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Southern Finland

DECISION (Unofficial translation)

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SUBJECT Construction of two natural gas pipelines in the Finnish exclusive economic zone and authorisation for preparation

APPLICANT Nord Stream 2 AG

REGIONAL STATE ADMINISTRATIVE AGENCY FOR SOUTHERN FINLAND / ENVIRONMENTAL PERMITS DEPARTMENT
ymparistoluvat.etela@avi.fi
tel. +358 29 501 6000
fax +358 3 570 8002
kirjaamo.etela@avi.fi
www.avi.fi/etela

Hämeenlinna Office Birger
Jaarlin katu 15
PO Box 150, FI-13101
Hämeenlinna

Helsinki office
Ratapihantie 9
PO Box 110, FI-00521 Helsinki

FILING OF THE APPLICATION

Nord Stream 2 AG filed an application with the Regional State Administrative Agency for Southern Finland on 19 September 2017 and subsequently supplied additions to the application concerning a permit for the construction of two natural gas pipelines in the Finnish exclusive economic zone and authorisation for commencing preparations for the implementation of the project prior to the decision becoming legally enforceable.

GROUNDS FOR APPLYING FOR THE PERMIT AND THE PERMIT AUTHORITY'S COMPETENCE

Finnish Water Act, Chapter 3, Sections 2 and 3(4) and Chapter 1, Section 7(1)
Finnish Act on the Finnish Exclusive Economic Zone, Section 18

ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

An environmental impact assessment (EIA) report on the Nord Stream 2 project was completed on 3 April 2017. The Uusimaa Centre for Economic Development, Transport and the Environment, which acts as the coordinating authority, issued a statement on the assessment report on 26 July 2017, according to which the assessment report complies with the content requirements for assessment reports laid down in Section 10 of the Finnish Decree on Environmental Impact Assessment Procedure.

Transboundary environmental impacts were also taken into account in the EIA procedure pursuant to Sections 14, 15 and 22 of the Finnish Act on Environmental Impact Assessment Procedure. Latvia, Lithuania, Poland, Sweden, Germany, Denmark, Russia and Estonia were consulted in the course of the procedure. The procedure factored in the obligations laid down in the Espoo Convention (Finnish Treaty No 67/1997). In its statement, the coordinating authority concluded that the assessment report had been drawn up appropriately and that it was sufficient considering the stage of the EIA procedure. According to the EIA report, the most important harmful impacts of the project will occur during the construction phase and affect marine mammals that are the basis for the protection of Natura 2000 sites. Any available measures must be taken to mitigate the harmful impacts of the project. The statement stipulates that the project's deleterious impacts on Natura 2000 sites must be evaluated in more detail in the course of impact assessments.

PERMITS AND DECISIONS CONCERNING THE PROJECT AND PROTECTED AREAS

Permits and decisions

By its decision No 4/2010/4 of 12 February 2010, the Regional State Administrative Agency for Southern Finland issued a permit for Nord Stream AG to construct subsea natural gas pipelines running from Russia to Germany in the Finnish exclusive economic zone.

Natura 2000 sites

There are three Natura 2000 sites that extend into the Finnish exclusive economic zone: Sea Area South of Sandkallan (FI0100106) (minimum distance of 1.9 km from the planned gas pipelines), Luodematalat (FI0400002) (19.7 km) and Länsiletto Area (FI0400001) (29.8 km).

The applicant has also carried out Natura assessments or screening studies pursuant to Section 65 of the Finnish Nature Conservation Act on the following Natura sites in Finnish territorial waters that are relevant from the perspective of the planned gas pipelines: Kallbådan Islets and Waters (FI0100089) (minimum distance of 9.8 km from the project site), Söderskär and Långören Archipelago (FI0100077) (12.5 km), Pernaja Bay and Pernaja Archipelago Marine Protection Areas (FI0100078) (13.1 km), Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area (FI0100005) (17.8 km) and Eastern Gulf of Finland Archipelago and Waters (FI10408001) (23.5 km).

Site-specific screening studies and Natura assessments are discussed on pages 39–46.

Seal sanctuaries

The seal sanctuaries closest to the pipelines are Sandkallan (minimum distance of 12.4 km from the pipelines), Stora Kölhällan (17.0 km) and Kallbådan (9.8 km). Seal sanctuaries were established in state-owned sea areas in 2001 primarily to protect grey seals and their habitats. Other purposes of the seal sanctuaries are to support seal population monitoring and to protect marine habitats. Some of the seal sanctuaries are also important for the protection of Baltic ringed seals, but Baltic ringed seals are very rare in the Gulf of Finland around these seal sanctuaries.

Cultural heritage sites

A total of 88 potential underwater cultural heritage sites have been identified in the course of archaeological evaluations of underwater cultural heritage in the survey area. All sites that are located within 250 m of the pipelines have been studied in more detail. The most important underwater cultural heritage object is a wooden cannon barge around which a 50-m

safety zone will be left. There is also a Second World War anti-submarine net near the pipelines. A badly damaged steel-hull wreck potentially dating from the Second World War is located 250 m away from the pipelines at its nearest.

CONTENTS OF THE PERMIT APPLICATION

Purpose and overview of the project

The objective of the project is to lay two subsea natural gas pipelines running from Narva Bay in Russia to the Lubmin area of Germany. The total length of the pipelines in the Baltic Sea is approximately 1,200 km, with 374 km passing through the Finnish exclusive economic zone. The route of the natural gas pipelines will run in the proximity of the existing Nord Stream pipelines. The installation of the natural gas pipelines is scheduled to begin in spring 2018, and the pipelines are planned to be operational in late 2019.

In addition to pipe-laying and installation, surveys, seabed intervention works, munitions clearance, pre-commissioning, monitoring and maintenance, repairs and inspections will be carried out in the area. The most important measures apart from the pipe-laying are munitions clearance and rock placement during installation and maintenance. The applicant has optimised the route so as to avoid the need to clear munitions where possible.

Information about the waters in the area

Depth and currents

The average water depth in the Gulf of Finland is 37 m, and the maximum depth is 123 m at Paldiski Deep. Water depth in the natural gas pipeline route corridor within the Finnish exclusive economic zone varies between 34 m and 183 m. The majority of the route is located in the area of the deepest waters (> 60 m).

Currents in the Gulf of Finland are mainly created by wind, but also by variations in salinity and temperature. Mean surface circulation is cyclonic with an average velocity of a few centimetres per second. Circulation patterns in the Gulf of Finland include numerous mesoscale eddies, including small-scale eddies in the eastern part of central Gulf of Finland, small-scale vortices in depths exceeding 45 m and mesoscale cyclonic circulation patterns in the western part. The average current magnitude was 0.04–0.06 m/s based on measurements during the Nord Stream project.

The Gulf of Finland and the northern part of the Baltic Proper are either partially (mild winter) or wholly (average winter) covered by ice during

winters. In winters, extensive movement of drift ice occurs (up to 20–30 km/day during storms).

Water quality

Salinity, temperature and oxygen have a significant influence on the water quality and biodiversity of the Gulf of Finland. Salinity conditions in the Gulf of Finland vary relatively considerably in the east-west axis. In surface waters, salinity increases from 0‰ in the east to 6–5‰ in the west. In the lowermost layers, salinity varies between 0‰ and 5‰ in the east, between 5‰ and 8‰ in the middle and between 7‰ and 9‰ in the west.

Turbidity was measured continuously at two stations during the Nord Steam project in the Gulf of Finland in 2009–2012. Average turbidity above the seabed was 1–2 NTU.

At present, the physical-chemical status with regard to open waters in the Gulf of Finland is classified as poor based on monitoring by the Finnish Environment Institute. Eutrophication is the most important threat to the biodiversity of the Baltic Sea. Moreover, climate change is forecast to alter the brackish water system and to contribute to increased nutrient levels (mainly nitrogen and phosphorus), which in turn cause algae growth and oxygen depletion.

Seabed morphology

The seabed of the pipe-lay corridor consists of sedimentation areas, erosion areas and a mixture of these. In the eastern part of the exclusive economic zone, the pipe-lay corridor is mostly located on hard seabed consisting of hard clay, while the middle and western parts mostly consist of soft clay/mud sediments. Soft seabed areas account for approximately 59% of the total project area. Based on an environmental baseline survey carried out in December 2015, an indication of poor oxygen conditions was detected in the sediment-water interface in areas with soft sediment.

Baseline surveys relating to the Nord Stream 2 project were conducted in December 2015. Sediment samples were collected from seven regional stations in order to analyse the survey area’s surface sediments for contaminants. The normalised median concentrations of metals were lower than the lowest guideline value 1 of the sediment dredging and disposal guidelines of the Finnish Ministry of the Environment (2015). However, normalised concentrations of some metals in individual samples exceeded this level but were still within an acceptable level 1A. The higher guideline value 2 in individual samples was exceeded by nickel and copper. The median concentration of cadmium exceeded the lowest guideline level 1 slightly at three stations. The median concentrations of metals at the stations were all within the range of the lowest guideline levels 1, 1A and 1B. The highest median concentrations were measured for zinc.

Polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), tributyltin (TBT) and triphenyltin (TPhT) were present in the project site in low concentrations, not exceeding level 1A.

Flora and fauna

Fish

The Baltic Sea is host to approximately 70 saltwater fish species and another 30–40 brackish or freshwater species. In the open seas of the Gulf of Finland along the route of the natural gas pipelines, the fish community is dominated by the European sprat and the Baltic herring and, during the winter period, also by three-spined stickleback. Migratory fish species, which spend most of their adult life in the sea, but spawn and spend their juvenile stage in the rivers, are the Atlantic salmon, sea trout and whitefish.

The only fish species that breeds in the pelagic offshore areas is the European sprat. Although the breeding ground of the European sprat covers the open waters westward of the mouth of the Gulf of Finland, its most important spawning spots are located on the edges of the deep basins of the Baltic Proper.

Marine mammals

There are three resident marine mammal species in the Baltic Sea; the grey seal, the Baltic ringed seal and the harbour porpoise. The grey seal and the Baltic ringed seal are found in the Gulf of Finland. The harbour porpoise is rare in the northern parts of the Baltic Sea main basin, and the species does not breed in Finnish waters.

The grey seal population amounted to approximately 40,000 individuals in 2014. Grey seals feed in cold, open water and breed in a variety of habitats where disturbance is minimal, such as rocky shores, sandbanks, sea ice and islands. The most critical period for the grey seal is from January to late March, when the seals stay on the ice during the calving and mating season.

The Baltic ringed sea population amounts to approximately 11,500–17,400 individuals. The most important breeding grounds are found in the easternmost parts of the Gulf of Finland. The highly critical period lasts from February until June, until the moulting period is over.

Benthic flora and fauna

The pipeline system will mainly be located in deep waters where the diversity of benthic fauna is low and consists of species that can tolerate oxygen fluctuations and deficiency.

In the depth zone 30–60 m (approximately 9% of the route), the diversity of benthic communities is relatively low with only a few opportunistic species

dominating which can survive even in sediments with low oxygen content, such as *Marenzelleria spp.*, *Bylgides sarsi* and *Macoma balthica*. Potential areas with reef formations include the Sea Area South of Sandkallan Natura 2000 site and its surroundings as well as the pipeline section off the coast of Porkkala. Zonation of benthic communities, relatively high diversity and abundance are typical in these areas.

In the 60–80 m depth zone (approximately 57% of the route), only a few opportunistic species can survive the oxygen depletion and temporary anoxic conditions. Due to anoxic conditions, there is no life in the western parts of the pipeline route.

Birds

The Baltic Sea is an important breeding and wintering area for marine and coastal birds, and it is situated on a globally major flyway. Approximately 40 out of the 82 European seabird species breed in the Baltic Sea region. The Finnish exclusive economic zone is of limited value as a feeding and/or stop-over area for breeding and migrating birds, as there are no islands in the exclusive economic zone. The Finnish exclusive economic zone has even less value for wintering bird species, as the majority are found in shallow waters less than 10 m deep.

Water resources and marine resources management plans and status of waters

Finland's programme of measures for the development and implementation of the marine strategy in 2016–2021 includes an analysis of the sufficiency of current measures for protecting the marine environment and lays down new measures for reaching and maintaining Good Environmental Status. The programme includes measures relating, inter alia, to the sustainable use of natural resources in the marine environment, to reducing underwater noise (including subsea construction) and to preventing damage and loss of seabed habitats.

The coastal waters of the Gulf of Finland are governed by the Kymijoki–Suomenlahti River Basin Management Plan for the period 2016–2021. The ecological status of Finland's coastal waters has been estimated as poor around Kotka in the eastern parts of the Gulf of Finland, as moderate along most of the coast of the Gulf of Finland and as poor in the inner archipelago around Raseborg and Ingå in the western part of the Gulf of Finland. The biggest risk to the marine environment in the coastal areas is eutrophication, which relates to nutrient loading primarily from sources other than point sources and internal loading resulting from poor oxygen conditions near the seabed. The Nord Stream 2 project is cited in the Kymijoki–Suomenlahti River Basin Management Plan as one that may have impacts on the outer archipelago of the Gulf of Finland and a minor impact on the coastal zone of the Gulf of Finland.

Use of the sea area

Infrastructure

The pipeline route enters the Finnish exclusive economic zone from Russian territorial waters south of the Nord Stream pipelines before crossing both pipelines close to the Russian border. The rest of the pipeline route in the Finnish section runs north of the Nord Stream pipelines, where the distance varies between 0.2 and 4.7 km.

The natural gas pipelines will cross the planned Balticconnector natural gas pipeline between Finland and Estonia south of Ingå. The construction of the pipeline has not yet begun.

Moreover, 29 existing cables and two planned cables cross the route of the natural gas pipelines. Of these cables, there are 13 whose owner has not been identified and four that are inactive.

Ship traffic

There are 11 known shipping routes in the Finnish exclusive economic zone, of which the main traffic route in the Gulf of Finland, i.e. the east-west route to Russia, runs parallel to the pipelines. Crossing traffic mostly consists of ferries between Helsinki and Tallinn (10 daily departures and 12 daily departures by fast crafts from April to December) and between Hanko and Paldiski (8 weekly departures).

In the Finnish part of the Gulf of Finland, the pipelines will run close to or within the following traffic separation schemes (TSSs): TSS Kalbådagrund Lighthouse, TSS Porkkala Lighthouse and TSS Hanko Peninsula.

Fishery

The majority of vessels that fish in Finnish territorial waters operate in the southwestern parts of Finland. Almost the entire fishing fleet consisted of small coastal fishing boats less than 10 m in length in 2014–2016. In 2016, there were 41 commercial fishing vessels of over 12 m in length registered in Finland.

Trawls are the principal gear type used in commercial fishery in the open waters of the Baltic Sea. Mid-water trawls are used to capture Baltic herring and European sprat, which are the most important catch species commercially (97%). Bottom trawling is not practised in the exclusive economic zone, although some fishermen are registered as using the method. Long-line fishing is used to catch salmon in Finnish offshore waters.

Recreational use

Pleasure boats and cruise liners operate in the archipelago and between Finland and Estonia especially in the summer.

Works and structures

Technical design of the natural gas pipelines

The length of the subsea section of the natural gas pipelines is 374 km. The maximum external diameter of the pipes will be approximately 1.4 m. The total capacity of the pipelines will be approximately 55 bcm per year.

The Nord Stream 2 pipelines will be constructed of individual single-seam carbon steel line pipes with an average length of 12.2 m that are welded together. The pipes will have a nominal external diameter of 1.22 m and a constant internal diameter of 1.15 m. The wall thickness of the steel pipes is based on the maximum allowable operating pressure, prevention of external collapse and resistance to external impacts. In the Finnish exclusive economic zone, the wall thickness will be 34.6 mm or 30.9 mm.

The line pipes will be internally coated with an epoxy-based material. The purpose of the coating is to reduce hydraulic friction, thereby improving gas flow conditions.

An external three-layer polyethylene coating will be applied over the line pipes to prevent corrosion. The overall thickness of the coating will be 4.2 mm, and it will cover the entire pipe-joint length, except for a cutback at the pipe ends of approximately 200–250 mm, which will be kept free of coating to facilitate welding and inspection.

A concrete coating containing iron ore will be applied on top of the external anti-corrosion coat. The thickness of the concrete coating will vary between 60 mm and 90 mm. While the primary purpose of the concrete coating will be to provide additional submerged weight to ensure on-bottom stability of the pipeline, the coating will also provide additional external protection against impacts from foreign objects, such as fishing gear.

The concrete-coated pipes will be welded together on board the pipe-lay vessel. The pipe joints will be sealed using a heat shrink sleeve, a polyurethane infill and a protective mould.

Additional corrosion protection will be provided by galvanic anodes to ensure the integrity of the pipelines over their entire operational life. This secondary protection will protect the pipelines in case of damage to the external anti-corrosion coating. The design of the anodes ensures that the exposed anodic surface is capable of producing the required protective current and that the mass of the anode material is sufficient for the estimated 50-year operational life of the pipelines. The operational life of the pipelines can be extended by means of regular servicing and maintenance.

Buckle arrestors

To minimise the risk of pipe collapse during installation, buckle arrestors will be installed at specific intervals in areas susceptible to so-called propagation buckling. The risk of buckling (bending of the pipe) may arise during the laying of the pipeline or, under certain conditions, during the operation of the pipeline system. The buckle arrestors will be welded into the pipelines at predetermined intervals in the deeper water depth areas that are susceptible to propagation buckling. The buckle arrestors limit the extent of damage arising from any unrestrained propagating buckle. The distance between buckle arrestors will be approximately 930 m (76 pipe joints). The buckle arrestors will be made of the same steel alloy as the pipelines and be equal in length to the pipe joint.

Routes of the natural gas pipelines

A key requirement in the development of the route in the Finnish exclusive economic zone has been to reduce the potential environmental impact by minimising the required seabed intervention works and munitions clearance. As regards the Finnish section, the route of the pipelines will be located entirely in the exclusive economic zone and will not extend to Finnish territorial waters. The route continues into Russian territorial waters in the east and to the Swedish exclusive economic zone in the west. The shortest distance to Finnish territorial waters is 0.6 km, and the shortest distance to the Estonian exclusive economic zone is 1.8 km. The pipeline route is located north of the Nord Stream pipelines for the most part of the Finnish exclusive economic zone. Only a short section of approximately 400 m in the easternmost part of the pipeline route will run south of the Nord Stream pipelines.

Survey corridor

Surveys will be carried out in the project area during the pre-lay phase of construction, during the actual construction of the pipelines and after the pipe-laying. The pipelines will also be surveyed throughout their life-cycle. The survey area extends to 1,000 m from the centre line on each side.

Survey monuments

To ensure the accuracy and repeatability of sub-surface positioning across all project vessels and all construction work phases it is intended to deploy a minimum of two seabed survey monuments. The monuments will be made of concrete. They will measure approximately 2 m x 2 m and have a low vertical profile, and they will be designed to be overtrawlable. They will be equipped with lifting points for deployment and eventual recovery. The monuments will hold positioning transponders and will be used by all survey and construction vessels to ensure the repeatability of position throughout the construction phase of the project. All previously installed

seabed monuments will be recovered on completion of all construction activities and survey operations.

Pipe-lay corridors

The pipe-lay corridor (pipeline installation corridor) is a width made up of the pipe-lay tolerance centred on the design route centre line within which the pipeline will be laid. The pipe-lay tolerance will be ±7.5 m of the design route centre line in general, ±2.5 m at restricted areas such as crossings and pre-lay rock berms, and ±15 m on curves. In certain parts of the pipeline route, greater deviations may be required due to unplanned events, such as chance finds. Any such resulting route deviations will be located within the safety corridor.

The safety corridor width is approximately 35 m from either side of the centre line including pipe-lay tolerance centred on the design route centre line within which all munitions will be identified and assessed, and, if deemed to be a risk to the pipeline, disposed of. The safety corridor width is based on the minimum distance required for the pipeline to safely withstand the effects of an underwater clearance of munitions along the route, and it includes the pipe-lay tolerance.

Munitions clearance

In order to ensure the safe installation and operation of the natural gas pipelines, any munitions located within the pipe-lay corridors and safety corridors need to be surveyed. The routes of the pipelines have been optimised on the basis of the surveys so as to avoid munitions wherever possible.

The surveys identified 85 munitions in the Finnish exclusive economic zone. Of these munitions, a total of 25 have an explosive weight of more than 100 kg. Due to the high density of munitions in the Gulf of Finland, avoiding munitions by rerouting the pipelines in places is not always possible.

The most common and widely used method of clearing munitions in offshore areas is to detonate them in situ. Munitions clearance will be carried out using a specialised vessel and staff. The operation will also be supported by a works vessel, and an ROV will be used for several tasks: surveying the munitions and the seabed at the detonation site prior to clearance, placing a donor charge at the clearance site near the munition, confirming the demolition and recovering scrap and equipment after clearance and surveying sensitive receptors near the munition before and after clearance.

Some munitions may need to be lifted off the seabed or moved for clearance depending on the seabed morphology, the status of the sea and shipping channel conditions. Lifting and moving a munition involves placing

a mounting bracket and a floating device around the munition. The floating device is inflated with air by means of remote control, causing the munition to lift off the seabed in a controlled manner. Once the floating device reaches the surface of the water, it is towed to a new location with the help of a support vessel. Once in the new location, the floating device is emptied of air, and the munition will sink to the seabed in a controlled manner. The mounting bracket and floating device are then detached from the munition, and the vessel can move on to the next munition.

If munitions need to be cleared during the operational phase, the primary method will be to move the munition a safe distance away from the pipelines, other infrastructure and Natura 2000 sites and then clear it in situ on the seabed in a controlled manner.

Seabed intervention works

Seabed intervention works refer to rock placement and the placement of concrete mattresses. Pre-laid supports (rock berms) allow the pipeline to be installed within acceptable limits for free-span lengths and pipe stresses. The pipelines may also require additional protection along the route to avoid excessive movement due to hydrodynamic loading and/or fatigue caused by current action of free-spans in sections of uneven seabed. Seabed intervention works will take place before and after pipe-laying. In addition to rock placement to support the pipelines, seabed intervention works will also be conducted at the cable and pipeline crossing locations.

Rock placement refers to the use of rock to locally reshape the seabed, thereby providing support to the pipeline to ensure its long-term integrity. Each rock support (berm) will be designed so as to minimise the amount of material to be used. The shape of the rock berm is designed depending on the seabed conditions (type and bearing capacity of the sediment), and bathymetry and currents in the surroundings. The size and shape of each rock berm is individually designed in order to ensure the required pipeline support and protection. The amount of rock material for each berm is calculated on the basis of the required structure and anticipated settlement into the seabed.

Crushed, new and unweathered granite will be used for the rock berms. The rock material will be chemically stable for the 50 years that the pipelines will be operational. The average size of the rock material will be 50 mm and will range between 20 and 125 mm. The material used will not contain any contaminants, such as heavy metals that can dissolve in the aquatic environment. In addition, it will be clean, i.e. not contain any clay, silt, lime, vegetation or other scattering constituents or any additional waste materials.

The rock material will be transported by a fall-pipe vessel to each position where rock placement is required. The rock material will be loaded into the

fall-pipe by conveyors on board the rock placement vessel and placed onto the seabed through the fall-pipe, which extends through the water column. The lower end of the fall-pipe is equipped with nozzles to allow precise shaping of each rock berm. The rock placement process will be supervised by an ROV, and the final geometry will be verified by surveys.

Rock placement is primarily required for the following: supports for free-span correction (pre-lay and post-lay); cover (post-lay) for additional stabilisation of the pipeline after pipe-laying, where required; and pre-lay and post-lay support/stabilisation at the pipeline crossings. The free-span sections will be between 90 and 130 m long.

Rock volumes required for different rock placement applications:

Application	**Estimated total volume, m^3**
Pipeline crossings (pre-lay and post-lay)	37,300
Stress/free-span correction (pre-lay and post-lay)	901,100
In-service buckling mitigation (post-lay)	352,600
Spot gravel placement for on-bottom stability (post-lay)	39,600
Total rock volume, net	**1,330,600**
Maximum rock volume with provisions for wastage and tolerance taken into account	**1,703,000**

Cable and pipeline crossings

A cable crossing can be accomplished by elevating the natural gas pipelines with concrete mattresses. The number and locations of such mattresses depend on the actual position of the cable to be crossed. Two types of mattresses will be used: approximately 360 flexible multi-block concrete mattresses with tapered edges (6 m x 2.5 m x 0.3 m) and approximately 110 rigid concrete beam mattresses (10 m x 3 m x 0.3 m). At pipeline crossings, the crossing pipelines will be elevated using gravel berms, and separation mattresses may be used between the pipelines. The support heights will be selected so that the agreed minimum separation between the pipelines and the cable or pipeline being crossed can be ensured throughout the design lifetime of both pipelines and the cable/pipeline.

Regarding cables for which the owner is known, the crossings will be based on cable-crossing agreements between the applicant and the owner of the cable. For cables the owner of which is unknown, crossings will be

based on a dedicated crossing design. No concrete mattresses will be used in the case of cables that are not in use.

Pipe-laying

A visual check of the route will be performed immediately before pipe-laying to ensure that nothing has fundamentally changed after the original reconnaissance and detailed surveys. Any chance munition finds will be addressed to ensure the pipeline is laid in a safe corridor.

The individual line pipes will be delivered to a dynamically positioned (DP) vessel, which does not use anchors. Once on board the vessel, the pipes will be assembled into a continuous pipe string and lowered onto the seabed as the DP vessel moves forward. This method of pipe-laying using a horizontal firing line is called S-lay.

Laying both pipelines will take approximately 220 days in total. The pipe-laying operation will proceed at a rate of approximately 3 km per day depending on weather conditions. The construction works will mainly take place outside the ice season in two directions from Russia to Sweden and from Sweden to Russia.

The process on board the DP vessel comprises the following general steps, which are repeated in a continuous cycle: welding of the pipes, non-destructive testing of the welds, field joint preparation and laying on the seabed.

The welding of new single pipe joints into a continuous pipe string will be performed on board as either a semi-automated or fully-automated welding process. When the joint is complete, the vessel will be moved forward a distance corresponding to the length of two pipe joints (24.4 m). Following this move, new pipe sections will be added to the pipeline as described above. As the DP vessel moves forward, the continuous pipe string will exit the vessel at the rear into the water. The pipeline is supported by a “stinger” extending 40–100 m behind and below the vessel. The stinger supports the initial curve of the pipe initiating the “S” configuration. Tensioners on the DP vessel will keep the pipeline under sufficient tension at all times as it runs from the stinger to the touchdown location on the seabed, thereby avoiding the risk of buckling and damage to the pipe.

As the pipeline is being laid, the actual touchdown point of the pipeline on the seabed will be monitored particularly when the pipe is being laid around curves or over pre-installed rock berms. This monitoring will ensure that the pipeline is laid in the correct horizontal position.

