue 15, pp. 105-119, p. 113.

B.4.10 Weighting of private matters / decisions

The objectors will be identified by numbers allocated in sequence for data protection reasons. To make reading simpler, a singular, masculine pronoun will be used in all cases. Each objector knows 'his' serial number. In addition, the decision is notified to the objectors and the objector numbers are given.

Objectors 001, 003, 007, 011, 016, 020, 023, 024, 026 to 031, 036 to 051, 054 to 059, 061, 066, 069, 073, 076, 081, 083, 084, 084+, 085, 089 to 101, 104, 105, 107, 109 to 113, 115, 116, 119 to 124, 127, 128, 136 to 144, 148, 152, 153, 156, 157, 160v, 161v, 165v on the requested compensatory measure 1 Wreecher See

Objectors 005, 006, 008 to 010, 018, 019, 059, 074, 077, 078, 086, 164v on requested compensatory measure 2 Ossen

Objectors 002, 012 to 015, 025, 032 to 035, 052, 053, 059, 060, 063 to 065, 067 to 071, 072, 080, 082, 087, 088, 114, 117, 125, 126, 129 to 132, 145 to 147, 152, 158, 160v, 161v, 162, 163v on requested compensatory measure 3 Mellnitz-Ueselitzer Wiek

The objectors, apart from 160, 161, 163, 164 and 165, have each written their own submission in good time and objectors 160 (mail received on 6 June 2017), 161 (mail received on 6 June 2017), 163 (mail received on 8 June 2017), 164 (mail received on 15 June 2017) and 165 (mail received on 19 June 2017) were late in presenting their objections to the project. In terms of impact, the objectors refer to their own properties, to existing leases or other economic dependencies, in some cases objections by others were adopted. Particular objections were put forward against any use of land for the implementation of compensatory measures 1, 2 and/or 3. It is said that agricultural use of the land will no longer be economically feasible once the compensatory measures are put in place. Reference is made to the impact on the right to hunt and on the inalienability of church property according to the constitution of the northern church.

The objections, where they related to personal matters, are rejected unless they had not been taken into account by the current planning decision. The modification to the plan entitled 'Supplementary volume: Concrete specifications' submitted by the project developer and the use of an eco-account no longer provides for appropriation of the objectors' property affected by this measure and thus neither any impact of the project on this property nor restrictions on the current use can be identified. No interventions amounting to an actual change will be carried out on the land owned by the objectors. This non-utilisation, or utilisation on a voluntary basis, had already been conceded by the project developer during the discussions (cf. report dated 26 September 2017, pp. 318 and 342). The compensation requirement for the project will be covered elsewhere and only with the consent of other owners of sites affected. Rejection of the pipe laying proposal as such by reason of the compensation requirement triggered by it does not therefore come into consideration. Nor can any risk to the continuation of existing businesses be identified.

Suspension of the plan approval procedure until the project developer has submitted further documents which the objectors have not seen is out of the question. Any such requests are declined. The procedure has been carried out in accordance with the legal provisions of sections 73 et seq. of the German Administrative Procedures

Act for Mecklenburg-West Pomerania (VwVfG M-V). It is the view of the planning authority that the plan is ready for decision in its established version, with no need for further documents to be presented.

The remaining objections referring to the real compensatory measures on Rügen have been resolved by covering the compensation requirement elsewhere:

- long-term change to the visual amenity of the region,
- that future agricultural use would be excluded - including that of the fields, meadows and woods,
- that there are no statements relating to possible uses of the areas concerned after expiry of the 25 years, nor is there anything more concrete relating to the transformation and the management approach,
- threat to jobs by the rededication of arable land,
- suppression of the legally required consideration of agricultural/agrarian matters,
- no examination of federal government sites, measures relating to coastal protection or areas closer to the intervention,
- no exploitation of the possibilities of compensation in the marine area, although regulations provide for the option of purely offshore compensation,
- that compensation should be provided in the same area of visual amenity as the intervention,
- doubt as to whether it will be possible to implement the measure successfully,
- compatibility of the measure given the location in European Bird Special Protection Area DE1747-402 has not been demonstrated,
- furthermore, there are doubts as to the compatibility of K3 with landscape conservation area L144,
- that an environmental impact assessment should be carried out for the new afforestation proposed in the context of the compensatory measure,
- proof in terms of nature conservation and conservation legislation that the objective - reducing the area of nutrient inputs into the coastal waters - can compensate for the project-related interventions,
- project-related interventions should be compensated for on land; there is no indication that the construction of the pipeline leads to nutrient inputs; area strips are too far away from the waters affected by the intervention,
- there is no proof that the compensatory measure would not be liable to have a considerable impact on the performance and capability of the ecological balance of the area or the overall visual amenity,
- that there is no reasoning why alternative measures were not considered,
- it is not permissible to take areas used for agriculture for compensation and substitution measures, the selection, nature and extent of the onshore compensatory measures is deficient,
- the representation of the majority of the land as an area reserved for agriculture in the Regional Development Programme for Mecklenburg-West Pomerania (LEP M-V) 2016 and in the Western Pomerania RROP 2010

has not been sufficiently taken into consideration,

- there are no studies relating to the reshaping of the landscape and the consequences on the behaviour of prey animals for hunters,
- the compensation concept directed at the purely nature conservation aspects is under the reservation of the availability of land under civil law and the sites claimed have a far broader scope than would be necessary for compensation under the measure of the project developer,
- there is building approval for individual sites,
- loss of cultivatable sites cannot be compensated for in terms of the contracted supplies of raw material (sugar beet) and would have negative consequences for the entire sector,
- the evaluation of the compensatory measures under water legislation is not correct; the relevant statements are defective,
- reference to the 'unsatisfactory condition' of the Pomeranian Bight and the Bay of Greifswald in accordance with the Water Framework Directive, the causes of pollution from nitrates should be sought in the input from the rivers and thus the intervention should not be compensated for by measures on Rügen.

These cannot be considered the objectors' own concerns. Notwithstanding this, such aspects should also be dismissed as being unfounded. The project developer has examined, and introduced into the process, alternatives and especially technical expansion measures to existing water treatment plant for an additional treatment stage, the implementation of renaturing of the Bargischow polder and the use of an eco-account. The plan approval decision is in order formally, from the point of view of procedural law and of substantive law. Reference is made in detail to the statement of grounds in section B of this decision.

