Sydvaranger ESIA

Non-Technical Summary

Sydvaranger Drift AS

Sydvaranger Industriområde,
Kirkenes 9900,
Norway

Prepared by:

SLR Consulting Limited

3rd Floor, Summit House, 12 Red Lion Square,
London, WC1R 4QH

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	Click to enter a date.			

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Acronyms and Abbreviations

CO2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
EIA	Environmental Impact Assessment
EN	Endangered - NRL Status
ESIA	Environmental and Social Impact Assessment
EU	European Union
GHG	Greenhouse Gases
HVO	Hydrotreated Vegetable Oil
LC	Least Concern – NRL Status
NIBIO	Norwegian Institute of Bioeconomy Research
NIL	Northern Iron Limited
NRL	Norwegian Red List
NTNU	Norwegian University of Science and Technology
NVE	Norwegian Water Resources and Energy Directorate
PM	Particulate Matter
RHD	Reindeer Herding District
SEP	Stakeholder Engagement Plan
SLR	SLR Consulting Ltd
SYD	Sydvaranger Drift AS
TKN	Tschudi Kirkenes AS
VU	Vulnerable- NRL Status
WRD	Waste Rock Dump

1.0 Introduction

Sydvaranger Drift AS (SYD) is planning to recommence mining activities at Sydvaranger iron ore mine (the Project), in Sør-Varanger municipality in the Finnmark County of Norway in 2026 (Figure 2-1). It is expected that the Project will result in beneficial and adverse environmental and social impacts. Adverse impacts will need to be avoided, reduced or offset, and beneficial impacts should be enhanced as far as possible.

The Environmental and Social Impact Assessment (ESIA) has not been produced because of requirements by law, as the Project already has an existing valid mining permit and the necessary environmental permits in place to commence with operations. The main purpose of the ESIA is to consolidate the environmental and social studies that have been completed to date and to summarise and quantify the environmental and social impacts, of the Project. This document is a summary of the outcomes of the ESIA.

2.0 Background

The Project has a long history. Iron mineralisation was first discovered in 1866, the first mine permit was granted in 1906, and iron ore was first produced in 1910. Production halted during World War I and the company could not recover afterwards, resulting in it falling under bankruptcy protection between 1924 and 1927.

During the German withdrawal at the end of World War II in October 1944, Kirkenes was scorched, including most of the mining infrastructure. Reconstruction started in 1945 and operations commenced in 1953. Production was profitable from the reopening until 1976, but then thereafter struggled to remain economically viable before being shut down in 1996.

In 2006, the Tschudi Group acquired rights to the Project and entered into a joint venture with the Australian company Northern Iron Limited to form Sydvaranger Gruve AS. Following exploration activities in 2007 and 2008, the mine resumed production in 2009, operating until 2015. A decline in iron ore prices resulted in the Sydvaranger Gruve AS filing for bankruptcy in 2015. The mine has been on care and maintenance since then.

In 2016, the Tschudi Group reacquired the Project and commenced activities to restart operations under its subsidiary Sydvaranger Drift AS. Subsequently, the Tschudi Group engaged Orion Mine Finance Inc. which invested in a feasibility study. In 2020, the Tschudi Group and Orion secured Tacora Resources Inc. as the operator through an agreement with Orion Mine Finance Inc. to facilitate the restart of operations.

In 2023, Orion exercised its rights to reclaim Sydvaranger from Tacora, as Tacora had failed to commence activities as per the agreement, and subsequently sold it on the open market to the Swedish company Grangex AB in May 2024.

Figure 2-1: Project location

3.0 Approach and Methodology

The ESIA has been compiled by SLR; however, the technical work, including baseline studies, were prepared by several other independent consultants along with SYD. A list of the main contributors and reports used for this ESIA report is provided in Table 3-1.

An ESIA was initiated in 2018. Ramboll completed baseline studies from 2019–2021, alongside stakeholder engagement planning, grievance mechanism design, and tailings and water modelling work, before activities were paused due to funding constraints. ESIA work resumed after Tacora's 2021 acquisition, including supplementary surveys and further tailings alternatives assessment. Following Grangex's acquisition in 2024, a new ESIA process was launched, building on previous work and adding new studies.

The Project will utilise the same footprint as with historic operations, with minor adjustments and upgrades to equipment and facilities required. The ESIA covers all aspects of the proposed mining and processing activities of the Project and aims to identify impacts and promote the responsible construction, operation and closure of the Project.

Where additional studies are required for the management of impacts as per the outcomes of the ESIA, these are discussed as part of the mitigation and monitoring requirements. It is noted that an Air Quality Impact Assessment is yet to be undertaken and thus only a qualitative impact assessment has been included as part of the ESIA. Sweco AB has been appointed to undertake a quantitative air quality assessment and this is planned following the collation of 12 -months of monitoring data.

While considering the Norwegian EIA guideline (M-1941), which provides detailed technical standards and reporting formats, the methodology has also been adapted to align with EU requirements and Good International Industry Practice.

As the ESIA is not required for national permitting requirements, no official consultation with stakeholders is required; however, SYD will make the Non-Technical Summary available to all Project stakeholders.

Table 3-1: Key ESIA Study Inputs

Topic Area	Main Reports	Author
Biodiversity	Impact assessment for terrestrial biodiversity – Sydvaranger (2025)	Pelagia
	Marine biodiversity impact assessment and monitoring programmes (2025)	Det Norske Veritas Group. (DNV)
	Environmental Monitoring Programme Bøkfjorden (2025)	DNV
	Knowledge base: Marine Environmental Monitoring (2025)	DNV
	Knowledge base: Baseline Studies Shoreline (2025)	DNV
	Biodiversity study summaries (2025)	Ecofact
	Baseline studies for terrestrial biodiversity (2019-2020).	Ramboll
	Impact on biodiversity by opening a new open pit mine at Ørnungen in Sydvaranger Mine (2024)	Ecofact
Land Quality and Soils	Contaminated land assessment (2022)	Norconsult ASA
	Evaluation of oil barriers (2024)	SYD

Topic Area	Main Reports	Author
	Supplementary field studies (2025)	Pelagia
Water	Assessment of Dioxins, Furans and SVOC in Surface Water. Sydvaranger Mine (2025)	Geosyntec Consultants Inc (Geosyntec)
	Environmental Impact of Pit Dewatering - Sydvaranger Mine (2025)	Geosyntec
	Field Report: Surface and Groundwater (2025)	Geosyntec
	Gap Analysis. For Environmental and Hydrogeological Baseline Investigations regarding Surface Water and Groundwater (2025)	Geosyntec
	Groundwater Modelling Report. Sydvaranger Iron Ore Mine (2025)	Geosyntec
	Predicted Environmental Concentrations in Recipients. Sydvaranger Mine Area (2025)	Geosyntec
	Water Balance Model Enrichment Plant, Sydvaranger Iron Ore Mine. Geosyntec (2025)	Geosyntec
	Water balance, data collection and impact assessment for surface and groundwater (2025)	Geosyntec
	Groundwater Modelling Report. Sydvaranger Iron Ore Mine (2025)	Geosyntec
	Supplementary field studies (2025)	Pelagia
	Surface and groundwater baseline studies (2019-2020)	Ramboll
	Sydvaranger Iron Ore Mine, Norway. Water Balance Model (2019)	Ramboll
Climate and Greenhouse Gases	Lifecycle assessment (2025)	Gidås hållbarhetsbyrå AB (Gidås)
Air Quality	Proposed dust monitoring plan	Sweco AB (Sweco)
	Air quality review (2025)	Sweco
	Air quality baseline (2020)	Ramboll
	Dust monitoring reports (2014-2015)	Department of Geosciences Norwegian University of Science and Technology (NTNU)
Noise and Vibrations	Noise investigation (2025)	Nitro Consult AB (Nitro Consult)
	Risk analysis and predictions of vibrations and shock waves from blasting (2025)	Nitro Consult
	Sydvaranger Heritage Area - Risk Analysis of blasting near heritage area (2025)	Nitro Consult

Topic Area	Main Reports	Author
	Noise baseline (2020)	Ramboll
	Noise baseline (2010)	Norconsult
Waste	Waste characterization (2025)	Geosyntec
	Seepage Water Modelling – Waste Rock and Open Pit. Sydvaranger Mine (2025)	Geosyntec
	Waste: Discharge Modelling (2025)	DNV
	Tailings discharge assessment and alternatives assessment (2020)	Ramboll
Social	Socio-economic baseline (2020)	Ramboll
	Traffic baseline (2020)	Ramboll
Indigenous Peoples	Reindeer husbandry analysis (2025)	Norwegian Institute of Bioeconomy Research (NIBIO)
Archaeology and Cultural Heritage	Cultural heritage baseline (2020)	Ramboll
Landscape and Visual	Landscape baseline (2020)	Ramboll

4.0 Regulatory Framework

4.1 Environmental and Social Impact Assessment

The ESIA has been prepared in accordance with the Norwegian Planning and Building Act and the EIA Regulations which transpose the EU EIA Directive into Norwegian Law. Although the Project is already fully permitted to re-commence operations and the ESIA is not required for a new application. All baseline studies by engaged by SYD have been undertaken to comply with Norwegian standards.

Chapter 5 of the Norwegian EIA Regulations mandates that impact assessments shall identify and describe the factors that may be affected and assess significant impacts on the environment and society and specifies the factors to be considered including: biodiversity, ecosystem services, cultural heritage, outdoor activities, landscape, pollution, aquatic environments, soil resources, Sámi culture, transport, energy needs, emergency preparedness and accident risks, climate change, population health, recreation, accessibility to outdoor areas, living conditions, crime prevention, architectural and aesthetic design.

The EU EIA Directive requires systematic identification and assessment of significant effects on population, human health, biodiversity, land, water, air, climate, material assets, cultural heritage, and landscape. The ESIA addresses these through dedicated technical chapters.

4.2 Other Applicable Norwegian Laws

The Project must comply with a suite of national legislation, including:

- Pollution Control Act – governing emissions and waste management.
- Minerals Act – regulating extraction and operational plans.
- Water Resources Act – ensuring sustainable water use.
- Nature Diversity Act – protecting biodiversity.
- Cultural Heritage Act – safeguarding archaeological and cultural sites.

- Working Environment Act and Transparency Act – addressing labour conditions and human rights.

Future compliance with EU sustainability directives, such as the Corporate Sustainability Reporting Directive and Taxonomy Regulation, is anticipated.

4.3 Permitting Status

SYD holds the following permits:

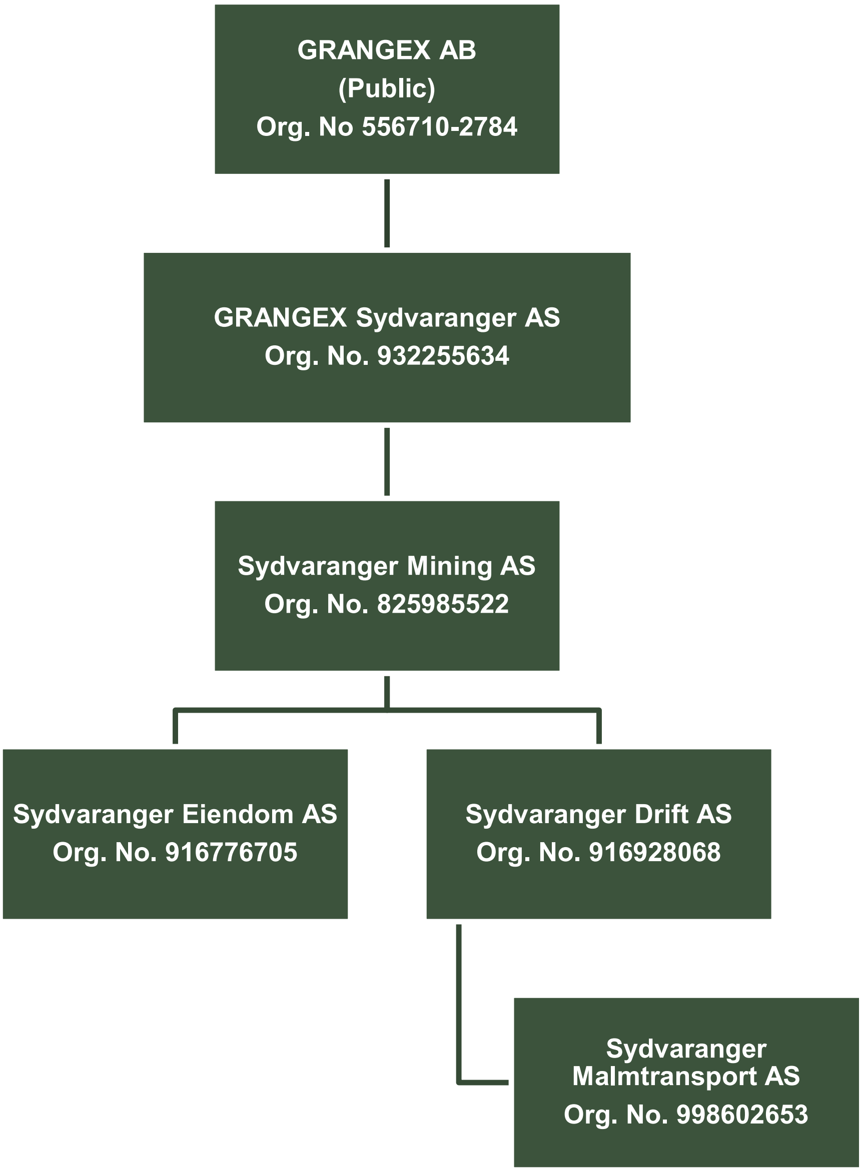
- Mining Permit (issued in on 19 March 2019).
- Environmental Permit (2008.190.T) – covering emissions to air and water, noise, blasting, chemicals, and submarine tailings disposal; revised in 2022 and updated in 2023.
- Water Supply – Permit to take water from Kirkenes lakes.
- Tailings Pipeline – Permit for the placement of the tailings pipeline in the harbour.
- Railway Permits
- ISO 9001 certification covering port operations

5.0 Project Description

5.1 Project Owner

An organogram of the company structure is shown in Figure 5-1. The Project is owned 100% by Sydvaranger Mining AS, which is owned by Grangex Sydvaranger AS. Swedish company Grangex AB owns 98.5% of Grangex Sydvaranger. The Tschudi Group owns the remaining 1.5%. The Sydvaranger operations are managed by two subsidiaries of Sydvaranger Mining: namely SYD and Sydvaranger Eiendom AS.