More detailed surveys will be carried out as the pipe is laid to ensure the route remains clear and safe. A survey support vessel will perform touchdown monitoring where required and any ad-hoc survey activities that may arise during pipeline construction.

A post-lay survey will be conducted after the pipeline has been installed to ensure that the pipeline is correctly installed, stable and to specification. The surveys will establish the as-laid position and condition of the pipeline as well as the spans present.

Post-lay rock placement may be performed in some areas to aid pipeline stability and to restrict pipeline buckling and movement. A survey of the rock placed over the pipeline and on the seabed will be conducted to ensure that the design specifications have been achieved.

A post-construction survey will be carried out after all construction works relating to the installation of the pipelines have been completed. The survey will confirm that the integrity of the pipelines has been achieved and that construction has not had any impact on monitoring targets. The survey also typically includes a visual inspection of the pipeline by an ROV to provide assurance that the pipeline is free from any damage.

The commissioning survey will be combined with the post-construction survey and the inspection survey of the first pipeline. The ROV and vessel will use, inter alia, multi-beam echo sounders (MBES), pipe trackers, acoustic leak detection and visual survey sensors.

Chance finds during pipeline installation

New objects may be discovered in the pipe-lay corridors or safety corridors during the installation phase that were not identified in connection with the surveys or that have come into the corridors later. The plan is to identify these objects using an ROV.

The primary method for handling chance finds is to avoid them through localised rerouting within the safety corridor. If rerouting within the safety corridor is not possible due to the character or location of the chance find or the general seabed conditions, the pipelines will need to be rerouted within the survey area. The regional Centre for Economic Development, Transport and the Environment, the Finnish Border Guard and the Finnish Transport Agency will be notified 48 hours prior to any rerouting within the survey area and prior to the start of pipe-laying along the section in question. Any necessary munitions screening surveys, cultural heritage screening surveys and other pre-lay surveys in the rerouted pipe-lay corridor will be carried out as was done for the designed pipeline route.

If the object is deemed unlikely to cause any harm, it can be lifted aboard a vessel for delivery to an appropriate disposal facility on land.

Chance find munitions will be cleared in a controlled manner in accordance with the normal munitions clearance and mitigation procedure if rerouting is not feasible or practical. Chance find munitions will either be cleared in situ on the seabed or first moved to a new location nearby within the survey area and then cleared later at that new location. Prior to moving a munition

to a new location, the regional Centre for Economic Development, Transport and the Environment, the Finnish Border Guard and the Finnish Transport Agency will be provided with a relocation plan containing munition identification and information on the new location. The aforementioned authorities will also be provided with a chance find clearance plan including a munition-specific impact assessment at least 48 hours prior to clearance.

If a new potential underwater cultural heritage object is identified, the Finnish National Board of Antiquities will also be notified.

In addition to the impact of a chance find on pipe-laying, additional rock berms may need to be constructed in order to safely avoid the chance find or concrete mattresses may need to be used to provide additional protection and support for the pipelines.

Wet buckle contingency

An unplanned wet buckle may occur during pipeline installation. A contingency plan will be followed should the pipeline be damaged during pipe-laying in the event that the DP pipe-lay vessel moves unexpectedly or there is a failure of the vessel tensioner systems. Such unplanned events could have the potential to damage (buckle) the natural gas pipeline, which could cause an ingress of water into the pipeline and the partial flooding of the installed pipe string (wet buckle). Alternatively it is also possible that the pipeline is damaged without water entering the pipe string, but the damage is such that the pipe-lay vessel is unable to recover the pipeline (unrecoverable dry buckle). In both these scenarios the normal pipe-lay operation will have to be halted until the damage is repaired.

The DP pipe-lay vessels are scheduled to commence the offshore pipe-laying from Russia for pipeline A and from Germany for pipeline B. At the start of the pipe-lay operation, a so-called start-up head is installed from which the pipe string starts. The start-up head contains bidirectional pipeline inspection gauges (“pigs”) that can be used to clean and dewater the pipe string in the event of a buckle occurring.

In the event of a buckle, the damaged section of the pipeline will be cut off and removed. If seawater has entered the pipeline, a vessel will be deployed to the location of the start-up head. The pipeline will be flooded in a controlled manner using filtered seawater treated with an oxygen scavenger (sodium bisulphite ($NaHSO_3$)) in order to eliminate dissolved oxygen and prevent corrosion to the pipeline. Once flooded, a pipeline recovery tool will be installed into the cut end of the pipe string.

A dewatering pig will then be pushed from the start-up head through the pipeline with air to dewater the pipeline. The water will be discharged at the location of the buckle. Once the pipeline is dewatered, the pipe-lay vessel

will recover the pipe string from the seabed and continue with the normal pipe-laying procedure.

A wet buckle can alternatively be repaired using a hyperbaric tie-in. This method may be considered should there be a wet buckle in the Finnish exclusive economic zone during the construction of pipeline B which is scheduled to start from Germany, i.e. when a considerable length of pipe string will have already been installed. The use of a hyperbaric tie-in requires the installation of an underwater rock berm in order to ensure stable support for the subsea equipment involved in this type of operation.

Pre-commissioning and commissioning of the natural gas pipelines

After the pipelines have been installed, pre-commissioning will be performed. The pre-commissioning of the Nord Stream 2 natural gas pipelines will be based on the dry pre-commissioning technique. During dry pre-commissioning, the pipelines will not be water-filled, and there will be no water intake or discharges from the pipeline.

Dry pre-commissioning enables the implementation of additional controls in connection with the material supply and pipeline construction process as well as internal and external inspections even after the pipeline has been installed.

Commissioning comprises all activities that take place after pre-commissioning and before commencing the transport of natural gas, including filling the pipelines with natural gas. The pipelines cannot be filled with gas before all pre-commissioning activities have been completed successfully, after which the pipeline will be left filled with dry air that is close to atmospheric pressure, or nitrogen gas.

Nitrogen gas will be inserted into the pipelines as an inert buffer immediately prior to natural gas filling. At least 60 km of the length of the pipeline is usually filled with nitrogen. This distance will be sufficient to ensure that no interaction occurs between gas and air during gas filling. Gas filling will be performed immediately after the injection of nitrogen by filling the pipelines with dehydrated natural gas from the connected facilities in Russia.

The gas filling operation will be done in two stages. The first stage will comprise the replacement of air and nitrogen by hydrocarbon gases. During this phase, the pipeline blowdown system in the pig launching station in Germany will be used to vent off the air as well as the nitrogen gas. The pipeline will not be pressurised at this stage.

The second stage comprises pipeline pressurisation. This will commence when a predetermined level of hydrocarbon gas is detected at the vent location in the pig launching station in Germany. At this point, the blowdown system will be closed and the pig launching station in Germany

will be set into operational configuration up to the first block valve in the downstream system.

Gas injection will continue from the Russian side until the required pipeline pressure to start normal operation is achieved.

Offshore waste management

Waste generated during the offshore construction process will comprise waste generated during vessel operation and waste that is specific to pipe-laying activities. Vessel-related waste typically comprises, inter alia, waste oil and sludge, wastewater, food waste and general waste. Waste specific to the pipe-laying process typically comprises, inter alia, concrete coating dust, metal waste generated through end millings from the pipe end bevelling process, and flux from the welding process.

Based on the installation of the Nord Stream pipelines, it is presumed that the project will generate approximately 1,000 tonnes of concrete waste, 560 tonnes of metal scraps, 500 tonnes of general waste, 60 tonnes of waste oil and 45 tonnes of plastic. All waste produced on board the project vessels will be sorted and sent to shore to be properly disposed of by a licensed waste disposal contractor.

Natural gas pipeline operation

Natural gas transport operations comprise the daily functioning of the pipeline system. Normal operating conditions are those in which the pipeline system flow rate, pressures and temperatures are all within the pipeline's design parameters, and any flow rate regulation will be reported in accordance with the natural gas transport agreement. The pipeline outlet pressure will be controlled by the German receiving terminal control valves. The pipeline inlet flow rate will be controlled by the compressors at the Russian compressor station.

The pipeline system pressure control system will comprise a pressure regulating system and a pressure safety system. The pressure regulating system is designed to monitor the local operating pressure along the pipeline route and will provide alarms in case the maximum allowable operating pressure is threatened to be exceeded in any section. The pressure safety system is designed to ensure that the local incidental pressure for each pipeline section is not exceeded.

Pipeline leak detection

The PAS system used for monitoring the offshore pipeline operating conditions will also double as a leak detection system. The system can detect leaks down to 1–2% of throughput. The amount of time it takes for a leak to be discovered varies, and a small leak may take several hours to detect while a larger leak may be detected as quickly as in a few minutes.

The landfall facilities in Russia and Germany will have local emergency shutdown systems. The emergency shutdown will be triggered if the system detects operating conditions outside of acceptable limits (i.e. pressure or temperature) or fire or gas detection in the facility. In the event of an emergency within the landfall facilities, the emergency shutdown system will isolate the offshore pipeline. The shutdown valves will close within 60 seconds.

Maintenance and repair of external natural gas pipeline structures

The maintenance and repair system will include an emergency pipeline repair system that will be deployed in the event of damage to the pipeline. The pipelines have been designed so as to minimise the need for maintenance during their operational lifetime.

External maintenance is expected to be limited to occasional maintenance of rock berms used to maintain support and stability to the pipelines, possibly the replacement of anodes and the clearance or relocation of munitions or other objects existing on the seabed should these have moved into the safety corridor due to fishing activities or other events which could potentially move such objects. Surveys and inspections will in most cases be carried out by means of surface support vessels and ROVs.

During the first years of operation, surveys will be performed every one to two years over the entire length of the pipelines. Later, this frequency will be optimised based on experience and the availability of technologies, which may make inspections faster or more efficient. It will take between 60 and 90 days to survey each pipeline. Planned maintenance and inspections will be scheduled for non-winter months whenever possible in order to avoid working in severe winter weather conditions.

Based on lessons learnt from previous projects, the natural seabed supporting the pipelines may gradually change during the operational life of the pipelines, in which case a section of the pipeline may be left in suspension (“free-span”) unless periodic maintenance activities are performed. Free-spans could be a consequence of metocean events or possibly settlement of the rock berm supports and the pipeline in its first years of operation. Remedial actions may require additional rock placement in critical sections.

Although the likelihood of such additional rock placement works during the operational phase cannot be predicted at this stage, it is unlikely to be more than 20% of the current planned rock volume during the main construction phase. The applicant has constructed one additional rock berm (5,700 m^3) for maintenance purposes.

Munitions clearance and/or removal of objects that currents or, for example, commercial fishing equipment have brought into the safety corridor may be required during the life of the pipeline. Prior to conducting

any clearance activities, the type of munition and its condition will be identified as has been done in preparation for the construction phase. A clearance plan for the munition will then be drafted and the environmental impacts of the clearance analysed. The planning sequence described above will be followed unless there is an immediate and urgent need to move the munition (such as a contact mine) away from the pipeline before any clearance planning is commenced. The regional Centre for Economic Development, Transport and the Environment and the Finnish Border Guard will be notified and provided with clearance plans at least 14 days before any action is taken regardless of the phase of the project. The Finnish Transport Agency will also be notified of all munitions that are discovered.

The internal integrity monitoring of the pipelines will be carried out using an intelligent inspection pig that will move with the natural gas medium. It is planned that internal inspections will be carried out every 7th to 10th year.

Natural gas pipeline repairs

The pipelines have been designed so that no repairs will be necessary in normal operations. Repairs may nevertheless be required in the event of unplanned circumstances, such as where external objects have come into contact with the pipelines.

The possible situations where repairs may be required have been grouped into three categories: 1) local damage: the damage is small (dent or pinhole) and affects one line pipe; 2) short damage: the damage affects one or two line pipes; and 3) long damage: the damage affects several hundred meters to several kilometres of pipeline. None of the three categories automatically means that the pipeline is leaking. This application seeks the right to repair local damage or short damage. With regard to long damage, the applicant will consult with the supervising authorities to agree on the procedure and act according to their instructions.

As regards the repair of local and short damage, repairs will in most cases be carried out using ROVs and specialist diving works. If just one line pipe has been damaged, the likely local damage repair will consist of placing a specially designed clamp on the damaged section. If the damage affects one or two line pipes, the repair may, instead of a repair clamp, entail using a so-called pipe spool, thus replacing the damaged line pipe with a line pipe that has the same characteristics as the main pipeline system.

Long damage will be repaired by recovering the damaged section using a pipe-lay vessel and relaying the section. The required hyperbaric welding will take place on a rock berm in order to ensure a stable base for the equipment involved in the hyperbaric welding process.

When the location of a potential leak is identified, the area will be marked with one or more signalling buoys and a notice will be issued to mariners to ensure safe navigation around the site. A restriction area will be in force around the damage location during the repair works where third party vessels will not be allowed. The radius of this restriction area will generally be 0.5 nautical miles from the outer edge of the construction area. Damage repairs may take from two weeks to six months.

Decommissioning of the natural gas pipelines

The natural gas pipelines are designed to be technically operational for at least 50 years. The applicant will supply the permit authority with a decommissioning plan at least one year prior to decommissioning. The decommissioning plan will be drafted in accordance with the laws applicable at that time.

Based on current information, it may be possible to find other use for the pipelines after the end of natural gas transport. If this is not possible, the current best decommissioning method for large-diameter gas pipelines is to flood the pipelines in a controlled manner with seawater and leave them in place following gas inventory removal and pipe cleaning operations. Another option could be to cut the pipelines into sections on the seabed and recover them individually using an ROV.

Agreements and consents relating to the project

The applicant has made an agreement with the Finnish Commercial Fishermen’s Association based on which affected fishermen will be compensated for the losses caused by the project.

The applicant has entered into crossing agreements with owners of cables and pipelines.

Property details

The project site is located in the Finnish exclusive economic zone. Monitoring relating to the project will also take place in territorial waters on Metsähallitus’s properties Nos 710-894-1-1, 257-894-1-1 and 638-891-1-1.

Impacts of the project

Seabed morphology and sediments

The two main construction activities that may alter the seabed morphology and the quality of surface sediments are clearing the route of the pipelines of any munitions and the placement of rock materials on predetermined locations. These activities will have a direct impact by creating elevations or depressions in the seabed as well as an indirect impact by relocating suspended sediment particles and due to the resedimentation of contaminants attached to such particles in the seabed.

Erosion and suspension due to the DP vessel could potentially occur at water depths of 34–40 m with loose sediment. Based on the seabed types on the pipeline route, calculations and monitoring data from the Nord Stream project, pipe-laying using a DP vessel is not expected to cause any disturbance or relocation of seabed sediments. However, the pipe-laying itself may cause some sediment disturbance when laid on soft seabed.

The area used for the Nord Stream 2 pipeline system accounts for approximately 0.03% of the seabed in the Finnish exclusive economic zone. Based on data gathered during the Nord Stream project, the gradual embedment of the natural gas pipelines and natural sedimentation processes will diminish the morphological anomaly and the footprint effect of the pipelines.

The pipelines may cause minor local changes in small-scale hydrodynamic conditions and hence sediment dynamics in areas where the pipeline is exposed. Processes like erosion or sedimentation near the pipelines are not expected to occur to a significant extent.

Hydrography and water quality

Munitions clearance is assessed to cause short-term impacts on seawater quality near the seabed and release of sediments in the water layers nearest to the seabed. Increased concentrations of suspended solids may be present even at a distance of 1,000 m from the clearance locations. Based on modelling results, the local duration of concentrations of > 10 mg/l will not exceed one day.

The clearance activities are mainly assessed to cause relocation of sediments, deposited nutrients and contaminants for a short period of time and very locally. The magnitude of change in seawater quality has been estimated as minor and low in significance.

The highest concentrations of suspended solids are expected to occur nearest to rock placement sites in the lower water layer, but concentrations of less than 20 mg/l may appear within a distance of 1,000 m from the route. The duration of increased (> 10 mg/l) concentrations of suspended solids is estimated to vary between two and 19 hours depending on hydrographic conditions.

Suspended particles may include attached contaminants and nutrients. Once dissolved, the contaminants (dioxins/furans, inorganic zinc and PAH compounds) normally attach to organic or inorganic particles present in the seawater, thus making the concentrations decrease rapidly. Based on modelling and monitoring results during the Nord Stream project, the release of nitrogen and phosphorus is not assessed to have any impact on the eutrophication status of the Gulf of Finland.

The operational phase of the pipelines may have a potential impact on the current fields near the soft seabed surface, thus affecting the prevailing scour and sedimentation patterns. The Nord Stream 2 pipelines will be located in areas where currents near the seabed are normally low. The pipelines are therefore not assessed to have any impact on bottom-near current patterns in the Gulf of Finland. Based on data from the Nord Stream project, minor current changes are possible near the pipelines (< 50 m) where the pipeline is clearly exposed. The observed minor impacts were too small to cause significant scouring.

The anodes attached to the natural gas pipelines will protect the pipelines against corrosion during operation. The impacts of one zinc anode on seawater quality were monitored at the beginning of the operational phase of the Nord Stream pipelines. Elevated concentrations are assessed to be limited to the immediate vicinity of the anodes. The Predicted No Effect Concentration value for neither metal (zinc, aluminium) was exceeded in seawater. The aluminium compounds in the anodes are not soluble in water. Where pipelines are fully embedded, no zinc is released directly to the water phase.

The natural gas temperature is estimated to vary between 5˚C and 10˚C, whilst the temperature of seawater near the seabed in the same area varies between 2˚C and 10˚C. Heat transfer from gas to seawater is therefore estimated to be low.

Airborne and underwater noise

The main sources of offshore airborne noise will be pipe-laying during the operational phase and vessel traffic caused by maintenance inspections. The magnitude of the project's airborne noise impact has been estimated as low due to the short duration of these activities and low noise levels. Pipe-laying in the vicinity of the nearest sensitive area, the Kallbådan Islets and Waters Natura 2000 site, will take a maximum of two or three days.

Munitions clearance and rock placement on the seabed will cause underwater noise. The detonation of munitions will create a pressure shock wave in the water. The shock waves' primary impact on mammals will be hearing loss.

Benthic flora and fauna

Munitions clearance and, to a lesser extent, rock placement will cause local physical disturbance on the seabed that interferes with biota or results in partial or complete defaunation in the impacted area. The benthos under the pipelines and support structures will be permanently destroyed. Based on experience from the Nord Stream project, the impacted areas in which benthic fauna was completely destroyed by detonations were small (in the worst case, within a radius of 10–15 m and

a depth of 5–7 m). Benthic recovery is estimated to progress rapidly after the clearance.

Munitions clearance and rock placement may also cause sediment resuspension and sedimentation that may have a reversible negative impact on the benthos. Based on monitoring, such impacts are assessed to occur only in the immediate vicinity of munitions clearance and rock placement sites.

Contaminants attached to sediments may be released during sediment dispersion, but the contaminants are not expected to have an impact on benthic fauna, as the change in living conditions will be short-lived and temporary.

Fish

Interaction between fish and the planned project activities during the construction phase mostly relates to underwater noise and sediment spreading resulting from the various works.

Fish mortality resulting from munitions clearance is assessed to be direct, as individual fish will be killed or injured. The impact is assessed to be negligible at fish-stock level. Avoidance reactions of fish in relation to construction activities are assessed to be temporary and short in duration, and there will be no long term impact on the fish communities. The impacts of suspended sediments and released contaminants on the eggs and larvae of the European sprat, which breeds in the pelagic area, are assessed to be minor considering the low value of individual European sprat eggs and larvae in the context of the entire European sprat stock.

The magnitude of the change in relation to fish is assessed to be negligible, as the impact on the European sprat spawning success or salmon and sea trout feeding grounds is assessed to be negligible. The overall impact significance on fish is assessed to be negligible.

Marine mammals

The project’s most notable impacts on marine mammals will be attributable to the noise caused by munitions clearance. The impact of sediment dispersion and the release of contaminants on marine mammals has been estimated as negligible.

Harbour porpoises

The risk of porpoises being present in the zones where animals may be exposed to blast injuries or a permanent threshold shift (PTS) in hearing is extremely low.

Grey seals

It is highly probable that most of the seals are found near the haul-out sites or nearby foraging areas. In other areas, seal densities will most probably be lower. However, it cannot be excluded that some individuals may be affected by some degree of PTS, and the impact significance at the individual level is assessed to be moderate. At population level, the overall impact significance has been estimated to be minor, as the Baltic population of grey seals is abundant and has been increasing over the last decades.

Baltic ringed seals

Although Baltic ringed seals may be potentially found everywhere in Finnish waters, the densities are generally higher near the haul-outs and foraging sites. A small subpopulation of approximately 100–300 individuals concentrated in the Eastern Gulf of Finland is reproductively isolated and its abundance may be in severe decrease. Consequently, the Gulf of Finland subpopulation is considered sensitive to all kinds of disturbance.

According to most recent munitions survey results, there are 12 munitions that need to be cleared in the areas of most concern regarding the Gulf of Finland ringed seal subpopulation. The explosive weights of these munitions range between five and 180 kg, and most of the munitions are small in size.

Densities of ringed seals in the offshore areas are presumably lower compared to haul-out areas, which are concentrated nearer to the coast. Thus the probability that individual ringed seals would be in the impact area during clearance will be extremely low. The impact significance at the individual level and also the overall impact significance on the Gulf of Finland Baltic ringed seal subpopulation is estimated to be minor.

Birds

The main impact mechanisms on birds are disturbance, noise and impacts on water quality. No significant feeding or resting areas have been identified in the vicinity of the planned pipeline system. Shallow water areas are located mainly more than five kilometres from the planned pipeline route, and all important protected areas are located more than eight kilometres away from the pipeline route. Impacts on birds are therefore considered to be mainly temporally short, and the magnitude of the impacts is assessed to be low.

During the construction phase, munitions clearance, rock placement and pipe-laying will cause mostly temporary loss of use of feeding areas mainly in the shallow water areas. The impact will be partly reversible and very local. During the operational phase, maintenance rock placement will have a similar impact. Most of the construction activities will cause sediment

resuspension and resedimentation. This may lead to turbidity and contaminant release, which may cause indirect impacts on birds by making foraging more difficult and reducing food resources. These impacts will be reversible.

Ship traffic

The main impact on ship traffic in the Gulf of Finland from the construction works will come from the creation of so-called temporary safety zones around rock placement, munitions clearance and pipe-lay sites. The extent of the safety zone will depend on the construction activities and the vessel in question, as well as the actual location of the vessel in the Finnish exclusive economic zone.

The safety zone around the pipe-lay vessel and its support vessels will have the largest radius. They will therefore have the largest impact on ship traffic. During the Nord Stream project, a safety zone with a radius of two kilometres was used for the DP vessel. A safety zone will also be needed for the munitions clearance vessels.

The impact on ship traffic will come from third-party vessels being requested to reroute around the safety zone of the pipe-lay vessel.

No vessels related to the Nord Stream 2 project will be present along the pipeline route during the normal operation of the pipelines. External surveys will probably be conducted at one-year or two-year intervals at the beginning of the operational phase.

Commercial fishery

There are a number of activities during the construction phase that will impact on commercial fishery in the Finnish exclusive economic zone. Munitions clearance will have a direct impact on individual fish but a negligible impact on fish stocks.

All vessels with limited manoeuvrability will be secured for the duration of the construction activities using safety zones. Third-party vessels will be instructed to avoid the safety zones. These kinds of activities will be transient and, for short durations at particular locations, will prevent fishing vessels from entering the safety zone and thus prevent fishing in that particular area. The pipe-lay vessel will not hinder fishing in any area for more than one day. It will also be easy for Finnish trawlers to fish elsewhere during the pipeline installation phase.

During the operational phase, the most relevant impact relates to the presence of the pipelines. The pipelines are designed to withstand the mechanical impact caused by trawl gear. The pipelines may potentially hinder near-bottom mid-water trawling, especially in sections where the pipeline is free-spanning. The probability of a trawl hooking to a pipeline is assessed to be low or medium in smooth seabed areas and medium in

uneven seabed areas. Trawl gear hooking a pipeline free-span may lead to damage to the trawling equipment, breakage of the trawl wire and subsequent loss of the gear or even the sinking of the vessel.

The overall significance of the impact on commercial fishermen during the operational phase is assessed to be minor due to the fact that uneven seabed areas always hinder near-bottom mid-water trawling. The free-spanning pipeline sections may nevertheless pose a hindrance for bottom-close mid-water trawling, as the operating depth of Finnish trawlers in the Gulf of Finland is often very near the seabed.

The presence of the natural gas pipelines will not lead to fishing restrictions. The design of the pipelines ensures that fishing may continue in close vicinity of and across the pipelines, albeit with the potential for additional effort.

The potential damage caused by the pipeline to the general fishery interest can be considered in terms of a reduction in the profit of long-term fishing and a fall in the natural resource value, which in turn is based on the productivity of fish resources and on the profitability of fishing.

Existing infrastructure

The applicant will ensure the protection of existing subsea cables and pipelines in accordance with crossing agreements. If the owner of a cable or a pipeline remains unknown, protective concrete mattresses will be laid over the cable, thus providing protection between the cable and the natural gas pipeline. Rock placement will therefore not cause any damage to cables even if the activity is carried out at or close to the crossing locations.

The main source of impacts during the construction phase will be munitions clearance. If munitions are cleared in the immediate vicinity of existing natural gas pipelines and cables, the peak pressure caused by the clearance may damage them mechanically.

The rock placement vessels are able to place rock very accurately on the seabed. Rock placement will therefore not cause any damage to cables even if the activity is carried out at or close to the crossing locations. Based on lessons learnt during the Nord Stream project, impacts on existing cables can be avoided. The existing Nord Stream pipelines will be protected by rock berms at the crossing locations. The crossing designs will ensure that a separation is maintained between the natural gas pipelines and existing pipelines and cables and that the operation of existing pipelines and cables will not be impaired. Pipe-laying activities at the cable crossing locations will be monitored by means of pipeline touchdown monitoring (TDM) in order to enable accurate pipe-laying on top of the protective concrete mattresses and to avoid damage to cables.

Once in place on the seabed, the natural gas pipelines will not restrict the laying of planned pipelines and cables.

Future use of the Finnish exclusive economic zone

The footprint of the pipeline system comprising the two pipelines and support structures is 2.21 km^2, which is 0.03% of the Finnish exclusive economic zone in the Gulf of Finland and the northern Baltic Proper. For safety reasons, and to maintain pipeline integrity, certain distances from the pipeline system to any potential future infrastructure or exploitation site will be applied. The pipeline system may therefore restrict other use of the seabed in the Finnish exclusive economic zone in corridors of various widths and not just in the area of the footprint, depending on the type of the potential future use. Any infrastructure already in the planning stage, such as the Balticconnector natural gas pipeline between Finland and Estonia, has been taken into account during project development. The presence of the Nord Stream 2 pipelines will have little or no impact on oil and gas pipelines, subsea cables, subsea mining, gravel taking and spoil dumping, wind farms, wave energy schemes or subsea tunnels. The applicant aims to enter into crossing and/or proximity agreements with future infrastructure and/or exploitation project owners. These agreements will lay down technical methods and precautionary measures on a case-by-case basis.