The further objections from the objectors listed above directed at the approved pipeline are rejected.

- Reference is made to section B.4.1 with respect to the increased doubt as to the need for the project and the public interest in its completion.
- It must be stated, as grounds for a rejection of the objection, that the doubled pipeline (Nord Stream and Nord Stream 2) represents a circumstance increasing the danger and risk, that the two pipelines comply with the relevant safety provisions and requirements of section 49 of the German Energy Industry Act (EnWG) and the residual risks have been examined for their acceptability and evaluated as negligible (cf. section B.4.8.17).
- The planning authority considered in detail the question of the correct methodology for dealing with the intervention. Reference is made to section B.4.8.4 in respect of the dismissal of this objection.

<u>Objectors 084, 084+, 085 on the requested compensatory measure 2 Ossen</u>

The objectors presented their objections to the project in good time in a joint letter dated 30 May 2017. The objectors are proprietors of an agricultural enterprise which farms an area of a total of 509 ha on Rügen and owners of 14 plots of arable land (approximately 50 ha), 6 plots of grassland (approximately 12 ha) and 3 plots of

arable land (approximately 10 ha) and one plot of grassland (< 1 ha), which is leased. Around 60 ha of arable land are affected by the compensatory measures. Objections have been raised against the planning approval including the required consequential measures and an application made not to include the consequential measures or the areas owned or leased by them (including compensatory measure 2) in the plan approval decision. Furthermore, in the case of reversion to private property and land for the compensatory and substitution measures the constitutional prohibition on excess must be taken into account in respect of the expropriatory pre-effect in order to give due effect to the public interest of article 14 paragraph 3 sentence 1 of the German Basic Law.

The objections are rejected. The objections by the objectors specified above referring to the real compensatory measures on Rügen have been resolved by covering the compensatory requirement elsewhere, see the discussion for the objectors listed above for further details.

As already stated (cf. section B.4.8.4), the interest in real compensation and the conflicting interests in use by the private individuals concerned must be balanced out (German Federal Administrative Court, judgement dated 23 August 1996, 4 A 29/95, NVwZ 1997, 486). It must be noted here that the project developer must prioritise the use of his own or freely acquired land (German Federal Administrative Court, decision dated 26 September 2013, 4 VR 1/13, juris para. 60). Considering the fact that the project developer is in a position to fulfil the compensatory requirement through an available, suitable eco-account, any compulsory use of private property cannot be justified in accordance with the legal situation.

Objector 152 (Bauernverband Rügen e.V.) on the requested compensatory measure 2 Ossen and compensatory measure 7 Grosser Lobber See

The objector presented his objections to the determination of the necessary consequential measures for the project in good time in a letter dated 29 May 2017. The impact arises from the significant use of land under agricultural use. The use of arable land as a compensation area for nature and landscape conservation is rejected and it is not clear to what extent options have been weighed or other alternatives examined. A re-evaluation of the interventions, with no unilateral imposition on agriculture and without using arable land for compensatory measures, is requested.

The objections do not relate to the objector's own affairs and are rejected. These objections referring to the real compensatory measures on Rügen have been resolved by covering the compensation requirement elsewhere. The modification to the plan entitled 'Supplementary volume: Concrete specifications' submitted by the project developer and the use of an eco-account no longer provides for appropriation of the property on Rügen, particularly that in agricultural use, affected by this measure and thus neither any impact of the project on agriculture nor restrictions on the current use can be identified. This non-utilisation, or utilisation on a voluntary basis, had already been conceded by the project developer during the discussions (cf. report dated 26 September 2017, pp. 318 and 342). The compensation requirement for the project will be covered elsewhere and only with the consent of other owners of sites affected. Rejection of the pipe laying proposal as such by reason of the compensation requirement triggered by it does not therefore come into

consideration. Nor can any risk to the continuation of existing businesses be identified.

Objectors 160v, 161v on the requested compensatory measure 2 Ossen and compensatory measure 7 Grosser Lobber See

The objectors presented their objections to the planned compensatory measures late in a joint letter dated 1 June 2017. The objection was received by the Stralsund Mining Authority on 6 June 2017. It was noted that the farmers had long-term supply contracts and loss of cultivatable sites cannot be compensated for in terms of the contracted supplies of raw material (sugar beet) and would have negative consequences for the entire sector.

As stated in the properly posted public notices, there is an opportunity to raise objections to the plan and/or the project in writing for up to two weeks after expiry of the display deadline - and therefore up until 31 May 2017 inclusive - or declare an objection for the record at the Stralsund Mining Authority, at the Federal Maritime and Hydrographic Agency or at one of the other aforementioned display locations (deadline for objections). The receipt of the objection is determinant for the purposes of compliance with the deadline. As an objection as defined by section 43a of the German Energy Industry Act (EnWG) in connection with section 73 paragraph 4 of the German Administrative Procedures Act for Mecklenburg-West Pomerania (VwVfG M-V), the letter was out of time when received by the hearing planning authority, the objection is rejected.

Incidentally, the objection is also dismissed on its substance. These objections referring to the real compensatory measures on Rügen have also been resolved by covering the compensation requirement elsewhere.

Objectors 021, 022 on the requested compensatory measure 7 Grosser Lobber See

The objectors presented their objections to the project in good time in a joint letter dated 26 May 2017. The objectors are owners of a property in the area of compensation site 7, which is leased as part of a larger farm and this could also be used for other purposes because of its location directly at Lobbe.

The objections are rejected. The objection to the plans for the compensatory measures is not sufficiently substantiated to allow the matters concerned to be identified. The fact of the lease to a third party as part of a larger farm means that the matter concerned is not the objector's own matter; the possibility for undetermined other uses in the future is not limited. The objections of the above-mentioned objectors referring to the real compensatory measures on Rügen have been resolved by covering the compensation requirement elsewhere.

Objectors 059, 103, 134 and 135 on the requested compensatory measure 7 Grosser Lobber See

Objector 059 presented his objections to the project in good time in a letter dated 29 May 2017. The objector is affected by the planned nature conservation measures as the property owner of approximately 236 ha, which is mainly high quality arable land.

The removal/conversion of valuable agricultural productive assets in this substantial amount is held to be disproportionate.