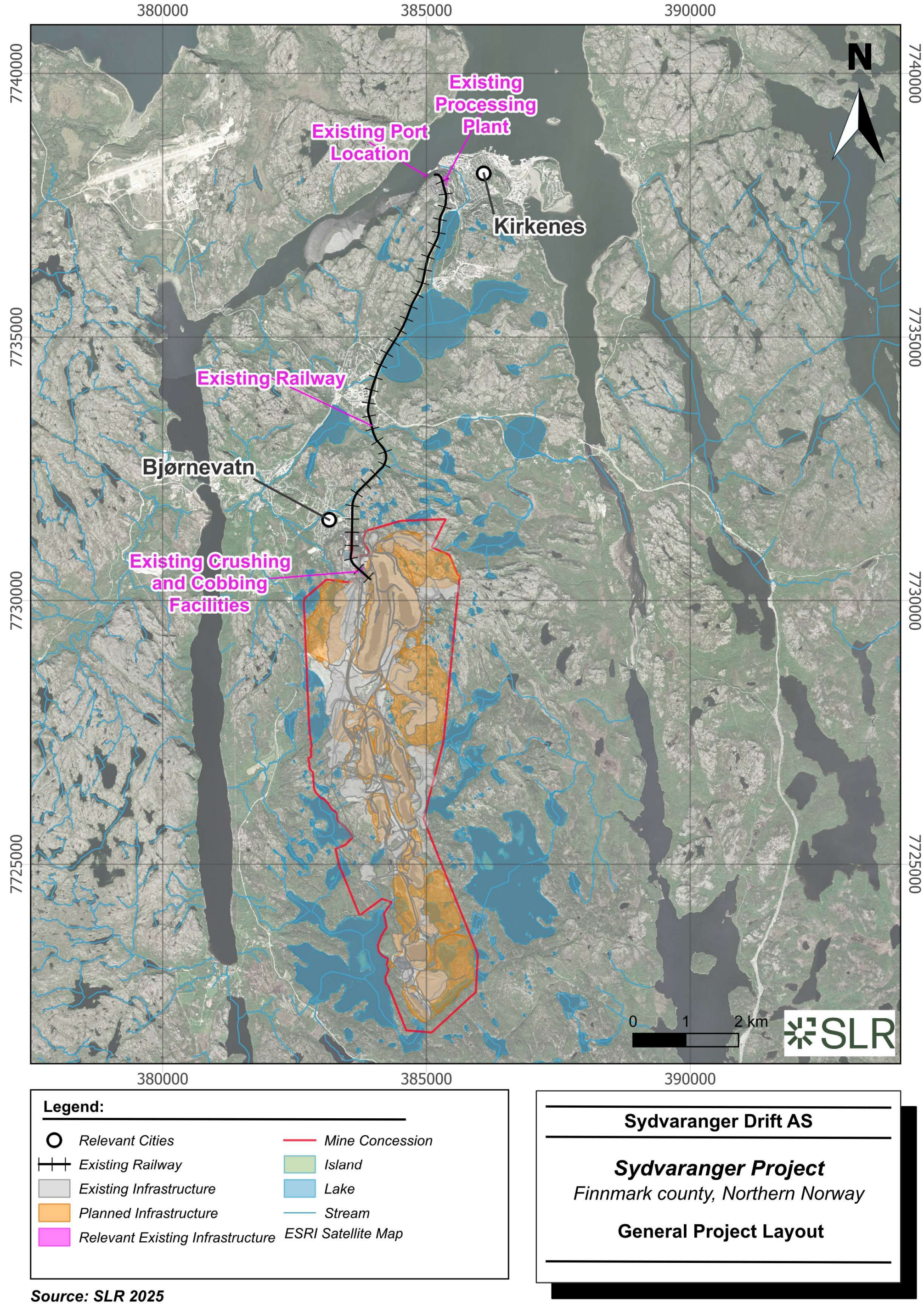
Figure 5-1: SYD Company Structure



5.2 Project Location and Setting

The Mine Concession Area is located near Bjørnevatn, and the process plant and port facilities are in Kirkenes in northern Norway. The mine and the processing facilities are connected by an 8 km long private (company owned) railway, purpose-built for the previous mining operation. A map showing the Mine Concession Area and the location of the main facilities is provided in Figure 5-2.

Figure 5-2: General Project layout with existing and planned infrastructure



Source: SLR 2025

5.3 Project Schedule

The Project is planned to be executed in two phases allowing time for upgrade of equipment and facilities. Phase 1 is from 2026 to 2029 and Phase 2 from 2030-2050. The total life of the mine is 25 years. The mine operations will run 365 days per year, 24 hours per day, with the processing plant operational for 330 days (the remaining days set aside for maintenance).

Phase 1 will involve the use of existing infrastructure for production with primary crushing, and cobbing taking place in the Mine Concession Area[1]. Further, secondary and tertiary crushing, milling and concentrating will take place at the Kirkenes process plant. Some upgrades including altered classification in the primary circuit, increased separation capacity, increased filtration capacity, and implementing a new separation circuit. Integrity checks and some limited construction work including concrete works at the port and the development of water management infrastructure at the Mine Concession Area will be undertaken prior to the commencement of Phase 1 operations. The need for a new laboratory at Kirkenes is under investigation. Two new construction camps will be developed, one in Bjørnevatn and the other in Kirkenes.

Phase 2 will involve installing a new crushing circuit (primary, secondary and tertiary crusher) and upgrades to the existing cobbing area in the Mine Concession Area. A secondary mill will be added to the milling area in Kirkenes to allow for increased production at the process plant.

The schedule of activities is provided in Table 5-1.

Table 5-1: Operational schedule

Years	Activities
2026	Pre-construction engineering and construction for Phase 1
2027-2029	Phase 1 production, engineering and construction for Phase 2
2030-2050	Phase 2 production
2050-	Mine closure

5.4 Overview of Operations

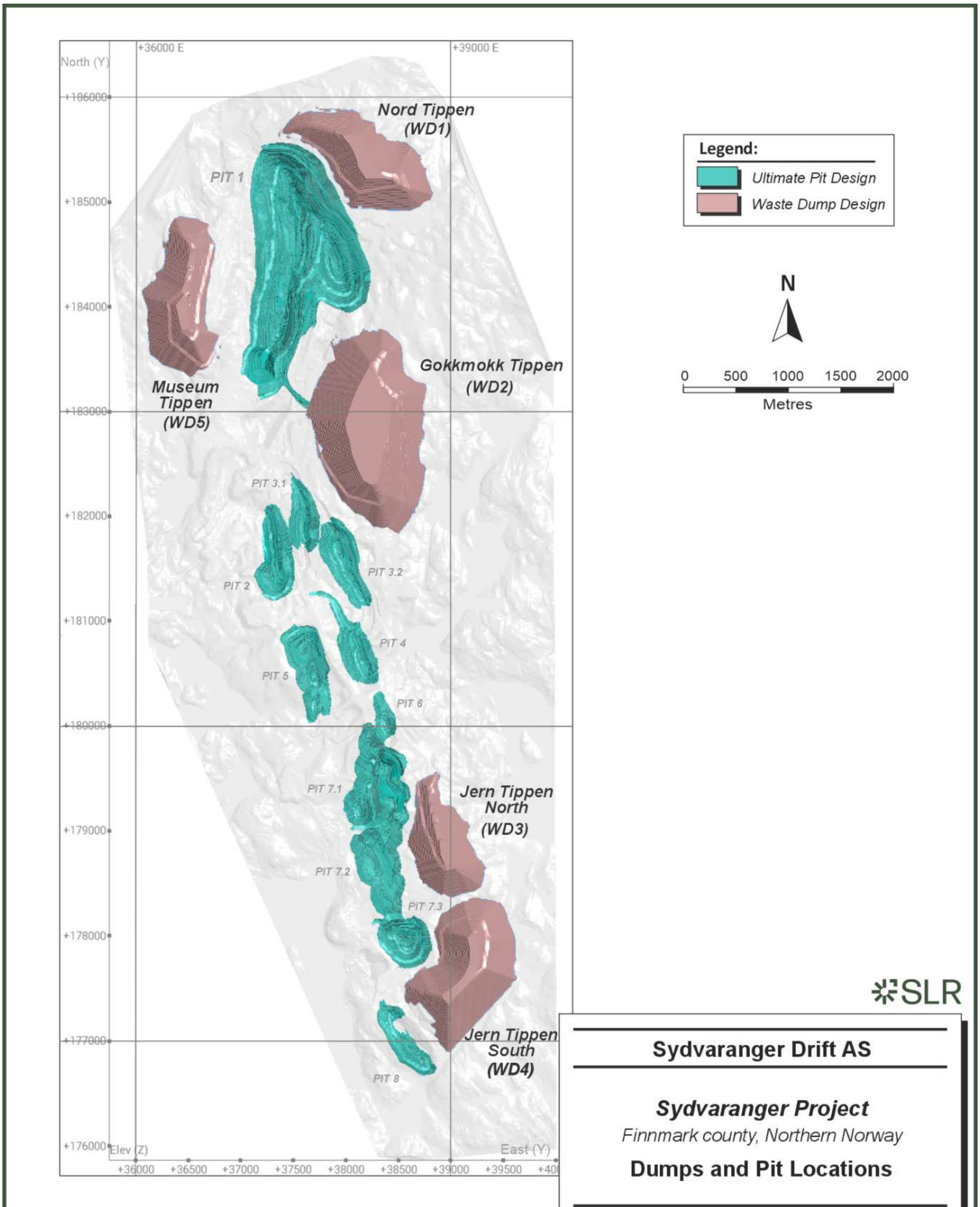
5.4.1 Mining

Iron ore will be mined from open pits (see Figure 5-3). The future pits will overlap the footprints of existing pits but these will be made deeper, wider and longer. The pits are currently filled with water from precipitation and groundwater sources and this water needs to be pumped out prior to beginning the mining process. The dewatering of the pits will take place throughout the life of the mine with each pit being pumped try prior to the commencement of mining.

The rock is mined by using explosives placed within holes established by drilling rigs. The ore is then loaded on to trucks using excavators, after which it is hauled to the primary crusher. Waste rock is taken to the waste rock dumps (WRDs). Five waste rock dumps have been planned, using existing permitted dump sites. The layout of the mine pits and WRDs is given in Figure 5-3.

[1] Cobbing – using magnetic separating devices to remove waste (non-iron bearing material) from the iron ore.

Figure 5-3: Open Pit and Waste Rock Dump Locations



Source: SLR 2025.

During the 25-year life of the mine, a total of 161 million tonnes of ore and 475 million tonnes of waste rock will be mined. The operational profile across the life of the mine is given in Figure 5-4.

Figure 5-4: Sydvaranger Operational Production Profile (SLR 2025)

5.4.2 Processing

During Phase 1, primary crushing and cobbing will be undertaken at the existing facilities in the Mine Concession Area near Bjørnevatn. The iron ore is then transported from the mine area close to the Kirkenes process plant via rail, where further cobbing, secondary and tertiary crushing is undertaken. Within the process plant the iron ore is milled, separated and upgraded to concentrate[2] ready to be shipped from the port.

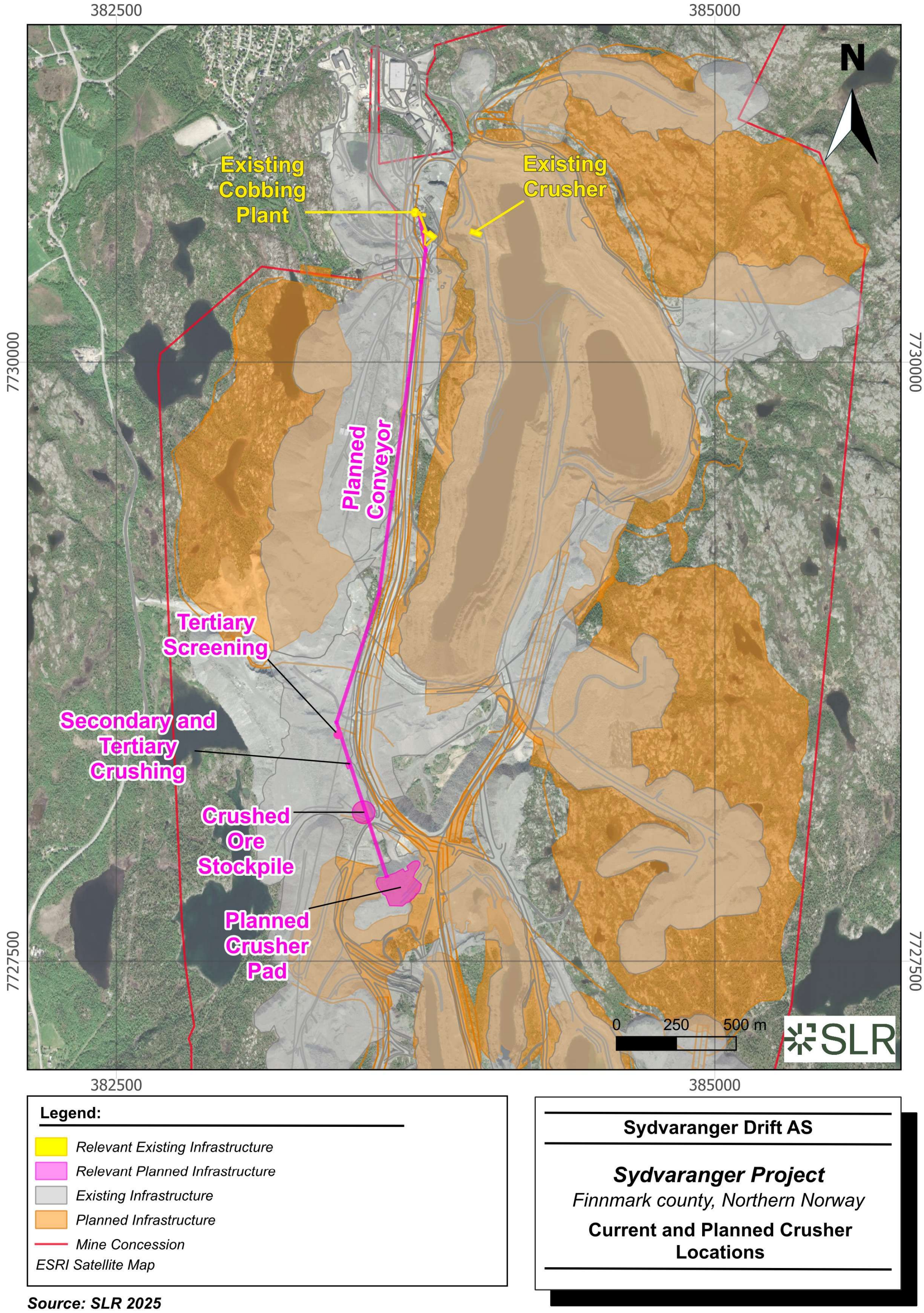
The concentrate will then be exported by cargo ship to steel producers around the world. The iron ore concentrate will contain 70% iron and be suitable for direct reduced iron and may therefore be used for low-carbon steel making, so-called “green steel”.

The process waste material produced during processing is referred to as ‘tailings’. This material will be deposited via the existing pipeline to the existing subsea deposit in Bøkfjorden. The tailings disposal plan is a continuation of the existing submarine tailings disposal method from the previous companies AS Sydvaranger (1973–1997) and Sydvaranger Gruve AS (2009–2015). The tailings discharge permit limits the annual mass of tailings to 4 million tonnes. A schematic showing tailings disposal is given in Figure 5-6.

In Phase 2, all crushing and cobbing will take place within the Mine Concession Area at the new crushing circuit in Bjørnevatn. Conveyor belts will be used to transport ore from the crushing area to the existing cobbing plant. Conveyor belts will be enclosed to reduce dust. The location of the existing and future crushing and cobbing infrastructure is shown in Figure 5-5. The existing primary (within the Mining Concession Area), secondary and tertiary crushers (at the Kirkenes process plant) will be decommissioned in Phase 2.