Scientific heritage, cultural heritage and military areas

The assessed impacts on scientific heritage have been identified by considering the various project activities during the construction and operational phases and how these activities may affect long-term monitoring stations. Interaction between scientific heritage and the planned project activities during the construction phase relates principally to sediment spreading due to the various construction activities. The overall impacts of the project are estimated to be negligible based on the environmental monitoring results of the Nord Stream project.

The area’s cultural heritage sites have been surveyed together with the Finnish National Board of Antiquities. The project’s impacts have been assessed as minor with regard to one site and as negligible with regard to all others. Rock placement on the seabed will have a minor impact, as it will cover portions of a Second World War anti-submarine net.

Due to distance, neither the construction activities nor the operation of the pipelines will cause any impacts or restrictions on the use of restricted areas by the Finnish Navy or R areas. The closest restricted area held by the Finnish Navy is located approximately 3.5 km from the route of the natural gas pipelines. The route of the Nord Stream 2 pipelines passes twice through airspace danger areas (D areas). Vessel movement is not restricted in D areas.

Cumulative impacts

During the construction phase the most prominent cumulative impacts of the Nord Stream 2 project may come from the construction of the Balticconnector natural gas pipeline between Finland and Estonia. There are also plans to lay at least three telecommunications or optical fibre cables on the seabed in the near future. The main potential cumulative impact on ship traffic in connection with the Balticconnector project is the elevated level of risks caused by increased ship traffic in the same sea area.

The construction of the Nord Stream 2 pipelines will cause a cumulative impact on commercial fishery during the construction phase if the Balticconnector pipelines are constructed simultaneously. These pipeline projects will also have cumulative impacts on commercial fishery during the operational phase of the pipelines.

The Nord Stream AG project and the Balticconnector project have been considered as potential sources of cumulative impacts together with the Nord Stream 2 project in the Finnish exclusive economic zone in terms of existing and planned infrastructure. The impacts relate to potential future utilisation plans of the seabed.

As the Balticconnector route and the Nord Stream 2 AG route encounter each other almost vertically in the Finnish exclusive economic zone, the footprint of the crossing is small. New infrastructure projects in the same sea area are possible, taking the safety distances to the pipelines into account.

Transboundary impacts

Regarding transboundary impacts from the project activities in Finland, potentially affected countries are Russia, Estonia and Sweden. The EIA report nevertheless states that there will be no significant transboundary impacts as defined, for example, in Article 2 of the Espoo Convention from project activities in Finland towards any other jurisdiction.

Measures to prevent or reduce losses

Route optimisation

A number of different factors have been taken into consideration in the development and optimisation of the pipeline route in order to avoid or reduce environmental impacts. One of the most important factors during the optimisation of the pipeline route has been the avoidance of uneven seabed. This has significantly reduced the need for seabed intervention works and therefore the associated impacts.

Time-based restrictions

Construction activities such as pipe-laying and rock placement are not foreseen in winter ice conditions.

The applicant has coordinated munitions clearance and rock placement with the Finnish Environment Institute so that no such activities will be performed simultaneously with or just before the yearly benthos monitoring campaign in May within two kilometres of the monitoring sites LL5, LL6A, LL7S and LL11.

Rock placement

Rock placement will be a controlled operation utilising a fall-pipe and an instrumented discharge head located near the seabed to ensure precise placement of rock material. This will reduce the rock volumes needed and thereby the environmental impact of rock placement both during the construction phase by reducing sediment spreading and during the operational phase by reducing the footprint of the pipeline. Where vessels equipped with fall-pipes are used, the rock placement process will be monitored and final geometry controlled through surveys.

Use of a DP vessel

The use of a DP vessel eliminates interaction from anchors and anchor chains with the seabed, thus substantially reducing the environmental impacts (e.g. sediment dispersion, impacts on benthos) of the project.

Ship traffic and fishery

The applicant will provide information on project vessels' plans and schedules to the Finnish Transport Agency for Notices to Mariners. The information will be provided in notifications and monthly, weekly and daily reports. In areas subject to the traffic separation schemes (TSS) of Kalbådagrund Lighthouse and Porkkala Lighthouse, consultations will be held with the pipe-lay contractor and the competent authorities to reduce the safety zone around the pipe-lay vessel from a radius of 1.0 nm to a radius of 0.5 nm. A tug will be stationed in the area of TSS Kalbådagrund Lighthouse for the duration of pipe-lay operations in order to reduce the risk of a ship grounding. The tug will be on standby to assist the contractor and third-party vessels by towing and pushing as necessary. The Finnish authorities will be notified of any unplanned events during pipeline operation.

The applicant will inform fishermen of the pipeline routing and the seabed elevations associated with the pipeline and intervention works based on agreements made with the fishermen and also provide them with digital information on the configuration of the pipelines. The applicant will also update the aforementioned information within three months of the

completion of the pipelines. Guidelines describing best practices and policies to be observed when fishing in the vicinity of the pipelines will be laid down in the agreements.

Existing and planned infrastructure

The applicant has entered or will enter into crossing and/or proximity agreements with known affected cable and pipeline owners. These agreements lay down the crossing method and precautionary measures on a case-by-case basis. The crossing designs will ensure that a separation is maintained between the Nord Stream 2 AG pipelines and existing pipelines and cables and that the operation of existing pipelines and cables will not be impaired. If the owner of a cable is unknown, the integrity of the cable will be ensured by means of a dedicated crossing design.

Cultural heritage

In general, all construction activities and equipment will keep a minimum safety perimeter assigned to each underwater cultural heritage site (50 m from the centre of the wreck/target) unless stated otherwise. The inspected Second World War sites have been taken into consideration in the project planning and implementation process. In the event that an unforeseen underwater cultural heritage object (chance find) is located in a position that cannot be avoided by routing the pipeline at the prescribed distance because of other constraints, an object-specific management plan will be prepared. Should cultural heritage objects not previously identified through the cultural heritage surveys be encountered during the construction activities, they will be dealt with in accordance with the chance finds procedure. The procedure provides guidelines for actions to be taken in dealing with chance finds and their documentation and reporting. The procedure will also prescribe notification instructions to inform the national cultural heritage agencies of the finds, contractor roles, management actions, responsibilities and lines of communication.

Munitions clearance

The project will only use a DP vessel, thus reducing significantly the need for munitions clearance in the Gulf of Finland compared to anchored lay barges, where a wider anchor corridor would need to be cleared. The route has been revised where possible to avoid munitions.

The authorities will be kept up to date during the activities in order to ensure ship traffic safety. In order to avoid harmful effects on ship traffic safety, a safety corridor will be established around each munition to be cleared. The safety corridor will be one kilometre wide during the pre-clearance and post-clearance surveys and one nautical mile wide during clearance. Mariners will be notified of the areas where munitions clearance will be carried out in advance.

Marine mammal observers will make visual observations. The observers will be in place from one hour before each clearance until one hour after the clearance. Clearance activities will be conducted during daylight hours, as good visibility is required by marine mammal observers. Echo sounders will be deployed on board the works vessel to detect schools of fish and passive acoustic monitors to detect sounds of marine mammals prior to clearance. In addition to visual methods, acoustic deterrent devices will be deployed prior to detonation. A deterrent blast will be used to drive fish and seals from the area prior to the detonation of the actual clearance charge.

The bubble curtain system involves feeding compressed air to a hose where nozzles generate an air curtain between the sound source (munition) and the surrounding environment. The air bubbles decrease the intensity of the sound waves generated by the blast as sound travels through the bubble curtain, attenuating noise. Bubble curtains therefore efficiently reduce the distance within which animals may sustain permanent hearing loss. Bubble curtains also reduce the distance within which blast injuries may occur.

Bubble curtains mitigate the impacts, as studies show that they reduce the noise generated by munitions clearance in water by 6.8 dB. Bubble curtains will be used for the in-situ clearance of munitions that are located in proximity to the Natura 2000 sites with seals listed as a conservation objective and the Baltic ringed seal distribution areas east of the Finnish EEZ kilometre point 60 in the Eastern Gulf of Finland.

A total of 20 munitions have been chosen on the basis of the aforementioned criteria for the use of bubble curtains as an additional means of mitigation.

Benefits and losses resulting from the project

Benefits

Private interests

The total investment value of the project is estimated to be approximately EUR 8 billion capex and approximately EUR 9.5 billion when including financing costs. The company will collect biannual transport fees. The direct financial benefits gained by the applicant will be considerable.

Public interests

Demand for natural gas in the 28 European Union Member States (“EU 28”) is projected to show an almost stable development from 494 bcm in 2020 to 489 bcm in 2035 and 487 bcm in 2050. At the same time,

however, EU 28 domestic production of natural gas is projected to decline from 118 bcm in 2020 to 72 bcm in 2035 and 61 bcm in 2050.

In combination, the stable development of demand and the strong decline in production result in a constantly increasing natural gas import requirement of EU 28. There would be an import gap without the implementation of the Nord Stream 2 project. The Nord Stream 2 natural gas transport system can contribute to covering the upcoming import gap of EU 28 as of 2020, while making the EU's gas supply more robust, more economically beneficial, more sustainable, more efficient and more consumer-friendly.

Finland's public interest will benefit from the project during the construction phase through increased employment, as at least the coating and logistics operations for the natural gas pipelines will take place in Finland and rock material may be extracted in Finland.

A sufficient energy supply to the countries of the European Union is of vital importance for the functioning of the common market. It is, therefore, of vital economic importance also to Finland even though Finland is not amongst the countries directly receiving the Nord Stream 2 pipeline system. Therefore, the benefit gained from the project to public interests is considerable.

Losses

Private interests

The losses incurred for private interests are minor. The applicant has entered or will enter into crossing agreements with all known owners of the cables and pipelines that the Nord Stream 2 pipelines will cross.

The applicant has made an agreement with the Finnish Commercial Fishermen's Association based on which affected fishermen will be compensated for the losses caused by the project.

Public interests

The losses incurred for public interests are generally minor. The impacts caused by the project will be mostly negligible or minor, and most of the potential impacts will be local and short-lived. The significance of the impacts of the project has been assessed as follows for different receptors and project activities:

Negligible impacts:
- Climate and air quality,
- Seabed morphology and sediments (pipe-laying),

- Hydrography and water quality during the construction phase: release of dissolved contaminants and nutrients during installation (locally minor changes),
- Spreading of sediments during pipe-laying,
- Hydrography and water quality during the operational phase: overall hydrographical changes near the pipelines and support structures on the seabed,
- Heating effect of gas flowing in the pipelines,
- Underwater noise from the pipelines during operation,
- Airborne noise,
- Benthic flora and fauna (save for occupation of the seabed),
- Fish,
- Marine mammals (sediment spill, release of contaminants),
- Birds (save for underwater noise during construction),
- Protected areas (with underwater habitats and/or birds as conservation objectives),
- Non-indigenous species,
- Biodiversity (habitat level for all impact targets and species level for fish and birds due to underwater and airborne noise),
- Ship traffic (save for construction phase at TSS Kalbådagrund Lighthouse and TSS Porkkala Lighthouse),
- Existing and planned infrastructure,
- Scientific heritage,
- Cultural heritage (save for wreck S-R09-09806), and
- Tourism and recreation (during the operational phase).

Minor impacts:

- Seabed morphology and sediments (munitions clearance, rock placement, pipelines and support structures on the seabed),
- Hydrography and water quality during the construction phase: spreading of sediments by munitions clearance and rock placement,
- Hydrography and water quality during the operational phase: release of metals from the anodes,
- Local hydrographical changes near the pipelines and support structures on the seabed,
- Benthic flora and fauna during the operational phase: occupation of the seabed,
- Marine mammals (underwater noise from munitions clearance: impacts on harbour porpoises, Baltic ringed seals and grey seals save for individual level impact on the grey seal),
- Birds (underwater noise during construction),
- Protected areas (underwater noise impacts on protected areas with seal species as the conservation objective),
- Biodiversity (underwater noise impact from munitions clearance on grey seals and Baltic ringed seals at species level,
- Occupation of the seabed and change of habitat impact on soft and hard bottom benthos during the operational phase),
- Ship traffic (construction phase at TSS Kalbådagrund Lighthouse and TSS Porkkala Lighthouse),

- Future use of the Finnish exclusive economic zone (pipelines and support structures on the seabed),
- Cultural heritage (wreck S-R09-09806),

- Social impacts: impacts on tourism and recreation during the construction phase,
- Impacts on civic confidence / worries and expectations during the operational phase.

In addition to the impacts listed above, it has been assessed that the impact on civic confidence (worries and expectations) during the planning and construction phase is moderate.

Also the impacts from munitions clearance on grey seals on the individual level have been assessed to be moderate at most. Individual grey seals would be affected by munitions clearance only if an individual grey seal would be within the PTS area of the cleared munitions, which is unlikely due to the mitigation measures described above. The impact on grey seals at population level is minor, and the conservation status of the grey seal population is favourable in the Gulf of Finland and the Baltic Proper.

Losses to the general fisheries interest can be compensated by means of a yearly fisheries fee of EUR 33,425. The fisheries fee is based on the mean yearly catch (EUR 2.67 million), potential profit (EUR 1.34 million) and the possible harm caused to fish stocks (1%). The total potential harm to the general fisheries interest therefore equates to EUR 668,500. Based on general praxis and also the Nord Stream project decision, the annual fisheries fee will therefore be EUR 33,425 (EUR 668,500 / 20), which is the applicant's proposal for a yearly fisheries fee. The applicant has also proposed that the annual fisheries fee should be re-evaluated after five years to determine whether there is a need for a continuation of the fisheries fee.

Monitoring

According to the monitoring programme, environmental monitoring during the construction of the natural gas pipelines will cover underwater noise, turbidity and currents. The project's impacts on commercial fishery and cultural heritage will also be monitored. The applicant has undertaken to use marine mammal and bird observers during munitions clearance, both before and after each clearance. The monitoring plan lays down monitoring techniques and locations.

A revised monitoring programme has been supplied as an addition to the application after the public notice, and it will be discussed below on pages 73–76.

Application for authorisation for preparation

The applicant is seeking authorisation for preparation for the activities described in this application, up to and including successful completion of pre-commissioning activities when the pipeline would be left filled with dry air (or nitrogen) close to atmospheric pressure, i.e. not including the actual project activity (natural gas transport) for which the pipelines are constructed.

The natural gas pipeline project is a significant transboundary infrastructure project with a construction timetable covering two years. The project consists, inter alia, of the following operations:

- Munitions clearance
- Pre-lay seabed intervention works (including rock placement and cable crossing preparation works)
- Pipe-laying (including welding of the pipe, non-destructive testing of welds, field joint preparation, laying on the seabed)
- Post-lay seabed intervention works (stabilisation and additional rock placement where needed)
- Pre-commissioning (including cleaning and gauging of the pipelines, inspection and filling with dry air and nitrogen)
- Commissioning (including all activities that take place after pre-commissioning and until the pipelines commence natural gas transport, including filling the pipelines with natural gas)
- Operational phase

Justifications for the authorisation for preparation

The management of all these tasks, including all the needed input from all different providers of materials and services, not only within Finland but also for the whole pipeline route, as well as the seasonal limitations, makes the Nord Stream 2 project very complex and thus very sensitive to delays. All the highly specialised external experts and specialised contractors and vessels involved in the project have time limits in which they have to perform their work. In accordance with industry practices, they may have some spare time in their schedule, but they cannot undertake the contracted work in a totally different time period. The market is narrow and the number of these highly specialised contractors is very limited, and delay may result in these contractors being assigned to other projects around the world.

The project also consists of several related stages before the operational phase, and all these stages must be carried out in a well managed sequence in order to safely construct the pipelines resulting in a reliable and safe pipeline system. The project as a whole is therefore highly susceptible to delays.

The activities in Finland only form a part of the largest and most important cross-border infrastructure investment in Northern Europe. The Finnish

operations therefore need to be evaluated as a part of the entire project. It should be noted that generally, of the five countries where Nord Stream 2 AG is applying for permits (in addition to Finland also Russia, Sweden, Denmark and Germany), appeals in Finland over the permit decisions have an automatic suspensive effect on the enforcement of decisions. Whilst only in the German exclusive economic zone the situation is comparable unless the competent authorities grant immediate enforcement, in Russia, Sweden, Denmark and the German territorial waters the permits are immediately enforceable by law. If the applied authorisation for preparation is not granted, the whole project could be delayed by several years. This could lead to very considerable costs for the applicant and endanger the whole project.

Nord Stream 2 AG will be the operator of the pipeline and will collect transport fees for its operation. If the commencement of the construction works is postponed and the whole project thus delayed, the applicant will lose transport fees. The total investment value of the project is estimated to be approximately EUR 8 billion capex and approximately EUR 9.5 billion when including financing costs. If the project is delayed, the applicant will suffer additional losses due to, inter alia, capital costs for the pipeline materials and large operational and capital costs for logistics and coating, as well as additional costs from the pipelines being on standby.

There would be an import gap without the implementation of the Nord Stream 2 project. The Nord Stream 2 AG pipeline will increase Russia's sustainable transport capacity towards the EU internal gas market and thus compete with the volatile-priced liquid natural gas, but this and closing the aforementioned import gap from 2020 onwards require that the permit processes are not delayed. If the project were delayed due to the permit processes in Finland, this would be against the general European interest.

The project's impacts are mostly negligible or minor. The activities for which authorisation for preparation is applied for can be taken without causing considerable harm to other uses of waters or the natural environment and its functions. The authorisation for preparation can be granted as applied.

If the permission is overturned or its conditions altered, it is possible to substantially restore the environment. The newly installed pipeline may be recovered (in parts or totally) either by using the reverse lay method or the section-by-section recovery method. The rock material, so far as it impacts seabed morphology, can be removed. The environment can therefore be substantially restored in this respect as well. The concrete mattresses used in the cable and pipeline crossings can also be recovered. It may be better for the avoidance of risk with respect to the current infrastructure that the cable/pipeline crossing structures are left in place.

The estimated offshore impacts from the removal of the newly installed pipeline system are mostly minor. The main offshore impacts from the

removal of the newly installed pipeline system identified were minor negative impacts on marine mammals, ship traffic, infrastructure, cultural heritage (the anti-submarine net) and tourism and recreation.

It is possible to recover all works, save for some parts of the rock material, and the impacts from the works are mostly minor negative impacts. The conditions can therefore, in their material parts, be restored to their previous state, should the permit be overturned or amended.

Security

In the water permit decision for Nord Stream AG the security was set at EUR 70 million. The starting point is that at least such measures must be taken which do not cause more harm than is necessary in order to essentially restore the original conditions. The permit authority also noted that it may not be necessary to remove all rock material laid in the sea or the entire pipeline and that, for example, rock material should be removed in locations where the structure essentially deviates from the seabed morphology and the pipeline removed mainly from areas of free-spans and also possibly other locations where it may affect, for example, bottom currents or fishing. The permit authority further noted that the measures should be specified separately in more detail. It has also been observed that the carrying out of the possible measures will require equipment booking and contract arrangements which will result in additional expenses.

The Nord Stream 2 project is very similar to the Nord Stream project in all essential parts: the technical design is the same, and the pipelines are laid using the same technique in the same area as the Nord Stream pipelines, running essentially in parallel through the Finnish exclusive economic zone. The recovery actions would therefore also be the same in all essential respects. The proposal is to set a security of EUR 70 million for the Nord Stream 2 project.

NATURA 2000 SITES

Natura 2000 screening studies

Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area (FI0100005)

The site has been included in the Natura 2000 network on the basis of the Habitats Directive and the Birds Directive (SAC and SPA). The site is a marine area of approximately 52,000 ha consisting of Pohjanpitäjänlahti marine areas, the southern bays of Hanko and Tammisaari Archipelago and extending to the outer border of inner territorial waters in the south.

The site hosts a total of 22 of the habitat types listed in Annex I to the Habitats Directive: sandbanks which are slightly covered by sea water all

the time, coastal lagoons, large shallow inlets and bays, reefs, annual vegetation of drift lines, perennial vegetation of stony banks, vegetated sea cliffs, islets and islands in outer archipelago and open sea zones, coastal meadows, Baltic sandy beaches, narrow inlets, embryonic shifting dunes, shifting dunes with marram (“white dunes”), fixed dunes with herbaceous vegetation (“grey dunes”), lime-deficient dune heathland with crowberry, wooded dunes, humid dune slacks, dystrophic lakes and ponds, species-rich Nardus grasslands, species-rich dry to mesic grasslands, hydrophilous tall herb fringe communities, lowland hay meadows, siliceous rocky slopes, siliceous rock with pioneer vegetation, western taiga, old broad-leaved deciduous forests, herb-rich forests, deciduous swamp woods and bog woodland. A proposal has also been made to add the following habitat types to the form: esker islands, oligotrophic waters containing very few minerals, water courses of plain to montane levels, transition mires and quaking bogs, coniferous forests on, or connected to, glaciofluvial eskers and wooded pastures.

Of the species listed in Annex II to the Habitats Directive, the site is home to the grey seal, the large white-faced darter and the narrow-mouthed whorl snail. A proposal has been made to add *Macroplea pubipennis* to the form and to remove the narrow-mouthed whorl snail.

The species listed in Annex I to the Birds Directive and migrating bird species that regularly stop to rest in the area are the boreal owl, the northern pintail, the garganey, the gadwall, the grey heron, the ruddy turnstone, the hazel grouse, the Eurasian bittern, the Eurasian eagle-owl, the red knot, the curlew sandpiper, the little stint, the European nightjar, the tundra swan, the whooper swan, the black woodpecker, the Eurasian hobby, the red-breasted flycatcher, the black-throated diver, the Eurasian pygmy owl, the common crane, the red-backed shrike, the woodlark, the jack snipe, the velvet scoter, the smew, the European honey buzzard, the red-necked phalarope, the ruff, the grey-headed woodpecker, the spotted crake, the Caspian tern, the common tern, the Arctic tern, the barred warbler, the wood grouse, the spotted redshank, the wood sandpiper and the common redshank. A proposal has been made to add the following species to the form: the great reed warbler, the razorbill, the northern shoveler, the common pochard, the tufted duck, the greater scaup, the barnacle goose, the Temminck’s stint, the black guillemot, the broad-billed sandpiper, the northern wheatear, the red-necked grebe and the common eider.

The minimum distance between the Natura site and the route of the natural gas pipelines is 17.8 km, and the pipelines will run at a depth of approximately 60–90 m in the area closest to the Natura site. The nearest munition to be cleared is located approximately 18.2 km to the south of the Natura site, and there is a second munition almost at the same distance.

Söderskär and Långören Archipelago (FI0100077)

The Natura site is protected under the Habitats Directive and the Birds Directive (SAC and SPA). The site comprises four separate parts in the outer Porvoo Archipelago. The site measures 18,000 ha, of which only 149 ha is land.

The habitat types listed in Annex I to the Habitats Directive are sandbanks which are slightly covered by sea water all the time, reefs, annual vegetation of drift lines, perennial vegetation of stony banks, vegetated sea cliffs, esker islands, islets and islands in outer archipelago and open sea zones, coastal meadows, Baltic sandy beaches and species-rich dry to mesic grasslands. A proposal has been made to add western taiga and herb-rich forests to the form.

The only species listed in Annex II to the Habitats Directive that is found in the area is the grey seal.

The species listed in Annex I to the Birds Directive and migrating bird species that regularly stop to rest in the area are the gadwall, the ruddy turnstone, the Caspian tern, the common tern, the Arctic tern and the common redshank. A proposal has been made to add the red-necked grebe, the barnacle goose, the common shelduck, the northern pintail, the northern shoveler, the tufted duck, the greater scaup, the common eider, the velvet scoter, the black grouse, the wood sandpiper, the black guillemot, the western yellow wagtail, the northern wheatear, the Steller's eider and the lesser black-backed gull to the form.

The shortest distance between the Natura site and the route of the Nord Stream 2 pipelines is 12.5 km, and the pipelines will mostly run at a depth of 30–60 m. The nearest munition to be cleared is located approximately 12.7 km from the Natura site. All munitions that are located within 20 km of the site will be cleared using bubble curtains in order to mitigate the impacts on the Natura site.

Pernaja Bay and Pernaja Archipelago Marine Protection Areas (FI0100078)

The site has been included in the Natura 2000 network on the basis of the Habitats Directive and the Birds Directive (SAC and SPA). The Natura site comprises vast areas in the inner, middle and outer archipelago between Porvoo and Loviisa, and it measures approximately 660 km^2.

The habitat types listed in Annex I to the Habitats Directive that are found in the Natura site are coastal lagoons, reefs, annual vegetation of drift lines, perennial vegetation of stony banks, vegetated sea cliffs, esker islands, islets and islands in outer archipelago and open sea zones, coastal meadows, Baltic sandy beaches, narrow inlets, hydrophilous tall herb fringe communities, old broad-leaved deciduous forests, herb-rich forests and bog woodland. A proposal has been made to add sandbanks which are slightly covered by sea water all the time, estuaries, large shallow inlets and bays, species-rich dry to mesic grasslands, transition

mires and quaking bogs, springs and springfens, siliceous rocky slopes, western taiga and deciduous swamp woods to the form.

The only species listed in Annex II to the Habitats Directive that is found in the area is the grey seal. A proposal has been made to add the large white-faced darter and the Baltic ringed seal to the data form as new species.

The species listed in Annex I to the Birds Directive and migrating bird species that regularly stop to rest in the area are the razorbill, the northern pintail, the garganey, the gadwall, the taiga bean goose, the ruddy turnstone, the greater scaup, the hazel grouse, the Eurasian bittern, the Eurasian eagle-owl, the European nightjar, the western marsh harrier, the corn crake, the tundra swan, the whooper swan, the black woodpecker, the ortolan bunting, the Eurasian hobby, the common kestrel, the common crane, the red-backed shrike, the velvet scoter, the smew, the European honey buzzard, the ruff, the spotted crake, the Caspian tern, the common tern, the Arctic tern, the barred warbler, the wood sandpiper and the common redshank. A proposal has also been made to add the following species to the form: the great reed warbler, the northern shoveler, the black guillemot, the great snipe, the lesser black-backed gull, the little gull, the common eider and the common guillemot.