Objector 103 presented his objections to the project in good time in a letter dated 22 May 2017. The objector is the owner of a property including approximately 4 ha of grassland and from which he aimed to gain lease income. He spoke against permanent use for nature conservation purposes and feared restrictions on owner's control and exploitability.

Objector 134 presented his objections to the project in good time in a letter dated 30 May 2017. The objector farms 157 ha of grassland, approximately 60 ha of arable land and has 120 suckler cattle with their offspring. Over 50% of the farm's acreage would be lost to compensatory measure 7. The grazing land for the beasts will be lost to extensification and standing water and valuable arable land will be lost to the planned afforestation. The objector was ready to collaborate on the measure if the business income would be assured and the farm would be competitive over the long term thanks to better ownership structures.

Objector 135 presented his objections to the project in good time in a letter dated 30 May 2017. The objector farms approximately 65 ha of arable land in the area of planned compensatory measure 7. A critical mainstay of the farm would be seriously weakened by the removal of arable land near the farm by transformation into woodland or grassland. The farm's business plan would no longer work because of the loss of income and the economic capacity would be significantly impaired.

The objections are rejected. The objections by the objectors specified above referring to the real compensatory measures on Rügen have been resolved by covering the compensatory requirement elsewhere, see the discussion for the objectors listed above for further details.

As already stated (cf. section B.4.8.4), the interest in real compensation and the conflicting interests in use by the private individuals concerned must be balanced out (German Federal Administrative Court, judgement dated 23 August 1996, 4 A 29/95, NVwZ 1997, 486). It must be noted here that the project developer must prioritise the use of his own or freely acquired land (German Federal Administrative Court, decision dated 26 September 2013, 4 VR 1/13, juris para. 60). Considering the fact that the project developer is in a position to fulfil the compensatory requirement through an available, suitable eco-account, any compulsory use of private property cannot be justified in accordance with the legal situation.

Objector 004

The objector raised his objections to the project in good time in a letter dated 12 May 2017. In his letter he states that there is great certainty that the lost trading station of Vineta is located in the area to the west and east of the navigation channel into the port of Lubmin; it had been sacked by the Danes in 1130, 1166 and finally in 1178 and the ruins were lost in the Bay of Greifswald because of floods and storms in the years 1188/89 or 1198/99. The findings from the exploration of the pipeline route must therefore be preserved accordingly or notified to the responsible authorities.

This objection is rejected. Notwithstanding the fact that this matter is not a personal matter of the objector, it is also not possible to establish any substance. The responsible State Bureau for Culture and Care and Preservation of Ancient Monuments and Artefacts in Mecklenburg-West Pomerania noted in its submission dated 29 May 2017 the appropriate representation of the archaeological heritage in the application documents and also did not bring up any sites in the region suspected of being of interest in terms of historic monuments. Furthermore, the project developer has been required to implement archaeological measures along the entire pipeline route and anchorage corridor in the exercise of which it will be ensured inter alia that Vineta, if it were located in the region of the planned landfall, will not be ignored (cf. letter from State Bureau dated 17 October 2017).

Objector 017

The objector raised his objections to the project in good time in a letter dated 25 May 2017. As a resident and leisure user of Usedom island, the Western Pomerania-Rügen area, and neighbour of the Nord Stream AG and Nord Stream 2 AG construction sites immediately connected to the Peenestrom, he is personally, directly and adversely affected by the project. His complaint (in respect of the project) is that the project contradicts the diversification of energy sources, it pollutes sea areas, bathing waters and beaches, danger signs would be missing, chemical weapons and occupational safety and compensatory measures have not been specified. He was particularly worried that secondary effects could arise during the build up and run down of compressed air in the area around the landfall, e.g. waters containing E222/NaH_2SO_5. The objector could not find any information on the safe disposal of any bombs and munitions registered in the war archives and in the explosive ordnance land register as being in the Baltic Sea. He further complained about the planned real compensation; nor could he identify any reduction in CO_2 emissions in the EU. Insurance protection, with the nature, scope, duration and liabilities have not been recorded, their disclosure is requested. Accidents and consequences, and Mecklenburg-West Pomerania management planning has been completely neglected; likewise the effects of leaks and accidental gas loss. The human aspect has not been given sufficient consideration.

The objections are rejected; to start with, there is no relevant matter put forward for consideration that would affect the objector himself. Even if, as a precaution, the enjoyment of the Baltic Sea and the landfall site for private and professional activities were to be treated as the objector's own interests, these must be given less weight than the interests of the project simply because there is no relevant impact on the objector. Notwithstanding this, the aspects complained about should also be dismissed as being unfounded. The legally binding limit and guide values in the relevant technical regulations regarding airborne pollution have been complied with. The maritime construction sites will be operated in compliance with the usual safety requirements and with the agreement of the Federal Waterways and Shipping Administration so that any impacts on the safety and ease of movement of shipping traffic are excluded or reduced to an acceptable level. Detailed seabed surveys have been carried out and will be carried out before the pipe is laid. The offshore construction activities in German coastal waters will probably be completed within the year. The plan approval decision is in order formally, from the point of view of

procedural law and of substantive law. Reference is made in detail to the statement of grounds in section B of this decision.

Objector 062

The objector raised his objections to the project in good time in a letter dated 24 May 2017. The objector is a society the purpose of which is "promoting nature protection and preservation of the countryside." (cf. http://www.salmonidenschutz.de/unser-verein/satzung). Its particular focus is the protection of salmonids and their waters. It has requested that the required compensatory measures also be implemented in the aquatic sector. Furthermore, it would make more sense to use the compensatory funds from the construction of the pipeline for the implementation of the EU Water Framework Directive instead of 'destroying' arable land.

The objections are rejected. The society is not one of the nature conservation organisations recognised in the state of Mecklenburg-West Pomerania; no impact to matters defined in the articles can be identified. Notwithstanding this, these objections referring to the real compensatory measures on Rügen have also been resolved by covering the compensation requirement elsewhere. The approved compensatory measures are suitable for compensating for the unavoidable project-related interventions. In accordance with section 15 paragraph 2 p. 3 of the German Federal Nature Conservation Act (BNatSchG) an impact has been substituted for if and as soon as the impaired functions in the ecosystem are established in equivalent manner in the space affected. The decisive factor is, thus, not the implementation of the measure, but its (recovery) effect in the natural space concerned. Accordingly, it is not necessary that the measures absolutely must be carried out in the same natural space in which the intervention has occurred. In addition, it would not be appropriate, because of the purpose of the compensation, that is to say "making good again" impacts on certain functions of nature and the landscape, to establish a relationship between intervention and compensation by the geographical definition of the natural space alone. It is rather more the case that the natural space should be delimited functionally, also to comply with the purpose of the compensation regulations, i.e. the substitution measure must act on the functions of the natural space affected by the intervention as defined in section 15 paragraph 2 sentence 3 of the German Federal Nature Conservation Act (BNatSchG), which is the case here.