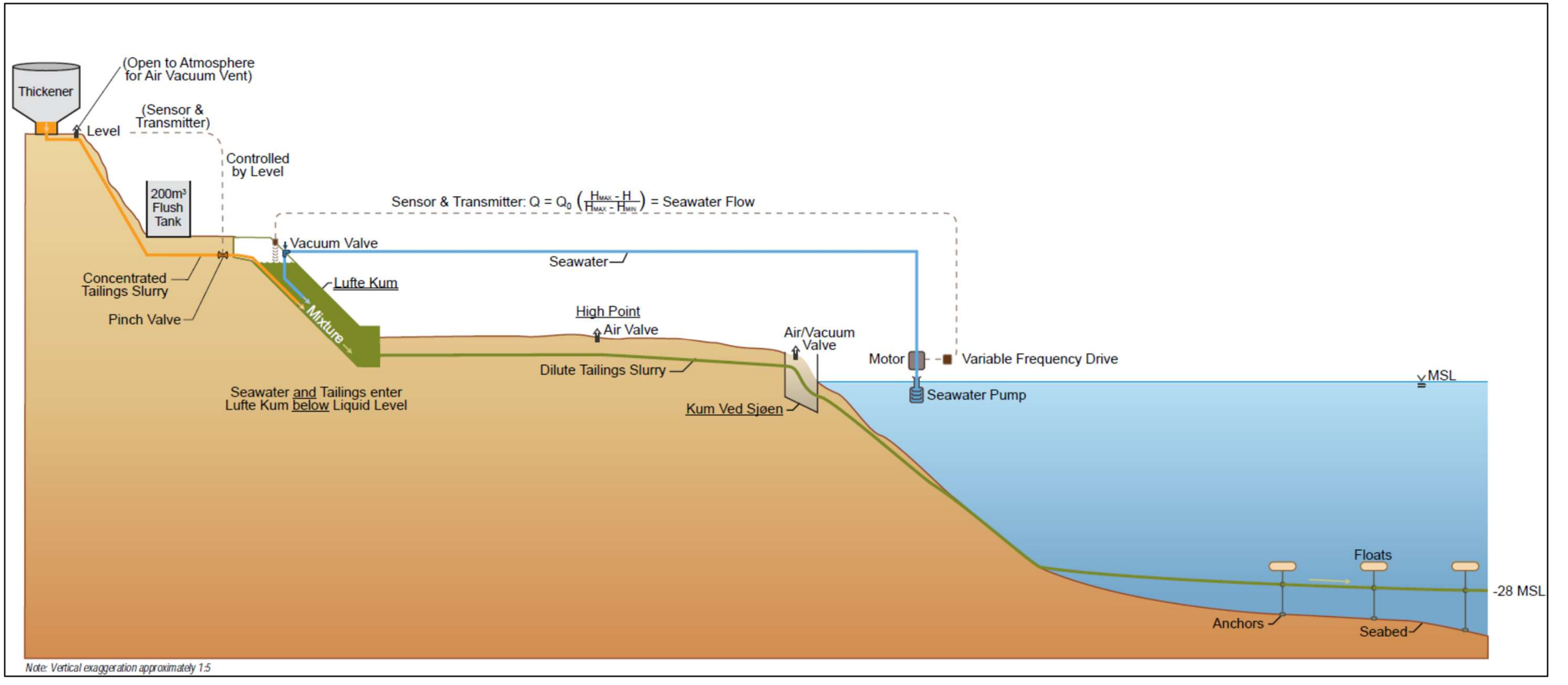
[2] Concentrate – the product of processing where non-iron bearing minerals such as quartz are removed, making the percentage of iron in the remaining material higher.

Figure 5-5: Existing and Planned Crushing and Cobbing Plant Locations



Source: SLR 2025

Figure 5-6: Tailings Disposal Schematic



5.4.3 Water Supply and Management

Water supply for use in the process will come from the Kirkenes Lakes, Førstevatn, Andrevatn, Tredjevatn, and Prestevatn, with supply pumps located at Førstevatn. The raw water demand will be 240 – 250 m^3/hour. The water levels of the lakes are regulated through a water permit. Water is recycled within the process as far as possible with water losses in the concentrate and the tailings. Only make-up water is sourced from the lakes as raw water supply.

The open pits from previous mining have flooded since operations ceased. Prior to re-commencing, the pits must be de-watered (pumped dry) to access the ore. A pumping strategy and surface water management strategy has been developed in collaboration with the mining schedule. Water will have to be continuously drained as mining progresses to maintain safe mining conditions, as surface water and groundwater flow into the pits.

Discharge points and receiving waterbodies for water originating from pit dewatering are defined in the environmental permit which allows for discharge to Langfjorden in the west and to Krokvatnet and Store Fiskevatnet in the east. Based on the mitigation of impacts identified in the ESIA, dewatering in the south will be discharged to Store Fiskevatnet or to Langfjorden via the Triangle area and the tunnel. The mid-pits will be dewatered to Krokvatnet or to Langfjorden. The northern pits will be dewatered to Langfjorden. Both Krokvatnet and Store Fiskevatnet drain to the Pasvik River. Both the Pasvik River and Langfjorden are connected to Bøkfjorden.

For the continuous draining new surface water management structures (ditches and culverts) have been designed to allow for water to be pumped and stored in settlement/collection ponds to allow for settlement of suspended solids prior to discharge into the environment. The new structures also take into consideration the new designs of pit and WRD expansion.

5.4.4 Infrastructure

5.4.4.1 Roads

Existing haul roads will be upgraded and extended where necessary to allow transport of ore and waste materials around the site. Road surfaces will be constructed from compacted dirt and gravel. Existing local roads will also be used to transport staff and supplies. Existing road infrastructure provides access and transport routes, and no additional thoroughfares are required. Upgrades to the ex-pit haulage routes for off-highway dump trucks along with additional bypass haul roads to pass Pits 7.1 and 7.2 has been planned. Haul roads will be built to provide access to the new buildings, equipment, associated stockpiles and pit mining areas.

5.4.4.2 Rail

Cobbed ore is transported to the process plant in Kirkenes from the mine area via rail. The railway is owned and operated by Sydvaranger Malmtransport AS and connects Kirkenes plant with the mine site. Loading at the mine site is completed in an enclosed tunnel (390 m length) that limits the size of the train to 18 ore wagons as well as the locomotive. The unloading facility consists of a covered silo of approximately 6,000 tonnes, with open access at both ends for entering and exiting the train.

5.4.4.3 Port

The port in Kirkenes is owned by Tschudi Kirkenes AS (TKN) but is operated by Sydvaranger Drift AS. The concentrate is fed onto the ship loader by conveyors from a battery of silos excavated in the mountain near the process plant. The ship loader crane is a PHB built loader installed in 1968. The loader was completely refurbished in 2009 before restarting the Sydvaranger Gruve AS operation. The port is designed to load the iron ore concentrate into Panamax size vessels.

5.4.5 Utilities

5.4.5.1 Power

The Project's existing electrical infrastructure spans two sites: the mine site facilities near Bjørnevatn and the process plant at Kirkenes. Power is supplied via an existing 22 kV powerline owned by the Barents Nett (local supply company of electricity). Statnett is the owner of the regional and national grid and infrastructure. Sydvaranger have a valid grid connection agreement with the local grid owner, ensuring an available capacity of 24 MW throughout the life of the mine. This capacity is sufficient to meet the operational needs.

5.4.5.2 Communications

Mobile phone coverage is generally good, with 4G available in most populated areas and ongoing expansion of 5G technology. In the mining areas, coverage is reliable along the pit edges but varies in quality deeper within the pits. Communications associated with the mine site crushing facilities are integrated through fibre optic communication of the control system networks. A fibre optic communication system will be implemented to cover large distances in the field and pass through areas of high electromagnetic interference.

5.4.5.3 Sewage

There are existing sewage treatment facilities located at both the mine site and Kirkenes process plant, operated by the municipality authorities. The domestic sewage from toilets and sinks at the new crushing area control room gravitates into a septic pit, which will be periodically emptied via a certified contractor using tanker trucks. There are no modifications planned for the sewage treatment facilities. Sewage water is sent to municipal wastewater treatment plant, which is paid for via fees.

5.4.5.4 Non-Mining Waste

Both the mine site in Bjørnevatn and the processing areas in Kirkenes will generate non-mineral waste. In the construction and operational phases, dedicated waste stations will be established at the processing areas in Kirkenes, and at the mine site in Bjørnevatn to support systematic waste sorting and handling. Waste management plans will be updated to address the specific waste streams generated during operations, with an emphasis on re-using or recycling waste whenever feasible.

The Project has existing agreements with licenced contractors for the transport, recycling, treatment and final disposal of waste. The environmental permit allows for the collection and temporary storage of up to 100 m³ of oil-contaminated material for a maximum of 12 months.

5.4.5.5 Accommodation

Kirkenes township is well developed with a long history of mining. It is expected that it will support accommodation for Project staff in the long-term. It is expected that during initial operations most of the employees will live outside the community but this is expected change to the majority residing locally within 5 years. During the previous operation (2009-2015) the operations started with 80% fly-in-fly-out workers, by the end of the operational period that had turned to 80% residing in the community

A new workers' accommodation camp will be established in Bjørnevatn, near the main entrance gate to the Mine Concession Area. The camp will comprise 88 rooms and common areas. There will also be a new camp in Kirkenes with the same number of rooms. In total 176 rooms available when the mine is in operation. The camps will provide full services, including cleaning and meals.

In addition, SYD currently has two barracks available, one in Bjørnevatn and one in Kirkenes (owned by TKN, leased by SYD), which can be upgraded before use. These camps will be used in the construction phase. Other available apartments and houses in the community will be rented.

5.5 Alternatives Analysis

The alternatives assessment begins with the 'do-nothing' option, which means leaving the mine as it is. This would avoid new negative environmental and social impacts but also prevent any economic benefits and positive environmental and social impacts. The area has been dormant since 2015, allowing nature and communities to adapt. Choosing this option would maintain the current landscape and biodiversity but forego opportunities for jobs, tax revenue, and safer management of the old mine site.

The current infrastructure required to regulate the water levels in the Kirkenes lakes is in need of an upgrade. The preferred solution is repairing the lake system and adding pumps to transfer water when levels drop. This approach ensures a steady supply without major new infrastructure, balancing practicality and cost and also ensuring regulatory compliance. Note that should the Project not proceed the lakes will remain as they are with continued risk for flooding on the E6 road. If the Project proceeds the water levels within the lakes will be regulated through the implementation of new equipment and pumps and the risk of flooding is thus substantially reduced.

The current environmental permit requires exploring alternatives to marine disposal, to reduce the volume of tailings deposited at sea. Options evaluated includes terrestrial disposal which would involve, due to lack of other suitable land area, using nearby lakes or in-pit disposal. The option to use nearby lakes included evaluation of nine lakes. Out of those lakes Store Fiskevatnet is the only technically feasible option as it has capacity to manage the volumes to be disposed. The option to use lakes was rejected due to both technical challenges, significant impacts on the environment and due to the likelihood of strong community opposition.

The in-pit disposal option entails placing tailings in mined-out pits. The study looked at the technical viability of implementing in-pit tailings disposal and included geological, geotechnical, hydrogeological, and tailings characterisation aspects. It was found that there are pits which could be used from a technical perspective. The in-pit tailings disposal would, however, require substantial further evaluation regarding technical, social and environmental aspects and impacts. The in-pit disposal alternative has not been rejected but it comes with major challenges including impacts such as substantial infrastructure (pipelines) impacting the community and the reindeer herding practices, and additional power that is currently not available. Further, the pits are not yet mined-out and there is also a likelihood for additional ore beneath the planned pits and sterilization of ore is not permitted. This is further complicated by the fact that the mining permit requires that waste rock to be placed in mined-out pits.

Another promising option is turning tailings into a silica sand product to be used in cement production. This could cut waste, generate revenue, and support low-carbon construction materials. A high-level market study has been conducted and it concludes that the Sydvaranger tailings may be suitable for the cement industry. As the waste characterization studies show, the tailings primarily consist of silica (70-80%) and oxides of iron, magnesium, aluminium and calcium. There are virtually no heavy metals present. In addition to the market study stakeholders in the cement industry have been contacted and there is a definite interest in the product. This option stands out because it combines environmental benefits with economic opportunity. It should be noted that this option will require additional power. The technical and market study will be taken forward in conjunction with the financing of the project as a project on its own.

Energy use was also reviewed. Mining traditionally relies on diesel, which drives high greenhouse gas emissions. A life cycle analysis showed big reductions are possible by switching to alternatives like biofuels, electrification, and relocating equipment to shorten haul distances. Full electrification could, together with relocation of equipment and use of nitrogen free explosives, which has a lower climate impact, cut emissions by over 70%. However, power supply constraints mean this may take years to implement. For now, the project plans incremental steps of improvement, like using cleaner fuels and shortening haulages by the relocation of the primary crusher, while keeping long-term options open.

5.6 Mine Closure

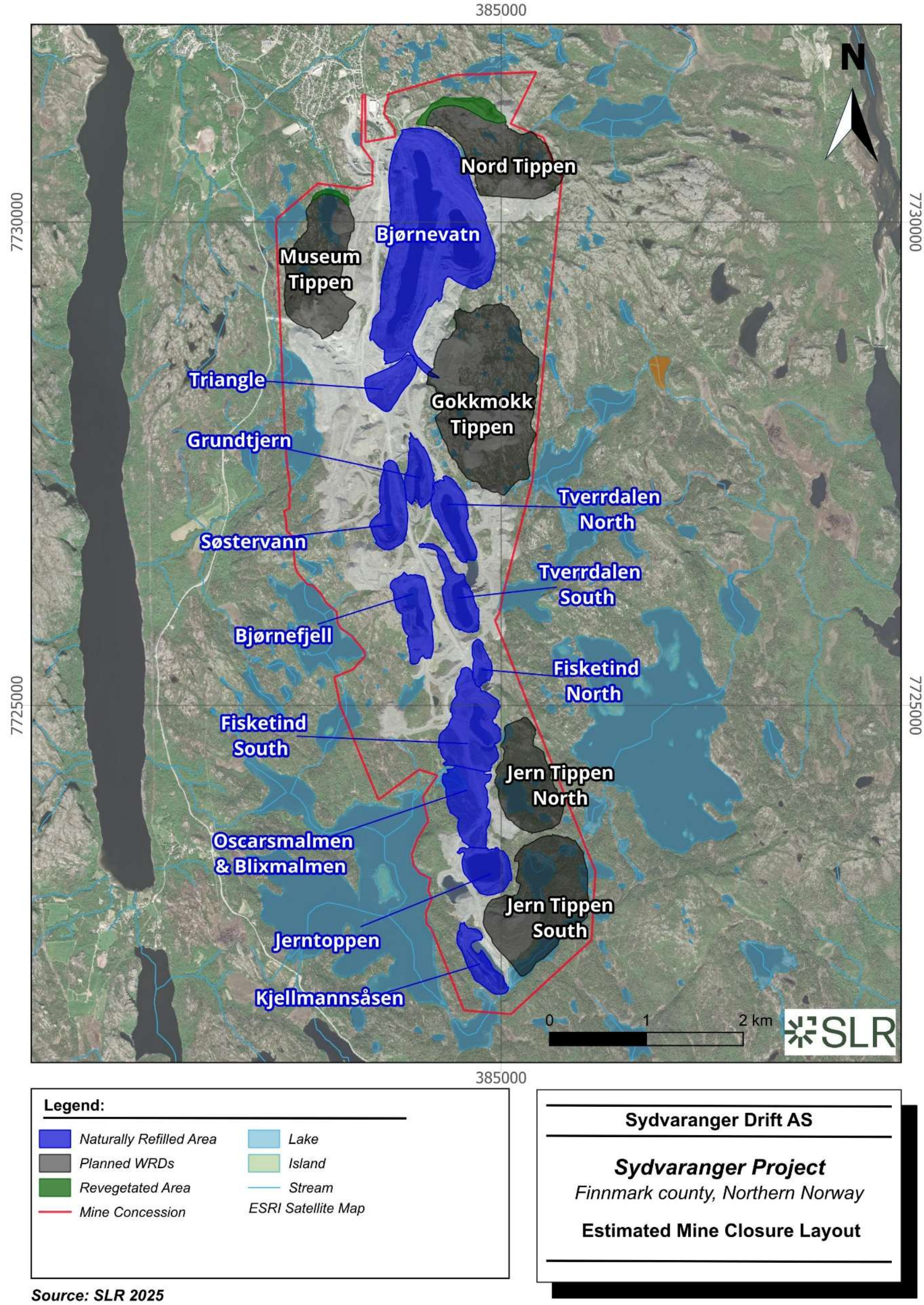
Once the iron ore is depleted and the economic value decreases to the point where operations must cease, the mine will be closed and the area rehabilitated. At closure the aim is to minimise long-term environmental and social impacts, ensure regulatory compliance, and support the return of the land to a beneficial post-mining use. Key considerations include the management of pits, WRDs, tailings management, water quality, landform stability, and stakeholder engagement.

Closure is governed by the closure plan, clean-up plan, and safety plan, all approved under the mining permit, which together define the requirements and determine the financial security required to cover closure obligations. In addition, the legally binding agreement with the Reindeer herding district forms part of the closure framework, ensuring that obligations agreed with the RHD 5A/C are integrated into the closure plans. It will be refined through ongoing environmental monitoring and stakeholder consultation as the project advances.