The shortest distance between the Natura site and the route of the Nord Stream 2 pipelines is 13.1 km, and the pipelines will mostly run at a depth of 30–60 m. The nearest munition to be cleared is located approximately 14 km from the Natura site. All munitions that are located within 40 km of the site will be cleared using bubble curtains in order to mitigate the impacts on the Natura site.

Eastern Gulf of Finland Archipelago and Waters (FI0408001)

The site has been included in the Natura 2000 network on the basis of the Habitats Directive and the Birds Directive (SAC and SPA). The site is located off the coast of Kotka, and it borders Russia in the east. The total area of the Natura site is 956 km^2. The site is dominated by vast water areas, and it is mostly located in the outer archipelago.

The habitat types listed in Annex I to the Habitats Directive are sandbanks which are slightly covered by sea water all the time, coastal lagoons, reefs, annual vegetation of drift lines, perennial vegetation of stony banks, vegetated sea cliffs, esker islands, islets and islands in outer archipelago and open sea zones, coastal meadows, Baltic sandy beaches, species-rich dry to mesic grasslands, lowland hay meadows, siliceous rock with pioneer vegetation, western taiga and herb-rich forests. A proposal has also been made to add the following habitat types to the form: shifting dunes with marram (“white dunes”), fixed dunes with herbaceous vegetation (“grey dunes”), lime-deficient dune heathland with crowberry, wooded dunes, transition mires and quaking bogs, siliceous rocky slopes, coniferous

forests on, or connected to, glaciofluvial eskers, deciduous swamp woods and bog woodland.

The only species listed in Annex II to the Habitats Directive that is found in the area is the grey seal. A proposal was made in connection with a review of the data forms on Natura sites to add the Baltic ringed seal as a new species to the form.

The species listed in Annex I to the Birds Directive and migrating bird species that regularly stop to rest in the area are the razorbill, the ruddy turnstone, the Eurasian eagle-owl, the European nightjar, the black woodpecker, the merlin, the Eurasian hobby, the pearl kite, the red-backed shrike, the woodlark, the velvet scoter, the Caspian tern and the common tern. A proposal has also been made to add the following species to the form: the barnacle goose, the black guillemot, the peregrine falcon, the lesser black-backed gull, the northern wheatear, the horned grebe, the common eider, the common shelduck, the black grouse and the common guillemot.

The shortest distance between the Natura site and the route of the Nord Stream 2 pipelines is 23.5 km, and the pipelines will mostly run at a depth of 30–60 m. There are five munitions to be cleared in Finland's territory, which are located 26–50 km from the Natura site.

Conclusions based on the screening studies

The project is not expected to have any negative impacts on the habitat types that are the basis for the protection of the aforementioned Natura sites.

The grey seal is mentioned as the basis for the protection of all the Natura sites. The Baltic ringed seal has been proposed as a new species to be added to the conservation objectives of the Pernaja Bay and Pernaja Archipelago Marine Protection Areas and Eastern Gulf of Finland Archipelago and Waters Natura sites.

Based on modelling, the zones where munitions clearance in Finland will cause a permanent threshold shift (PTS) in hearing do not extend to any of the Natura sites included in the screening studies. Temporary hearing loss (TTS) from munitions clearance will only reach one of the Natura sites (Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area). The impacts on grey seals and Baltic ringed seals in the Eastern Gulf of Finland Archipelago and Waters Natura site are estimated to be minor at the individual level and at population level. Seals present inside the Natura site or around it may be exposed to the risk of temporary hearing loss (TTS) due to munitions clearance in Russian territorial waters if large munitions are cleared in the area.

Seals present inside the Natura sites are therefore unlikely to be affected, but if they are, the impacts incurred will be short-lived. Seals outside the Natura sites for foraging reasons, for example, may, however, incur impacts resulting from underwater noise. The use of seal scrammers is estimated to effectively prevent blast injuries and to reduce the number of seals exposed to more severe forms of permanent hearing loss. The impacts on grey seals are estimated as minor on the whole in all the surveyed areas, and impacts on the Baltic ringed seal are also assessed to be minor. The impacts will occur during natural gas pipeline installation, and the impacts during the operational phase are estimated as negligible.

Impacts on the species of birds included in Annex I to the Birds Directive and migrating bird species that are regularly found in the area are assessed as minor at most and due to blast injuries resulting from munitions clearance. Impacts on the razorbill in the Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area are estimated as minor. The impacts on birds in the Söderskär and Långören Archipelago and the Pernaja Bay and Pernaja Archipelago Marine Protection Areas are assessed to be negligible. All in all, impacts on the razorbill and the common guillemot in the Eastern Gulf of Finland Archipelago and Waters Natura site resulting from blast injuries are assessed as minor. The impacts on all other protected bird species are assessed as negligible.

Based on the above, the Nord Stream 2 project will neither individually nor in combination with other projects or plans significantly deteriorate the nature values due to which the aforementioned Natura sites have been included in the Natura 2000 network. The screening studies identified no reasons for performing Natura 2000 assessments pursuant to Section 65 of the Finnish Nature Conservation Act in any of these Natura sites.

Natura 2000 assessments

Kallbådan Islets and Waters (FI0100089)

The Natura site’s primary objective is to protect the grey seal, and there is a seal sanctuary of the same name within the site. The Natura site is protected under the Habitats Directive (SAC). The site measures approximately 1,500 ha, and it is located in the pelagic offshore area to the southwest of Porkkalanniemi.

The habitat types listed in Annex I to the Habitats Directive are boreal Baltic islets and islands in outer archipelago and open sea zones and, as per a proposal for a new protected habitat type, rocks and underwater parts of rocky shores in the algal zone. The only species listed in Annex II to the Habitats Directive that is found in the area is the grey seal.

Impact assessment

Impacts on habitat types are assessed to be negligible due to the distance between the Natura site and the project site (minimum distance of 9.8 km). The project's impacts on water quality and underwater habitats are not expected to reach the Natura site.

Blast injuries and permanent hearing loss resulting from munitions clearance are estimated as minor at most at the individual level in the case of seals present in or near the Natura site. The Gulf of Finland grey seal population is increasing, and the status of the population is estimated as favourable. The actual numbers of grey seals that may be exposed to impacts in or around the Natura site are not known for certain, but considering the duration of each clearance operation (less than one second) and the use of bubble curtains in the clearance of the most critical munitions, the number of exposed animals is assessed to be very low. Due to these factors and the favourable status of the grey seal population, the significance at population level is estimated as minor at most.

The sensitivity of grey seals to a temporary threshold shift (TTS) in hearing and the magnitude of the change are assessed as small and the significance of the impact as minor at the individual level and at population level. The significance of the harmful impact of a permanent threshold shift (PTS) in hearing is assessed as minor at population level.

Impacts on behaviour (disturbance) resulting from the extremely short-lived noise peaks are possible. These include, inter alia, a startle response caused by involuntary muscle contractions or a momentary cessation of whichever activity the animal is engaged in at the time. Significance is not estimated to be greater than minor. Negative impacts will only occur during the construction of the natural gas pipelines.

Impacts on the integrity of the Natura site

The natural gas pipeline project may have minor short-lived negative impacts with regard to the criterion relating to the presence and abundance of the species that are the basis for the site's protection. Based on underwater noise modelling, some seals in or near the Natura site may be exposed to permanent hearing loss due to munitions clearance. This may cause a short-lived negative effect on the presence of grey seals in the area. Based on the assessment, the risk of demographically significant impacts is extremely unlikely, as the grey seal population is in a favourable status and the minor negative impacts will be limited to the construction phase. The project will not alter conditions in the Natura site to an extent that would threaten the presence or breeding of grey seals in the area in the long term.

Conclusion

The Nord Stream 2 project will neither individually nor in combination with other projects or plans significantly deteriorate the nature values due to which Kallbådan Islets and Waters have been included in the Natura 2000 network.

Sea Area South of Sandkallan (FI0100106)

The Natura site is protected under the Habitats Directive (SAC). The site measures 7,468 ha, and the Natura data form identifies reefs in the area as a habitat type protected under Annex I to the Habitats Directive. The Natura data form mentions no species included in Annex II to the Habitats Directive or Annex I to the Birds Directive.

Impact assessment

Based on distance, modelling results and lessons learnt from the Nord Stream natural gas pipeline project, construction works on the route of the pipelines are not expected to have harmful impacts on water quality, sedimentation or benthic flora and fauna in the Natura site.

The operation of the pipelines will not have a significant impact on the environment or the Natura 2000 site. Once in place on the seabed, the pipelines may have minor and local impacts relating to hydrological conditions. Based on experiences, impacts on currents may occur in the immediate vicinity of the natural gas pipelines and within a limited area around the pipelines. Turbidity resulting from construction works will spread to a distance of less than one kilometre. The shortest distance from the route of the pipelines to the southern edge of the Natura 2000 site is 1.9 km.

Conclusion

No such combined effects of the natural gas pipeline project and existing or planned infrastructure projects or other functions were identified in the course of the Natura assessment that would threaten the reefs habitat of the Sea Area South of Sandkallan Natura 2000 site.

The project will have no such impacts on the Sea Area South of Sandkallan Natura 2000 site that would threaten the nature values of the protected habitat (reefs). The Nord Stream 2 project is also not expected to have a significant impact on the integrity of the Natura site.

Opinions issued on account of the Natura assessments and screening studies

The **Environment and Natural Resources Department of the Uusimaa Centre for Economic Development, Transport and the Environment** has issued an opinion on the screening studies conducted on the Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine

Protected Area (FI0100005), the Söderskär and Långören Archipelago (FI0100077) and the Pernaja Bay and Pernaja Archipelago Marine Protection Areas (FI0100078) as well as the Natura assessments carried out on Kallbådan Islets and Waters (FI0100089) and the Sea Area South of Sandkallan (FI0100106).

The most likely impacts of the project and the affected area have been identified and the assessments cover the correct impacts on the habitats and species on the basis of which the Natura sites are protected. Cumulative effects with other known projects and plans have also been taken into account in the assessments.

The Natura assessments were carried out by experts on the basis of available information on the habitat types and species present in the areas. The key source data for the assessments came from the Natura 2000 data forms and, inter alia, the EIA report of the Nord Stream 2 project and its appendices as well as lessons learnt from the Nord Stream project's earlier monitoring surveys concerning the environmental impacts of natural gas pipeline installation. The assessment reports show that relatively extensive use was made of the source data.

The project's impacts on sites included in the Natura 2000 network were studied in a manner that satisfies the appropriateness requirements laid down in the Finnish Nature Conservation Act, and justified conclusions can be drawn on the significance of the impacts on the basis of the assessments.

The conclusions presented in the assessment reports concerning the Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area (FI0100005) and the Söderskär and Långören Archipelago (FI0100077) are justified, and the impacts will not significantly deteriorate the nature values on which the protection of the Natura sites is based. The conclusion is the same even if the proposal made by the Finnish Ministry of the Environment in 2016 concerning revisions to the data on the site and new additions to the network is taken into account.

The conclusions presented in the screening report concerning the Pernaja Bay and Pernaja Archipelago Marine Protection Areas (FI0100078) and the assessment report concerning Kallbådan Islets and Waters (FI0100089) are justified, and the impacts will not significantly deteriorate the nature values on which the protection of the Natura sites is based, provided that mitigation measures are taken as planned. The conclusion is the same even if the proposal made by the Finnish Ministry of the Environment in 2016 concerning revisions to the data on the site and new additions to the network is taken into account.

The conclusions presented in the assessment report concerning the Sea Area South of Sandkallan (FI0100106) are justified, and the impacts will not significantly deteriorate the protected habitat (reefs). The conclusion is

the same even if the proposal made by the Finnish Ministry of the Environment in 2016 concerning revisions to the data on the site and new additions to the network is taken into account.

The implementation of the project will not damage the ecological structure or functions of any of the assessed Natura sites in a manner that would threaten their integrity. There will also be no significant cumulative impacts with other projects.

Monitoring must be carried out to ensure that the project's impacts on the seal populations of the Natura sites and the protected reefs habitat of the Sea Area South of Sandkallan in particular will not be greater than expected and that mitigation measures function as planned.

The construction of the Nord Stream 2 natural gas pipelines will not, either individually or in combination with other projects and plans, significantly deteriorate the nature values due to which the Natura sites were included in the Natura network in the manner referred to in Section 65 of the Finnish Nature Conservation Act, provided that the planned mitigation measures are carried out.

The Environment and Natural Resources Department of the Southeast Finland Centre for Economic Development, Transport and the Environment has stated regarding the screening of the Eastern Gulf of Finland Archipelago and Waters Natura site (FI0408001) that the project's likely impacts and the affected area have been identified and that the assessment covers the correct impacts on the habitats and species on the basis of which the Natura site is protected. Cumulative effects with other known projects have also been taken into account.

The assessment covers both direct and indirect impacts, the significance of impacts and uncertainties relating to the impacts. The impacts are described quantitatively, and the time span of the impacts has been assessed. The probability of impacts occurring or not occurring has been explained. Measures for mitigating impacts are described in the assessment report.

The assessment was appropriate. Provided that the mitigation measures are implemented, the project is unlikely to significantly deteriorate the nature values of the Natura site. The project will not impact on the integrity of the Natura site, and it will not have harmful cumulative impacts with other projects and plans.

In order to monitor impacts on the Baltic ringed seal, an underwater noise monitoring station in the Eastern Gulf of Finland must be added to the environmental impact monitoring programme.

PUBLICITY OF THE APPLICATION

The Regional State Administrative Agency published a notice of the application pursuant to Chapter 11, Sections 7, 10 and 11 of the Finnish Water Act in the Regional State Administrative Agency and reserved an opportunity for stakeholders in the Town of Hanko, the City of Espoo, the City of Helsinki, the City of Kotka, the Town of Loviisa, the Town of Pargas, the City of Porvoo and the Town of Raseborg as well as the Municipality of Föglö, the Municipality of Ingå, the Municipality of Kimitoön, the Municipality of Kirkkonummi, the Municipality of Kökar, the Municipality of Pyhtää and the Municipality of Sipoo to lodge opinions and objections on account of the application until 20 November 2017. A separate notice was sent to the stakeholders identified in the documents.

The notice and the key contents of the application have been published at www.avi.fi/lupa-tietopalvelu. The publication of the notice was also announced in the Official Journal on 20 October 2017.

The Regional State Administrative Agency requested statements on the application pursuant to Chapter 11, Section 6 of the Finnish Water Act from the Environment and Natural Resources Departments of the Uusimaa, Southwest Finland and Southeast Finland Centres for Economic Development, Transport and the Environment, the Fisheries Authority of the Southwest Finland Centre for Economic Development, Transport and the Environment, Metsähallitus, the Sea Route Unit of the Finish Transport Agency, the Logistics Command of the Finnish Defence Forces, the Environmental Department of the Government of Åland, the Finnish National Board of Antiquities, the Finnish Border Guard and the Town of Hanko, the City of Espoo, the City of Helsinki, the City of Kotka, the Town of Loviisa, the Town of Pargas, the Town of Raseborg and the City of Porvoo and their Environmental Protection Authorities as well as the Municipality of Föglö, the Municipality of Ingå, the Municipality of Kimitoön, the Municipality of Kirkkonummi, the Municipality of Kökar, the Municipality of Pyhtää and the Municipality of Sipoo and their Environmental Protection Authorities.

A statement was also requested from the Swedish Environmental Protection Agency pursuant to Article 5 of the Nordic Environmental Protection Convention (Finnish Treaty No 75/1976) between Norway**,** Sweden**,** Finland and Denmark.

STATEMENTS

1) The Environment and Natural Resources Department of the Uusimaa Centre for Economic Development, Transport and the Environment states that the application is well drawn up and that most of the assessments concerning environmental impacts governed by the Finnish Water Act have been carried out appropriately. The application

also factors in the issues highlighted by the EIA coordinating authority in its statement on the EIA report.

Munitions clearance

The actual number of munitions is approximately 70% higher that the estimate given in the EIA report. However, only some of the munitions are large enough to cause impacts. The applicant is seeking permission to clear munitions in situ. This was also the starting point in the EIA report.

In addition to the techniques employed during the Nord Stream project, alternative clearance techniques are being studied in order to reduce the impacts of underwater noise. This would also reduce the dispersion of solids and contaminants. According to the application, the feasibility study concerning this technique has not yet been completed. The decision must stipulate that, once the study is completed, the permit holder must supply the results of the study and conclusions drawn on that basis to the permit authority and the supervisory authorities. The same provision must also stipulate that the alternative technique must be used wherever possible based on the feasibility study. This is justified on the basis of the principle of minimising detrimental consequences laid down in Chapter 2, Section 7 of the Finnish Water Act. The environmental impacts of on-barge clearance are considerably smaller, which is why it should be the preferred technique wherever possible. Considering the explosive weights given, the (direct) adverse effects of noise from on-barge clearance are likely to be limited to a distance of comfortably less than one kilometre and mostly related to hearing.

The permit must contain a provision on the use of bubble curtains as described in the application. The permit must also provide for the use of the other underwater noise disturbance mitigation measures described in the application. These include deterrent devices for driving away marine mammals and schools of fish and monitoring their effectiveness, various monitors, echo sounders and minimising the volume of explosives. In order to facilitate the detection of mammals, all clearance works must be carried out during daylight hours.

Should significant adverse effects on fish or mammals be detected by monitoring during the works, these must be immediately reported to the supervisory authority, the reasons must be analysed and steps taken to improve and revise the munitions clearance process so as to reduce harmful impacts.

The applicant is seeking permission to also clear any “new” munitions detected during the construction process as well as any munitions that are brought into the safety corridor by currents or other factors (such as trawls) after the construction phase. The permit may cover these as well, provided that the aforementioned mitigation measures and the potential alternative clearance technique are observed. The permit may also cover the moving

of munitions to a better clearance location for justified reasons as described in the application.

Water resources and marine resources management planning

In its statement on the EIA report, the Centre for Economic Development, Transport and the Environment as the coordinating authority states that impacts on water resources and marine resources management and the associated environmental targets have been factored in to a sufficient degree. According to the statement, the Nord Stream 2 project will not prevent reaching good water quality. The statement nevertheless goes on to say that this must be ensured at the point of the permit procedure when the results of further surveys and Natura assessments are available. The further surveys did not identify any such factors on the basis of which the aforementioned conclusion would need to be revised.

The Centre for Economic Development, Transport and the Environment is still processing the Natura assessments, which is why a final conclusion cannot yet be made.

Impacts on Natura sites and the Baltic ringed seal

The Centre for Economic Development, Transport and the Environment will issue a separate statement on the Natura assessments and Natura screening studies that have been conducted.

The only official basis for the protection of the Natura sites at the moment is the grey seal, but the Baltic ringed seal has been proposed for the revision of the data concerning the Pernaja Bay and Pernaja Archipelago Marine Protection Areas (FI0100078). The impacts on both species are similar.

It was concluded during the EIA phase that, without additional mitigation measures, munitions clearance would have a moderate impact on the Baltic ringed seal subpopulation of the Eastern Gulf of Finland. The applicant has introduced additional mitigation measures after the EIA phase, namely bubble curtains, which will be used to clear munitions in the Eastern Gulf of Finland as well as any munitions that are located in the vicinity of conservation areas established for the protection of seals.

The breeding season of the Baltic ringed seal lasts from mid-February to mid-March. The females feed pups for 2–3 weeks and maintain an access opening in the ice field. As the grey seal, the Baltic ringed seal is also very sensitive during the breeding season; the highly critical period lasts from February until June, until the moulting period is over. As the Baltic ringed seals are dependent on the ice and snow cover during breeding, ice-breaking activities (including noise, loss of the breeding areas and visual disturbance) can have negative impacts on their breeding success. No construction works must be carried out in winter ice conditions. The

project's environmental impact assessment (EIA) was based on the premise that construction works will not be carried out in winter ice conditions.

Waste management

The volume of waste generated during the construction process, surveys, inspections, maintenance and decommissioning must be minimised. As a rule, all waste must be collected and sent for processing or recycling on land. In the application, offshore waste management only covers the construction process itself. Based on lessons learnt from the Nord Stream project, provision should also be made for waste management in the context of activities after the construction phase.

The application does not provide details on the deposition of explosive debris resulting from rock extraction, such as shock tubes, in the sea. With regard to the technical requirements for rock, the application states that it must be clean and not contain any waste materials. The application does not specify whether explosive debris contained in the extracted rock has been taken into account in the assessment. Attention should be given to explosive debris at the beginning of the chain and its deposition in the sea should be minimised. Due to their long life and chemical properties, plastics are harmful for the marine environment.

Monitoring

According to the monitoring programme, the supervisory authority will be consulted with regard to noise, commercial fishery and cultural heritage. The significance of this relative to the table describing the monitoring schedule has not been explained. The monitoring schedule must be revised in this respect and, in so far as decisions on discontinuing monitoring are to be taken after the permit decision has been issued, the permit provisions must clearly state the authority that will make the decision (such as the competent Fisheries Authority in the case of fishing). Monitoring may only be discontinued on the basis of the competent authority's written consent.

There are also some ambiguities relating to reporting and schedules that appear to be in conflict between Section 4.1 and Sections 4.2–4.4. The monitoring programme should be revised in the aforementioned respects. The confusion between monitoring relating to construction and long-term monitoring at the end of Section 2.4.1 should also be rectified. The revised programme must be sent to the Environment and Natural Resources Departments of the Uusimaa, Southwest Finland and Southeast Finland Centres for Economic Development, Transport and the Environment, the Fisheries Authority and other competent agencies as well as municipal Environmental Protection Authorities.

It must be possible to revise the monitoring programme subject to the supervisory authorities' consent and, in the case of fisheries monitoring, the Fisheries Authority's consent, if necessary. It must also be possible to revise the reporting schedule for monitoring, if necessary.

Maintenance

It may be necessary to add rock to the project site in connection with the maintenance of the natural gas pipelines. This may be incorporated into the provision concerning maintenance. Based on lessons learnt from the Nord Stream project, dredging may also be necessary, which is why the provision concerning maintenance may also incorporate any dredging required for maintenance purposes. According to the application, soft seabed areas account for approximately 59% of the total project area. The measures must be specified in detail in the provision concerning maintenance. Reports on maintenance activities must be supplied to the authorities supervising compliance with the Finnish Water Act.

Authorisation for preparation

The applicant is seeking authorisation for preparation for the activities described in the application, up to and including successful completion of pre-commissioning activities when the pipeline would be left filled with dry air (or nitrogen) close to atmospheric pressure, i.e. not including the actual project activity (natural gas transport) for which the pipelines are constructed. According to the latest design, the total amount of rock material to be placed on the seabed in the Finnish exclusive economic zone is approximately 1.1 million m^3 (net), and the loss given the construction tolerance is 1.4 million m^3.

Considering the project's total impacts on the environment, the conditions for granting authorisation for preparation laid down in Chapter 3, Section 16 of the Finnish Water Act are not satisfied in the case of the proposed measures. Restoring the original conditions in essential respects as stipulated in the provision in question would also cause harmful impacts on the environment.

The project may be granted a permit, provided that the issues raised in this statement are taken into account and that no reason to conclude otherwise arises from the Natura assessments.

2) The Environment and Natural Resources Department of the Southwest Finland Centre for Economic Development, Transport and the Environment states that, apart from the loss of the seabed covered by the natural gas pipelines, the impacts of pipeline installation will mostly be short-lived and will not extend beyond the project site. The area of the lost

seabed is relatively small, and, based on the application, no vulnerable habitats will be covered by the pipelines. The implementation of the project would therefore not significantly hinder the achievement of a good status for the marine environment by the end of 2020.

The applicant may be granted a permit and an authorisation for preparation pursuant to the Finnish Water Act.

3) The Environment and Natural Resources Department of the Southeast Finland Centre for Economic Development, Transport and the Environment states that the laying of the natural gas pipelines and other works associated with the project must be carried out so as to cause as little harm as possible. The project is not forecast to prevent reaching the targets laid down in the river basin management plan.

The Environment and Natural Resources Department of the Southeast Finland Centre for Economic Development, Transport and the Environment must be notified of the start and completion of the works in writing.

The turbidity monitoring programme is sufficiently comprehensive. It must be possible to extend the scope of the programme if necessary by means of additional sampling, for example, if the dispersion of substances released from sediments proves to be greater than predicted or if the works have other surprising or unexpected impacts.

With regard to underwater noise monitoring, the statement calls for one additional long-term monitoring station in the Eastern Gulf of Finland.

4) The Fisheries Authority of the Southwest Finland Centre for Economic Development, Transport and the Environment states that, according to the statement on the Nord Stream pipelines, the project would not have significant impacts on fish stocks. The statement references a statement issued by the Finnish Game and Fisheries Research Institute in connection with the project, according to which the project would have an impact on offshore fishing (trawling for Baltic herring and European sprat) in the Gulf of Finland. The Fisheries Authority called for an annual fisheries fee of EUR 40,000 on the basis of the Finnish Game and Fisheries Research Institute’s natural resources debt model. The permit authority imposed an annual fisheries fee of EUR 30,000 in the permit and included a provision according to which the fisheries obligation will be reviewed five years after the commissioning of the pipelines.

The Fisheries Authority has mostly spent fisheries fees on projects that have aimed to bring about permanent positive impacts on the operating conditions of commercial fishery in the Gulf of Finland, as the presence of natural gas pipelines causes what can be considered a permanent hindrance. The project’s impacts may also change over time if, for example, the nature of trawl fishery changes. Fish stocks may vary, and it may become necessary to start making more use of bottom trawling, for

example. The project's potential impacts extend far into the future, and an assessment of the current situation is not sufficient on its own. The fisheries obligation needs to be reviewed at set intervals.

The applicant is expected to submit an application for the review of the fisheries fee imposed on the Nord Stream project in the near future. The Fisheries Authority intends to propose that the need to impose a fisheries obligation be reviewed at five-year intervals in the future as well, due to the aforementioned reasons.

The project's impacts on fish stocks are likely to be minor, as explained in the application. The monitoring programme included in Appendix 26 to the application may be approved as per the permit. Monitoring reports must also be supplied to the Fisheries Authority. The yearly fisheries fee proposed and justified in Appendix 32 to the application is acceptable compensation for the losses to the general fisheries interest, and the fee must be imposed similarly to what was done in connection with the previous pipeline project. It makes sense to stipulate that the fee be reviewed five years after the commissioning of the pipelines. The answers to the commercial fishery survey described in the monitoring programme may be consulted in connection with the review.

5) The Sea Route Unit of the Finnish Transport Agency states that the planned natural gas pipeline routes run in the Finnish exclusive economic zone crossing the outer section of the Finnish Transport Agency's shipping channel in Mussalo as well as the Gulf of Finland traffic separation schemes through which ships enter the Gulf of Finland. Traffic separation schemes are designed to reduce the risk of vessel collisions by directing ship traffic in the Gulf of Finland to designated lanes. There are no official anchoring areas or floating navigation safety devices in the vicinity of the planned routes of the Nord Stream 2 natural gas pipelines.