Objector 070

The objector raised his objections to the project and presented his alternative proposals for compensation in good time in a letter dated 28 May 2017. The objector is a trust which manages approximately 8 ha of bulrush (Typha) on the Peene opposite Schadefähre island (paludiculture). The objector requests that the property owners are given significantly more time to present and discuss alternative compensatory measures. No other method which would reduce the nutrient input more strongly is mentioned; what is more, semi-natural wetland areas should not be zoned as compensatory areas. The trust is lacking suitable cultivatable areas throughout Europe. The possibility of reducing nutrient inputs by bulrush fields is indicated as a proposal; the trust would be happy to make available its many years of collective experience to put this proposal into action.

The objections are rejected. No impact can be identified, nor is it a matter personal to the objector. There are sufficient suitable measures/eco-account in place to compensate for the project-related intervention. The project developer can also not be required to adopt a specific compensatory measure, even if it were just as suitable as the measures determined. The objection is also unfounded in its substance. The legal requirements of the German Federal Nature Conservation Act (BNatSchG) have been satisfied, to this extent, therefore, there is no need for further examination of the alternative proposals made. Apart from that, the plan approval decision is in order formally, from the point of view of procedural law and of substantive law. Reference is made in detail to the statement of grounds in section B of this decision.

Objector 076

The objector raised his objections to the project and the subsequent measures in good time in a letter dated 30 May 2017. He notes that it is specifically smaller and medium-sized businesses that are affected by the compensatory measures in a form that would threaten their existence. It is harmful and also amoral that people are starving and arable land would be destroyed.

The objections do not relate to the objector's own affairs and are dismissed. These objections referring to the real compensatory measures on Rügen have been resolved by covering the compensation requirement elsewhere. The modification to the plan entitled 'Supplementary volume: Concrete specifications' submitted by the project developer and the use of an eco-account no longer provides for appropriation of the property on Rügen, particularly that in agricultural use, affected by this measure and thus neither any impact of the project on agriculture nor restrictions on the current use can be identified. This non-utilisation, or utilisation on a voluntary basis, had already been conceded by the project developer during the discussions (cf. report dated 26 September 2017, pp. 318 and 342). The compensation requirement for the project will be covered elsewhere and only with the consent of other owners of sites affected. Rejection of the pipe laying proposal as such by reason of the compensation requirement triggered by it does not therefore come into consideration. Nor is it possible to identify a risk to the existence of existing operations; hunger in the world is a global problem and cannot be reduced in the possible discretionary powers of the Mining Authority of Stralsund.

Objector 103

The objector raised his objections to the project in good time in a letter dated 29 May 2017. These objections were submitted as a farmer. The very existence of agricultural operations on Rügen island is threatened by the proposed compensatory measure and the change of use of valuable arable land and the cultural landscape which has been shaped by agriculture over the centuries would suffer radical changes.

Notwithstanding the fact that the objection is not affected by the planned compensatory measure as evidenced by the list of properties attached to the application documents, the objections do not relate to the objector's own affairs and are rejected. The modification to the plan entitled 'Supplementary volume: Concrete

specifications' submitted by the project developer and the use of an eco-account no longer provides for appropriation of the property on Rügen, particularly that in agricultural use, affected by this measure and thus neither any impact of the project on agriculture nor restrictions on the current use can be identified. This non-utilisation, or utilisation on a voluntary basis, had already been conceded by the project developer during the discussions (cf. report dated 26. September 2017, pp. 318 and 342). The compensation requirement for the project will be covered elsewhere and only with the consent of other owners of sites affected. Rejection of the pipe laying proposal as such by reason of the compensation requirement triggered by it does not therefore come into consideration. Nor can any risk to the continuation of existing businesses be identified.

Objector 118

The objector raised his objections in good time in a letter dated 31 May 2017. The objector is a trust the purpose of which is "promoting protection of nature and the environment, promoting science and research" (cf. http://succow-stiftung.de/satzung.html). Its particular focus is the promotion of a use of land that is compatible with nature and is socially responsible. No objections to the project and the required compensatory measures are presented, instead reference is made to the possibility of making land owned by the trust available as compensation land for a possibly required modification to the compensation plans.

The trust is not one of the nature conservation organisations recognised in the state of Mecklenburg-West Pomerania; no impact on the trust itself arising from the project can be identified. Since the requirement for compensation triggered by the project can be covered elsewhere by suitable measures/an eco-account, the planning authority did not take up this proposal.

Objector 133

The objector presented his objections to the project in good time in a letter dated 31 May 2017. The legally represented objector is the owner and operator of the Polish ports of Świnoujście (Swinemünde) and Szczecin (Stettin). Around 20 million tonnes of cargo is handled there each year. Świnoujście port is currently accessible to vessels with a draught of up to 13.2 m and Szczecin port for a draught of up to 9.15 m. The seaports at Świnoujście and Szczecin are accessed by two shipping lanes: no. 5 Odermündung and no. 20 Świnoujście - Ystad. The expansion plans for Polish ports intend to allow use by container ships with a draught of up to 15.4 m. Laying the pipeline in shipping lane no. 20 would render this impossible (17.5 m depth - 1.5 m pipe diameter - 2.5 m keel clearance).

More specifically: The pipeline would adversely affect the interests of the port company and should be trenched so as not to restrict the usability of Świnoujście port disproportionately.

1. The right to unhindered access to Polish ports and hence to the objector's property would be infringed.
2. The laying of the pipeline infringes the company's freedom to exercise its occupation in accordance with article 12, paragraph 1 of the German Basic Law.