The overall objective of the mine closure is to be able to close the facilities in such a way that the area affected by the facilities is restored to a satisfactory condition, with particular regard to the protection of soil and water quality, animal and plant life, natural habitats, landscape, future land use, including social aspects (e.g. future employment, Sámi rights), and health aspects.

Following cessation of mining, the Mine Concession Area will undergo restoration involving placement of topsoil over Nord Tippen and Museum Tippen to aid in re-establishment of vegetation material. Specifically for Nord Tippen, topsoiling is proposed on the northern side of the WRD as this side faces Kirkenes and associated buildings (Figure 5-7). Similarly, the north side of Museum Tippen will also be covered in topsoil as this faces the settlements of Sandnes and Hesseng (Figure 5-7).

Figure 5-7: Closure Plan for the Project withing the Mine Concession Area



Source: SLR 2025

Due to the limited availability of topsoil, the other WRDs will be allowed to naturalise. Open pits will naturally refill with water. There will also be the creation of shoreline/access around most of the waterbodies.

6.0 Environmental and Social Impacts

6.1 Biodiversity

6.1.1 Baseline Conditions

The Project area comprises disturbed brownfield areas, open pits, WRDs and surrounding natural habitats. Habitat types identified are shown in Figure 6-1. The land-cover types include old-growth pine forest with old trees are formally designated as having very great value (Figure 6-2).

Field surveys undertaken by Pelagia in 2025 identified seven red-listed plant species (one of which is classified as Vulnerable (VU) in the Norwegian Red List for Species (NRL), namely *Carex arctogena*) and three fungi species (one classified as VU, namely *Aphroditeola olida*). One invasive species (*Arabidopsis arenosa*) was also noted during the surveys, a non-native plant that is widespread across Norway and classified as potentially high risk. It grows on open and dry areas such as roadsides or railways.

Birds of conservation importance identified include black-headed gull (Critically Endangered (CR)), hen harrier (Endangered (EN)), common eider (VU) which all have conservation significance. Important mammals such as Eurasian wolf (CR) and brown bear (EN) occur regionally but were not observed on site.

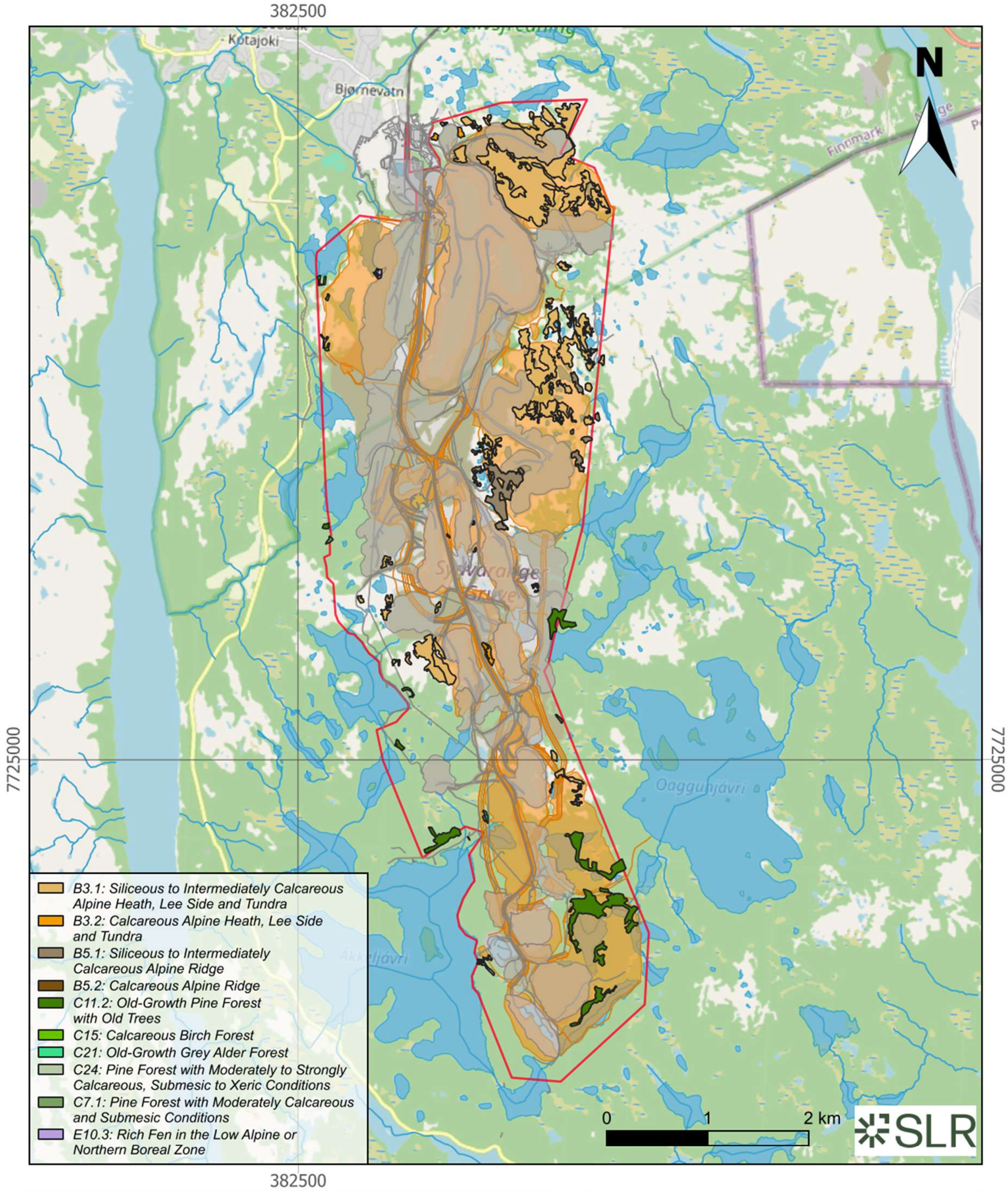
Sensitive aquatic fauna relevant to the site and surrounding freshwater habitats include brown trout (Least Concern (LC), migratory) and freshwater pearl mussel (VU) downstream. Sixteen aquatic waterbodies were included in studies undertaken by Pelagia. A summary of the ecological and chemical status of these bodies is given in Table 6-1.

It was concluded that the marine environment supports sensitive biodiversity features, including Atlantic salmon, soft-bottom fauna, and macroalgae. The baseline was informed by a study conducted in 2025 by DNV. Additional baseline data were collected by DNV for Mid Bøkfjorden and adjacent waterbodies because there is an existing submarine tailings disposal discharge into Mid Bøkfjorden that will be reactivated for the project. In addition, a supplementary macro algae field study was carried out in 2025.

Table 6-1: Summary of Waterbodies included in Aquatic Studies

Sub-area	Water body ID	Included water bodies	Ecological status	Chemical status
Bodilbekken /Bodilbekken bekkefelt	246–161-R1/246–163-R	Langvatn, Gamvatn and Gotmagavatnan	Good/High (Vann-Nett 2025; Pelagia 2025b; Ramboll 2022)	Good (Vann-Nett 2025, Ramboll 2022)
Krokvatnet			Good (Ramboll 2022)	Good (Ramboll 2022)
Langfjorden inner bekkefelt	246–62-R	Ragnmonbukta Bjørnevatnet	Moderate (Vann- Nett 2025)	Good (Ramboll 2022; Vann-Nett 2025)
Langfjorden - inner	0424030601 -C		Bad (Pelagia 2025b)	Poor (Vann-Nett 2025)
Langtjernet			High (Ramboll 2022)	Good (Ramboll 2022)
Langvatnet			Moderate (Ramboll 2022)	Poor (Ramboll 2022)
Pasvikelva – Fossevatn	246–65230-L		Moderate (Ramboll 2022) *	Poor (Vann-Nett, 2025)[a]
Reitanvatnet			Moderate (Ramboll 2022)	Good (Geosyntec 2025a)
Andevatn			High (Ramboll 2022)	Good (Vann-Nett 2025)
Sundtjernan			Good (Pelagia 2025b)	Good (Vann-Nett 2025)[b]
Sandbotnvatn			High (Ramboll 2022)	Good (Ramboll 2022)
Store Fiskevatnet	246–2451-L		Moderate (Ramboll 2022)	Poor (Ramboll 2022)
Valpvatnet	246–64391-L	Rundvassbekken	Good (Ramboll 2022)	Good (Ramboll 2022)
Ørnevann stream network	246–69-R	Langvatn, Lomvatnet, Store and Lille Peskevatn and Ørnungen	Good (Pelagia 2025b, Ramboll 2022)	Good (Vann-Nett 2025)
Ørnevatnet and Ørnevassbekken	246–2460-L/ 246–71-R		Good (Geosyntec 2025a)	Good (Ramboll 2022)
Bøkfjorden Midtre	0424030500 -5-C		Good (Vann-Nett, 2025)	Poor (Vann-Nett, 2025)
Bøkfjorden Indre	0424030700 -1-C		Moderate (Vann-Nett 2025	Not defined
Bøkfjorden Ytre	0424030500 -5-C		Good (Vann-Nett, 2025)	Poor (Vann-nett, 2025)
Langfjorden Ytre	0424030602 -C		Good (Vann-Nett, 2025)	Not defined

Figure 6-1: Habitat Types



Legend:

- Existing Infrastructure
- Planned Infrastructure
- Mine Concession
- Lake
- Island
- Stream

OpenStreetMap

Sydvaranger Drift AS

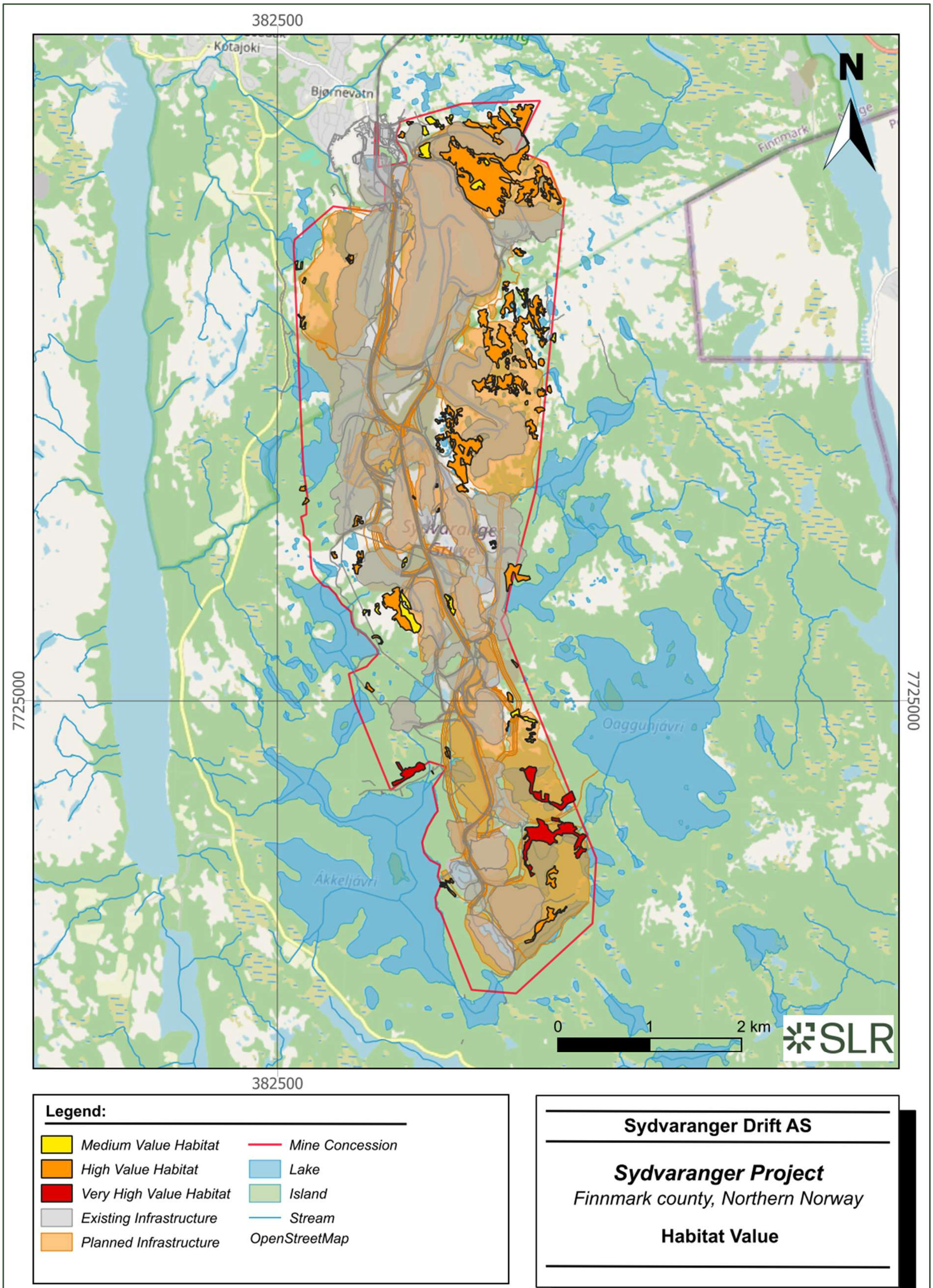
Sydvaranger Project

Finnmark county, Northern Norway

Habitat Types

Source: SLR 2025

Figure 6-2: Habitat Values



Source: SLR 2025

6.1.2 Potential Impacts and Mitigation

6.1.2.1 Land-claim, Fragmentation and Edge Effects

Undeveloped areas will be claimed for the expanding mining operations resulting in the clearance of some natural habitat. This will result in the loss of some native plants and the likely displacement of animals. The impact on a species level will vary depending on the specific ecology and habitat-use. Red-listed animal species are not expected to be directly impacted. Plant species that are dispersal limited may be impacted because of habitat fragmentation, where individuals or localities may lose connectivity with other habitat patches. There can also be secondary and edge effects, such as alterations to microclimates reducing the overall quality of some sections of habitat.

The loss of natural habitat is assessed as a significant environmental impact, particularly because some of the areas to be disturbed are formally designated as being of high value. To manage this, proposed mitigation measures include:

- minimising footprint;
- avoiding tree felling during bird breeding season;
- retaining and translocating dead wood;
- developing an alien invasive species management plan.

However, even after the implementation of these avoidance and minimisation measures, there remains an impact on biodiversity as a result of the loss of natural habitats due to vegetation clearance.

To address this residual impact, SYD is to develop a Biodiversity Action Plan (BAP) that will aim to restore areas within the Mine Concession Area that were cleared historically. Certain habitats, such as old-growth forests may take decades or centuries to regain their full natural value, but the measures in the BAP should improve their resilience to impacts and the likelihood of a full recovery in the long-term. The BAP could, if required, also include additional conservation actions outside of the Mine Concession Area and habitat restoration during mine closure. Should the BAP be implemented appropriate and successfully, then it is feasible to achieve a positive impact on natural habitats and overall biodiversity value.

6.1.2.2 Discharge of Tailings Deposits to Bøkfjorden

An impact assessment specific for marine biodiversity was developed by DNV in 2025. It analysed two potential concerns arising from the deposition of tailings into Bøkfjorden: toxicity to flora and fauna; and high levels of sedimentation. The tailings primarily consist of inert mineral particles and do not present a source of heavy metal contamination. The evidence reviewed shows that impacts from the flocculants to be used are low to zero, and the area impacted would be small with low concentrations (see also Section 6.3.2.2). Therefore, there was found to be no potential for toxic impacts.

The study however did conclude that there is a potential impact due to increased sedimentation associated with the tailings deposits. The increased sedimentation can directly impact the sensitive benthic flora and fauna by smothering it, stopping access to light, oxygen, nutrients, etc. Increased turbidity in water column due to suspended solids can also disrupt migratory routes for salmon and other fish.

Based on modelling, DNV concluded that the topography of the fjord would limit extent of sedimentation (above 6.5 mm/yr) to an area of 3.8 km^2. Moderate impacts to Atlantic salmon were predicted, but there are sufficient alternative routes for their migration; essential functions will be maintained; and the impacts will be diluted in the large fjord system.