The Finnish Transport Agency is participating in a project called FinEst Link, which explores the feasibility and profitability of a possible undersea railway tunnel between Helsinki and Tallinn. According to current plans, the tunnel would be constructed using a tunnel boring machine and the construction works would therefore not damage the Nord Stream 2 natural gas pipelines. The potential railway tunnel project also encompasses the construction of artificial islands off the coasts of Helsinki and Tallinn. The artificial island off the coast of Helsinki would be located in the vicinity of the Helsinki shallows.

Should the Nord Stream 2 natural gas pipeline project be implemented, pipeline installation would affect both the Finnish Transport Agency as the authority responsible for nautical charting and sea traffic control in the project area and sea traffic in the Gulf of Finland and the routes used by mariners due to, inter alia, the safety zone to be imposed around the vessels participating in the project. The safety zone is designed to ensure sufficient separation between the vessels participating in the pipe-laying

project and other mariners and to prevent the risk of vessel collisions. The Finnish Transport Agency acts as Finland's vessel traffic service (VTS) authority pursuant to the Finnish Vessel Traffic Service Act (623/2005) and, as the nautical charting authority, is responsible for keeping nautical maps up to date and mariners informed of any activities of navigational significance. The objective of nautical charting and vessel traffic services is to increase the safety of vessel traffic. In addition to controlling maritime traffic along the coast, the VTS authority controls traffic separation schemes in the Gulf of Finland (GOFREP; mandatory ship reporting system) and the Sea of Åland. With regard to the Finnish VTS Centres mentioned in the application, vessel traffic services in the project area are currently provided by the Western Finland VTS Centre and the Gulf of Finland VTS Centre and their VTS areas Archipelago VTS, Hanko VTS, Helsinki VTS and Kotka VTS. In order to ensure general maritime safety and smooth cooperation, negotiations and dialogue concerning information sharing and traffic arrangements required by the project between the project coordinator and the Finnish Transport Agency are essential at least three months before construction activities begin. The project must comply with the International Regulations for Preventing Collisions at Sea 1972 (COLREG). The following also need to be taken into account:

Considerations to be taken into account with regard to the route of the natural gas pipelines

The final routing of the natural gas pipelines in and near the Mussalo channel must not prevent potential development or alteration works on the channel in the future either, which is why the natural gas pipelines and all the associated structures must be laid at a depth of at least 20 m measured from the mean water level where they cross the Mussalo channel. The potential need to protect the natural gas pipelines must be taken into account where they cross the channel. Should the project require a temporary closure of the Mussalo channel to mariners, the Sea Route Unit of the Finnish Transport Agency must be notified of this well in advance.

The route of the natural gas pipelines runs approximately three kilometres from the shallows located to the southeast of Kalbådagrund Lighthouse, which mark the boundary of a traffic separation scheme. The statement issued on the EIA programme of the Nord Stream 2 project calls attention to the potential need to remove the shallows in the future. This must be taken into account in the technical solutions of the pipelines if necessary, albeit the risk of damage to the pipelines due to occasional small earthquakes in the area, for example, has been assessed as extremely low.

Information required by the Finnish Transport Agency prior to the start of the project

If the project is granted a water permit and progresses to implementation, the project coordinator must supply the Finnish Transport Agency with the coordinates of the planned natural gas pipeline routes along their entire length (from shore to shore) in a universally recognised GIS format (WGS84 coordinate system) without delay in order to mark them in nautical maps as areas under construction and to inform mariners. The project coordinator must supply the Finnish Transport Agency with a work plan at least six weeks before the start of construction works in order to update navigational warnings, electronic nautical charts and Notices to Mariners. The work plan must show the names of the vessels participating in the works, their call signs, the safety distances requested for the works vessels and the VHF channels they use as well as contact details for contact persons (name, telephone number and e-mail address). The Finnish Transport Agency must be notified of any changes to the information or schedules without delay.

Information required by the Finnish Transport Agency during the project

The project will affect vessel traffic in the project area, as the route of the natural gas pipelines runs in busy shipping channels and traffic separation schemes. The project coordinator or a contact person assigned to the project must supply the Gulf of Finland VTS Centre and the Western Finland VTS Centre, the Navigational Warning Coordinator and Turku Radio, which is responsible for safety radio communications, with daily and weekly reports showing the works that are in progress and their locations as well as descriptions of future works and their schedules during the installation works. All vessels involved in surveying and construction works must maintain contact with either the Gulf of Finland VTS Centre or the Western Finland VTS Centre at all times and follow the VTS authorities' instructions and seaway rules. The vessels participating in the project must also use AIS transponders.

Information required by the Finnish Transport Agency after the completion of the project

After the natural gas pipeline installation, the project coordinator must supply the Finnish Transport Agency with a notice of completion as well as a map showing the location of the natural gas pipelines, including positioning information, along the entire route (from shore to shore) without delay. The positioning information must be supplied numerically in a universally recognised format.

6) The Logistics Command of the Finnish Defence Forces states that if any cables belonging to the Defence Forces are found in the area, they must be taken into account in the design and construction of the natural gas pipelines in a coordinated and supervised manner.

The planned pipeline will run in the Finnish exclusive economic zone in its entirety and will therefore not affect the operations of the Finnish Navy.

The Navy Command Finland has submitted the following comments:

1) Works relating to the laying of the natural gas pipelines (surveys, seabed intervention works, munitions clearance, pre-commissioning, operation and maintenance, repairs and technical inspections) must not extend to restricted areas without a separate permit procedure.
2) The clearance of mines or explosives on the seabed in the Finnish exclusive economic zone is not the Finnish Navy's responsibility without a specific agreement or order. In such cases, the contractor will bear the costs.
3) Construction and other works must factor in any cables belonging to the Finnish Defence Forces that may run in the area or its vicinity. The locations of any such cables must be established well in advance, at least 10 working days prior to the planned construction works.

Furthermore, the locations of any submarine cables must be checked with the Navy Command Finland.

With regard to all cables that the natural gas pipelines will cross, crossing agreements will need to be made with the Finnish Defence Forces / the Finnish Navy / State Security Networks Group Finland, laying down provisions on the execution of construction, maintenance and repair works and associated communications.

The costs incurred from any relocation of cable routes, protection during installation or other changes to existing cables resulting from construction works must be borne by the party causing the change. No liability is accepted for clearance in the area of the natural gas pipelines. Any clearance operations will be the responsibility of the pipeline contractor.

Pursuant to the Finnish Act on the Finnish Exclusive Economic Zone, the authority with overall responsibility for any activities in the Finnish exclusive economic zone that are not related to territorial surveillance or national defence is the Finnish Border Guard.

7) Metsähallitus states that the Natura 2000 assessments cover the likely impacts and their nature. The assessments are focused on the correct impacts on the habitats and the species of the Bird Directive on the basis of which the Natura sites are protected according to the data forms. The assessments comply with Section 65 of the Finnish Nature Conservation Act, and they can be used to draw conclusions on the significance of the impacts. The conclusions of the assessments are correct. According to the conclusions, the project will not, either individually or in combination with other projects, significantly deteriorate the nature values on the basis of which the Natura sites are protected, provided that the planned mitigation measures are carried out.

Any permits granted under the Finnish Water Act must factor in the mitigation measures described in the Natura assessments and screening

studies. Moreover, Metsähallitus must be notified whenever works are carried out in the vicinity of areas controlled by Metsähallitus.

A proposal is made to monitor grey seals in the Kallbådan Islets and Waters Natura site (FI0100089) prior to, during and after the installation of the natural gas pipelines. The objective is to monitor the potential impacts of the construction works on the health of the seals and their presence on the islets of the seal sanctuary / Natura site. Monitoring should be based on a remotely controlled video camera with an independent power supply that is of sufficiently high quality to operate reliably in the demanding conditions of the outer archipelago.

Metsähallitus's Parks & Wildlife Finland has expertise and previous experience of the camera surveillance of seals, and Parks & Wildlife Finland may be consulted with regard to arranging monitoring, if necessary.

8) The Finnish Border Guard states that it has no comments on the permit application.

9) The Finnish National Board of Antiquities states that underwater cultural heritage has been appropriately taken into account in the preparations for the Nord Stream 2 project. Sufficient information has been collected on cultural heritage objects at a suitably early stage of project planning to enable the information produced by the surveys to be used in the more detailed design of the natural gas pipeline route. The project's impacts on underwater cultural heritage have been assessed appropriately. As has been stated in the application, the project will not pose a threat to the historic wreck S-R15-02960 identified in the course of the cultural heritage surveys. No significant adverse impacts will be caused to the Second World War wreck S-R11-2395 either. The fact that no bottom-anchoring vessels will be used in pipe-laying is of great benefit to the conservation of underwater cultural heritage.

The most significant underwater cultural heritage object in the area affected by the project is the 18th or 19th century wreck S-R05-7978 located in the Eastern Gulf of Finland. Protecting the wreck by means of a safety zone during the construction of the natural gas pipelines is essential. It is justified to also check the condition and status of the wreck by means of ROV photography after the pipe-laying, as maintaining a distance of less than 60 m in the demanding working conditions in the open sea cannot be considered absolutely certain, also taking into account the considerable water depth in the location of the conservation site (approximately 70 m).

The Second World War anti-submarine net S-R09-09806 is not sufficiently old to satisfy the criteria of ancient monuments laid down in the Finnish Antiquities Act which applies to Finnish territorial waters, but the object represents important cultural heritage in terms of war history, as it relates to events that are of considerable general interest and linked to numerous

Baltic Sea countries. Although the purpose and overall design of the object are known from historical sources, the physical relic may nevertheless provide more information about the actual method of the object's construction. As the construction of the natural gas pipelines will inevitably cause physical changes to the object, the object must be inspected after the pipe-laying by documenting the parts of the net that are close to the pipelines, their changes and the situation after the pipe-laying by means of ROV photography.

The project may be granted a permit under the Finnish Water Act, subject to the following proposed conditions:

1. No rock material must be placed and no other construction works that could damage the target carried out inside the 50-m safety zone around target No S-R05-7978.

2. Target No S-R05-7978 must be inspected by photography after the pipe-laying in order to establish whether the pipe-laying has caused changes to the object. The photographs must be sent to the Finnish National Board of Antiquities for the purpose of monitoring the wreck.

3. Pipe-laying and other construction works by target No S-R09-09806 must be carried out so as to minimise damage to the target.

4. Target No S-R09-09806 must be inspected by means of photography after the pipe-laying so as to document any parts of the target near the pipelines as well as any potential changes. The photographs must be sent to the Finnish National Board of Antiquities for the purpose of monitoring the target and distributing them to other authorities as required.

5. Should new cultural heritage objects or finds suggestive of the same be encountered during the construction works, the Finnish National Board of Antiquities must be notified immediately and procedures for factoring in the finds agreed if necessary.

10) The Swedish Environmental Protection Agency states that construction works in Finland will not have a notable environmental impact on Sweden. The Swedish Agency for Marine and Water Management was consulted for the statement.

11) The Town of Raseborg states that it has no comments on the application, as the project will not have a direct impact on the town's territory or functions.

12) The Town of Loviisa's Public Works and Environment Committee states that the permit must stipulate that bubble curtains be used in connection with munitions clearance as described in the application everywhere in the Eastern Gulf of Finland. Should it not be possible to use bubble curtains due to seabed topography, the permit must allow for munitions to be moved to a new location for clearance.

The supervisory authorities must be notified of the start and completion of works.

13) The City of Porvoo's Public Works and Environment Committee states that the project's environmental impacts must be monitored in a similar way and to the same extent as the impacts of the previous natural gas pipeline project. The seabed will be disturbed especially in connection with excavation and munitions clearance so that sedimented contaminants may be released and have a harmful impact on the area's flora and fauna.

Should the project be granted a permit under the Finnish Water Act, it must include an obligation to monitor, inter alia, contaminants released from sediments and noise dispersion. The removal of the pipelines and the associated environmental impacts also need to be taken into account in the decision.

14) The Municipality of Kirkkonummi's Public Works and Environment Committee states that it has no comments on the application.

15) The City of Helsinki's Environmental Protection Authority states that the application factors in previous experiences, the results of the EIA and the statements issued on the basis thereof. All in all, the application addresses the impacts of different functions comprehensively. The route of the natural gas pipelines does not run through Helsinki's waters, and the pipelines mostly run on soft seabed at great depths where they pass the sea area off the coast of Helsinki. The underwater noise zone of munitions clearance also does not extend to the sea area off the coast of Helsinki.

A previous statement issued by the City of Helsinki's Environmental Protection Authority to the City Board on 9 May 2017 concerning the environmental impact assessment report on the Nord Stream 2 project and an assessment report on the entire project called attention to the fact that the measures described in the assessment report for reducing the adverse impacts of underwater noise were relatively generic. More detailed descriptions of measures for minimising adverse impacts on flora and fauna needed to be drawn up for the areas most at risk of underwater noise and attention needed to be given to the timing of phases of work. The current application contains more detailed descriptions of measures for reducing the adverse impacts of underwater noise, such as plans to use bubble curtains in sensitive areas to reduce underwater noise. Based on the updated assessment, the overall significance of the impact on the Finnish Baltic ringed seal population will drop from moderate to minor in the Eastern Gulf of Finland. According to the assessment, it is unlikely that the project will have an impact on indicators concerning the abundance, population trends and distribution of seals or long-term effects on the ecosystem or reaching good environmental status. Natura assessments have been carried out on Kallbådan Islets and Waters and the Sea Area South of Sandkallan after the EIA phase. Moreover, screening studies

have been conducted on the Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area, the Söderskär and Långören Archipelago and the Pernaja Bay and Pernaja Archipelago Marine Protection Areas Natura 2000 sites.

According to the previous statement, the dispersion of sediments and contaminants resulting from rock placement and munitions clearance will be limited to the vicinity of the pipeline corridor as per the model described in the assessment report. With regard to contaminants, the model shows that the Predicted No Effect Concentration values may be exceeded in some areas. A more detailed assessment of the dispersion of contaminants in the water column and their impact on the food resources of fish and on fish was called for in these areas. According to the updated assessment, the total number of munitions is 70% higher compared to what was estimated in the EIA. However, lessons learnt from the Nord Stream pipelines show that the craters are smaller than assumed and the volume of dispersed sediments is lower. It would nevertheless be good to continue investigating the possibility of moving munitions or on-barge clearance in order to reduce harmful impacts. Moreover, munitions clearance should, where possible, be carried out during weather conditions that minimise the resulting harmful impacts, such as the dispersion of contaminants. In addition to the EIA, the application also discusses the impacts of the Nord Stream project on fish. Fish mortality in terms of individual fish will be local, and the impacts of contaminants and sediments on the entire European sprat population are expected to be negligible.

According to the application and the assessment discussed therein, the risk of accidents will be low. However, good risk management must be ensured during the implementation of the project as well as the inclusion of measures to minimise adverse environmental effects in the permit and the execution of the same as planned. The execution of measures must be based on guidelines and agreements, and training must be provided to ensure compliance in practice.

The application may be approved.

16) The City of Helsinki concurs with the statement of the City of Helsinki’s Environmental Protection Authority and states that the application may be approved.

17) The Municipality of Ingå’s Public Works and Environment Committee states that the application is extensive and describes the most important environmental impacts in detail. Lessons learnt from previous pipe-laying operations (Nord Stream 1) show that no notable negative environmental impacts are to be expected. The clearance of mines and munitions in the Gulf of Finland is a positive measure from the perspective of the environment on the whole.

OBJECTIONS AND OPINIONS

18) Fingrid Oyj states that it has a stake in the matter, as the planned natural gas pipelines will cross the EstLink 1 and 2 cables between Finland and Estonia. The objector is a national electricity transmission grid operator, which is responsible for Finland's electricity system. Its role is to ensure the balance of Finland's electricity production and demand and the technical operability of the electricity transmission system.

The surveys, seabed intervention works, munitions clearance, construction works and operation and maintenance measures described in the application must be implemented so as to not prevent or unreasonably hinder any potential future energy and telecommunications projects or other infrastructure projects.

All works in the vicinity (< 1 km) of the EstLink 1 and 2 cables must be planned in cooperation with Fingrid Oyj in order to not jeopardise electricity transmission between Finland and Estonia. Special care must be taken with regard to seabed intervention works and munitions clearance as well as crossing design.

19) Kari Silvennoinen demands that the permit application be rejected, as the applicant does not have the right to build on the objector's land. The objector owns approximately 100 km^2 of land along the route of the natural gas pipelines, and the applicant has not consulted the objector. Permission to build on the land is denied. Building on land or in waters owned by others is forbidden.

20) Elisa Oyj states that the applicant must immediately stop installing and laying the natural gas pipelines on top of Elisa Oyj's telecommunications cables (FEC-1 or FEC-2), if the objector is reduced to only one operational telecommunications cable (FEC-1 or FEC-2) between Finland and Estonia. The cessation of works must continue until the damaged cable has been fully repaired. Pipe-laying and crossing the second cable may be resumed once the damaged cable has been repaired and there is no risk of both cables being out of operation simultaneously.

There is a clear risk of the objector's cables being damaged and data transmissions via the cables deteriorating or being prevented altogether during the pipe-laying phase.

The distance between the cables is such that when the pipe-lay vessel has crossed the first cable, it will take approximately 10–12 days before it crosses the second cable. If the first cable is damaged, it can, in an ideal scenario, be repaired during the approximately 10 days. However, repairing the cable requires first of all that a special cable repair vessel is available at the time.

The applicant must fully reimburse the objector for any costs incurred from contingency planning and for the loss, damage or degradation of a cable or cables, prevention of or interference with the use of the cables, decrease in the return on them and any other losses for which the applicant is liable pursuant to the Finnish Water Act both during the laying of the natural gas pipelines and thereafter.

In future, the applicant must assist and facilitate any repairs on the telecommunications cables and the laying of new cables upon the objector's request and free of charge so that no additional costs are incurred from the existence of the natural gas pipelines. If such costs are incurred, the applicant must reimburse them in full.

21) ClientEarth objects to the granting of a permit for the construction of the natural gas pipelines, to surveys being carried out in Finnish territorial waters and to the granting of an authorisation for preparation. There is no need to construct two new natural gas pipelines in the Baltic Sea, and construction has a harmful environmental impact on the Baltic Sea.

Part I of the opinion discusses the legal prerequisites for granting the permit especially from the perspective of the European Union's gas demand.

Part II examines the European Union's gas deliveries and claims that the European Union's natural gas demand will not increase. Moreover, constructing the pipeline system will increase dependence on Russian natural gas.

Part III addresses environmental considerations and consists of several subsections outlining the objector's concerns:

- The project's impacts on marine mammals
- The project's impacts on Natura 2000 sites including the Kallbådan Natura 2000 site as well as two Natura 2000 sites located in Poland
- The project's impact on reaching the targets set in the Water Framework Directive and the Marine Strategy Framework Directive
- The lack of an appropriate assessment of alternative routes and omissions in the assessment of environmental impacts
- Climatic and air quality problems potentially caused by the project
- Environmental impact assessment in Russia
- The method of decommissioning the pipelines and the associated environmental impacts
- The fact that several parties to the Espoo Convention process have expressed concerns over the project and asked for a third-party assessment of the permit

The opinion also expresses concerns over the fact that most of the application documents are only available in Finnish and that a period of only 30 days has been reserved for the public consultation.

Part IV explains the reasons why an authorisation for preparation should not be granted. The key reason given is that the environment must be considered more important than the project. Moreover, restoring the seabed to its original condition would cause environmental impacts, and a plan would need to be submitted on the decommissioning of the natural gas pipelines.

22) The Finnish Association for Nature Conservation states that the project is strongly supported by two factors: monitoring results concerning the first natural gas pipelines and the high standard of the environmental impact assessment. The results of the EIA and the conditions set in the coordinating authority's statement have been relatively well taken into account in the application.

The water permit must make the good practice described in the application concerning the use of a dynamically positioned vessel to reduce the adverse effects of munitions clearance into a mandatory provision so that compliance can be monitored.

The chosen southern pipeline routes that run close to the Finnish Natura 2000 sites are better than the northern routes. Prior to the granting of the permit, however, all Centres for Economic Development, Transport and the Environment must have issued Natura 2000 statements pursuant to the Finnish Nature Conservation Act and the statements must be in favour of the project.

The greatest challenge concerning the water permit relates to the potential harm caused to animals, including seals that are the basis for the protection of the Natura 2000 sites, by the clearance of munitions along the route of the natural gas pipelines, which is an essential element of the project. The works must be timed and measures taken to observe and deter animals so as to minimise harmful effects as described in the application. In problematic cases, munitions may also be lifted off the seabed and cleared on land at the Syndalen shooting range in Hanko, for example.

Some of the documents are secret, which is not a good practice. At least the reason for secrecy (such as national defence) should be given.

Although foreign nature conservation areas are not governed by the Finnish Water Act, it is important to protect the Kurgalski nature reserve in Russia and the Natura 2000 sites of all EU countries.

From the perspective of energy and climate policy, using Russian natural gas in EU countries is not a sustainable solution. Importing Siberian oil and gas to EU countries should also be phased out due to the damage caused by oil and gas drilling to the environment and indigenous peoples. If gas is nevertheless used, a subsea natural gas pipeline is a better form of

transport than ships. Transporting gas by ships would increase the risk of accidents in the already heavily trafficked Gulf of Finland.

23) Baltic Connector Oy states that the Balticconnector natural gas pipeline will cross the pipelines discussed in the application in the Finnish exclusive economic zone. Negotiations between the objector and the applicant concerning a crossing agreement for the natural gas pipelines have not yet been concluded. There are no other objections to the application.

24) Nord Stream AG states that a crossing agreement is about to be signed.

ADDITIONS TO THE APPLICATION AND THE APPLICANT'S RESPONSES

Additions to the application (19 January 2018) concerning munitions clearance and alternative clearance techniques

Munitions detected in the vicinity of the pipeline system have been reassessed as planning has progressed. The number of munitions to be cleared has increased from 85 to 87. More information has also come to light concerning munition-specific environmental impacts during the assessment. The changes are minor. The impacts will be the same or less severe in all cases.

Based on ongoing detailed planning, the safe operation of the pipeline system requires the clearance of five new munitions. These munitions are small, and their explosive weight is less than 50 kg. Four of the munitions are located to the south of Kallbådan, and the closest (with an explosive weight of 17 kg) lies approximately 10.5 km from Kallbådan. The fifth munition is located to the south of Hanko.

Detailed planning has also revealed that three of the munitions that were to be cleared do not in fact need to be cleared for ensuring the safe operation of the pipeline system. Two of these are located in the Eastern Gulf of Finland and one to the south of Hanko.

The on-barge clearance technique has now been deemed unfeasible. The use of bubble curtains will consequently be extended to all munitions where acoustic deterrent devices are not capable of fully eliminating moderate impacts on marine mammals.

Acoustic deterrent devices have been deemed adequate as mitigation measures in the case of munitions with a charge of less than seven kilograms. As the volume of explosives needed to detonate munitions of more than two kilograms is 15 kg, bubble curtains will be used in connection with all munitions with a total charge of more than 22 kg. In deviation of the above, one munition of five kilograms located in the east will be cleared using a bubble curtain as described in the application.

Based on current estimates, seven of the munitions have a charge of less than seven kilograms.

The munitions clearance contractor will inspect the munitions before clearance and make a final assessment on the charge, overall condition and type of each munition.

It is likely that there are also other munitions with a total charge of less than 22 kg. If the total charge of other munitions is estimated to be 22 kg or less, bubble curtains will not be used except in the Eastern Gulf of Finland. If a decision is made to not use bubble curtains on the basis of the pre-clearance inspection, the relevant Centre for Economic Development, Transport and the Environment and the Finnish Border Guard will be notified once the munition-specific clearance plan has been drawn up and in any case at least 48 hours before the clearance.

It may be necessary to move munitions prior to clearance in order to ensure the efficient use of bubble curtains or to facilitate clearance or pipe-laying works otherwise. In such cases, the munitions will be moved before clearance in a safe and controlled manner and in accordance with the clearance plan. Depending on the time of year, any moved munitions will be cleared within a few months or during the following summer at the latest, if the munition is moved during winter ice conditions or in challenging weather conditions otherwise. In such cases, clearance will be postponed until the following summer in order to minimise impacts on seals.

Applicant's responses

Uusimaa Centre for Economic Development, Transport and the Environment / Environment and Natural Resources Department (1):

The comments and suggested improvements concerning monitoring have been taken into account in the revised monitoring programme.

The same waste management procedures will be followed during the operational phase as during installation. The rock used by the applicant will be crushed and levelled/screened twice in order to remove fines, including plastic. This technique will ensure that rocks of the correct size can be cleaned to a point where the volume of any remaining plastic residues will be below the detection limit.

The number of munitions to be cleared is likely to be smaller than the one stated in the application. The mitigation measures described in the application as well as bubble curtains will be used during munitions clearance. Thanks to bubble curtains, the impacts on the grey seal at the individual level will be reduced to minor.

The aim is to avoid all construction works, including munitions clearance, when the sea is frozen. The spring season when the Gulf of Finland is still

covered by ice is an especially critical time for seals. The applicant undertakes to avoid construction works when the sea is frozen.

The concerns raised in the statement have been discussed above. New mitigation measures have been introduced and more detail has been added to sections that concern construction works in winter ice conditions, waste management during the operational phase and the management of waste generated by munitions clearance. As the concerns raised in the statement have been appropriately mitigated, an authorisation for preparation may be granted, as also proposed by the Southwest Finland Centre for Economic Development, Transport and the Environment.

Annual reports will be supplied to the Centres for Economic Development, Transport and the Environment responsible for monitoring the project when they are ready.

Southwest Finland Centre for Economic Development, Transport and the Environment / Environment and Natural Resources Department (2):

The mitigation measures described in the application as well as bubble curtains will be used during munitions clearance. Thanks to bubble curtains, the impacts on the grey seal at the individual level will be reduced to minor.

Annual reports will be supplied to the Centres for Economic Development, Transport and the Environment responsible for monitoring the project when they are ready.

Southeast Finland Centre for Economic Development, Transport and the Environment / Environment and Natural Resources Department (3):

The comments and suggested improvements concerning monitoring have been taken into account in the revised monitoring programme.

The mitigation measures described in the application as well as bubble curtains will be used during munitions clearance. Thanks to bubble curtains, the impacts on the grey seal at the individual level will be reduced to minor.

Annual reports will be supplied to the Centres for Economic Development, Transport and the Environment responsible for monitoring the project when they are ready.

Southwest Finland Centre for Economic Development, Transport and the Environment / Fisheries Authority (4):

The applicant has no comments on the statement.