3. The installation of the pipeline would impact the company's freedom to enjoy its property in accordance with article 14, paragraph 1 of the German Basic Law.
4. Laying the pipeline in shipping lane no. 20 over a length of 2.2 km between KP 27.645 and KP 29.892 will have the effect of preventing vessels with a draught of more than 13.5 m from entering ports operated by the company, and hence of an unjustified restriction on European freedom to provide services.
5. There are considerable environmental concerns as the pipeline represents a significant interference in the existing ecosystem of the Baltic Sea. Furthermore, the effects of laying the pipes on the seabed compared with trenching have not been adequately investigated; there is no necessity because of Nord Stream and existing alternatives with a land routing. The considerable hazards to the environment and shipping in the event of damage to the pipeline have not been adequately investigated.

The objections are rejected, the objector refers to positions which are as such not even due to him (Hamburg Administrative Court, judgement dated 17 December 2015, 7 K 607/11, p. 23; appearing as the plaintiff). Above all, an intervention in the positions of the basic law mentioned should not even be considered possible according to the (generous) scale applicable for the permissibility of legal redress (Hamburg Administrative Court, p. 32 et seq.). The Hamburg Supreme Administrative Court confirmed this in its judgement of 25 September 2017 (1 Bf 93/16). There is no impact on the rights of the objector as a result of the planned pipeline. Apart from that, shipping lane no. 20 and the Nord Stream 2 pipeline do not even cross within the German 12 nm zone which is covered by this planning approval.

Re objections 1 to 4:
Notwithstanding this, nor are impacts to be feared. Following installation of the pipeline, vessels will be able to pass through shipping lane no. 20 with the same draught as today. The natural water depth of shipping lane no. 20 has been only 14 m on average, at some points it is even less than 12 m, from time immemorial. Accordingly, it is not possible to understand, as is asserted, to what extent laying the pipeline in shipping lane no. 20 will have the effect of preventing vessels with a draught of more than 13.5 m from entering ports operated by the company, and hence of an unjustified restriction on European freedom to provide services.

There is no evidence, either in accordance with the objection or elsewhere identifiable that the excavation of this shipping lane necessary to open the ports up to shipping lane no. 20 has been planned or even suggested. All statements by the objector concern only dredging of the port, not its development. The lack of firm plans for dredging shipping lane no. 20 is an important aspect in the rejection of the objections for the planning authority principally because large sections of the over 50 km long deepening area pass directly through the (German) nature reserve, FFH area and EU bird Special Protection Area in the Pomeranian Bight and there is doubt that dredging of this nature would be compatible with German and European nature conservation laws. Even as far as the plans for dredging the port are concerned, it is impossible to determine whether, following the "Preliminary Study on the Feasibility of the Construction of the Container Terminal in Świnoujście“ (Ernst & Young, 21 September 2015), following the decision of the company's supervisory board to progress the measures taken for the container terminal project dated 13 June 2016

and following the agreement with the Wuprohyd Project Office dated 24 January 2017 concerning the implementation of the technical concept for the construction of a container module, further studies have been commissioned, any approvals procedure has already been started, whether the permission is already in place and construction contracts have been awarded. To this extent, a very early planning phase must be assumed, the implementation of which is not truly assured. Adverse impact on persons and their affairs are not in the least identifiable.

Furthermore, it is not possible to determine why the construction of a pipeline should be a measure that could represent an impact on the petitioner's business. The pipeline does not come into contact with the petitioner's properties, but rather the part of it that is the subject of the complaint is well over 50 km distant from it. The relationship between the pipeline construction and the objector's activities exists only in that the objector wishes to assert an interest in a future expansion of the traffic able to use shipping lane no. 20. This change could, if it is to be at all reasonable, that is to say eligible for consideration, only relate to the fact that the navigable channel is being substantially redeveloped, that is to say deepened and widened, not only in the area of the crossing but on the total distance to the port facilities. However, there can be no dispute that this dredging does not fall into the area for which the objector is responsible, has authority or for which planning is required. The objector is responsible, according to its mandate under the law, solely for the port facilities themselves (cf. article 13 paragraph 2, article 7 of the Harbour Act of the Republic of Poland dated 20 December 1996); in other words, according to the law which established it, it must carry on its business with those approach conditions that are offered to it by the state authorities responsible. Thus, according to article 2 paragraph 1 no. 1 of the Law of the Republic of Poland dated 24 April 2009 on investments in the area of the regasification terminal the remit to secure the infrastructure for the access to the outer port is assigned to the maritime authorities in Szczecin. There is no cordoning-off effect in respect of the objector's ports associated with the project to lay a pipeline that is material under the law. For the relevant, present circumstances (cf. German Federal Administrative Court, decision dated 3 November 2006, 10 B 19/06, juris) it is already clear that there has been no shipping traffic (and this remains the case) in the area of shipping lane no. 20 which would have been (or could be) hindered by the pipelines because, elsewhere on this shipping lane - other than the case with lane no. 5 which is anyway the only recommendation - substantially lower water depths are met than those remaining above the pipelines which are laid in comparatively deep water (cf. re Details Hamburg Administrative Court, judgement dated 17 December 2015, 7 K 607/11).

Re objection 5:
Notwithstanding the fact that the environmental matters are not part of the objector's own affairs, the project developer has presented comprehensive documents that demonstrate the environmental compatibility of the project. The Stralsund Mining Authority is the responsible authority and has carried out its own environmental impact assessment (cf. section B.4.4) and has examined the possible risks to the safety and ease of movement of shipping traffic (cf. section B.4.8.18). DNV-GL's expert opinion (see application document, part I.3.07, section 11.3, table 11.2, p. 54 et seq.) showed that the possibility of damage to the pipeline can reasonably be excluded, that is to say, the possibility of any damage is so slight that it does not need to be considered according to the acceptance criteria of the internationally recognised engineering codes for offshore pipelines. An onshore route does not

represent an alternative for an offshore pipeline, but rather a different project or an alternative concept which does not need to be taken into consideration (cf. German Federal Administrative Court, judgement dated 11 August 2016, 7 A 1.15, para. 139; judgement dated 9 February 2017, 7 A 2/15, para. 412).