To confirm the findings of the modelling, and to manage potential impacts, monitoring of sedimentation and water quality needs to be undertaken. DNV together with SYD commenced a monitoring programme in 2025 that will continue in 2026 and throughout the operations. The programme includes monitoring of turbidity, sedimentation and other parameters to collect a baseline data before start of the operations. In 2026 the programme will include additional data collection including e.g. soft bottom fauna status.

Dependent on monitoring results, an alternative option for the marine discharge may need to be considered. As an option, DNV modelled a disposal alternative located further into the fjord and in deeper water. This is expected to have a lower impact owing to being a less sensitive environment and because discharge will be diluted quicker in the deeper water. This alternative is under consideration subject to future monitoring and modelling.

6.1.2.3 Water Quality Changes due to Mine Discharge

As discussed in Section 5.4.3, the original discharge plan to lakes, would potentially affect to aquatic life due to eutrophication resulting from increased nitrogen levels. Key impacts were predicted for Bodilbekken and Krokvatnet, which were listed as in good ecological condition, and for Store Fiskevatnet, which was listed as in moderate ecological condition. Bodilbekken is also recognised as a key waterbody for brown trout.

Therefore, SYD worked with Geosyntech and Pelagia to develop and alternative discharge plan that avoids impacts to the most sensitive areas and minimises the overall impact (see Section 5.4.3). Pelagia concluded that the alternative discharge plan would significantly reduce the risk posed to aquatic ecosystems. The alternative plan will thus be implemented to address this impact.

6.2 Land, Soil and Geology

6.2.1 Baseline Conditions

The Sydvaranger Mine Concession Area is characterised by limited soil cover, with exposed bedrock common due to the harsh climate and minimal soil formation. Where present, soils are thin, typically comprising glacial till or anthropogenic fill material from previous mining activities

Geological mapping indicates the area consists of Precambrian metamorphosed sedimentary iron formations (Fisketind Formation) and associated rocks, which host the economically significant iron ore deposits. These formations exhibit a regional northwest strike and steep dip, with a major syncline dominating the mineralised zone.

The updated Mineral Resource is estimated at 444 million tonnes of measured and indicated resources grading 32.7% total iron and 68 million tonnes of inferred resources grading 31.9% iron ore. The reported mineral reserve totals 161.2 million tonnes grading 31.7% iron ore, including 25.5 million tonnes of proven mineral reserves grading 32.7% iron ore.

Preliminary site investigations have revealed localised contamination in specific areas, notably around the crusher line and workshop zones. These contaminants include hydrocarbons and heavy metals.

There is also a known deposit of dioxins and asbestos within the Mine Concession Area, which has been mitigated by covering the deposit with geotextile before it was infilled over. These deposits are owned by the former owner, TKN who holds the full responsibility for these including monitoring. There is also an area historically used for the storage of materials contaminated with oil during previous operations, which is suspected to be contaminated with oil.

Geoheritage mapping shows no designated sites within 2 km of the Project. Landslide susceptibility mapping suggests precautionary risks in pit and waste dump areas, though these are based on regional datasets rather than site-specific analysis.

Waste rock and tailings characterisation indicates low sulphide content and net buffering capacity, making acid rock drainage unlikely.

6.2.2 Impact Assessment and Mitigation Measures

6.2.2.1 Contamination of Land

There are known contaminated areas within the southern extent of the planned crusher line area. There is a risk that the Project could disturb and spread contaminated soil over a wider area or expose the areas to potential emissions to air. Further sampling should be undertaken prior to excavation in this area to fully quantify the magnitude and extent of contamination and to identify remediation actions required.

The Project will involve the use of equipment and machinery which have the potential to cause new leaks or spills which may enter ground in existing areas or new areas. The risk is lower in areas of concrete or hardstanding, such as within the processing plant area in Kirkenes, where the ability to infiltrate the ground is reduced. Much of the Mine Concession Area, is exposed soils (whether natural or made ground) or bedrock with a higher expected infiltration rate and there is thus a greater risk of contamination due to spillages.

To manage the risk of contamination, equipment and machinery will be subject to strict maintenance regimes. Refuelling and the addition of hydraulic oils or lubricants to vehicles or generators will only take place on-site in designated areas. Additional measures will also be put in place for the management of hydrocarbons in key risk areas including improved pipe shielding, containment systems, and automated oil management solutions. A spill management and emergency response plan will be in place for the clean-up and management of spills should they occur.

6.2.2.2 Geohazards

There is a potential for instability to arise due to mining activities particularly when an open pit or a WRD or stockpile is dynamic and changes over time as mining activities continue. The potential stability or instability of these work areas will be an ongoing risk management aspect for the Project.

Open pits, stockpiles and WRDs will be evaluated and kept stable to ensure safety and to minimise erosion. A routine programme of checks will be established to include visual checks. Geotechnical assessments are to be conducted on a regular basis by an experienced and suitably qualified geotechnical engineer. The Project will also ensure compliance with relevant safety and statutory legislation, as well as best practices recommended by national guidelines.

6.3 Water

6.3.1 Baseline Conditions

The Project area lies within a subarctic climate, with seasonal snowmelt driving high flows in spring and low flows in winter. Surface water systems include numerous lakes and streams draining toward Langfjorden in the west and the Pasvik River in the east. Sensitive receptors include lakes such as Store Fiskevatnet, Krokvatnet, and Valpvatnet, fjords including Bøkfjorden and Langfjorden, and potable water sources. Surface water features and drainage patterns are shown in Figure 6-3.

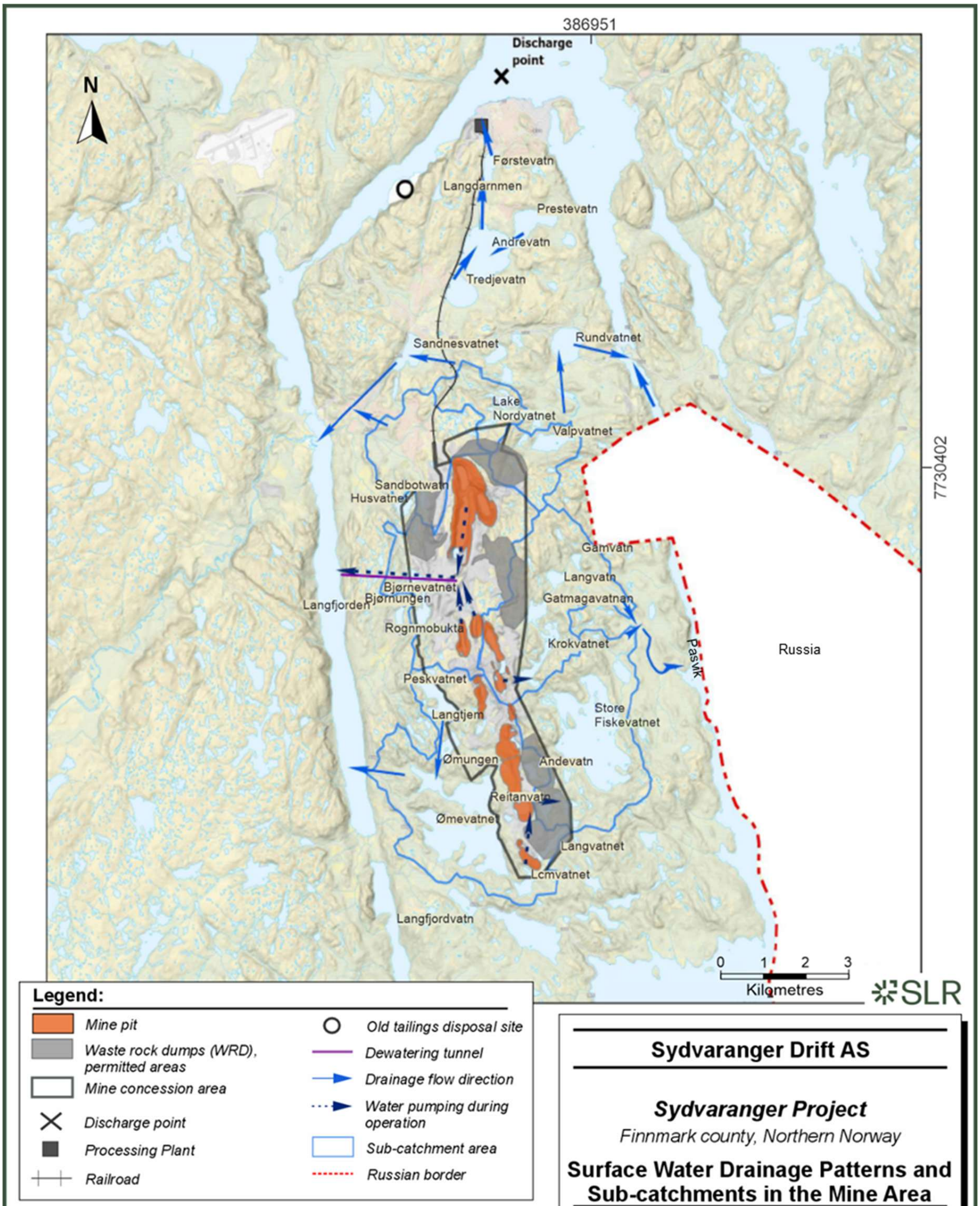
Marine receptors include Inner, Mid, and Outer Bøkfjorden, which connect to Langfjorden and Varangerfjorden (Figure 6-4). Inner Langfjorden is categorised as coastal water fjord influenced by freshwater. The Kirkenes Lakes (Førstevatn, Andrevatn, Tredjevatn and Prestevatn) provide process water for the plant and are regulated under water permits.

Most water bodies assessed have a 'good' to 'high' chemical quality status (see Table 6-1) though some lakes such as Ørnevatnet have received a poor status as a result of historical contamination thought to originate from emissions from the smelter in Nikel, Russia. The smelter was decommissioned in December 2020. Bøkfjorden Midtre is assessed as poor condition based on elevated levels of nonylphenol, octylphenol, anthracene and TBT in sediment, and mercury in blue mussels (Vannett, 2025). None of these toxins or heavy metals can be directly linked to mine tailings disposal from Sydvaranger in Bøkfjorden Midtre.

Metal concentrations within water bodies from sampling undertaken by between June and August 2025 indicate generally low values in line with surrounding waters, except for arsenic and nickel which were elevated in some locations including Store Fiskevatnet and the Lake Lille Peskvatn outlet. Marine waters exhibit localised contamination from historical industrial activities, unrelated to the Project.

Groundwater occurs mainly in fractured bedrock with low hydraulic conductivity, and flow is directed towards fjords. Four designated groundwater bodies near the site have good chemical and quantitative status. Potable water is primarily supplied by municipal systems, though private wells and cabin users may exist near the Mine Concession Area.

Figure 6-3 Surface Water Drainage Patterns and Sub-catchments in the Mine Concession and Process Plant Area



Source: Ramboll 2022b.

Figure 6-4: Map of Bøkfjorden including Relevant Waterbodies

Source: SLR 2025.

6.3.2 Impact Assessment and Mitigation Measures

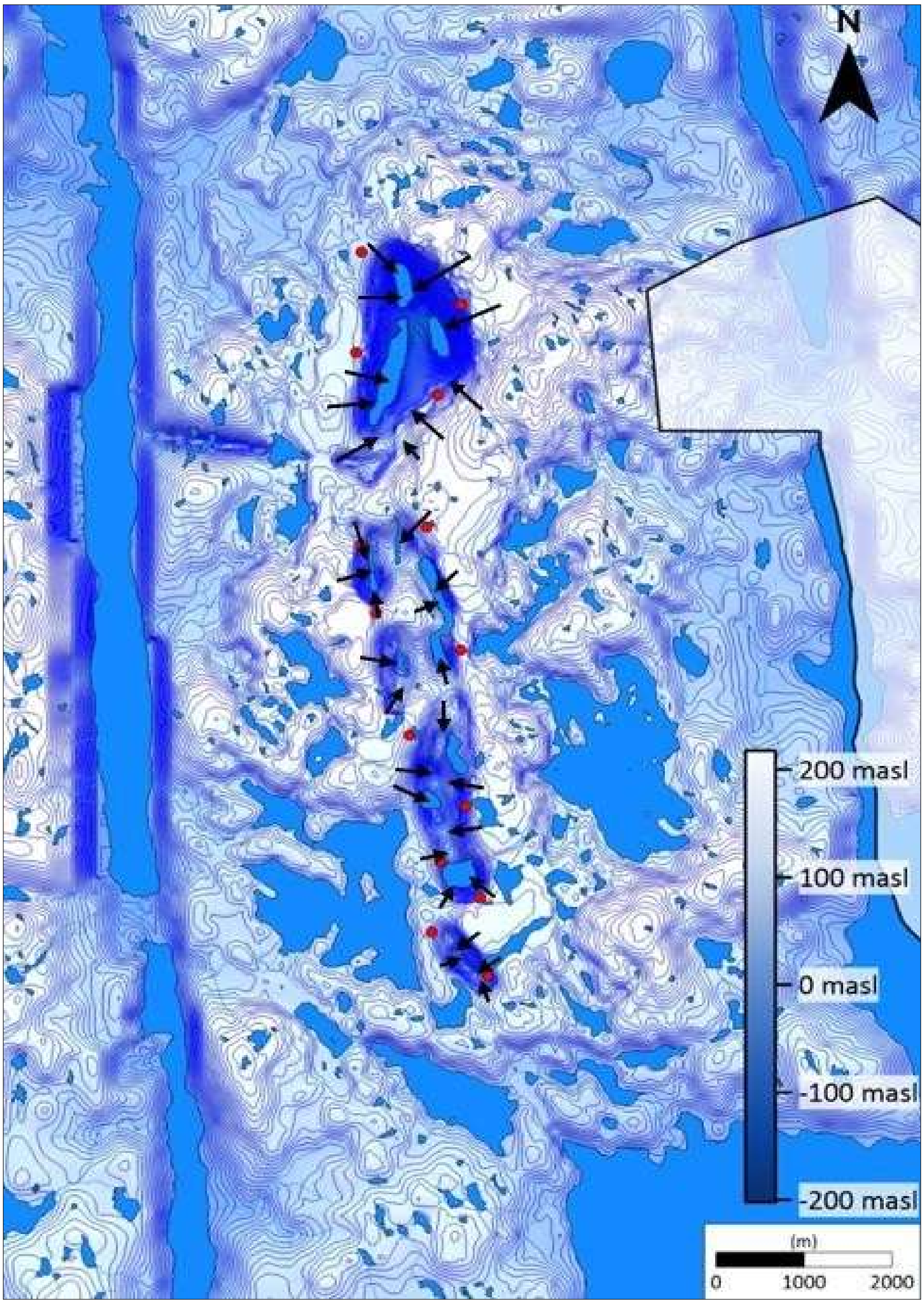
6.3.2.1 Change in Groundwater Levels and Quality

Geosyntec undertook a groundwater modelling exercise in 2025 to determine the impact of the dewatering of pits throughout the life of mine on groundwater levels (i.e. the potential drawdown area). The results of the modelling show that the potential drawdown area does not extend far beyond the open pit boundaries within the Mine Concession Area. This is due to the low bedrock hydraulic conductivity, high recharge and proximity of surrounding lakes. Based on this modelling, dewatering will lower groundwater levels locally and the area of impact remains within the boundaries of the Mine Concession Area (see Figure 6-5).

While there is the potential for spill and leaks from equipment or machinery operating within the open pit areas within the Mine Concession Area, the impacts are expected to be low and localised. Hardstanding within the process plant area, means that the risk of groundwater contamination in the Kirkenes area is minimal. Mitigation described for the protection of soils (see Section 6.2.2.1) will also serve to protect the groundwater from any contamination due to spillages.

In addition, potential impacts from runoff or seepage from the WRD is also expected to be low. Waste characterisation shows that the bedrock is generally inert, both ore and waste rock have a low content of heavy metals and the naturally high pH in waters in the area also prevents leaching of metals. No additional mitigation is thus required to specifically protect groundwater.