Finnish Transport Agency / Sea Route Unit (5):

Methods of communication have been discussed with subcontractors and the Finnish Transport Agency. The opinion during all the discussions has been that the reporting practices adopted during the Nord Stream project should be followed in the context of this project.

The applicant has met with representatives of the Finnish Transport Agency, the Helsinki VTS Centre, the Finnish Border Guard and the Finnish Transport Safety Agency. It was agreed in the meeting that a further meeting would be held around February 2018 concerning communication and reporting practices relating to rock placement and pipe-laying. A similar meeting will be held around March 2018 concerning munitions clearance, once the munitions clearance contractor has been chosen and before construction works begin.

Route information will be supplied in the requested format before construction works begin and again once construction works have been completed. The Finnish Transport Agency was supplied with the details of the planned natural gas pipeline routes along their entirety (from shore to shore) on 18 January 2018.

The applicant is aware of the plans to remove the shallows in the vicinity of Kalbådagrund Lighthouse in the future. The shallows are located approximately 3.1 km from the route of the pipelines. Based on current information, the removal of the shallows will not affect the integrity of the Nord Stream 2 pipelines. The applicant will request a separate meeting concerning any precautionary measures that may be needed once the removal of the shallows has been confirmed and the schedule of the works is known.

The natural gas pipelines will be laid in the Mussalo channel so that a free water depth of more than 20 m is left above the pipelines, including rock berms. The highest point of rock berms is typically no more than approximately two metres above the highest point of the pipelines, which means that the entire pipeline system will lie at a depth of comfortably more than 20 m. According to nautical charts, the water depth in the Mussalo channel where the pipelines will be laid is more than 20 m. The applicant has checked the water depth in the Mussalo channel where the pipelines will be laid at one-metre intervals. Based on this information, the shallowest point of the channel is 47.5 m along the route of pipeline A and 41.3 m along the route of pipeline B. Based on the current technical design and available water depth information, the pipeline system and its support structures will be 38.9 m below the surface in the Mussalo channel at their shallowest. The pipelines and their support structures will lie at a depth of more than 20 m measured from the mean water level in the Mussalo channel.

Finnish Defence Forces / Logistics Command (6):

Maps of the areas to be used were sent to the Finnish Defence Forces for approval on 28 November 2017. According to the application, construction works will not take place in restricted areas on the seabed. Vessels supporting the pipe-laying operation (i.e. vessels that will bring line pipes and rock to the route of the pipelines) will use the ports of Hamina, Kotka, Ingå and Koverhar as well as channels when entering and leaving ports and, if necessary, when navigating in the open sea.

Enquiries have been made concerning new cables along the route of the pipelines or in their vicinity. No new information concerning cables has been obtained so far, but if there are cables, crossings will be constructed in accordance with the Finnish Defence Forces' specifications and requirements.

Metsähallitus (7):

A meeting has been held with Metsähallitus, in which the statement and especially the proposal concerning the video monitoring of grey seals were discussed. Based on the discussions, Metsähallitus intends to carry out video monitoring of grey seals in the Kallbådan area. This kind of monitoring is not covered by the applicant's monitoring programme. Metsähallitus has been told that the applicant will bear the costs of the camera equipment and installing it in the Kallbådan area. Metsähallitus will be responsible for the monitoring itself and for drawing up annual reports for the years 2018 and 2019 in the course of its normal environmental protection activities.

Finnish Border Guard (8):

The applicant has no comments on the statement.

Finnish National Board of Antiquities (9):

The proposals have already been factored into the monitoring programme. All information produced by surveys before and after the pipe-laying will be supplied to the Finnish National Board of Antiquities once documented.

Swedish Environmental Protection Agency (10):

The applicant concurs with the statement.

Town of Raseborg (11):

The applicant has no comments on the statement.

Town of Loviisa / Public Works and Environment Committee (12):

Bubble curtains will be used in the Eastern Gulf of Finland. Moreover, bubble curtains will be used in connection with more munitions clearance operations than previously stated. If permission for munitions clearance is

granted, the applicant will move the munitions that are to be cleared using bubble curtains to new locations prior to clearance if their current location does not allow for the use of bubble curtains.

City of Porvoo / Public Works and Environment Committee (13):

The monitoring programme is based on lessons learnt from the Nord Stream project and comments received from the authorities before the application was submitted. This comprehensive body of information and the results of the EIA procedure have allowed the monitoring programme to be developed to its current form. The revised monitoring programme, which factors in the statements, is described in the addition following the applicant's responses. As has been stated in the EIA report, the combined impacts of the various works involved in the previous pipeline project were minor, local and mostly short-lived. Considering the properties of the contaminants observed on the seabed along the planned route of the pipelines in the Finnish exclusive economic zone and previous experiences of the behaviour of these kinds of contaminants in suspension, it was deemed unnecessary to include the monitoring of contaminants in the monitoring programme. The volume of sediments released during munitions clearance in connection with the construction of the Nord Stream pipelines between 2009 and 2012 amounted to a total of approximately 10% of the estimated volume. No seabed excavation works will take place in the Finnish exclusive economic zone. Moreover, none of the Centres for Economic Development, Transport and the Environment has requested that the monitoring of contaminants be added to the monitoring programme.

The monitoring programme covers underwater noise monitoring. Its aim is to establish the distance to which the noise generated by munitions clearance travels, what the highest noise levels are, by how much the noise generated by construction works increases background noise levels, how accurately the impacts modelled during the EIA procedure correspond to the actual measured values and how effectively the use of bubble curtains as a mitigation measure reduces underwater noise levels.

The natural gas pipelines are designed to be operational for approximately 50 years. A decommissioning programme will be drawn up during that period. The environmental impacts of the decommissioning of the pipelines have been discussed in the EIA report.

Municipality of Kirkkonummi / Public Works and Environment Committee (14):

The applicant has no comments on the statement.

City of Helsinki / Environmental Protection Authority (15):

The risks associated with the project have been assessed in detail and described, inter alia, in Appendix 39 to the application. Detailed feasibility studies have been conducted regarding alternative munitions clearance techniques, which addressed the safety of on-barge clearance. Unfortunately, the feasibility studies have shown that the on-barge clearance technique is not safe.

City of Helsinki (16):

Natural gas is a fuel for a transition period. The demand for natural gas in Europe is discussed in Appendix 10 to the application.

Municipality of Ingå / Public Works and Environment Committee (17):

The applicant has no comments on the statement.

Fingrid Oyj (18):

The applicant and Fingrid Oyj have agreed on the wording of the cable crossing agreement and are about to sign the agreement. The agreement factors in the concerns relating to construction works and crossing locations.

Objector (19):

The objector also objected to the construction of the Nord Stream pipelines. At the time, the objection was based on an application for a mining claim based on the repealed Finnish Mining Act. The Supreme Administrative Court of Finland ultimately rejected the application.

The National Land Survey of Finland rejected the objector's application for registering ownership of an area that the objector had marked with buoys on 26 July 2017. The objector appealed against the National Land Survey of Finland's decision to Vantaa District Court, which was the competent land court in the case. The Court rejected the appeal by its ruling on 30 November 2017. The Court found that the National Land Survey of Finland should never even have entertained the application, as it was without legal grounds, and in any case the Court found no reason to return the case to the National Land Survey of Finland for reconsideration.

Land court rulings may be appealed to the Supreme Court of Finland. However, leave to appeal is needed. Pursuant to Section 238 of the Finnish Real Estate Formation Act (554/1995), land court judgments and rulings are enforced in accordance with the provisions for the enforcement of legally final judgments. The land court ruling in this case is therefore legally enforceable.

Based on the above, the objector does not have an interest in the matter, and the objection is irrelevant to the case at hand.

Elisa Oyj (20):

The applicant and Elisa Oyj have signed a cable crossing agreement, which factors in the concerns raised in the statement.

ClientEarth (21):

The application satisfies the conditions for granting a permit under the Finnish Water Act. The demand for natural gas in the European Union is discussed in Appendix 10 to the application.

The claim of an oversupply of natural gas is defended by a reference to a review by CEDIGAZ. CEDIGAZ estimated the demand for natural gas in Europe to amount to approximately 470 bcm in 2014 and predicted that natural gas demand in Europe would increase to approximately 510 bcm between 2014 and 2020. Based on these figures, CEDIGAZ estimates that demand will remain stable until the end of the forecast period, i.e. 2035. CEDIGAZ estimates that during the same period, i.e. between 2014 and 2035, European gas production will decrease from the approximately 250 bcm in 2014 to 220 bcm in 2020 and to 160 bcm in 2035. The claim that there is currently an oversupply of natural gas in Europe is therefore incorrect. No evidence has been provided to support the claim either.

With regard to Europe's current natural gas transport infrastructure and its capacity, the construction of the Nord Stream 2 pipeline system will increase capacity by 55bcm, as stated in Appendix 10 to the application. The decline in the EU's natural gas import capacity is largely due to the limited export opportunities of the countries that export gas. For example, the Norwegian resources are declining, and in North Africa, domestic consumption is growing. Moreover, the actual capacity of some of the pipelines that feed gas to Europe is lower than the reported "official" capacity, as stated in Appendix 10 to the application. This is due to, inter alia, the fact that the pipelines are nearing the end of their technical operational life. Moreover, no pipeline system is ever used at 100% of its capacity, as this would leave no reserve capacity for peak loads or cold winters, for example.

The construction of the Nord Stream 2 pipeline will improve access to Russian natural gas. The pipeline system will connect European consumers to Russia's largest gas reserves in southeast Siberia. These are the only developed large-scale reserves that can be used to easily transport gas to European markets via pipelines.

Should only wind and solar power be used for electricity and heat production and fuel, the European industry and households would need to adopt a fully electrical economy. This would throw European energy systems into turmoil that would be expensive and technologically challenging. Until technology develops to that level, what is needed are solutions that allow emissions to be curbed efficiently and economically.

Natural gas is an ideal accompaniment to renewable forms of energy. It is the cleanest of all fossil fuels and has the lowest carbon dioxide emissions. Natural gas is a flexible, reliable and storable form of energy that complements renewable energy production.

The project's impacts on marine mammals have been discussed in the environmental impact assessment report and the application. Mitigation measures will be used in munitions clearance, and the project's impacts on marine mammals will mostly be minor at population level and at the individual level. As bubble curtains will be used in connection with almost all munitions, the impact on individual grey seals will also drop to minor. Harbour porpoises are only occasionally encountered in the Gulf of Finland, i.e. there is no permanent porpoise population in the area. If a porpoise is encountered in the area, munitions clearance will be discontinued.

The impact assessment produced for the purposes of the EIA procedure is based on the latest survey results on the distribution and behaviour of marine mammals. The information on seal distribution and population size is based on aerial counts and satellite tracking. Although the exact number of seals is not known for certain, estimates of the regional distribution and population sizes of different species are relatively accurate. The Gulf of Finland was consequently divided into separate areas for impact assessment purposes. The division was based on the density of munitions in each area and the status of different populations as well as the distribution of marine mammals. With regard to grey seals, the population is not red-listed and it is not considered vulnerable, and grey seals are classified as game animals in Finland pursuant to the Finnish Hunting Act (615/1993). The Finnish Ministry of Agriculture and Forestry issued a decree (511/2017) on grey seal hunting quotas for the 2017–2018 hunting season on 14 July 2017. Pursuant to Section 1 of the decree, a total of 417 grey seals can be hunted in the Southwest Finland and Gulf of Finland hunting districts. The impact assessment is based on seal experts' estimates.

The statements received during the EIA phase and also the statements issued by the authorities on account of this water permit application show that the Finnish authorities do not consider the impacts caused by munitions clearance to seals to be a problem, provided that the planned mitigation measures are taken in connection with clearance operations.

The Uusimaa Centre for Economic Development, Transport and the Environment has given a favourable opinion on the Natura 2000 assessments carried out in Finland. The other authorities have not expressed concerns over the project having harmful impacts on Natura 2000 sites either.

Construction works in Finland will not have an impact on Polish Natura 2000 sites. In this context, the applicant would also like to refer to the

Swedish Environmental Protection Agency's statement, according to which construction works in Finland will not have a notable environmental impact on Sweden.

All the Centres for Economic Development, Transport and the Environment have concurred that the project will not affect reaching the targets set in the Water Framework Directive and the Marine Strategy Framework Directive as transposed into Finnish law.

The project concerns the construction of subsea pipelines intended for the transport of natural gas. The construction of natural gas pipelines on land is very different, and the current project does not involve such works. The impacts of the construction works in Finland, on Finland and, where relevant, other countries have been taken into account appropriately in the EIA report concerning Finland and the Espoo Report.

The climatic and air quality impacts of the construction works that will take place In Finland are covered by the EIA report, in addition to which an analysis of the effects of the construction works has been updated for the application. The Finnish Meteorological Institute found in its statement of 5 June 2017 on the EIA report that the numeric modelling results given in the assessment report are an appropriate depiction of the sea conditions. The Finnish Meteorological Institute is the authority with expert knowledge of its specialist sector pursuant to the Finnish Nature Conservation Act (527/2014) and the Finnish Nature Conservation Decree (713/2014).

Environmental impact assessment in Russia is governed by the applicable Russian laws.

For the decommissioning of the natural gas pipelines, the applicant will observe the laws in force at that time. Environmental considerations have been taken into account in the EIA procedure, and the EIA coordinating authority considers the assessment to be sufficiently comprehensive. The environmental impacts of removing the pipelines have been assessed in case the permit concerning the project is revoked at a later date.

The processing language for this permit in Finland is Finnish, which is why most of the application documents are in Finnish. As Finland has two official languages, the application has also been translated into Swedish. The English translation of the application is not an official document, and its sole purpose is to facilitate the application process. Pursuant to the Finnish Water Act, the consultation procedure for water permit applications usually lasts 30 days. Finnish permit authorities consult other expert authorities in connection with the public consultation. The Regional State Administrative Agency is also an expert authority in water permit matters.

The concerns raised in the statement have been discussed above. New mitigation measures (more extensive use of bubble curtains) have been introduced and more detail has been added to sections that concern

construction works in winter ice conditions, waste management during the operational phase and the management of waste generated by munitions clearance. The concerns raised in the statement have been appropriately mitigated and it has been concluded that an authorisation for preparation may be granted, as also proposed by the Southwest Finland Centre for Economic Development, Transport and the Environment.

The Finnish coordinating authority responsible for the EIA procedure found that the environmental impact assessment report concerning Finland complies with Finnish laws on the environmental impact assessment procedure.

The applicant has carried out several environmental surveys as described in the application, and none of them indicate that the project will have significant environmental impacts. None of the Finnish expert authorities or the Finnish Association for Nature Conservation has raised concerns of the project causing significant environmental impacts.

Finnish Association for Nature Conservation (22):

The applicant has agreed and is also legally obligated to construct the pipeline system in the manner described in the application, unless otherwise provided in the permit. A dynamically positioned pipe-lay vessel will therefore be used for the entire Finnish section of the route. Moreover, the mitigation measures described in the application will be used during munitions clearance. Clearing munitions on land in Syndalen is unlikely to be a viable alternative, as it would require transporting the munitions by sea in a heavily trafficked area. Munitions may be moved short distances under water but not on board vessels. The feasibility study concerning on-barge clearance revealed that the integrity of the barge would be significantly jeopardised should a munition explode unexpectedly. The risks involved in munitions clearance on land are therefore not deemed acceptable.

The number of munitions to be cleared is likely to be smaller than the one stated in the application. The mitigation measures described in the application as well as bubble curtains will be used during munitions clearance. Thanks to bubble curtains, the impacts on the grey seal at the individual level will be reduced to minor.

The statements given by the Uusimaa and Southeast Finland Centres for Economic Development, Transport and the Environment concerning the Natura 2000 assessments and screening studies were favourable. With regard to environmental impacts in the context of the Russian landfall facilities, Russian laws and the Russian permit procedure apply in that area. The applicant is an infrastructure service provider that delivers natural gas. It will not own the gas transported using the pipeline system and it will not be involved in natural gas recovery.

Baltic Connector Oy (23):

Baltic Connector Oy and the applicant have agreed on the contents of the crossing agreement. The agreement is expected to be ready for signing in the near future.

Nord Stream AG (24):

The crossing agreement has been signed.

ADDITIONS TO THE APPLICATION (5 FEBRUARY 2018) CONCERNING THE ENVIRONMENTAL IMPACTS MONITORING PROGRAMME

The monitoring programme was revised on the basis of the statements issued on account of the permit application on 1 February 2018. In addition to monitoring the environment, the natural gas pipelines will be inspected at regular intervals throughout the operational phase as part of an inspection, maintenance and repair (IMR) programme. The primary aim of the inspections will be to ensure that the pipelines operate safely and reliably throughout their operational life.

Environmental monitoring will cover underwater noise, turbidity and currents, commercial fishery and cultural heritage.

Technical inspections will also be carried out on the natural gas pipelines during the operational phase. Monitoring will be at its most intensive during the construction phase. Regular monitoring will also be carried out during the operational phase until it has been ascertained that no unexpected impacts will be caused to the chosen monitoring targets.

Rough monitoring schedule:

Monitoring target	2018	2019	2020	2021	2022	2023
Underwater noise (during construction)	x					
Turbidity and currents (during construction)	x	x				
Commercial fishery (survey, analysis of monitoring data)					x	
Cultural heritage (once before construction and once after construction)	x		x			

Underwater noise

The construction of the pipeline system and especially munitions clearance will cause underwater noise. The plan is to only monitor underwater noise during munitions clearance, as this activity is expected to have the greatest potential of having an impact on marine flora and fauna. Noise levels will be monitored during the construction phase by means of underwater noise measurements. The measured noise levels will be compared against the values that based on the modelling carried out in connection with the environmental impact assessment and the updated munition-specific impact assessment may cause a permanent or temporary threshold shift in the hearing of marine mammals.

It has been proposed that underwater noise will be monitored using fixed sensors installed on the seabed and mobile noise measuring equipment in the Finnish exclusive economic zone. The fixed sensors will be used to collect time series when studying impacts across long distances.

Background noise levels and any changes in them will be calculated by means of fixed and mobile stations by comparing noise levels before, during and after munitions clearance. The measured noise time series will also be compared against the final timing of operations in order to establish what operations have been carried out at any given time.

It has been proposed that monitoring using fixed sensors will commence two weeks before the start of munitions clearance and that it will continue until munitions clearance in the Gulf of Finland has been completed. It has also been proposed to establish two monitoring stations in Estonian waters for monitoring transboundary impacts.

The locations of the fixed monitoring stations have been chosen on the basis of the highest densities of munitions, water depth, the location of Natura 2000 sites and the presence of known seal populations as well as distance from the pipeline route. The four fixed monitoring stations along the Finnish coast will be located in 1) Hanko, 2) Kallbådan in Porkkala, 3) Söderskär and 4) the Eastern Gulf of Finland. Two areas have also been chosen on the Estonian coast for monitoring transboundary impacts: 5) Malusi and 6) Uhtju. Monitoring will be based on sensors installed on the seabed. Two hydrophone chains will be placed in both Hanko and Kallbådan in Porkkala to measure the attenuation of noise caused by munitions clearance as distance from the clearance site grows. The two hydrophone chains will be installed between four and five nautical miles from each other. The monitoring areas in Söderskär, the Eastern Gulf of Finland, Malusi and Uhtju will have one hydrophone chain each. They will produce information on increases in noise levels and also data for verifying modelling. Each hydrophone chain will have one hydrophone below the thermocline at a depth of 35 m and another above the thermocline at a depth of 10 m.

Three monitoring visits will also be carried out using mobile measuring equipment. This system will comprise a hydrophone chain anchored to the

seabed consisting of at least three hydrophones as well as measuring equipment attached to a vessel. The monitoring area will vary between 1,000 m and 5,000 m depending on construction works and the required safety distances.

Reports will be produced after the end of the munitions clearance phase and appended to quarterly and/or annual reports.

Turbidity and currents

The pipeline construction phase will cause sediment dispersion, which may have environmental impacts on marine flora and fauna. A model based on particles and currents was used to assess impacts during the EIA phase. Sediment dispersion during the construction phase will be monitored by means of measurements, and the results will be compared against the modelled levels. Sediment dispersion can be measured using optical turbidity sensors. In addition to turbidity monitoring, 3D current fields will be measured in some areas using ADCPs. The flow measurements will be used to validate the results of modelling. The data will also be used as baseline information for interpreting the results of turbidity monitoring.

Monitoring in Finnish waters will be based on fixed sensors installed on the seabed. The sensors will be placed two metres, five metres and 15 metres above the seabed. Fixed monitoring sensors will be used for time series analyses on the scale and duration of sediment clouds. The 3D currents monitoring data will contain information about the direction and strength of currents in different water layers between the seabed and the surface. The data will also be used to interpret the results of currents monitoring.

The fixed monitoring areas have been chosen on the basis of location relative to the nature, scale and duration of construction works. The proposed monitoring areas comprise two rock placement sites and two munitions clearance sites. One monitoring station will also be established in the vicinity of the Sea Area South of Sandkallan Natura site (protected habitat “reefs”; hereinafter referred to as the “Sandkallan Natura site”), where both munitions clearance and rock placement on the seabed will take place.

Short-term monitoring of each activity (rock placement / munitions clearance) will begin one or two weeks before the start of works and continue for one week after the completion of the works. This allows for the system to be moved to a new location along the natural gas pipeline. Two long-term monitoring stations will also be established to collect baseline information on natural variations in turbidity levels and seasonal variations. In addition to turbidity sensors, these baseline stations will be equipped with sensors for measuring salinity, temperature and dissolved oxygen. Long-term monitoring will begin two weeks before the start of the construction phase and continue for four weeks after the completion of the works. The duration of monitoring is planned to be as follows:

approximately three weeks for munitions clearance, no more than a few months for the construction of rock berms and approximately one and a half years at control stations and off the coast of the Sandkallan Natura site.

Reports will be produced during monitoring and at the end of each monitoring period and appended to quarterly and annual reports.

Commercial fishery

A survey will be conducted during the operational phase, after the construction of the pipelines, among Finnish fishermen who fish in the Finnish exclusive economic zone in the area of the Nord Stream 2 pipelines. A fishing questionnaire will be drawn up for this purpose. The aim of the survey will be to collect information on how the fishermen perceived the construction phase and how the subsea pipeline system has affected their fishing behaviour. The questions in the questionnaire will relate to fishing methods, catch sizes and fishing areas as well as any changes that may have taken place in these respects during the project. Some questions will also address any inconvenience experienced by the fishermen when trawling in the area of the pipelines.

Any avoidance of the pipeline areas by the Finnish fishing fleet and any resulting changes in fishing areas in the Finnish exclusive economic zone will also be monitored. For this purpose, satellite tracking data collected prior to construction will be compared against follow-up data collected two years after the installation of the pipeline system.

Reports on fishery monitoring will be appended to annual reports.

Cultural heritage

There are three underwater cultural heritage sites or historic objects relating to the Second World War located relatively close to the route of the natural gas pipelines. A survey will be conducted after the construction works to ensure that the pipeline installation has not had an impact on underwater cultural heritage sites. The survey will be based on visual observations using a remotely operated underwater vehicle (ROV) and a multi-beam echo sounder (MBES). Any impacts of the construction works on underwater cultural heritage sites can be detected by comparing the results of the baseline survey (summer of 2016) against the results of the post-construction survey.

Reports on cultural heritage monitoring will be appended to quarterly and annual reports. Separate wreck monitoring reports will be supplied to the Finnish National Board of Antiquities.

ADDITIONS TO THE APPLICATION (12 MARCH 2018)

Barrels

There are a total of eight barrels in the pipe-lay corridor. There are no barrels in the locations where rock berms will be built. An effort will be made to avoid contact with the barrels during pipe-laying.

Rock placement

The final rock placement volumes have increased slightly but are still within the maximums stated in the application.

Chance finds

It has become clear in connection with producing detailed designs of rock berms that some of the rock berms will extend beyond the safety corridor specified in the application. Most of the rock berms that will extend to the survey area specified in the application are located in the east, where rock berms will generally only encroach on the survey area to a small extent. Moreover, a few rock berms in the west will encroach on the survey area to a larger extent. Munitions surveys will be carried out in areas beyond the safety corridor. The chance finds procedure will be followed in surveying if previously unidentified objects are found in the pipe-lay corridor, the safety corridor or the survey area in the immediate vicinity of a planned rock berm site during the construction phase.

However, the probability of chance finds in the west is lower, as there are more mines in the east. It is not expected that new munitions will be found in the immediate vicinity of rock berms. The applicant undertakes to also use bubble curtains in the clearance of any chance find munitions.

Security for the authorisation for preparation

The security associated with the authorisation for preparation covers all costs and expenses for which the security is in place, including value-added tax.

NOTE

The Finnish Government gave its consent to the installation of the natural gas pipelines on 5 April 2018 (TEM/1810/08.08.01/2017). The project coordinator must observe, inter alia, the general precautionary principle for preventing and minimising losses, the priority principle with regard to existing projects as well as the conditions of the construction permit granted under the Finnish Water Act. The Finnish Government’s consent will remain valid for 50 years from the date of the decision, after which it may be renewed by application. The consent is enforceable regardless of any appeals, unless otherwise ordered by the appellate authority.

DECISION OF THE REGIONAL STATE ADMINISTRATIVE AGENCY

Permit decision

The Regional State Administrative Agency hereby grants Nord Stream 2 AG a permit to construct two subsea natural gas pipelines and to operate them in the Finnish exclusive economic zone pursuant to the application of 19 September 2017 and subsequent additions.

The permit covers surveys before pipe-laying, during pipeline installation and after the pipe-laying, pre-lay and post-lay rock placement on the seabed, munitions clearance, the construction of the subsea natural gas pipelines and the pre-commissioning, operation and maintenance of the natural gas pipelines.

The munitions clearance works referred to in the permit cover not just the munitions that have been identified but also any chance finds and previously unidentified munitions located in the pipe-lay corridor or in its immediate vicinity that must be cleared in order to carry out the installation works or that can, based on a safety assessment, explode as a result of the detonation of nearby munitions.

An agreement has been made based on which affected commercial fishermen will be compensated for the losses caused by the project. Compensation for the losses to the general fisheries interest is covered by permit provision No 37. The project is not expected to result in losses compensable under the Finnish Water Act.

The permit holder must observe the provisions of the Finnish Water Act and the following provisions.

Permit provisions

Location of the natural gas pipelines and the required structures

1. The natural gas pipelines may be laid on the seabed and the seabed reshaping works required for pipeline installation carried out in accordance with the detailed pipeline route maps (Version 52) included in Appendix 6 to the application. The volume of rock material to be placed on the seabed must not exceed 1.7 million m^3. The length of the subsea section of the natural gas pipelines in the Finnish exclusive economic zone is 374 km. Pipeline installation accuracy is ±7.5 m on a straight section and ±15 m on a curve. The routing of the natural gas pipelines is shown in Appendix 1 to this decision.