Objector 154

The objector presented his objections to the project in good time in a letter dated 31 May 2017. He objects that the construction of Nord Stream 2 would necessarily be followed by the construction of EUGAL. He states in respect of the impact that the approval of Nord Stream 2 would widen the existing hazard corridor presented by JAGAL and OPAL. There is no demand for the expansion of Nord Stream; a subjective need of the project developer should not be sufficient, in view of the interventions in nature and the landscape, to set aside the statutory prohibition in accordance with sections 13 et seq. of the German Federal Nature Conservation Act (BNatSchG). Nord Stream 2 makes no contribution to a secure energy supply, the hazard radius would be substantially increased following bundling with other pipelines and the safety of the Nord nuclear waste interim storage facility would no longer be guaranteed. Mining law would also prohibit permission because there is no fundamental requirement and the project would endanger the internal and external security of the Federal Republic of Germany and is predominantly against the public interest. Finally, the project would endanger compliance with the climate protection obligations of the EU.

This objection is rejected in full. It is not possible to identify any breach of property rights, the village of Gross Köris and thus also the objector's (assumed) property is not affected by the project. The fear of a threat to health from the project is unfounded. The distance between the landfall site and the objector's residence is at least 220 km as the crow flies, so that any direct impact from the project can be excluded. Besides, impact on humans as a feature of conservation interest has been comprehensively dealt with in the application documents, no substantial detrimental impacts can be identified (cf. section B.4.4.2.1).

The construction and operation of EUGAL are not the subject of this plan approval procedure. Separate procedures will be held for this, split by authority over Mecklenburg-West Pomerania, Brandenburg and Saxony, in which the legal preconditions for an approval will be examined and the matters concerned will be considered. Thus the fear of a safety risk is unfounded. The construction and operation of the pipelines will only be permitted if the relevant statutory provisions regarding the state of the art, the avoidance of risk, fire protection and the relevant engineering codes are complied with. There is no aspect known to the planning authority at the time of this planning decision which could insurmountably prevent the approval of EUGAL (cf. section B.1.3). The high-pressure gas lines providing the general supply from the pipeline are expressly excluded from the German Equipment and Product Safety Act (GPSG) and they are neither within the scope of the Ordinance regarding Facilities that are Subject to Licensing (4th BImSchV, Ordinance for the Implementation of the Federal Imission Control Act) nor are they covered by the Hazardous Incident Ordinance (12th BImSchV, Federal Imission Control Ordinance). The lawful basis for the construction and operation of energy facilities is the German Energy Industry Act. High-pressure gas pipelines, which are

considered to be energy facilities for the supply of gas within the meaning of the German Energy Industry Act (EnWG), are subject to the High Pressure Gas Pipeline Ordinance (GasHDrLtgV), which is an Implementing Regulation for the German Energy Industry Act (EnWG). According to this, high pressure gas lines must be installed and tested in accordance with the latest state of the art. According to the High Pressure Gas Pipeline Ordinance (GasHDrLtgV), compliance with the prior art is assumed if the technical regulations issued by the German Technical and Scientific Association for Gas and Water (DVGW) have been complied with. By analogy with the concept behind the deterministic safety concept usual in Germany, pipelines are designed, built, tested and operated in such a way that equal safety is ensured at all points of the line, irrespective of the external conditions which cannot be influenced. This also applies in areas when bundled with other pipelines. No safety requirement related to spacing is defined in the guides. Ultimately, independent experts confirm that there are no issues with the installation and operation of high-pressure gas pipelines (sections 5 and 6 of the High Pressure Gas Pipeline Ordinance (GasHDrLtgV)). This guarantees compliance with the quality standard which also represents adequate basic safety of high-pressure gas pipelines. The Mecklenburg-West Pomerania Ministry for the Interior fundamentally sees no impermissible effects of Nord Stream 2 on the Nord nuclear waste interim storage facility (cf. note dated 16 May 2017). The hazards outlined by the objector exist independently of Nord Stream 2 and independently of the approval. To protect against events of this nature, the Federal Ministry for the Interior has developed, working with the State governments and the relevant experts' organisations and operators, various safety strategies and systems such as the national strategy for the protection of critical infrastructures (KRITIS strategy) and the implementation plan for them.

The remaining objections relate to aspects of the preparation of the plan, technical planning and to nature conservation topics, the environmental compatibility of the project and aspects of relevance to protection of the climate. Reference is made to the relevant statements in section B of this decision. It is not clear to what extent mining law could prevent approval in a plan approval procedure under energy law. The plan approval decision is in order formally, from the point of view of procedural law and of substantive law.

Objector 155

The objector presented his objections to the project in good time in a letter dated 31 May 2017. He states that the impact can be determined from his presentation. The objection is that there is no demand for the expansion of Nord Stream; a subjective need of the project developer should not be sufficient, in view of the interventions in nature and the landscape, to set aside the statutory prohibition in accordance with sections 13 et seq. of the German Federal Nature Conservation Act (BNatSchG). He additionally provides information relating to existing overcapacity, to reference scenarios and to transit capacity through Ukraine. He further objects that Nord Stream 2 makes no contribution to a secure and reasonably priced energy supply, the hazard radius would be substantially increased following bundling with other pipelines and the safety of the Nord nuclear waste interim storage facility would no longer be guaranteed. Mining law would also prohibit permission because there is no fundamental requirement and the project would endanger the internal and external

security of the Federal Republic of Germany and is predominantly against the public interest. Finally, the project would endanger compliance with the climate protection obligations of the EU.

This objection is rejected in full. It is not possible to determine how property rights have been breached nor how there is any impact, however possible, on the objector's own affairs. Reference is made to the statements relating to objector 154 for the grounds.

Objector 159v

The objector raised his objections to the project out of time in a letter dated 31 May 2017. The objection was received by the Stralsund Mining Authority on 01 June 2017. He states that the impact can be determined from his presentation regarding the EUGAL regional planning procedure. He objects that the construction of Nord Stream 2 would necessarily be followed by the construction of EUGAL. There is no demand for the expansion of Nord Stream; a subjective need of the project developer should not be sufficient, in view of the interventions in nature and the landscape, to set aside the statutory prohibition in accordance with sections 13 et seq. of the German Federal Nature Conservation Act (BNatSchG). Nord Stream 2 makes no contribution to a secure energy supply, the hazard radius would be substantially increased following bundling with other pipelines and the safety of the Nord nuclear waste interim storage facility would no longer be guaranteed. Mining law would also prohibit permission because there is no fundamental requirement and the project would endanger the internal and external security of the Federal Republic of Germany and is predominantly against the public interest. Finally, the project would endanger compliance with the climate protection obligations of the EU.