Figure 6-5: Groundwater Level Contour Lines



6.3.2.2 Water Quality Impacts due to Subsea Deposition of Tailings

The tailings does not present a source of heavy metal contamination, however there is a concern that the use of water treatment chemicals, i.e. flocculants used in the recycling of process water will contribute to contamination of water within Bøkfjorden. The recycling process utilises two different chemicals, Magnafloc 10 and Magnafloc LT 38. Magnafloc 10 is a flocculant allowing small particles in the water to aggregate into larger particles. Magnafloc LT 38 is a coagulant, allowing even smaller particles to coalesce thereby supporting the action of the flocculant. This process reduces the number of particles in the water allowing the water to be recycles for use. The process also reduces the proportion of fine particles in the tailings.

A specialist assessment has been undertaken by Bergfald Environmental Advisors. Magnafloc 10 is polyacrylamide, which is not considered toxic, however it may contain small amounts of the monomer acrylamide as an impurity which is toxic. The possible occurrence of acrylamide in water and sediment samples from Bøkfjorden was therefore investigated. Acrylamide was not detected in the water or the sediment sampled.

Bergfald considered the potential for polyacrylamide to leach and its bioavailability. It was determined that polyacrylamide is not toxic, and its toxic degrading product (acrylamide monomer) is readily biodegraded and not bioaccumulative.

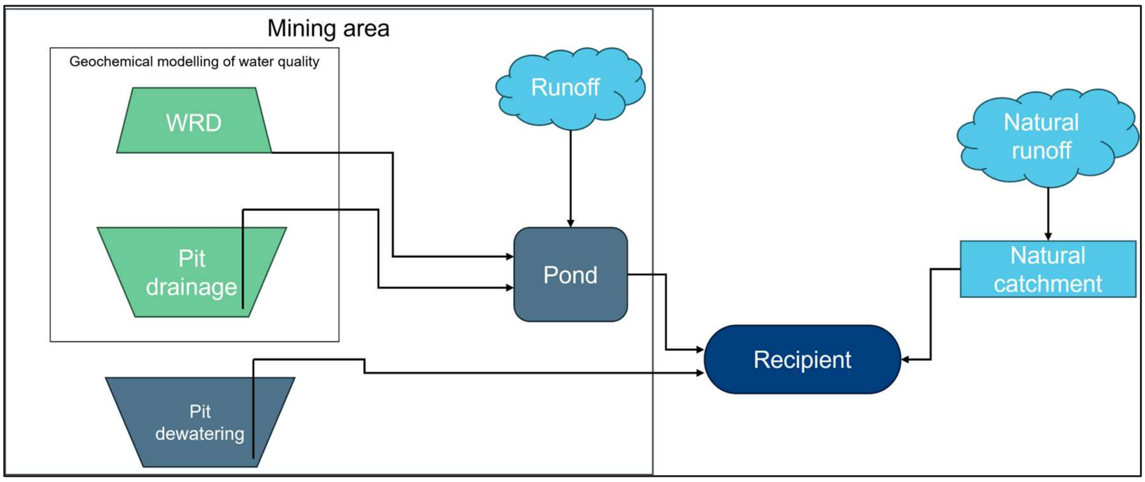
Magnafloc LT 38 contains the toxic compound polyDADMAC, however the compound is irreversibly bound to the tailings and is not degradable and therefore has no toxic potential when bound to particles. It is thus concluded that when standard dosages of Magnafloc LT 38 and Magnafloc 10 are bound to tailings, no toxic effect will occur.

Tailings disposal in Mid Bøkfjorden is thus expected to pose a negligible risk and insignificant impact on the chemical status of the water. The tailings disposal may however have an impact on the ecological status due to suspended solids and sediment deposition, as discussed.in Section 6.1.2.2.

6.3.2.3 Water Quality Impacts due to Direct and Indirect Discharges

Discharges from the mining operations because of waste rock seepage, pit dewatering, continuous pit drainage and runoff may result in the change in the water quality within the receiving water bodies (see Figure 6-6).

Figure 6-6: Conceptual Sketch showing sources of discharge to Receiving Water Bodies



Impacted surface waters will principally be discharge to Langfjorden, Krokvatnet and Store Fiskevatnet and indirect runoff from the Mine Concession Area to Valpvatnet, Husvatnet and Bjørnevatnet.

The assessment of the initially planned dewatering and continuous drainage of the pits shows increased concentrations of nitrogen in Langfjorden, Krokvatnet, and Store Fiskevatnet. It is not expected that there will be an increase in the concentration of metals. The elevated nitrogen levels have the potential to result in significant ecological impacts (further discussed in Section 6.1.2.3), particularly the discharge to Krokvatnet and Store Fiskevatnet during the dewatering and operational stages. There is also an expected large increase in flowrate to Store Fiskevatnet and Krokvatnet at times due to phased dewatering of the pits, compared to natural average inflows. However, the risk of increased erosion along stream channels due to this is expected to be low as the effluent water flow rates are low compared to natural yearly high flows. The increased flow rate is thus not expected to increase the risk of erosion.

To identify opportunities for reducing the impacts on the receiving water bodies and ecological receptors, as a result of increased nitrogen levels, options for the management of the dewatering and continuous drainage within the mine have been reviewed. A possibility will be to redirect some pit discharges to Inner Langfjorden in the west rather than to surface water receptors in the east.

As Inner Langfjorden is a larger waterbody and tidally influenced, its potential assimilative capacity is greater than the lakes. Further to this, although nitrogen levels in Langfjorden, are expected to increase it is unlikely that the increase will have a significant effect on the ecosystem as the concentrations occur only during a short period.

The option will reduce the potential impact from both high nitrogen load and erosion risks from large flows to Store Fiskevatnet and Krokvatnet and thus a lowered risk of erosion. SYD has thus selected to alter the water management strategy as discussed in Section 5.4.3

An extensive monitoring programme will be carried out as the discharges is carried out to continuously assess any impact and implement further mitigation measures as required.

6.3.2.4 Flooding Risks

There is potential for flooding of the E6 highway and possibly the village of Kirkenes during the snowmelt, if the road bank is overtopped. This scenario may potentially arise because once operations have ceased and there is no intake of raw water to the plant, water levels in Førstevatn will only be controlled through the passive spillway. Recommencement of operations lowers this risk during the life of the operations, but a flood risk assessment is to be undertaken to confirm the potential risk for flooding from Førstevatn post-closure of the mine.

6.4 Climate Change and Energy

6.4.1 Baseline Conditions

6.4.1.1 Climate Change

It is predicted that by the end of 2100, Norway will show and annual temperature increase of 4.5°C and an annual precipitation increase of 18% with an increase in the frequency and magnitude of heavy rainfall events and floods. Snowmelt related floods will decrease in magnitude and frequency, and snow coverage in low lying areas will be near non-existent. Areas in northern latitudes are expected to experience the most extreme warming because of climate change.

In the Finnmark region observations have shown that temperatures have been increasing, which are supported by the future modelled predictions. Similarly annual precipitation is also increasing. Snow coverage, as part of precipitation, is also expected to experience changing trends compared to existing levels. Snow seasons will remain shorter at the coast compared to inland areas due to the variations in trends for temperature between the two areas. Drifting snow may also cause variations in snow coverage. Coastal regions are expected to experience more storm events than inland areas, meaning the likelihood of snow drifts occurring will increase.

6.4.1.2 Energy Supply and Fuel

Power is supplied to the Project via an existing 22 kV powerline owned by the local grid owner, Statnet. All power purchased by the Project currently is sourced from hydropower derived from hydropower stations located on the River Pasvik. The regional power supply network also includes a smaller backup transmission line from Finland which is sourced mainly from nuclear power; however, this is not currently used by the Project.

Although the current energy requirements for the Project are secured, further requirements would be constrained by additional supply to the region. Statnet is planning a new 420 kV powerline across the Finnmark plateau, this development has however been met by objections and the Norwegian Water Resources and Energy Directorate (NVE) has introduced new requirements for substantially more comprehensive environmental impact assessments. It is estimated that the new line will only be in place in 2034.

The Project will initially operate with a traditional diesel haulage fleet as well as diesel locomotives. Alternative fuels are being considered for haul trucks and mining equipment, as described in Section 5.5 and discussed further below.

6.4.2 Impact Assessment and Mitigation Measures

6.4.2.1 Greenhouse Gas Emissions

SYD has developed a detailed Lifecycle Assessment to assess the greenhouse gas emissions (GHG) for the operating Project. The total GHG emissions for the Project are estimated to be 709,550 kg CO2eq based on the average yearly emissions occurring over the 25-year life of the mine, which corresponds to 28.5 kg CO_2eq/tonne of iron ore concentrate. The use of diesel for the mining fleet and the processing plant are the most significant contributors to these emissions.

Options to reduce emissions include the electrification of the vehicle fleet and train, use of HVO100 (hydrotreated vegetable oil) in vehicles and the train and using a nitrogen free alternative to conventional explosives. The position of the new primary crusher has also already been optimised to reduce haulage distances, reducing fuel consumption and associated emissions.

The option of electrification of the vehicle fleet is constrained by future power supply to the mine. However, the feasibility of the HVO alternative is being considered. This option will reduce the fossil carbon emissions by 49%. In addition to relocating the primary crusher and converting to electricity or HVO100, the use of nitrogen free explosives, which have lower CO_2 emissions, will contribute with an additional 13% reduction.

SYD is committed to further evaluate its practices, implement GHG accounting in accordance with the Greenhouse Gas Protocol and promote decarbonisation strategies, with a long term ambition of being fully electrified.

6.4.2.2 Climate Change Risks

Climate change can pose physical risks to the Project if not planned for and adequately managed. Such risks could result from increased precipitation, increased flooding, extreme temperatures, increased freeze-thaw cycles resulting in issues *inter alia* water logging, ground instability, damage to infrastructure, increased wear and tear, reduced water availability. To fully understand the magnitude and extent of the risks, SYD is to undertake a comprehensive risk assessment to determine the impact of climate change on the Project. This needs to consider the robustness of the Project in terms of forecasted climate change over the lifetime of the Project as well as and additional vulnerability of communities as a result of changes.

6.4.2.3 Energy Efficiency

In accordance with the requirements of the environmental permit, SYD must have a system for continuous assessment of measures that can be implemented to achieve the most energy-efficient production and operation. The system for energy management must be included in the internal control and must comply with the principles and methods specified in the Norwegian standard for energy management.

The Project will undertake energy mapping and develop an energy management plan. This will aim to identify opportunities for the adoption of energy efficiency measures and heat recycling and a plan to include these where practicable.

6.5 Air Quality

6.5.1 Baseline Conditions

Air quality in Sør-Varanger Municipality reflects a subarctic environment with low background pollutant levels. Background data collected in 2020, indicate baseline annual averages particulate matter (PM_{10} and $PM_{2.5}$[3]) are well below Norwegian and EU limits. Sulphur dioxide concentrations have improved significantly following the closure of the smelter in Nikel in December 2020.

However, the existing disturbed footprint from historic mining, including 23 km^2 of exposed pit surfaces and 42 million cubic metres of waste rock material, present an existing substantial source of dust.

Wind patterns vary seasonally, with prevailing directions from the south and southwest, influencing dispersion towards nearby communities. Sensitive air quality receptors, particularly for dust dispersion include Kirkenes town, located near the process plant, and Bjørnevatn village adjacent to mine pits and waste rock dumps. Cabins and reindeer pastures also lie within the broader zone of influence.

6.5.2 Impact Assessment and Mitigation Measures

6.5.2.1 Increased Dust Deposition and Particulate Matter

Dust emissions from crushers, cobbing plants, erosion from exposed surfaces (such as WRDs), materials handling, rail transport and vehicle movement on unpaved may result in increased levels of particulate matter in Kirkenes, Bjørnevatn and at the nearby cabins. Fallout dust may also be experienced in areas outside the boundary of the Mine Concession Area, particularly where mining activities and where WRDs are located within proximity to the boundary. Fallout dust may also affect reindeer pastures, reducing forage quality and palatability.

The magnitude and extent of the impact is dependent on several factors (wind speed and direction, particle size, moisture content, number of vehicle movements etc). The impacts must thus be confirmed through air quality dispersion modelling which will also serve to identify key sources to be managed.

The following dust management measures are currently planned for the Project:

[3] PM_{10} and $PM_{2.5}$ are types of particulate matter (PM). PM_{10} are 10 micrometres or smaller while $PM_{2.5}$ are 2.5 micrometres or smaller and are used as indicators of health risks to communities. $PM_{2.5}$ can penetrate into the lungs and bloodstream, causing respiratory and cardiovascular issues, whereas PM_{10} often gets trapped in the throat and nose.

- Dust extraction systems are installed in the cobbing plant and crusher buildings.
- The fine crusher plant includes a bag filter system.
- At the cobbing plant, a cyclone is used to separate the dust, and the material is mixed with the cobbing rejects.
- A chemical dust suppressant will be applied if needed to the top of the fine crushed ore in the train wagons. This is planned for Phase 2 when all crushing takes place at the mine site hence smaller fractions are transported on the train. It has not considered necessary in Phase 1.
- Wet suppression with salt is planned for active haul roads.
- The new crusher station at the mine site: primary, secondary, and tertiary crushers must be in a closed circuit with screens.

The environmental permit obliges the Project to collect and recirculate dust from crushing and separation processes. Dust abatement is also to be included in engineering design for the new crusher buildings for Phase 2. This may include wet and chemical suppression during materials handling as well as dust extraction system to remove and collect the dust from buildings. Measures must also be implemented to reduce dust emissions resulting from materials handling, particularly at transfer points at the process plant where material is subjected to loading/unloading or moved from once section to the next.

It is expected that the erosion of exposed surfaces, particularly unvegetated WRD slopes and pit areas, are likely to be a significant source of dust. The current closure plan only provides for the rehabilitation of the northern face of the Nordtippen and Museumtippen WRDs for aesthetic reasons. However, if erosion of WRD surfaces is found to be a major source of windblown dust, additional areas may need to be rehabilitated, including the establishment of vegetation to manage these sources. The limited availability of topsoil to support vegetation growth may hinder the implementation of this mitigation measure.

An Air Quality Management and Monitoring Plan will formalise these measures, supported by real-time particulate monitoring and periodic fallout dust monitoring at key receptor locations.

6.5.2.2 Occupational Exposure to Silica Dust

Occupational exposure to respirable crystalline silica poses a major health risk for mine workers and requires stringent controls. The Occupational Health and Safety Management System will provide for the assessment of exposure risks to respirable crystalline silica followed by implementation of measures to reduce silica exposure where necessary. The objective is to ensure compliance with the national occupational health exposure limit. Training and the provision of appropriate Personal Protective Equipment will be provided to personnel working in areas where there is a risk of exposure. There will also be targeted health surveillance for employees exposed to silica dust.

6.6 Noise and Vibrations

6.6.1 Baseline Conditions

Noise measurements conducted in the absence of mining operations in 2009 and again in 2019, showed noise levels typical for urban areas in Kirkenes and Bjørnevatn, primarily influenced by road traffic and natural sounds. A noise impact assessment was conducted by Nitro Consult in 2025. The assessment looked at the plans for the Project together with the previous noise measurements and noise data on typical equipment to be used in the Project.

Nitro Consult also undertook a vibration risk survey in 2025. The assessment considered 223 buildings within 1,000 m of planned pits, including 219 residences and two protected heritage structures. World War II memorials, the Rørbua (old mine change house) and 1944 Bjørnevatn Tunnel, are located near Pit 1 (see Section 6.10). These nearby buildings and structures exhibit varying sensitivity, with the heritage sites classified as high-risk of damage due to vibrations in accordance with Norwegian standards.

6.6.2 Impact Assessment and Mitigation

6.6.2.1 Noise Disturbance

Noise dispersion modelling undertaken by Nitro Consult as part of the 2025 noise impact assessment indicates that noise levels resulting from the planned processing and mining operations may exceed the permit limits at certain locations, particularly near the processing plant and mining pits.