   Minor modifications may be made to the pipeline location during the installation phase. Route changes may be introduced in order to go around munitions or other objects identified along the route or in order to reduce the need for seabed reshaping. The regional Centre for Economic

Development, Transport and the Environment in charge of monitoring must be notified of any route changes.

2. Additional rock berms may be constructed if necessary. The regional Centre for Economic Development, Transport and the Environment in charge of monitoring must be notified prior to commencing the works.

   Reasons for the need to construct additional rock berms must be supplied with the notice of works. Final rock volumes and structural drawings of the works must be reported to the regional Centre for Economic Development, Transport and the Environment in charge of monitoring.

3. The pipe used in the pipelines must comply with the application. The external diameter of the concrete-coated pipes is approximately 1.4 m. The pipe sections must be welded and the joints coated in accordance with the application. An external anti-corrosion coating and any required support structures as described in the application may be applied to the pipelines.

   A different pipe coating technique may be used if necessary in order to ensure pipeline integrity. The regional Centre for Economic Development, Transport and the Environment in charge of monitoring must be notified of any changes to techniques and coating solutions.

Natural gas pipeline installation and execution of the works

4. The natural gas pipelines must be installed so as to minimise the required seabed intervention works.

   Rock placement on the seabed must be carried out using a fall-pipe. Only clean rock may be placed on the seabed.

5. The natural gas pipelines must be installed on the seabed using a dynamically positioned vessel.

6. The seabed intervention works and the installation of the natural gas pipelines must be carried out so as to minimise harm to the marine environment and its functions. Works must not be carried out when there is a continuous ice cover over the site.

7. Should the pipeline be damaged during pipe-laying, the damage must be repaired immediately. The incident and the remedial action taken must be reported to the regional Centre for Economic Development, Transport and the Environment in charge of monitoring and the Finnish Border Guard.

8. All waste generated by the installation of the natural gas pipelines must be collected and sent for processing or recycling on land. Records must be kept of waste, waste volumes and the facilities where the waste is delivered. The records must be presented to the regional Centre for Economic Development, Transport and the Environment in charge of monitoring if necessary.

Channel crossing

9. The natural gas pipelines and any associated structures and coatings must be installed at a depth of at least 20 metres measured from the mean water level where the pipelines cross the Mussalo channel. The potential widening of the channel must also be taken into account in pipeline installation in the vicinity of the channel.

The techniques to be used for works relating to the Mussalo channel crossing, traffic control arrangements and safety devices to be used during the works must be agreed well before the start of the works with the Finnish Transport Agency.

Factoring in archaeological targets

10. No rock material must be placed and no other construction works that could damage the target carried out inside the 50-m safety zone around target No S-R05-7978.

11. Pipe-laying and other construction works by target No S-R09-09806 must be carried out so as to minimise damage to the target.

12. The targets must be inspected by means of photography after the pipe-laying so as to document any targets near the pipelines and any parts thereof as well as any potential changes. The photographs must be sent to the Finnish National Board of Antiquities.

13. Should new cultural heritage objects or finds suggestive of the same be encountered during the construction works, the Finnish National Board of Antiquities must be notified immediately and procedures for factoring in the finds agreed if necessary.

Munitions clearance

14. The condition of cables and pipelines within a 500-m radius of the detonation site must be inspected before and after clearance.

15. During munitions clearance, the radius of the safety zone must be at least 1.5 km when the explosive weight of the munition is less than 100 kg, at least 2 km when the explosive weight of the munition is between 100 and 300 kg, at least 2.5 km when the explosive weight of the munition is between 300 and 500 kg and 3 km when the explosive weight of the munition is more than 500 kg.

16. Munitions clearance must be carried out during daylight hours. Observers must be stationed to check for the presence of any marine mammals, schools of fish and seabirds in the safety zone around the clearance site at least 30 minutes prior to clearance. Both acoustic monitoring systems and visual observations must be used.

Should marine mammals, seabirds or significant schools of fish be observed in the safety zone, clearance must be postponed until they have been driven away from the area.

Should there be significant flocks of resting or feeding seabirds in the vicinity of the clearance site, clearance must not go ahead until the flocks have moved on.

17. Acoustic deterrent devices and echo sounders must be deployed as described in the application prior to each detonation operation.

18. Bubble curtains must be used in munitions clearance as described in the application and the additions, if the total volume of explosives (munition and clearance charge) amounts to at least 22 kg or if the munition is located in the eastern Gulf of Finland (to the east of the Finnish EEZ kilometre point 60). Should the location of a munition prevent the effective use of bubble curtains, the permit holder may move the munition to a better clearance position in order to facilitate the use of bubble curtains.

Munitions may be cleared without bubble curtains, if they cannot be moved to a better clearance position due to safety or environmental risks. The regional Centre for Economic Development, Transport and the Environment in charge of monitoring must always be notified of such cases in advance.

19. Prior to clearing a munition, checks must be made to ensure that there are no vessels or boats within a 2-km radius.

20. Clearance works must be carried out and timed so as to minimise harm to the sea area and its functions. The works must be carried out when the area is free of ice.

21. Clearance works during weather conditions that cause strong currents should be avoided.

22. All debris of munitions must be removed from the clearance site once the works are complete.

23. The permit holder may move munitions to a new, previously surveyed location due to scheduling or unforeseen events. Clearance works must be carried out in accordance with the procedures described in this permit decision.

Prior to moving a munition, the permit holder must notify the regional Centre for Economic Development, Transport and the Environment in charge of monitoring, the Finnish Transport Agency and the Finnish Border Guard.

The permit holder must supply the aforementioned authorities with a clearance plan including a munition-specific impact assessment at least

48 hours before the controlled clearance of any relocated munitions on the seabed.

24. Any previously unidentified munitions that are detected during clearance works or surveys relating to them in the pipe-lay corridor or in its immediate vicinity or any new munitions that drift into the area after pipeline installation has been completed must be cleared in accordance with the procedures described in the application plan and this permit decision.

The regional Centre for Economic Development, Transport and the Environment in charge of monitoring, the Finnish Border Guard and the Finnish Defence Forces must be notified of each new object and given at least the following information prior to clearance: the exact location of the munition and information about nearby areas shown on a map similarly to what was done in the permit application and reasons for why clearance is necessary.

Maritime traffic control

25. The Finnish Transport Agency must be supplied with the coordinates of the planned natural gas pipelines along their entire length in a universally recognised GIS format (WGS84 coordinate system) without delay in order to update nautical maps and inform seafarers.

26. The Finnish Transport Agency must be supplied with the pipe-lay vessel's work plan, which must show the names of the vessels participating in the works, their call signs, the safety distances requested by the works vessels and the VHF channels they use as well as contact details for contact persons (name, telephone number and e-mail address), at least six weeks before commencing pipeline installation. The Finnish Transport Agency must be notified of any changes to the information or schedules without delay.

27. The permit holder must supply the Finnish Border Guard with the information needed to maintain maritime and border security in advance. This stipulation must be followed in munitions clearance, pipeline installation-related works, pipeline condition monitoring, maintenance and project impact monitoring.

The information that must be provided includes full call signs and contact details for the vessels, the vessels' safety plans and diagrams, a rough work plan and updates to the same, daily notifications and information about any adverse events as soon as they occur (faults, accidents, spills that could pose a risk to the environment). The Finnish Border Guard may issue more detailed instructions on the information to be provided.

28. The project coordinator or a contact person assigned to the project must supply the Gulf of Finland VTS Centre and the Western Finland VTS Centre, the Navigational Warning Coordinator and Turku Radio, which is

responsible for safety radio communications, with daily and weekly reports showing the works that are in progress and their locations as well as descriptions of future works and their schedules during the installation works. All vessels involved in surveying and construction works must maintain contact with either the Gulf of Finland VTS Centre or the Western Finland VTS Centre at all times and follow the VTS authorities' instructions and seaway rules. The vessels participating in the project must use AIS transponders.

Cable and pipeline crossings

29. Arrangements for crossing cables and pipelines must be made in writing with the owners or parties responsible for their maintenance. The crossings must be implemented in accordance with the agreements so that all existing cables and pipelines remain intact. The coordinates of crossing points and a detailed description of how each crossing will be implemented must be supplied to each cable and pipeline owner.

30. Should the owner of a cable or pipeline be unknown or should it not be possible to conclude a crossing agreement before the works are implemented, the crossing must be implemented in the manner described in the application and so that all existing cables and pipelines remain intact.

31. The permit holder must allow for any pipelines and cables that will be laid later to cross the natural gas pipelines.

Pre-commissioning, operation and maintenance of the natural gas pipelines

32. The pre-commissioning of the natural gas pipelines must be based on the dry pre-commissioning technique.

33. The permit holder must ensure that the natural gas pipelines and their support structures as well as any cable and pipeline crossings are maintained appropriately.

34. The condition of the natural gas pipelines and support structures must be inspected in accordance with the monitoring programme of 1 February 2018 supplied as an addition to the application. The Finnish Border Guard must be notified of inspections in advance.

35. Rock berm repairs and the construction of any additional berms, any dredging relating to repairs and other works relating to improving the condition of the natural gas pipelines may be carried out in accordance with the provisions of this permit decision. The regional Centre for Economic Development, Transport and the Environment in charge of monitoring and the Finnish Border Guard must be notified one month before commencing the works. Where there is an immediate threat of damage to the pipelines, the aforementioned works may be commenced immediately after giving the notice.

Reasons for the need to carry out repairs must be supplied with the notice of repair works. Final rock volumes and structural drawings of all works that are carried out must be reported after the completion of the works to the regional Centre for Economic Development, Transport and the Environment in charge of monitoring.

36. The regional Centre for Economic Development, Transport and the Environment in charge of monitoring and the Finnish Border Guard must be notified immediately of any adverse events relating to the operation of the natural gas pipelines that may pose a threat of damage to the pipelines or a danger to other users of the sea area or the marine environment.

Fisheries fee

37. A fisheries fee of EUR 33,500 must be paid to the Fisheries Authority of the Southwest Finland Centre for Economic Development, Transport and the Environment by the end of March each year. The first fisheries fee will be due one month after the start of the works referred to in this permit decision.

The fisheries fee must be spent on measures to mitigate the adverse effects caused by the installation and operation of the natural gas pipelines to fisheries, including the planning and monitoring of the effectiveness of the measures.

The permit holder must submit an application for a review of the fisheries fee to the permit authority by the end of 2023. The application must be accompanied by a description of the project's impacts on fisheries and a proposal for a fisheries obligation or a fisheries fee. After the first review, the permit holder must submit a new application to the permit authority every five years unless the permit authority orders otherwise.

Compensations

38. The permit holder must reimburse the costs of repairing any damage caused to existing cables and pipelines.

39. Any immediate loss of benefit caused by the works must be reimbursed to the affected party without delay.

40. Should the project result in a loss of benefit that was not foreseen when the permit was granted and for which the permit holder is liable under the Finnish Water Act and the issue cannot be settled, compensation for the loss of benefit may be sought from the Regional State Administrative Agency notwithstanding this decision.

Monitoring

41. The permit holder must monitor the project's impacts on the status of the sea area and the restoration of the original conditions. Monitoring must be

carried out in accordance with the monitoring programme of 1 February 2018 supplied as an addition to the application.

The monitoring programme may be amended subject to the approval of the Uusimaa Centre for Economic Development, Transport and the Environment provided that the changes do not weaken the reliability of the results or the coverage of monitoring or result in unreasonable additional costs.

42. The results of monitoring must be reported in accordance with the monitoring plan. The results of monitoring must be supplied electronically to the Environment and Natural Resources Departments of the Southeast Finland, Uusimaa and Southwest Finland Centres for Economic Development, Transport and the Environment, the Fisheries Authority of the Southwest Finland Centre for Economic Development, Transport and the Environment and the Environmental Protection Authorities of the City of Espoo, the Town of Hanko, the City of Helsinki, the City of Kotka, the Town of Pargas, the City of Porvoo, the Town of Raseborg and the Town of Loviisa as well as the Environmental Protection Authorities of the Municipality of Föglö, the Municipality of Ingå, the Municipality of Kimitoön, the Municipality of Kirkkonummi, the Municipality of Kökar, the Municipality of Pyhtää and the Municipality of Sipoo by the end of February each year and quarterly during the construction phase and presented to anyone whose right or interest may be affected by them upon request.

Commencing and implementing the works

43. The implementation of the project must begin within three years, and all essential components of the project must be completed within five years of this decision becoming legally enforceable. Otherwise the permit will expire.

Notices

44. The Environment and Natural Resources Departments of the Southeast Finland, Uusimaa and Southwest Finland Centres for Economic Development, Transport and the Environment, the Fisheries Authority of the Southwest Finland Centre for Economic Development, Transport and the Environment, the Sea Route Unit of the Finnish Transport Agency and the Finnish Border Guard must be notified of the start of works in advance in writing.

45. The Regional State Administrative Agency, the Environment and Natural Resources Departments of the Southeast Finland, Uusimaa and Southwest Finland Centres for Economic Development, Transport and the Environment, the Fisheries Authority of the Southwest Finland Centre for Economic Development, Transport and the Environment, the Sea Route Unit of the Finnish Transport Agency and the Environmental Protection Authorities of the City of Espoo, the Town of Hanko, the City of Helsinki,

the City of Kotka, the Town of Pargas, the City of Porvoo, the Town of Raseborg and the Town of Loviisa as well as the Environmental Protection Authorities of the Municipality of Föglö, the Municipality of Ingå, the Municipality of Kimitoön, the Municipality of Kirkkonummi, the Municipality of Kökar, the Municipality of Pyhtää and the Municipality of Sipoo must be notified of the completion of the project in writing within 60 days.

The notice of completion must be accompanied by a map showing the final location of the natural gas pipelines, including positioning information (as-laid coordinates), in the sea area. The positioning information must be supplied numerically.

Decommissioning of the natural gas pipelines

46. A plan on the decommissioning of the natural gas pipelines must be submitted to the permit authority well in advance and in any case at least one year before decommissioning. The plan must lay out the measures required for removing restrictions on the use of the sea area resulting from the pipelines and for eliminating adverse effects on the marine environment. The permit authority may issue any regulations that are necessary for decommissioning the pipelines on the basis of the plan.

Grounds

Conditions for granting the permit

Purpose of the project

The purpose of the project is to construct two natural gas pipelines running from Russia to Germany in order to deliver natural gas to Europe. The route passes through the Finnish exclusive economic zone.

Benefits to be derived from the project

The investment value of the project is estimated to amount to almost EUR 10 billion. The applicant will benefit from the project financially through gas transport fees. The gas pipeline project is also important from the perspective of the energy security of Central Europe, as the project will close the predicted natural gas import gap in Europe. The project will increase the natural gas delivery capacity by 55 billion cubic metres. The pipelines will also help to ensure the security of natural gas supply.

Losses to be incurred from the project

Seabed

Munitions clearance along the route of the natural gas pipelines and rock placement will alter the seabed morphology and the quality of surface sediments in places. These activities will have a direct impact by creating elevations or depressions in the seabed as well as an indirect impact by

relocating suspended sediment particles and due to the resedimentation of contaminants attached to such particles in the seabed.

The area used for the natural gas pipelines accounts for approximately 0.03% of the seabed in the Finnish exclusive economic zone. The partial embedment of the natural gas pipelines and natural sedimentation processes will diminish the morphological anomaly and footprint effect of the pipelines over time.

Water quality

Seabed intervention works will cause turbidity in the sea water. Rock placement will be carried out in the sea area before and after the pipe-laying, and the volume of rock material to be placed on the seabed will amount to a maximum of approximately 1.7 million m^3. In order to mitigate adverse effects, rock placement will be carried out using a precise placement technique, and each rock support (berm) will be designed so as to minimise the amount of material to be used.

Munitions clearance may also cause momentary turbidity near the bottom.

Nutrients, solids and contaminants attached to sediments will be released at various stages of the works. Based on monitoring data collected in connection with the Nord Stream project, their volume during that project was considerably lower than estimated. The solids resedimented on the seabed. Turbidity and nutrient release were local and short-lived. It can therefore be estimated that this project will have a very minor impact on water quality in the pelagic area.

A dynamically positioned lay vessel will be used in the laying of the natural gas pipes, and the vessel will not need to be anchored during the pipe-laying, which will also help to reduce turbidity.

Fish and fishing

Fisheries will mostly be affected during the construction phase. Turbidity and increased sedimentation as well as munitions clearance and other activities that cause underwater noise will have a harmful effect on fish during this period. Having to drive fish away may have a harmful impact on fish stocks.

Pipeline installation will hinder fishing by preventing navigation and fishing within the safety zone of the pipe-lay vessel. The harmful effects on fish will have an indirect impact on fishing through longer fishing trips and potential catch losses, for example.

Losses incurred by fisheries will be compensated by means of the fisheries fee imposed in this decision. The applicant has agreed to compensate commercial fishermen for losses of benefit resulting from the works and the laying of the natural gas pipelines.

Flora and fauna

Most of the benthos under the pipelines and support structures will be destroyed. The resedimentation of solids and contaminants attached to such particles will also have a harmful effect on benthic communities for a few years.

There are no significant bird feeding or resting areas in the vicinity of the planned pipeline system, and the project will therefore have no notable harmful effect on birds.

According to the application plan, 87 munitions will be detonated in the pipe-lay corridors, which will cause noise disturbance. Munitions clearance may have a harmful effect on marine mammals in particular. Bubble curtains will be used to mitigate the effect of munitions clearance in most cases. Bubble curtains are estimated to reduce noise by 6–8 dB. The harmful effects and risks posed by the munitions clearance technique can be mitigated by carrying out the clearance works in accordance with the plan and the permit decision. Seal scrammers are also effective in reducing blast injuries and the number of individuals exposed to permanent hearing loss.

Existing infrastructure

Subsea cables and pipelines will be protected in accordance with agreements made with their owners or as described in the application using rock berms and concrete mattresses in order to prevent impacts from the pipe-laying. Compensation must be paid for any damage caused to cables and pipelines.

Maritime traffic

The project will hinder other maritime traffic during munitions clearance and rock placement works. The pipe-lay vessel will move along the route at a speed of approximately 3 km per day, which means that the inconvenience caused by the laying of the natural gas pipelines will be extremely short-lived. There will be a safety zone with a radius of approximately two kilometres around the pipe-lay vessel, which other ships must go around. The inconvenience caused by munitions clearance will also be extremely short-lived, as detonating each munition does not take long.

Cultural heritage

The applicant has surveyed the area’s cultural heritage sites together with the Finnish National Board of Antiquities. Rock placement on the seabed will have a minor impact, as it will cover portions of a Second World War anti-submarine net. The project’s impact on other sites will be negligible.

Natura 2000 and the marine strategy and river basin management plan

The project site is located approximately 9.8 km from the Kallbådan Islets and Waters Natura 2000 site (FI0100089) at its nearest. The Natura site's primary purpose is to protect grey seals. The implementation of the project will not cause a significant deterioration of the nature values of the Natura 2000 site, as the works will take place relatively far away from the actual seal sanctuary and taking into account the restrictions on munitions clearance laid down in the permit provisions.

The project site is located approximately 1.9 km from the Sea Area South of Sandkallan Natura 2000 site (FI0100106) at its nearest. Turbidity resulting from construction works will spread to a distance of less than one kilometre. Considering the distance between the route of the pipelines and the southern edge of the Natura site, the project is not estimated to have deleterious impacts on the site that would threaten the natural habitat "Reefs", which is the basis for the site's inclusion into the Natura 2000 network.

The Natura 2000 sites of Tammisaari and Hanko Archipelago and Pohjanpitäjänlahti Marine Protected Area (FI0100005), Söderskär and Långören Archipelago (FI0100077) and Pernaja Bay and Pernaja Archipelago Marine Protection Areas (FI0100078) are located 12.5 km from the project site at their nearest. Grey seal is mentioned as the basis for the protection of all the Natura sites and the Baltic ringed seal as the basis for the protection of the Pernaja Bay and Pernaja Archipelago Marine Protection Areas. Based on modelling, the zones where munitions clearance will cause a permanent threshold shift (PTS) in hearing do not extend to any of the Natura sites included in the screening studies. The project will not significantly deteriorate the nature values of the Natura 2000 sites.

Impacts on migrating birds stopping to rest in the Eastern Gulf of Finland Archipelago and Waters Natura 2000 site (FI0408001) are possible but extremely short-lived. Impacts on grey seals and Baltic ringed seals are estimated to be minor at individual and population level. The shortest distance between the Natura 2000 site and the route of the Nord Stream 2 pipelines is 23.5 km. Considering the distance and the permit provisions, the project is not deemed to significantly deteriorate the nature values of the Natura 2000 site.

The objective of Finland's programme of measures for the development and implementation of the marine strategy is to achieve Good Environmental Status by 2020. The project is cited in the Kymijoki–Suomenlahti River Basin Management Plan for the period 2016–2021 as one that may have impacts on the outer archipelago of the Gulf of Finland and a minor impact on the coastal zone of the Gulf of Finland. The project site is located far away from the coastal area and it will have no permanent

detrimental impacts on water quality. The project will therefore not hinder the attainment of the objectives of the marine strategy and river basin management plans.

Comparison of interests

The Finnish Government gave its consent to the installation of the natural gas pipeline in the Finnish exclusive economic zone on 5 April 2018, and the applicant therefore has rights to the areas required for the project.

The project does not pose a risk to public health or cause any notable detrimental changes in natural conditions or the aquatic environment and its functions, and it will not damage conditions for housing or economic activity in the area.

The project is part of an international natural gas pipeline network, and, considering the aforementioned benefits and disadvantages, the project will result in a considerable benefit to public or private interests compared to the losses of public or private benefits resulting from it.

Permit provisions

The location of the natural gas pipelines, the pipe-lay tolerance and the locations of seabed intervention works discussed in Provision 1 are based on the application and route maps. According to the provision, minor modifications may be made to the location of the pipelines, if a need to go around an obstacle on the seabed or to reduce seabed reshaping transpires during the pipe-laying. The supervisory authority must be notified of any changes to the location of the pipelines in order to allow the supervisory authority to evaluate whether the scale of the modification makes it necessary to amend the permit decision.

Provision 2 enables the construction of any necessary additional rock berms, if it transpires during the works that the pipeline requires additional support or if even a minor modification to the location of the pipelines necessitates building additional rock berms.

Provision 3. The pipeline structure described in the application is designed to withstand the operating pressure and any external impacts on the pipelines. Constructing the pipelines of individual pipes requires that the joints are coated in an acceptable manner. The pipelines will be protected against corrosion by means of anodes. The use of zinc and aluminium anodes is justified in order to prevent corrosion.

Provisions 4–6 are needed to reduce the environmental impacts caused by pipeline installation. The rock material must not contain explosive debris, such as impulse hoses or other debris.

Provision 7 enables the repair of any damage caused to the natural gas pipelines during the pipe-laying. The pipelines may need to be flooded from the start-up head in a controlled manner using filtered seawater treated with an oxygen scavenger and the water discharged back to the sea at the location of the buckle. Buckles may also be repaired using an underwater pipe joint, which requires the construction of an underwater rock berm.

Provision 8 is designed to ensure the appropriate disposal of waste related to the pipe-laying and monitoring of the same. Provisions on off-shore waste management are included in the Finnish Act on Environmental Protection in Maritime Transport (1672/2009).

Provision 9 is needed for enabling the safe use, development and maintenance of the channel area.

Provisions 10–13 are designed to protect any archaeological targets within the area affected by the project.

Provision 14. Munitions clearance may cause damage to cables and pipelines, which is why they must be checked for potential damage.

Provisions 15–18. Munitions clearance may injure or kill marine mammals, seabirds and fish that are inside the safety zone of the clearance site. Damage can be prevented by driving animals away or by postponing clearance if attempts to drive animals away are unsuccessful. Seabirds may gather in the open seas both in the autumn and in the spring. Driving resting or feeding flocks away is especially stressful for birds during migration, which is why they must be given time to move on during these times. The use of bubble curtains reduces the noise disturbance resulting from munitions clearance.

Provision 19 is needed to ensure that munitions clearance does not damage vessels and boats.

Provisions 20–21 are designed to ensure that munitions clearance is carried out at as innocuous a time as possible, such as outside the seal breeding season. Currents in the Gulf of Finland may change temporarily due to persistent winds or otherwise unusual weather conditions.

Provision 22 is needed to ensure that no debris from munitions is left on the seabed.

Provision 23 enables the moving of a munition to a new, previously surveyed location, if clearance works would cause significant delays in the overall schedule of the project or if bubble curtains cannot be used in the original location.

Provision 24. Munitions that may pose a risk to safety may be discovered in the pipe-lay corridor or in its immediate vicinity during installation works or the operation of the natural gas pipelines. These kinds of munitions need to be cleared. Advance notice of each find needs to be given in order to allow for the clearance operation to be supervised.

Provisions 25–28 are needed to ensure the safety of maritime traffic during the works. The provisions enable the dissemination of information about the progress of the project and allow different authorities to coordinate maritime traffic control and keep other users of the sea informed.

Provision 29 ensures that the permit holder agrees on the crossing of cables and pipelines with their owners so that the owners also know about the crossing structures. Provision 30 minimises the adverse effects of crossings if no agreement can be reached or if the owner of a cable or pipeline cannot be identified.

Provisions 32–36 are designed to ensure maintenance and the monitoring of the operation of the natural gas pipelines. Maintenance works may also comprise dredging, if, for example, the pipeline has sunk into the sediment and repairs require that the pipeline is dug up. Dredging must be carried out so as to cause as little harm as possible to the marine environment and its functions.

Provision 37. The amount of the fisheries fee has been set taking into account the nature and scale of the adverse effects caused by the project, the scale of the impacts on waters and the value of fishery in the area. With this in mind, an annual fisheries fee of EUR 33,500 is reasonable for planning and implementing the compensatory measures.

The provision concerning the fisheries fee has been issued subject to a review approximately five years after the installation and commissioning of the natural gas pipelines. At that time, the permit holder must produce a report on the basis of which an assessment can be made as to whether there are still grounds for the fisheries fee or whether the amount of the fee must be revised for another reason.

Provisions 38–40 are in place in case installation works or the operation of the natural gas pipelines result in unforeseen damage.

Provisions 41–42 are in place in order to enable follow-up and the monitoring of the project’s impacts. Amending the monitoring programme will be the responsibility of the Uusimaa Centre for Economic Development, Transport and the Environment. Changes to the monitoring programme must be made in cooperation with the other Centres for Economic Development, Transport and the Environment in the project area.

The aim of Provision 46 is to ensure that the decommissioning of the natural gas pipelines takes place in an appropriate manner and in accordance with current laws.