As stated in the properly posted public notices, there is an opportunity to raise objections to the plan and/or the project in writing for up to two weeks after expiry of the display deadline - and therefore up until 31 May 2017 inclusive - or declare their objection for the record at the Stralsund Mining Authority, at the Federal Maritime and Hydrographic Agency or at one of the other aforementioned display locations (deadline for objections). The receipt of the objection is determinant for the purposes of compliance with the deadline. As an objection as defined by section 43a of the German Energy Industry Act (EnWG) in connection with section 73 paragraph 4 of the German Administrative Procedures Act for Mecklenburg-West Pomerania (VwVfG M-V), the letter was out of time when received by the hearing planning authority, the objection is rejected.

This objection is also rejected in full as far as the substance is concerned. Reference is made to section B.4.1 in respect of the need for the project. No point of view has been put forward which would carry such weight in the deliberations that the project could not be permitted. It is not possible to determine how property rights have been breached nor how there is any impact, however possible, on the objector's own affairs from the attached representation by the objector relating to the regional planning process in Brandenburg, which indisputably has nothing to do with the plan approval procedure for the section of EUGAL to be taken into consideration in Mecklenburg-West Pomerania. Apart from that, reference is made to the statements relating to objector 154.

B.5 Overall outcome of the deliberations

The Nord Stream 2 pipeline project is approved in accordance with the present plan approval decision since it is reasonably required for compelling reasons of overwhelming public interest taking into consideration the rights of third parties within the scope of planning freedom. The binding plans approved are also reasonable in respect of the expropriatory pre-effect and take into account and comply with the planning guidance, instructions and prohibitions expressed in the German Energy Industry Act and other statutory provisions and finally comply with the requirements of the duty to take into reasonable consideration.

The impacts on public interests and private legal positions or interests associated with the project are justified and permissible, in view of the purpose of the project. The 'zero solution' (cf. German Federal Administrative Court, judgement dated 10 April 1997, 4 C 5.96, DVBl. 1997 1115) – that is to say, abandoning the project – is eliminated since the purpose pursued with the project cannot be achieved with the zero solution.

The plan for the installation and operation of the Nord Stream 2 pipeline complies closely with the objectives of energy industry policy according to section 1 of the German Energy Industry Act (EnWG). According to section 1 paragraph 1 of the German Energy Industry Act (EnWG), the objective of the policy is in particular a reasonably priced, consumer-friendly energy supply that is as secure as possible. Adequate pipeline capacity is not only necessary for effective competition, but also for piped supply to the general population with gas, in particular, that is environmentally friendly. The project also makes an important contribution to covering demand and to security of supply in Germany and Europe. Guaranteeing security of supply, which the approved project serves to a particular degree, is a common interest of the highest importance. Security of supply is a service which the citizen absolutely requires to secure an existence fit for human beings (cf. BVerfGE 38, 258, 270 et seq.; E 45, 63, 78 et seq., BVerfG, Decision dated 10 September 2008, 1 BvR 1914/02, juris para. 15).

The intervention in the environment which is limited locally and to the construction period is not considered so serious that it is able to support an overwhelming public interest in the refusal of the project. The environmental compatibility of the project has been evaluated in accordance with section 12 of the German Environmental Impact Assessment Act and the evaluation has been taken into account in the deliberations. The unavoidable impact on nature and the landscape, Natura 2000 areas and in particular on strictly protected species associated with the project are supportable given the purpose of the project. The regulation of impact under nature conservation legislation (sections 15 and 16 of the German Federal Nature Conservation Act) (BNatSchG), and the protection regime of the national biotope and area protection programme (e.g. sections 14 and 20 of the Nature Conservation Implementing Act for Mecklenburg-West Pomerania), of Natura 2000 habitat protection (section 34 of the German Federal Nature Conservation Act) and of special species protection (sections 44 et seq. of the German Federal Nature Conservation Act) have been complied with and compatibility with the management objectives for water (sections 27, 44, 45a and 47 of the German Federal Nature Conservation Act) is assured. The benefits associated with the project of securing

the energy supply for Germany and Europe with natural gas justify the sacrifices in the nature conservation matters associated with the project referred to.

It must be noted that the use of property – here above all the public Baltic Sea shipping lane belonging to the Federal Republic of Germany in accordance with section 4 paragraph 1 of the German Water Resources Act in conjunction with section 1 no. 2 of the German Federal Waterways Act (WaStrG) - is indispensable for the approved project. The use of the Baltic Sea shipping lane by the project must therefore be permitted by the FRG. Furthermore, it has been possible to grant an approval in accordance with section 31 of the German Federal Waterways Act (WaStrG). In addition to the approval in accordance with section 31 of the German Federal Waterways Act (WaStrG), a contract of use with the public utilities is required because of the ownership under civil law by the Federal Waterways and Shipping Administration. The contractual content of a contract of use of this kind is subject to legal obligations and is not in the discretion of the Waterways and Shipping Administration (cf. for example Friesecke, German Federal Waterways Act (WaStrG), 6th edition 2009, section 30 para. 4; Schmälter in: Danner/Theobald, German Energy Industry Act, 94. EL July 2017, 134a. Supply pipeline and public waters, para. 50 with further references). In particular, the contract of use may not serve the enforcement of rights that cannot be taken into consideration in accordance with section 31 of the German Federal Waterways Act (WaStrG). Section 31 of the German Federal Waterways Act (WaStrG) has no protective effect for third parties (Friesecke, German Federal Waterways Act, 6th edition 2009, section 30 para. 3) and the contract of use can also not be enforced over this legally described scope.

Contradicting concerns of the Federal Republic of Germany relating to the Bundeswehr and also in respect of shipping have been taken into consideration in the planning approval.

The relevant owners of public interests have overwhelmingly backed the project, others have also spoken against the project, referring to the concerns which they represent. Concerns, instructions and information have been taken into consideration except where they have been rejected.

The permission processes for the Nord Stream 2 high-pressure natural gas pipeline in the countries affected, Russia, Finland, Sweden, Denmark and Germany, have been harmonised in accordance with section 43b sentence 1 no. 2 of the German Energy Industry Act (EnWG) between the responsible authorities in the participating states within the scope of transfrontier cooperation between authorities.

The outcome of the overall decision in the present case is that the plan for the construction and the operation of the Nord Stream 2 pipeline including its additions and amendments can be approved, since the advantages that can be achieved in energy supply with the construction of the pipeline outweigh the disadvantages.