The assessment predicts that noise levels may be exceeded in residential areas adjacent to the in Kirkenes processing plant by up to 5 dB(A)[4] on Saturdays, Sundays, and holidays, particularly due to railway transport within the process plant area. No noise disturbance due to rail transport from the Mine Concession Area to the process plant is however predicted.

The community around Bjørnevatn and nearby cottages south of Bjørnevatn could be affected by operations related to activities at WRDs within the Mining Concession Area. The noise restrictions of $Lden$ = 50 $dB(A)$ for Saturdays, Sundays and holidays are exceeded by 2 - dB(A) by 5 dB(A) in these areas. Activities at the WRDs are considered to the most dominant noise source.

Nitro Consult recommended that, given the conservative nature of the modelling, noise disturbances should be confirmed through robust monitoring. Appropriate mitigation strategies should be implemented based on the outcomes of the monitoring. The Feedback and Grievance Mechanism will also be integral for identifying and monitoring noise disturbances.

6.6.2.2 Structural Damage due to Vibrations

Based on the risk analysis undertaken by Nitro Consult in 2025, the planned blasting activities will result in an exceedance in the Norwegian vibration standard at residences closer than 560 m from blasting. There is thus a potential risk of damage to nearby residences in Bjørnevatn due to blasting within Pit 1. Some cottages occur within 560 m of Pit 7 and Pit 8 and are therefore also at risk. The blasting regime will need to be altered (by reducing the charge) in the western sections of these pits to ensure the protection of nearby structures.

Blasting activities in Pit 1 also pose a high risk to the protected Rørbua and 1944 Bjørnevatn Tunnel, if not mitigated. The relevance of these historical sites is discussed further in Section 6.10.2.1. The blasting regime will need to be specifically managed (reducing the charge for ‘softer’ blasting) to allow for controlled blasting near these structures.

The use of deck charging is likely the simplest and most effective method to achieve the required blasting control. To preserve the tunnel and ensure its stability, the current condition of the tunnel should be inspected, and the existing reinforcement documented. If the inspection reveals any loose rocks or potential stability issues, it is recommended that rock bolts are installed to prevent larger rockfalls in the tunnel. If blasting is carried out within 50 m from the tunnel, an inspection should be undertaken both before and after blasting. If

[4] dB(A) is a weighted decibel (measure of sound level)

there is a change in the integrity of the tunnel, blasting parameters may need to be adjusted, to prevent damage to the rock mass near the tunnel.

6.6.2.3 Structural Damage and Safety Risks associated with Fly Rock

Blasting activities inherently involve the risk of fly rock. Fly rock could result in damage to infrastructure and present a safety risk to persons. Based on the risk analysis conducted there is a risk of fly rock at residences in Bjørnevatn near Pits 1 and cabins near Pits 5, 7 and 8, when blasting moves closer to the residences. The impact will be significant if blasting is not controlled in these pits. The area of impact is dependent on the charge used when blasting and impacts to infrastructures can be managed through directional blasting, increased stemming, and pre-blast risk assessments. Communication of blasting schedules to local communities will help minimise disturbance and maintain trust. A safety zone must be calculated prior to blasting to ensure persons and infrastructure are protected.

6.7 Waste and Material Assets

6.7.1 Baseline Conditions

The impact assessment has considered the effect that the Project may have on existing infrastructure, utilities and facilities. In particular those required for the management of waste and for the supply of resources.

The Project area has a long history of mining, leaving an extensive disturbed footprint and established infrastructure. Five existing WRDs provide storage capacity, with planned expansions to accommodate approximately 470 million tonnes of waste rock over the life of mine. Tailings have historically been disposed of in Bøkfjorden via a subsea pipeline, and this method will continue under the current permit, which limits disposal to 4 million tonnes per year.

Non-mineral waste streams include metals, plastics, rubber, and hazardous materials such as oils and chemicals, managed through licensed contractors.

Raw water is sourced from the Kirkenes Lakes system, requiring upgrades to meet operational demands. Power is supplied via a 22 kV grid connection, with Phase 2 requiring additional capacity.

Fuel storage, effluent treatment, and transport infrastructure are in place, with minor upgrades planned.

Baseline conditions indicate sufficient capacity of existing infrastructure, facilities and supply of resources for the implementation of the Project, although ongoing monitoring and adaptive management will be essential to address future changes in resource needs.

6.7.2 Impact Assessment and Mitigation

6.7.2.1 Hazardous and Non-Hazardous Waste Management

Hazardous and non-hazardous waste is expected to be generated through all phases of the Project from construction to post-closure. It will arise due to standard operations during each phase. The most common non-hazardous waste types expected during daily operations include metals, wood, paper, cardboard, plastics, electronic and electrical waste including cables, wires, and LED-modules. In addition, significant volumes of rubber waste will be generated during maintenance and replacement of tyres, conveyor belts, mill liners, and pump linings. A specific handling and recovery plan will be developed for rubber waste, including evaluation of recycling or material recovery options where feasible.

Hazardous waste types include waste oils and oil filters, oil-contaminated materials such as rags and absorbents, residual chemicals, solvents, paints, and spray cans, batteries, and fluorescent tubes.

In connection with any future demolition (only the existing primary crusher is currently scheduled to be removed) or renovation activities, additional waste types requiring special handling and treatment may occur. This includes:

- PCB-containing waste, such as old sealants, paints, window insulation units, or electrical components
- Asbestos-containing materials, which may be present in insulation, wall panels, pipe cladding, or roof materials
- Treated wood, including pressure-impregnated timber or painted surfaces that cannot be recycled as clean wood.

The waste types above are classified as hazardous and must be managed in accordance with national regulations for hazardous waste.

In the construction and the operational phases, dedicated waste stations will be established at the processing areas in Kirkenes, and at the mine site in Bjørnevatn to support systematic waste sorting and handling. Waste management plans will be updated to address the specific waste streams generated during operations, with an emphasis on re-using or recycling waste whenever feasible.

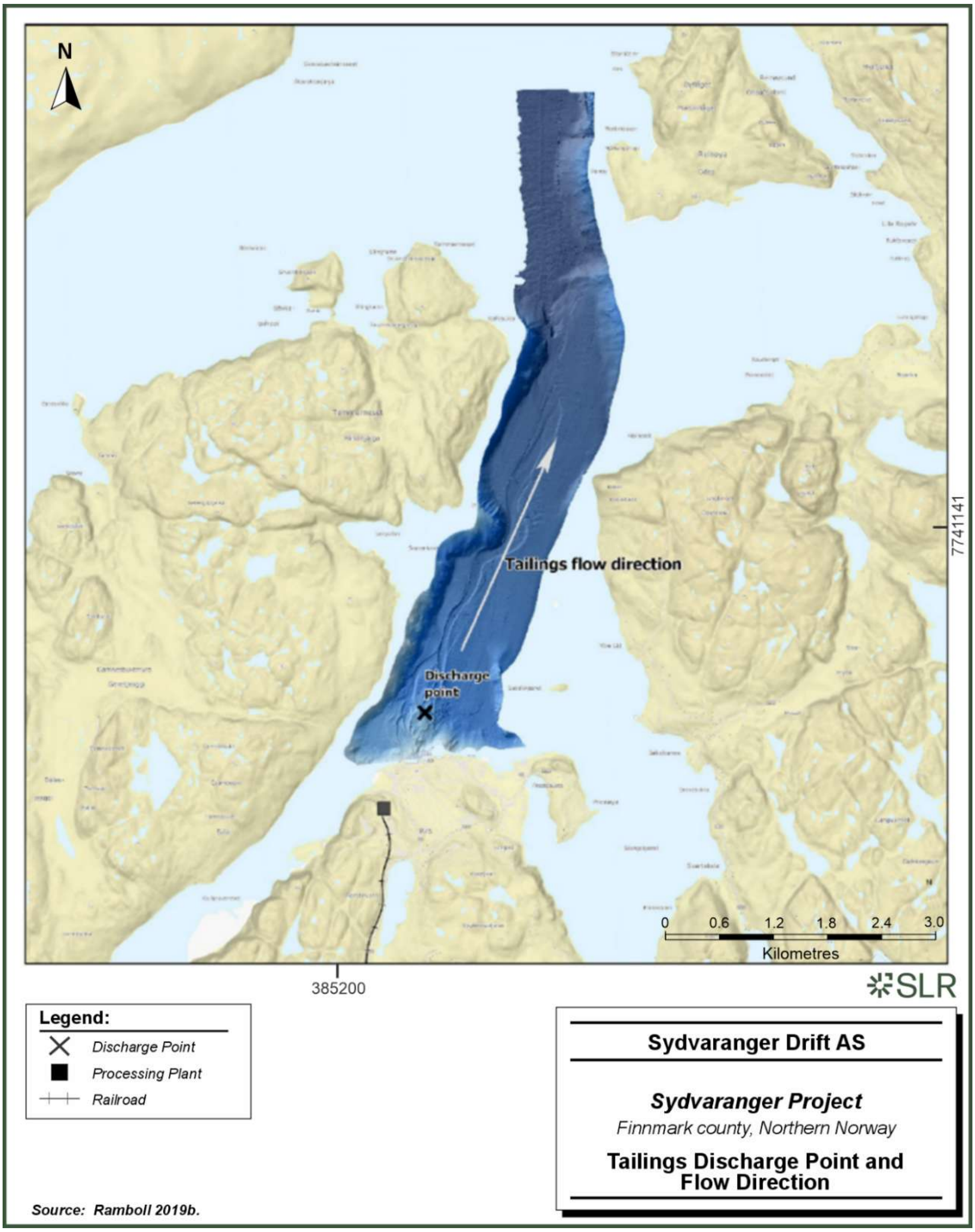
SYD has existing agreements with licenced contractors for the transport, recycling, treatment and final disposal of waste. The environmental permit allows for the collection and temporary storage of up to 100 m³ of oil-contaminated material for a maximum of 12 months. SYD will continuously monitor waste streams and industry advancements to implement measures that minimise waste generation.

6.7.2.2 Mine Waste Management

Geochemical waste characterisation has shown that the waste rock is inert and does not represent a risk category and the WRDs do not require any specific lining or capping. The Mine Concession Area, where WRDs are located is an existing industrial area with a long-standing history of mining. It is thus not expected that there will be a significant impact on land quality as a result of the Project.

The Project proposes to use the subsea tailings disposal site in the Bøkfjorden (see Figure 6-7). Tailings will be discharged directly into the 100-150 m channel in Bøkfjorden below the oxygenated (shallow) zone through a pipe which is ca. 450 m from the shore at a depth of ca. 30 m. At this location, the fjord has a water depth of approximately 40 m.

Figure 6-7: Tailings Discharge Point and Flow Direction



Other potential tailings storage methods have been considered as described in Section 5.5. The environmental permit stipulates a requirement for continuous improvement, therefore, while existing practices for disposal are acceptable, there must be an initiative to allow for the identification of opportunities to do better (i.e. apply the best available techniques which will reduce an impact to the lowest achievable impact rather than the lowest impact that is acceptable).

6.7.2.3 Raw Water Supply

The raw water supply for the Project will be sourced from the lakes known as the 'Kirkenes Lakes', including Prestevatn, Førstevatn, Andrevatn and Tredjevatn. The baseline supply system will be upgraded to allow for full implementation of the Project in line with the permitted maximum and minimum intake levels.

6.7.2.4 Power Supply

Sydvaranger has a valid grid connection agreement with the local grid owner, ensuring an available capacity of 24 MW throughout the life of the mine. Electrical works modifications will be required only for Phase 2 (years 2030 – 2050) for the addition of new equipment to feed the new loads associated with mine site crushing and Kirkenes Process Plant upgrades.

- While the Electricity Networks study indicates a shortfall in available capacity in Phase 1, it has been noted that the study makes use of fixed load factors without considerations for the process logic in-place on-site. Further analysis is ongoing to better understand the load factor simulations.
- The power load will be monitored during Phase 1 and simulations for Phase 2 will be adjusted to represent actual loads. If any loads are exceeding both the existing and any new additions to the supply limits, a backup generator will be sourced.

The Project is in ongoing discussions with the grid owner and state grid to ensure that the required load capacity will be met. An application for exceeding loads has been submitted to the state grid and is currently under review.

6.8 Social

6.8.1 Baseline Conditions

Sør-Varanger Municipality, located in Norway's far northeast, is characterised by a dispersed population of 9,983 residents, with 80% concentrated in Kirkenes and surrounding communities such as Bjørnevatn, Sandnes, and Hesseng. The demographic profile reveals an ageing population, a shrinking labour force, and recent arrivals of refugees, primarily from Ukraine, which have helped stabilise population decline but introduced integration challenges.

Healthcare, education, and emergency services are well-established; however, these systems are under pressure due to demographic shifts and limited municipal resources. The ongoing war in Ukraine, combined with sanctions on Russia, has brought significant disruption to the local population. Many businesses have shut down, the flow of Russian labour has stopped, and cross-border trade has come to a standstill. As a result, communities are facing growing uncertainty about their future.

Housing availability is a persistent concern, particularly for large families, single-person households, and vulnerable groups such as the elderly and persons with disabilities. The economy is service-oriented, dominated by public administration, healthcare, and defence, with limited industrial diversity following the mine's closure in 2015.

While the municipality benefits from cultural vibrancy and recreational opportunities, its geographic isolation and harsh climate amplify challenges related to transport, emergency response, and access to specialised services.

Vulnerability indicators highlight above-average disability prevalence, reliance on care services, and socio-economic risks among single-parent households and refugee families, underscoring the need for tailored mitigation strategies.

6.8.2 Impact Assessment and Mitigation

6.8.2.1 Increased Economic Investment and Development

The Project is expected to make a substantial contribution to both the Norwegian and regional economies over its life. At the national level, the Project will generate foreign exchange earnings through exports, contribute corporate taxes, provide revenue to state landowners from mineral extraction forming a recurring and long-term revenue stream.

Regionally, economic benefits will be concentrated in wages, procurement from local suppliers and businesses, and strategic infrastructure upgrades that enhance connectivity and unlock secondary economic activity.

Locally, the most direct impacts include a positive change away from persistent business closures and job losses towards increased and sustained job creation, improved household income, and increased business activity.

Direct employment will also broaden the tax base via employee income tax and social contributions that will benefit the local municipality and the services that it provides. In addition, retained wages spent in the community will support retail, services, housing, and public budgets through local taxation, creating visible economic uplift in a relatively depressed economy. Over and above, targeted community investments, such as infrastructure, vocational training, and community development funds, are expected to address locally identified priorities and strengthen the social licence to operate.

6.8.2.2 Direct Employment Opportunities

It is estimated that the reopening of the mine will lead to the creation of approximately 450 direct jobs. A ramp up plan for recruitment of staff will be established, however, it is expected that initially many employees will be fly-in fly-out and drive-in and drive-out due to a shortage of persons with the necessary technical skills and experience in the local community to fill all the available positions. The objective is however that most persons working at the Project will be local and measures will be in place to achieve this. Where skills are not available locally, persons will be supported to move to the area to work at the mine and local persons will also be trained and upskilled to fill the positions. Contractors will be obliged to also employ local persons.

There is college, a vocational school with mine related education, and a trainee programme for graduates from the universities with mining related professions provided by the NOR Mining Association, all of which will strengthen the opportunity for local employment. Further it is expected that many roles will require training and development in trainee programmes and similar which will benefit the area in the long-run.

SYD will work to strengthen local capacity building and support sustainable economic benefits for local communities. The work will be carried out through local employment and skill development, support for local suppliers and businesses, youth and education initiatives, transparent engagement and reporting, and participation in regional development initiatives. Such measures will serve to further enhance the local employment benefits of the Project.

6.8.2.3 Local Procurement and Indirect Employment Opportunities

Indirect employment will arise from the Project's procurement of goods and services, stimulating activity across various supplier industries, including construction, logistics, equipment maintenance, and catering. Induced employment will also emerge in sectors like early childhood education, retail, hospitality, transportation, property development, and real estate, as workers, both direct and indirect, spend their incomes within the local and regional economy. This spending is anticipated to increase demand for consumer goods, housing, and services, thereby supporting and revitalising small businesses and encouraging local entrepreneurship.