Factoring in environmental impact assessments

Statement of the Uusimaa Centre for Economic Development, Transport and the Environment of 26 July 2017

Adverse effects must be evaluated in more detail in the impact assessments of the Natura 2000 sites located within the area affected by the project. The assessments must take into account the latest seabed charts, information concerning munitions and their locations and measures aimed at mitigating the harmful effects of clearance works. Detailed plans concerning munitions clearance must be drawn up at the point of the permit procedure when the results of the Natura assessments are known.

Impacts on water quality and therefore biota will mostly be caused by munitions clearance and rock placement, as solids and contaminants and nutrients attached to sediments will be released as a result. Impacts on water quality are estimated to be limited to the lowest water layers and the relative vicinity of the operating area, and the significance of the impact has been estimated as minor at most. The estimate must be reviewed if necessary once more detailed clearance and construction plans become available.

Water status targets and potential threats to reaching them have been explored and analysed comprehensively in the assessment report. The project will not prevent reaching good water quality. This will be ensured at the point of the permit procedure when the results of further surveys and Natura assessments are available.

Measures to mitigate adverse effects, such as timing the project and activities so that no works are carried out in areas where there are especially sensitive or vulnerable species during the most critical periods, must be incorporated into the project.

Adverse effects on commercial fishing will be mostly limited to trawling in uneven seabed areas. All identified adverse effects on commercial fishing must be taken into account during the permit procedure by introducing measures that compensate for the harm to fishing.

In addition to the munitions clearance techniques and mitigation measures used during the Nord Stream project, it is important for the project coordinator to explore alternative clearance techniques that could be used to minimise the adverse effects of munitions clearance in more detail.

Efforts must be made during the project to monitor adverse effects in real time and implement corrective action sufficiently quickly, if it transpires that the harm and damage caused by underwater detonations to fish, birds, mammals or other organisms are greater than estimated.

Detailed monitoring programmes will be drawn up in the course of the permit procedure. The need to monitor the dispersion and impacts of solids and contaminants especially in the vicinity of sensitive receptors should be reassessed on the basis of more detailed clearance and construction plans at that time.

Factoring in the statement

The possibility of using new techniques to clear munitions was brought up in the permit application, but they had to be abandoned. The permit provisions lay down provisions on munitions clearance and measures for preventing and mitigating adverse effects. A dynamically positioned vessel will be used for the pipe-laying. The impacts on water quality are not deemed to have increased since the EIA phase of the project, as the volume of rock material to be placed on the seabed, for example, has decreased. The permit provisions include provisions on monitoring the project's impacts.

The applicant has carried out Natura assessments or screening studies on the seven different Natura 2000 sites mentioned in the statement. Centres for Economic Development, Transport and the Environment have deemed the assessments appropriate.

The applicant has agreed to compensate commercial fishermen. The decision contains a provision on the fisheries fee.

The objectives of water resources management and marine resources management have been taken into account in the application and the permit procedure. The project will not hinder the attainment of the objectives of the marine strategy and river basin management plans.

The permit provisions also include instructions for maritime traffic control and communication between different authorities.

Factoring in statements given by countries pursuant to the environmental impact assessment procedure in a transboundary context

Statement of Latvia of 30 June 2017

The statement raises concerns about contingency for potential oil spills in the sea area. A dynamically positioning (DP) vessel must be used to minimise the need for munitions clearance. Efforts must be made to plan the route so as to minimise the number of detonations.

Factoring in Latvia's statement

Works within the Finnish exclusive economic zone are not deemed to have significant adverse effects outside Finland’s borders.

The natural gas pipelines will be installed on the seabed using a dynamically positioned pipe-lay vessel. The route in the Finnish exclusive economic zone has been deemed to be the most optimal alternative. This permit decision contains permit provisions on munitions clearance so as to minimise adverse effects. Bubble curtains and deterrent devices, among other solutions, will be used to mitigate the adverse effects of detonations.

Statement of Lithuania of 7 July 2017

The statement comments, among other things, on the usefulness of the project, the lack of alternative routes, the project’s impacts on fish stocks and fishing, the lack of compensations, the lack of studies on long-term impacts on the genome of organisms, for example, the lack of safety measures in the event of emergencies, environmental monitoring and other infrastructure in the project area.

A consultation pursuant to Article 5 of the Espoo Convention was held with Lithuania on 21 November 2017 to provide an opportunity to ask further questions.

Factoring in Lithuania’s statement

The route in the Finnish exclusive economic zone has been deemed to be the most optimal alternative. The applicant has identified the professional fishermen in the area and agreed on compensation payments with them. The decision also contains a provision on the fisheries fee. The project is not deemed to have significant adverse effects outside Finland’s borders. This permit decision contains provisions on munitions clearance so as to minimise adverse effects and on taking other infrastructure into account during construction as well as on the use of bubble curtains and deterrent devices as mitigating measures, and the monitoring programme has been approved.

Statement of Germany of 31 May 2017

Germany’s statement calls attention to inadequacies in details about munitions. Germany states that munitions clearance will release sediments and nutrients that have a negative impact on the ecosystem and that the volumes of released sediments and nutrients have not been reported. Munitions clearance will also have an impact on harbour porpoises and ringed seals and may cause the collapse of the vulnerable ringed seal population.

Factoring in Germany’s statement

The exact locations of the munitions have been identified. This permit decision contains permit provisions on munitions clearance so as to

minimise adverse effects. Bubble curtains and deterrent devices, among other solutions, will be used to mitigate the adverse effects of detonations. Based on modelling, sediments will cause turbidity up to a distance of approximately 2–3 km from the clearance site, which means that the sediments will resettle on the seabed very quickly. Contaminant concentration levels in the sediments have been studied, and the sediments in the area are not contaminated.

Statement of Poland of 28 June 2017

Poland's statement calls attention to the following shortcomings:

- Mitigation or monitoring of adverse effects
- Other projects which implications on this project
- Lack of an assessment of overall effects at the Baltic Sea ecosystem level or outside the specified areas
- Need for a new environmental impact assessment of Natura 2000 sites in a transboundary context
- Description of the project's impacts on Baltic Sea flora and fauna especially with regard to Polish Natura 2000 sites in the Baltic Sea
- Monitoring programme
- Overly generic description of survey techniques, lack of free access to the findings of surveys and extremely inconsistent and selective approach to the scope of surveys in terms of individual parties of origin
- Untenability of the grounds for the project
- Impacts on commercial fishing
- More detailed charts of alternative land and sea routes
- Environmental impacts resulting from the removal of the pipelines
- Lack of analysis of the risk of vessel collisions especially on routes leading to the Polish port
- Lack of analysis and identification of potential crises during the project
- Risks relating to sunken chemical weapons (in the Adlergrund area and in Swedish waters) and sunken munitions

Factoring in Poland's statement

Works within the Finnish exclusive economic zone are not deemed to have significant adverse effects outside Finland's borders. This permit application does not cover all the impacts of the project across the entire Baltic Sea. The applicant has provided sufficient grounds for the project in the application.

The permit procedure pursuant to the Finnish Water Act does not address greenhouse gases or projects' impacts on the climate.

This permit decision contains permit provisions on munitions clearance so as to minimise adverse effects. Bubble curtains and deterrent devices will be used to mitigate adverse effects. The natural gas pipelines will be

installed on the seabed using a dynamically positioned pipe-lay vessel. The route in the Finnish exclusive economic zone has been deemed to be the most optimal alternative. Natura assessments or screening studies have been carried out on the project's potential impacts on seven Natura 2000 sites.

The applicant has studied impacts on commercial fishing and agreed on compensation with fishermen. The decision also contains a provision on the fisheries fee.

At the end of the useful life of the gas pipelines, the applicant must, pursuant to the permit provisions, submit a report on the removal of the pipelines.

Statement of Sweden of 5 July 2017

The report provides extremely imprecise information on impacts on Natura 2000 sites in terms of both the party of origin and affected parties. The project will clearly have an impact on the environment. The report is severely lacking with regard to the assessments of Natura 2000 sites. The statement also comments on Natura 2000 sites in the vicinity of the route with regard to Poland and Estonia.

The report is also deemed to be insufficient in terms of impacts relating to the climate.

Fine sediments and organic substances that bind metals and environmental toxins have accumulated both in Finland's and Denmark's territory in the vicinity of the boundary of the Swedish exclusive economic zone. Munitions clearance and works in the vicinity of the Swedish exclusive economic zone must be carried out with care and incorporating measures to prevent the dispersion of contaminated sediments.

Appropriate mitigating measures must be taken when detonating munitions in order to prevent damage to marine mammals, birds and fish. Special care must be taken in munitions clearance in the seal areas of the Gulf of Finland in particular.

Factoring in Sweden's statement

Works within the Finnish exclusive economic zone are not deemed to have significant adverse effects outside Finland's borders. Natura assessments or screening studies have been carried out on the project's potential impacts on seven Natura 2000 sites.

The permit procedure pursuant to the Finnish Water Act does not address greenhouse gases or projects' impacts on the climate.

The closest munitions are located approximately 100 km from the boundary of the Swedish exclusive economic zone. Based on modelling,

sediments will cause turbidity up to a distance of approximately 2–3 km from the clearance site.

This permit decision contains permit provisions on munitions clearance so as to minimise adverse effects. Bubble curtains and deterrent devices will be used to mitigate adverse effects.

Statement of Denmark of 20 June 2017

The statement mostly comments on the previous phases of the project discussed in the Espoo Report. The statement also comments on the route in Danish waters.

Factoring in Denmark's statement

Works within the Finnish exclusive economic zone are not deemed to have significant adverse effects outside Finland's borders.

Statement of Estonia of 26 April 2017

Estonia's statement comments on the assessment of climatic impacts and the relationship between the project and international and national climate and energy strategies. The usefulness of the project has also been called into question, as demand for gas is not believed to increase. Indirect impacts on marine mammals have not been taken into account, and the harm caused to marine mammals has been underestimated. Munitions clearance will have the greatest impact on seals, but no detailed studies on the munitions have been conducted. The report also does not specify the time when munitions will be disposed of in Russia. Not enough evidence has been presented on sediment transport and releases being short-lived. The release of nutrients from the sediments has also not been analysed to a sufficient degree. The project's monitoring programme is deemed to be inadequate with regard to underwater noise and marine mammals in both Finland's and Russia's territory.

Assessments have been carried out on Natura 2000 sites located in Estonia's territory, but these were not supplied with the report for evaluation.

The statement also comments on the ambiguity of terminology relating to the project's impacts, the vagueness of maps and other minor omissions in the report.

Factoring in Estonia's statement

The permit procedure pursuant to the Finnish Water Act does not address greenhouse gases or projects' impacts on the climate. The need for the project and its usefulness have been addressed to a sufficient degree in the permit application.

Works within the Finnish exclusive economic zone are not deemed to have significant adverse effects outside Finland's borders, and Natura 2000 sites located in Estonia's territory will not be adversely affected, as they are located far away from the project site. Adverse effects resulting from works carried out in the waters of other countries are not taken into account when processing permit applications.

This decision lays down clear instructions for munitions clearance and the measures to be taken to mitigate adverse effects, such as the use of bubble curtains and deterrent devices. The monitoring programme has also been supplemented with regard to noise monitoring.

Applicable legal provisions

Finnish Water Act (587/2011), Chapter 3, Sections 4(1)(2), 6(2), 7, 8, 10, 11, 14 and 18 and Chapter 11, Section 21
Convention on Environmental Impact Assessment in a Transboundary Context (Finnish Treaty No 67/1997), Article 6
Agreement between the Government of the Republic of Estonia and the Government of the Republic of Finland on Environmental Impact Assessment in a Transboundary Context (Finnish Treaty No 51/2002), Article 13

Authorisation for preparation

The Regional State Administrative Agency hereby authorises Nord Stream 2 AG to begin preparations for the implementation of the project prior to the decision becoming legally enforceable. The authorisation does not extend to beginning the delivery of natural gas through the pipelines. Prior to taking action, the permit holder must give the Basic Services, Legal Protection and Permits Department of the Regional State Administrative Agency for Southern Finland a security of EUR 70 million to compensate for any damage, nuisance and costs that may result from repealing the decision or amending the conditions of the permit.

Grounds

Pursuant to Chapter 3, Section 16(1) of the Finnish Water Act, in the permit decision, the permit authority may for a justified reason authorise the applicant to take preparatory measures (*authorisation for preparation*) even before the decision becomes legally valid. Another party's area may be used for the measures referred to above only if such a right is established in the permit or the holders of rights otherwise agree to this.

Pursuant to Chapter 3, Section 16(2) of the Finnish Water Act, authorisation for preparation may be granted, if 1) preparatory measures can be taken without causing considerable harm to other uses of waters or the natural environment and its functions; and 2) after carrying out the measures in question the conditions can be essentially restored in case the permit decision is repealed or permit conditions changed.

The applicant received consent for the installation of the natural gas pipelines in the Finnish exclusive economic zone from the Finnish Government on 5 April 2018. Germany has already granted the necessary permits for the installation of the natural gas pipelines and for commencing works. Russia's and Sweden's decisions are expected in the near future. The permit procedure is still pending in Denmark.

The construction of the natural gas pipelines consists of several different phases of work and will take approximately one year in total. Specialist machinery will be needed for carrying out the works, leasing which requires long-term contracts. The use of a dynamically positioned pipe-lay vessel will help to reduce the adverse effects of pipe-laying. The works will be carried out over one continuous period during the open-water season, which is why the works must be started in the spring. Beginning the long-term works included in the plan on which the application is based urgently must be deemed to be important.

Munitions clearance and works relating to the installation of the natural gas pipelines will cause dispersion of contaminants, solids and nutrients attached to sediments. However, the volumes of these substances will be relatively low, and the original conditions in the sea will be restored relatively quickly. Munitions clearance may damage the hearing of individual seals, but no harm will be caused at population level provided that the permit provisions are observed. Inconvenience caused by the pipe-laying to maritime traffic can be prevented by following the Finnish Transport Agency's instructions in accordance with the permit provisions. Considering the permit provisions laid down in this decision, according to which the project must be implemented, the measures are not deemed to cause significant harm to the environment, the sea area or its functions.

Postponing the start of works would cause the applicant to incur considerable losses, and the works can be commenced without causing any significant permanent damage to the use of the waters or the environment and its functions in the event that the permit is cancelled or its conditions changed as a result of appeals.

Should the decision be repealed and the applicant ordered to take action to restore the original conditions, the premise will be that at least all measures that do not cause more harm than what it necessary to restore the original conditions in material respects must be taken. Not all the rock material placed on the seabed will therefore need to be removed, nor all sections of the natural gas pipelines. Rock material would need to be

removed from areas where the structure is essentially different from the seabed morphology, for example. The pipelines would mostly need to be dismantled where there are free-spans and potentially also in areas where they may have an impact on undercurrents or fishing, for example. The amount of the security has been set taking into account the fact that machinery will need to be reserved and contracts signed if these kinds of measures need to be carried out, which will result in additional costs. Based on the above, the Regional State Administrative Agency concludes that a security of EUR 70 million can be deemed to be sufficient on the whole.

Considering the permit provisions laid down in the decision, the Regional State Administrative Agency concludes that the measures to be carried out pursuant to the authorisation for preparation may have minor adverse effects on the aquatic environment in the exclusive economic zone even if it does not make sense or will not even be possible to restore the original conditions in all respects. Considering the national and international importance of the project, an authorisation for preparation may be granted.

Applicable legal provisions

Finnish Water Act (587/2011), Chapter 3, Sections 16 and 17

Responses to statements and objections

The Regional State Administrative Agency has taken the **claims made in the statements and objections** into account in the manner shown in the permit provisions and their grounds.

The Regional State Administrative Agency's answer to the **Environment and Natural Resources Department of the Southeast Finland Centre for Economic Development, Transport and the Environment** is that the applicant has supplemented the monitoring programme by adding one monitoring station in accordance with the statement.

In response to the statement of the **City of Porvoo's Public Works and Environment Committee**, the Regional State Administrative Agency states that the contaminant concentration levels in the sediments are extremely low. As the project will not involve seabed dredging, the dispersion of contaminants will be extremely local.

In response to **objection No 19**, the Regional State Administrative Agency states that the objector has not supplied legally enforceable documents demonstrating their property rights along the route of the natural gas pipelines. The Regional State Administrative Agency also states that the exclusive economic zone is located outside Finnish territorial waters, and the exclusive economic zone is therefore not within Finland's national borders (Finnish Act on the Finnish Exclusive Economic Zone (1058/2004)).

In response to **objection No 21**, the Regional State Administrative Agency states that works within the Finnish exclusive economic zone are not deemed to have significant adverse effects outside Finland's borders, and Polish Natura 2000 sites will therefore not be affected. The application concerns construction pursuant to the Finnish Water Act in the Finnish exclusive economic zone, which is why the application only needed to be submitted in Finnish. English and Swedish translations of the application plan and some of the appendices have been made available. The project will bring benefits, and there are grounds for laying the natural gas pipelines.

In response to **objection No 22**, the Regional State Administrative Agency states that the permit procedure pursuant to the Finnish Water Act does not address greenhouse gases or projects' impacts on the climate.

PROCESSING FEE AND GROUNDS

The processing fee is EUR 26,806.

A bill will be sent separately via the Finnish Government Shared Services Centre for Finance and HR.

The processing fee is based on the Finnish Government Decree on Fees Payable to Regional State Administrative Agencies in 2017 (1353/2016) and the fee table contained in its appendix. According to the fee table, the fee payable for processing applications concerning rock placement in excess of 200,000 solid cubic metres is EUR 17,360. As the workload involved in processing the application exceeded the fee based on the volume of rock placement, 35% has been added to the fee. As the decision concerns a project that involves several aspects of water resources management governed by the Finnish Water Act for which processing fees are payable pursuant to the fee table, 50% of the fee payable for processing other water resources management issues according to the table has been added to the fee. In this case, the decision covers two pipelines, and a fee is therefore payable for each pipeline. The pipelines account for EUR 1,740 of the fee. Moreover, munitions clearance has, due to its impacts, been deemed to constitute a separate project pursuant to Chapter 3 of the Finnish Water Act, the fee payable for which is EUR 1,630.

RECIPIENTS OF THE DECISION

Nord Stream 2 AG
City of Helsinki
City of Espoo
City of Kotka
Town of Loviisa
Town of Raseborg

Town of Hanko
Town of Pargas
City of Porvoo
Municipality of Sipoo
Municipality of Kirkkonummi
Municipality of Ingå
Municipality of Kimitoön
Municipality of Kökar
Municipality of Föglö
City of Helsinki / Environmental Protection Authority
City of Espoo / Environmental Protection Authority
City of Kotka / Environmental Protection Authority
Town of Loviisa / Environmental Protection Authority
Town of Raseborg / Environmental Protection Authority
Town of Hanko / Environmental Protection Authority
Town of Pargas / Environmental Protection Authority
City of Porvoo / Environmental Protection Authority
Municipality of Sipoo / Environmental Protection Authority
Municipality of Kirkkonummi / Environmental Protection Authority
Municipality of Ingå / Environmental Protection Authority
Municipality of Kimitoön / Environmental Protection Authority
Municipality of Kökar / Environmental Protection Authority
Municipality of Föglö / Environmental Protection Authority
Uusimaa Centre for Economic Development, Transport and the Environment / Environment and Natural Resources Department
Southwest Finland Centre for Economic Development, Transport and the Environment / Environment and Natural Resources Department
Southwest Finland Centre for Economic Development, Transport and the Environment / Fisheries Authority
Southeast Finland Centre for Economic Development, Transport and the Environment / Environment and Natural Resources Department
Government of Åland / Environmental Department
Finnish Transport Agency / Sea Route Unit
Finnish Transport Safety Agency
Metsähallitus
Finnish Defence Forces / Logistics Command
Finnish Border Guard / Gulf of Finland Coast Guard District
Finnish National Board of Antiquities
Swedish Environmental Protection Agency
Finnish Ministry of the Environment
Finnish Environment Institute

NOTIFICATION OF INTERESTED PARTIES

Notices to individuals

In accordance with the dpoESAVI-9101-2017 list.

Notices on notice boards, online and in the Official Journal

A notice of the decision will be posted on the notice board of the Regional State Administrative Agency for Southern Finland and on the notice boards of the City of Espoo, the Town of Hanko, the City of Helsinki, the City of Kotka, the Town of Loviisa, the Town of Pargas, the City of Porvoo and the Town of Raseborg as well as the Municipality of Föglö, the Municipality of Ingå, the Municipality of Kimitoön, the Municipality of Kirkkonummi, the Municipality of Kökar, the Municipality of Pyhtää and the Municipality of Sipoo.

The decision will be published on the Regional State Administrative Agency's website at www.avi.fi/lupa-tietopalvelu.

A notice of the decision will be published in the Official Journal.

APPEALS

This decision may be challenged by lodging an appeal with Vaasa Administrative Court.

Appendices

1) Map of the route of the natural gas pipelines
2) Appeal instructions

Päivi Jaara Raija Aaltonen Ville Salonen

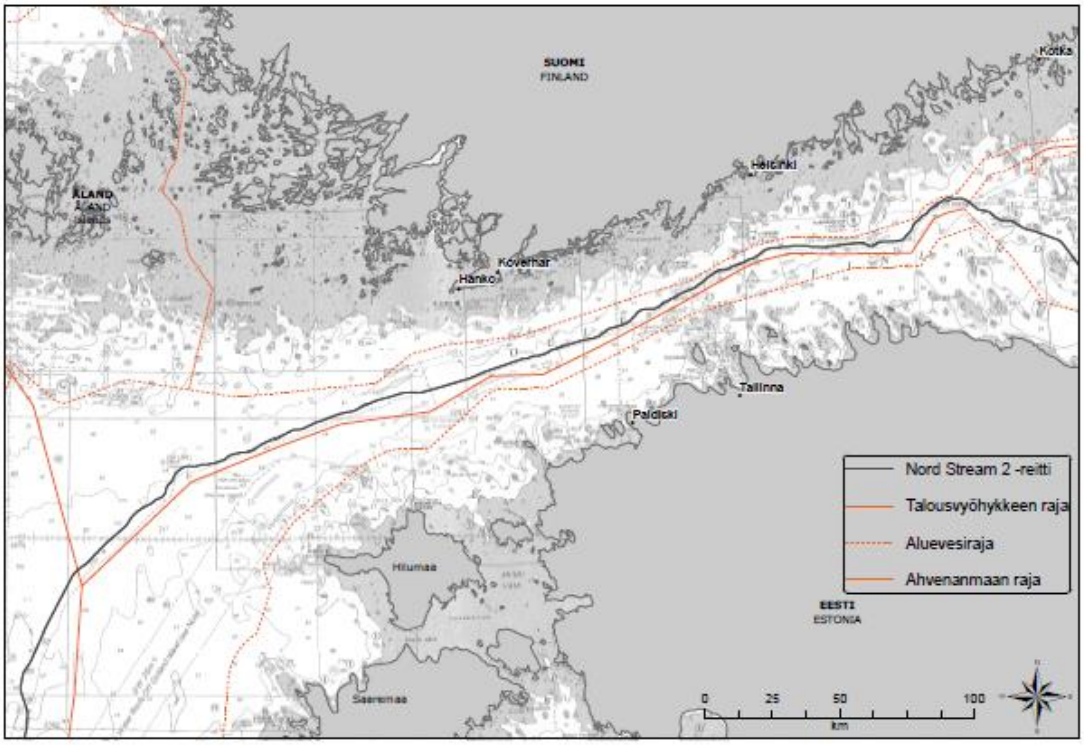
Piia Nieminen

The decision was delivered by Environmental Counsellors Päivi Jaara and Ville Salonen and Director Raija Aaltonen. The rapporteur was Senior Environmental Officer Piia Nieminen.

This document has been signed electronically. Confirmation of electronic approval can be found on the last page of the document.

Appendix 1

Map of the route of the natural gas pipelines



Nord Stream 2 route Boundary of the exclusive economic zone Boundary of territorial waters Boundary of the territory of the Åland Islands

Appendix 2

APPEAL INSTRUCTIONS

Appellate authority

Decisions of the Regional State Administrative Agency for Southern Finland may be challenged by lodging an appeal with **Vaasa Administrative Court**. The processing fee may be challenged in the same manner as the decision itself.

Deadline for appeals

The deadline for appeals is thirty (30) days from the date on which this decision was issued, excluding that date. The deadline for appeals is **14 May 2018**.

Right of appeal

The decision may be challenged by interested parties as well as registered associations or foundations promoting environmental protection, health or nature conservation or pleasant living environments within the area affected by the project, the municipality within which the project is to take place and the municipalities that will be affected by the project and their Environmental Protection Authorities as well as Centres for Economic Development, Transport and the Environment and other authorities safeguarding public interests in the matter.

Contents of appeals contain the following:

Letters of appeal must be addressed to Vaasa Administrative Court and

- Details of the contested decision
- The appellant's name and home town
- A correspondence address and telephone number and an e-mail address, where applicable, via which the appellant can be contacted regarding the matter (Vaasa Administrative Court must be notified of any changes to contact details at PO Box 204, FI-65101 Vaasa or by e-mail to vaasa.hao@oikeus.fi)
- An explanation as to which aspects of the decision the appellant is challenging
- The changes that the appellant wishes to introduce to the decision
- Justifications for the requested changes
- The appellant's, their legal representative's or attorney's signature, except where the letter of appeal is submitted electronically (by fax or e-mail)

Appendices to appeals

Letters of appeal must be accompanied by the following:

- Any documents that the appellant wishes to use to support their case unless these have already been supplied to the authorities
- A power of attorney, where applicable, or, if the letter of appeal is submitted electronically, a description of the attorney's powers

Submitting appeals

Letters of appeal and their appendices must be submitted to Vaasa Administrative Court. Letters of appeal must reach their destination by the deadline, before the end of office hours on the day in question. Letters of appeal may also be sent by post, fax or e-mail. Letters of appeal sent electronically (by fax or e-mail) must be available in the recipient's device or information system by the deadline, before the end of office hours on the day in question.

Contact details for the registry of Vaasa Administrative Court

Visiting address:	Korsholmanpuistikko 43, 4th floor
Postal address:	PO Box 204, FI-65101 Vaasa
Telephone:	+358 29 564 2780
Fax:	+358 29 564 2760

E-mail:	vaasa.hao@oikeus.fi
Opening hours:	8.00 am – 4.15 pm

Court fee

The court fee payable for processing appeals at Vaasa Administrative Court is EUR 250. No court fee will be charged if the Court rules in favour of the appellant. Certain types of cases are also exempt from court fees, and no court fee will be charged if the interested party is otherwise excused from paying fees by law. The court fee is payable by the party bringing the case, and a fee is charged for each letter of appeal.