B.6 Grounds for the ancillary provisions

The ancillary provisions are necessary to comply with sections 1 and 43a of the German Energy Industry Act (EnWG) and sections 36, 72 and 74 paragraph 2

sentence 2 of the German Administrative Procedures Act for Mecklenburg-West Pomerania (VwVfG M-V) for the protection of the general public interest and to ensure the conditions for approval. The ancillary provisions have been most widely justified in section B.4.8 in the material assessment of public interests of significance for the deliberations.

The ancillary provisions predominantly result from the representations from owners of public interests, nature conservation associations, private objectors and the authorities/government in other nations and, on the one hand have contributed to the fulfilment of preconditions under planning approval law and, on the other hand, to limit the impact of the project on third parties to the unavoidable extent.

B.7 Grounds for the reservations on the decision

The planning authority reserved the right in certain decisions in section A.1.3.

The reservations in A.1.3.1 and A.1.3.4 are necessary so as to be able to react to unforeseen events and to allow the project developer the possibility to be able to continue the project with the modification of individual details and to avoid the entire project being jeopardised for want of the conditions for approval. In accordance with sections 36 paragraph 2, 72 and 74 paragraph 3 of the German Administrative Procedures Act for Mecklenburg-West Pomerania (VwVfG M-V), an administrative act may be associated, after due discretion with a reservation on the subsequent adoption, modification or supplementation of a constraint.

The same is true with respect to the reservations of A.1.3.2 and A.1.3.3. These ensure that the conditions for approval are put in place by the final decision of the planning authority, even in the event of agreements or conformity with third parties not being achieved.

The permits under water law are subject to the reservation of A.1.3.5, that in accordance with section 13 paragraph 1 of the German Water Resources Act ancillary provisions (notably as defined by section 13 paragraph 2 of the German Water Resources Act) may be laid down to prevent or compensate for detrimental effects for others. These may be revoked in accordance with section 18 paragraph 1 of the German Water Resources Act.

B.8 Applicability

The plan approval decision is applicable immediately under the provisions of section 43e paragraph 1 sentence 1 of the German Energy Industry Act.

B.9 Costs

The decision regarding costs, for which a separate notification will be issued, is based on sections 1 paragraph 1, 2 paragraph 1, 12 paragraph 1, 14 and 17 of the Administrative Costs Act of the State of Mecklenburg-West Pomerania (VwKostG M-V) dated 4 October 1991 (GVOBI. M-V pp. 366, 435), as last amended by article 2 the law dated 2 December 2009 (GVOBl. M-V p. 666), in conjunction with section 1

and Tariff Section 3.46 and 4.3 of the fee schedule of the ordinance on the costs charged in the energy sector (Energy Industry Costs Ordinance - EnWKostVO M-V) dated 19 June 2009 (GVOBI. M-V p. 443), newly created by the ordinance dated 21 November 2012 (GVOBl. M-V p. 518).

Information on Statutory Rights

An appeal against this decision may be submitted in writing with a month of service to the Administrative Appeals Tribunal for Mecklenburg-West Pomerania, Domstrasse 7, D-17489 Greifswald. The appeal can also be submitted with a certified electronic signature in accordance with the Ordinance regarding Electronic Legal Communications in Mecklenburg-West Pomerania (ERVVO M-V) dated 18 December 2008 (GVOBl. M-V 2009 p. 53), as last amended by the fourth Amendment Ordinance dated 22 September 2017 (GVOBl. M-V p. 262) by submission to the Administrative Appeals Tribunal for Mecklenburg-West Pomerania by way of the Electronic Courts and Administration Postbox EGVP.

The appeal must identify the appellant, the respondent (Stralsund Mining Authority) and the object of the appeal and should contain a specific application. The factual situation and the evidence forming the basis of the appeal shall be submitted within a period of ten weeks following submission of the appeal. The court is able to reject any late pleading. The plan approval decision against which the appeal is raised should be attached as a copy.

The action for annulment of the plan approval decision does not cause any suspension. A request for an order for suspension of the plan approval decision in accordance with section 80 paragraph 5 sentence 1 of the Code of Administrative Court Procedure can only be submitted and argued within a month after the service of the plan approval decision at the Administrative Appeals Tribunal for Mecklenburg-West Pomerania, Domstrasse 7, D-17489 Greifswald. The application must be submitted in writing or with a certified electronic signature as provided for in the Ordinance regarding Electronic Legal Communications in Mecklenburg-West Pomerania (ERVVO M-V) dated 18 December 2008 (GVOBl. M-V 2009 p. 53), as last amended by the fourth Amendment Ordinance dated 22 September 2017 (GVOBl. M-V p. 262) by submission to the Administrative Appeals Tribunal for Mecklenburg-West Pomerania by way of the Electronic Courts and Administration Postbox EGVP, and identify the appellant, the respondent (Stralsund Mining Authority) and the object of the appeal.

Should material facts subsequently arise which justify the instruction for a suspension, the complainant affected by the plan approval decision may make and argue a request based on these facts in accordance with section 80 paragraph 5 sentence 1 of the Code of Administrative Court Procedure (VwGO) within a period of one month. The period begins at the point at which the complainant becomes aware of the facts.

The participants must be represented before the Administrative Appeals Tribunal of Mecklenburg-West Pomerania (except for the legal aid proceedings) by a fully authorised attorney at law or a law lecturer of a state or state-recognised law school in a member state of the European Union, another signatory state of the Agreement on the European Economic Area or Switzerland, having the qualification for

judgeship. The persons and organisations identified in section 67 paragraph 2 nos. 3 to 7 of the Code of Administrative Court Procedure (VwGO) are also recognised as authorised representatives. The power of attorney shall be granted in writing.

Authorities or bodies corporate under public law, including any associations they have formed for the fulfilment of their public obligations, can be represented by their own employees having the qualification for judgeship or by employees having the qualification for judgeship of other authorities or bodies corporate under public law, including any associations they have formed for the fulfilment of their public obligations.

Stralsund Mining Authority

– Official hearing and planning approval authority –

Thomas Triller - seal -
Mining Authority Director

Annex 1


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Vorschlag für eine Gebietserweiterung für den LRT 1160 (40 ha)
DOP40:
© GeoBasis-DE/M-V
Map ID:
03049_v01_20180123
Koordinatensystem:
ETRS 1989 UTM Zone 33N
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