The integration of local and non-local workers into nearby communities may also catalyse broader municipal development, including infrastructure upgrades, improved public services, and expanded housing markets, contributing to long-term regional growth. These economic benefits are expected to be sustained throughout the life of the mine.

6.8.2.4 Increased Pressure on Housing, Infrastructure and Services

The Project and the associated injection into the local economy is anticipated to attract individuals beyond the direct workforce, including family members and job seekers drawn by perceived economic opportunities. While influx itself is not considered an impact, the resulting in-migration can exert short-term pressure on local infrastructure, public services, and community systems while the local municipality adapts to new demand.

Key areas likely to be affected include the availability of suitable housing, early years education facilities, healthcare services particularly for women and children, and transportation networks. In the short-term, increased demand may lead to longer waiting times or the need to travel further to access them, reduced service quality, and heightened competition for limited resources. However, evidence from past operations suggests that both the municipal health services and the hospital have managed these challenges effectively.

The influx of skilled workers and contractors, combined with increased household income from approximately 450 direct and several hundred indirect jobs, could significantly increase demand for housing and short-term accommodation. Without the timely expansion of housing stock or the utilisation of underused properties, rental and house prices may rise noticeably due to increased demand, affecting both mine employees and long-term residents.

SYD will also be developing new worker's accommodation and upgrade existing barracks, which will serve to reduce pressure on housing in the short-term during the initial construction and operational activities. A Housing and Accommodation Management Plan is to be developed to mitigate potential social impacts associated with the influx of the workforce and housing market pressures during construction and operation. SYD will also liaise with property developers as part of the Stakeholder Engagement Plan. This together with ongoing engagement with the Sør-Varanger Municipality will allow future development plans to be co-ordinated with the Project.

SYD is making continuous improvements to its Stakeholder Engagement Plan and Community-level Feedback and Grievance Mechanisms that serve to address specific individual/ group/community grievances, reduce Project risk, and manage expectations.

6.8.2.5 Reduced Amenity Value to Local Residents and Tourists

The Project may lead to a reduction in the amenity value of the surrounding area, affecting both residents and tourists who use the landscape and public spaces for recreation, leisure, and cultural experiences. Amenity value refers to qualities such as visual aesthetics, tranquillity, accessibility, and environmental quality that contribute to the attractiveness and enjoyment of a location.

Increased noise, dust, traffic, and visual intrusion from heavy machinery, temporary infrastructure, and construction-related movements may detract from the area's natural and scenic appeal. These disturbances could negatively impact outdoor activities, nature-based tourism, and cultural heritage experiences, reducing the perceived quality of life for nearby communities.

Beyond physical and environmental changes, the Project may trigger psychological stress and anxiety among affected communities. These concerns often arise from changes that alter the character of the area and affect people's sense of place and well-being.

Measures discussed in earlier section to manage and monitor noise, dust and water quality will serve to reduce impacts. Landscape and visual impacts are also addressed (see Section 6.11.2). Further to this, as mentioned above ongoing engagement with stakeholders (Stakeholder Engagement Plan) and a mechanism to address grievances are integral to addressing issues (Grievance Management Mechanism) and concerns.

6.8.2.6 Increased Risk to Communities due to Accidents, Incidents and Exposure of Communities to Environmental Hazards

Mining projects inherently carry the risk of accidents that can have serious consequences for human safety, environmental integrity, and operational continuity. Incidents may include, for example chemical spills, tailings spills, fires, explosions, vehicle accidents, rail derailments.

Routine operations can also present hazards including blasting, the use of heavy equipment, and the demolition of asbestos-containing buildings, present ongoing safety risks. Safety hazards are further amplified by poor equipment maintenance, inadequate access control, and insufficient separation between operational zones and public areas. In such cases community members may be exposed to risks such as crush injuries, falls, or unintentional entry into hazardous zones.

Mining activities will generate multiple environmental hazards that pose risks to human health and the surrounding natural environment. Such hazards including dust, noise, fly rock, and discharges to water which have been discussed in the earlier sections of this document. The increased community exposure of the community to environmental hazards is however expected to be low.

SYD will develop a Community Health and Safety Management Plan. The objective of this plan is to prevent, minimise, and manage risks to community health and safety arising from mining activities. The plan ensures proactive engagement, monitoring, and emergency preparedness across construction, operational readiness, operation, and closure phases.

There are several measures in place to reduce the occurrence and manage accidents and incidents. These include SYD Occupational Health and Safety Management System, the Municipal Emergency Preparedness Plan and the SYD Mine Safety Plan. These will be supported by the development of the Community Health and Safety Management Plan, the Emergency Response and Crisis Management Plan and improvements to the SYD OHS Management System. In addition, the Stakeholder Engagement Plan includes coordination with local emergency services and actively participating in various forums aimed at developing and strengthening the community.

6.8.2.7 Increased Risk of to the Workforce to Accidents, Injuries and Exposure to Environmental Hazards

Mining exposes workers to a mix of physical, environmental, mechanical and human-factor hazards. Slips, trips and falls remain some of the most frequent incidents, especially around uneven benches, wet or unstable ground, and cluttered work areas. Working at height adds another layer of risk, with falls occurring from conveyor walkways, plant platforms, or temporary scaffolding if guardrails or harness systems are not properly maintained. Heavy mobile equipment is a major source of serious injury; haul trucks, loaders, and dozers can collide with light vehicles or personnel, and poor visibility around large machines increases the risk of run-overs. Fixed plant, including crushers, screens, mills and conveyor systems, introduces entanglement and pinch-point hazards, particularly during maintenance or when lock-out procedures are not followed. As discussed in Section 6.5.2.2, there is also health risks associated with the exposure to silica dust.

While SYD currently has an Occupational Health and Safety Management System in place that is suitable for the period during care and maintenance, a comprehensive Occupational Health and Safety System is in development aimed at addressing the future health safety of all persons that will work on the Project.

6.9 Indigenous Peoples

6.9.1 Baseline Conditions

The Sámi presence in Sør-Varanger is historically rooted, with Sámi communities maintaining unique cultural traditions and language. Today, the Sámi population is socially integrated, with members living in permanent residences and combining traditional activities with modern employment.

Reindeer husbandry remains the only traditional livelihood of significant economic importance. The Reindeer Herding District 5A/C Pasvik (RHD 5A/C) comprising two *siidas*[5] and approximately 28 registered members utilise a migration corridor that traverses the Mine Concession Area, making them uniquely sensitive to land-use changes.

Seasonal migration routes and grazing areas are essential for herd sustainability, yet these landscapes face increasing pressure from cumulative land-use changes, including infrastructure development and climate variability. Studies confirm that reindeer are highly sensitive to industrial disturbance, particularly noise and physical barriers, which can disrupt migration patterns and grazing behaviour.

Following a series of meetings, Sydvaranger Eiendom (Property) and RHD 5A/C concluded an agreement in 2018. Provisions of this Agreement also apply to SYD. The agreement ensures the arrangement of safe passage enabling reindeer to cross the Mine Concession Area, as well as the cooperation between SYD and RHD 5A/C.

While these communities are socially integrated within the Sør-Varanger municipality, their cultural identity and livelihoods remain closely tied to reindeer husbandry. Cultural erosion is an ongoing concern, with the Sámi language classified as severely endangered and traditional practices under threat from socio-economic pressures. These factors underscore the vulnerability of Sámi cultural and livelihood systems, making them highly sensitive receptors in the context of mining operations.

[5] *Siida* (or sometimes '*sijdd*') is a traditional Sámi community consisting of several families who live in and collectively use and control a specific geographical area. The term refers to both the members and the area, as they are considered synonymous. Various members of the *siida* are referred to as the '*njauddâmsamene*' and '*paččjokksamene*'.

6.9.2 Impact Assessment and Mitigation

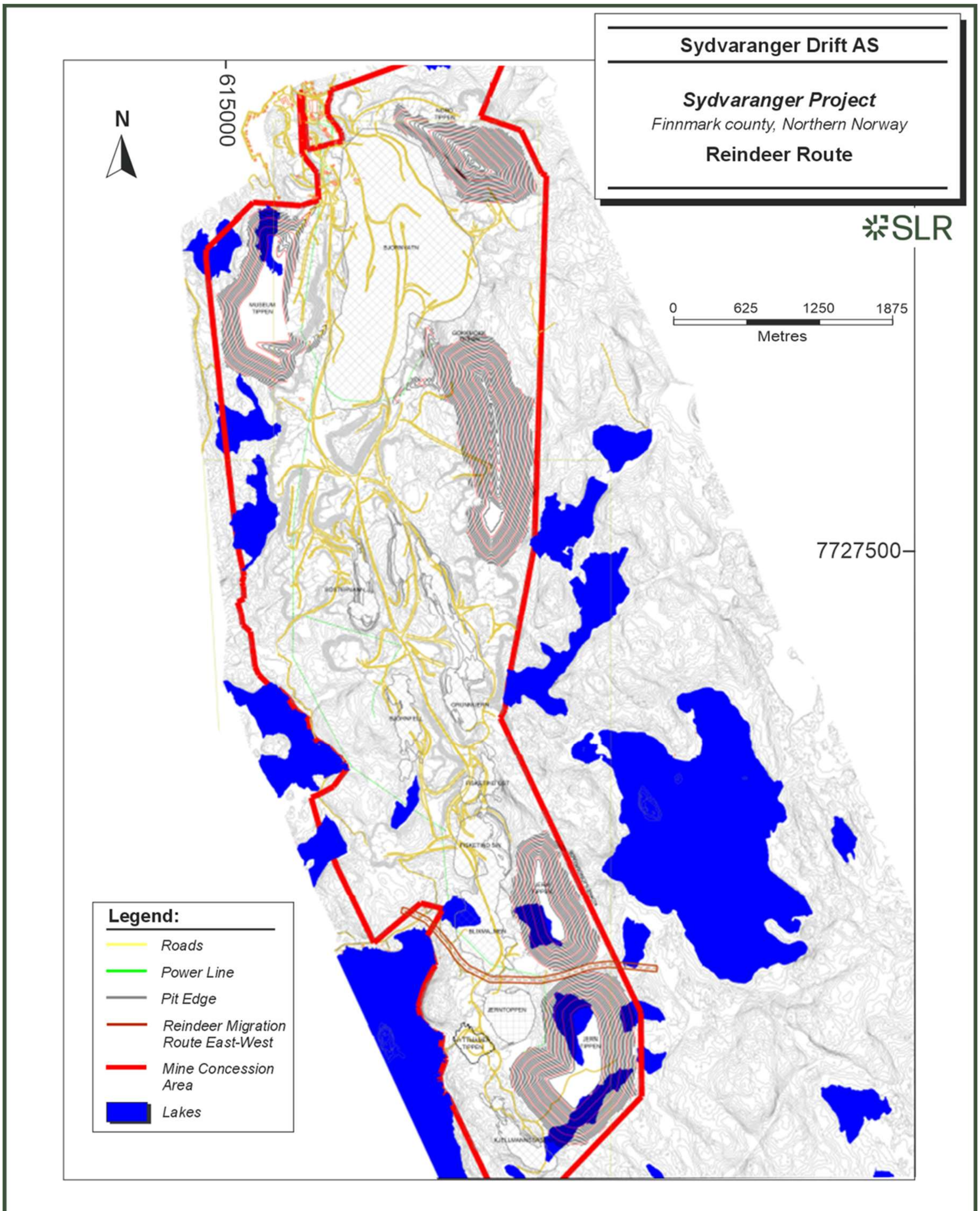
6.9.2.1 Barriers to Reindeer Migration

Historical mining and future expansions, particularly development of WRDs create barriers hindering the free movement of reindeer and other wildlife across the landscape, particularly restricting east–west migration routes. The development new WRDs and the expansion of existing ones is a key concern of the RHD 5 A/C.

The SYD WRD management strategy incorporates feedback from local reindeer herders. A key mitigation measure involves SYD's commitment to maintaining an open migration corridor across the mine, in the vicinity of Jern Tippen WRDs (see Figure 6.8). A route has been identified by SYD and agreed upon with RHD 5A/C for use during project operations. It is the only place where the reindeer can pass from east to west towards the winter grazing areas. This corridor will remain free of physical barriers, year-round, to ensure continued access. The agreement specifically highlights the need to avoid using fences, as they pose a risk of harm to animals, either through entanglement in snow-covered fencing or injury caused by damaged components.

Additionally, no new WRD will be established, nor will existing ones be expanded on the southwestern side of the mine. This measure is specifically intended to protect a key natural migration route used by reindeer moving from Peskvann toward the south.

Figure 6.8: Waste Rock Dumps and Reindeer Path



Source: SYD 2025.

6.9.2.2 Disturbance of Sámi Reindeer Herding Practices

Mining operations at Sydvaranger will involve regular use of heavy machinery and controlled blasting, both of which can cause disturbance to reindeer and other wildlife in the area. Ore and waste rock will be fragmented using conventional open-pit drill-and-blast techniques, with an estimated frequency of three to four blasts per week, all conducted during daytime hours. In addition to blasting, the site will host continuous activity from diesel-hydraulic shovels, large-capacity haul trucks, rotary drills, bulldozers, and other support vehicles operating on dual haul roads. This will create a persistent level of noise and movement in the Mine Concession Area. Whilst these activities will also impact other receptors, particular attention is given to the impact on reindeer.

The RHD 5 A/C raised concerns regarding the height of the WRDs, noting that increased elevation will exacerbate the spread of noise from truck traffic and other operational activities beyond the Concession Area. Reindeer are likely to avoid areas that are noisy or subject to high activity. Furthermore, dust dispersion outside of the mining area could render their grazing areas unpalatable for consumption. Measures for the management of noise, dust and blasting impacts are discussed in previous chapters and are applicable here for reducing disturbances to reindeer herding practices.

Regular consultation with the RHD 5 A/C is required to assess the success of mitigation measures, particularly those related to reindeer herding Sámi. In accordance with the agreement entered with the RHD 5 A/C SYD is to consult with them on any new or updated activities. As agreed, regular meetings will take place.

6.9.2.3 Erosion of the Sámi Culture

The Sámi, in general, have experienced a long history of linguistic and cultural erosion, as evidenced in the baseline. This process has been influenced by national assimilation policies, border divisions, and industrial developments that disrupted traditional livelihoods and land use patterns. Sámi languages, which were once widely spoken, are now at risk of dying out, with fluency largely confined to older generations and a limited number of revitalisation initiatives. Cultural practices, including traditional livelihoods, crafts, and oral traditions, have similarly declined due to socio-economic pressures and reduced access to customary lands. Any further impact on the Sámi's way of life (e.g. changes in livelihoods and relationship to land) could lead to the further erosion of the Sámi culture.

While the historical drivers of cultural and linguistic loss extend beyond any single project, continued mining activities could reinforce existing vulnerabilities. The impact may occur in two ways: firstly, by attracting a range of 'outsiders' to the area through project-induced influx, the project can accelerate the 'modernisation' or erosion of local cultures. Minority cultures often find it increasingly difficult to preserve their language when school, media, and work environments favour more standardised languages (e.g., Norwegian or English). The second way is when a project reduces the ability to participate in cultural practices associated with land (e.g. reindeer herding). When access to these areas is restricted, activities associated with them become more difficult to sustain and may eventually cease. Any further reduction in opportunities for language use, cultural expression, or intergenerational transmission, either directly or indirectly through an erosion of traditional livelihoods, may constitute an adverse impact on the Sámi's intangible heritage.

Measures to minimise impacts on cultural reindeer herding practices are important for the maintenance of the local Sámi culture. Regular meetings are also key to identify impacts, issues and concerns and to maintain relationships with the local Sámi community. SYD is encouraged to embrace opportunities to assist such communities in maintaining their culture as part of corporate social responsibility initiatives.

6.10 Archaeology and Cultural Heritage

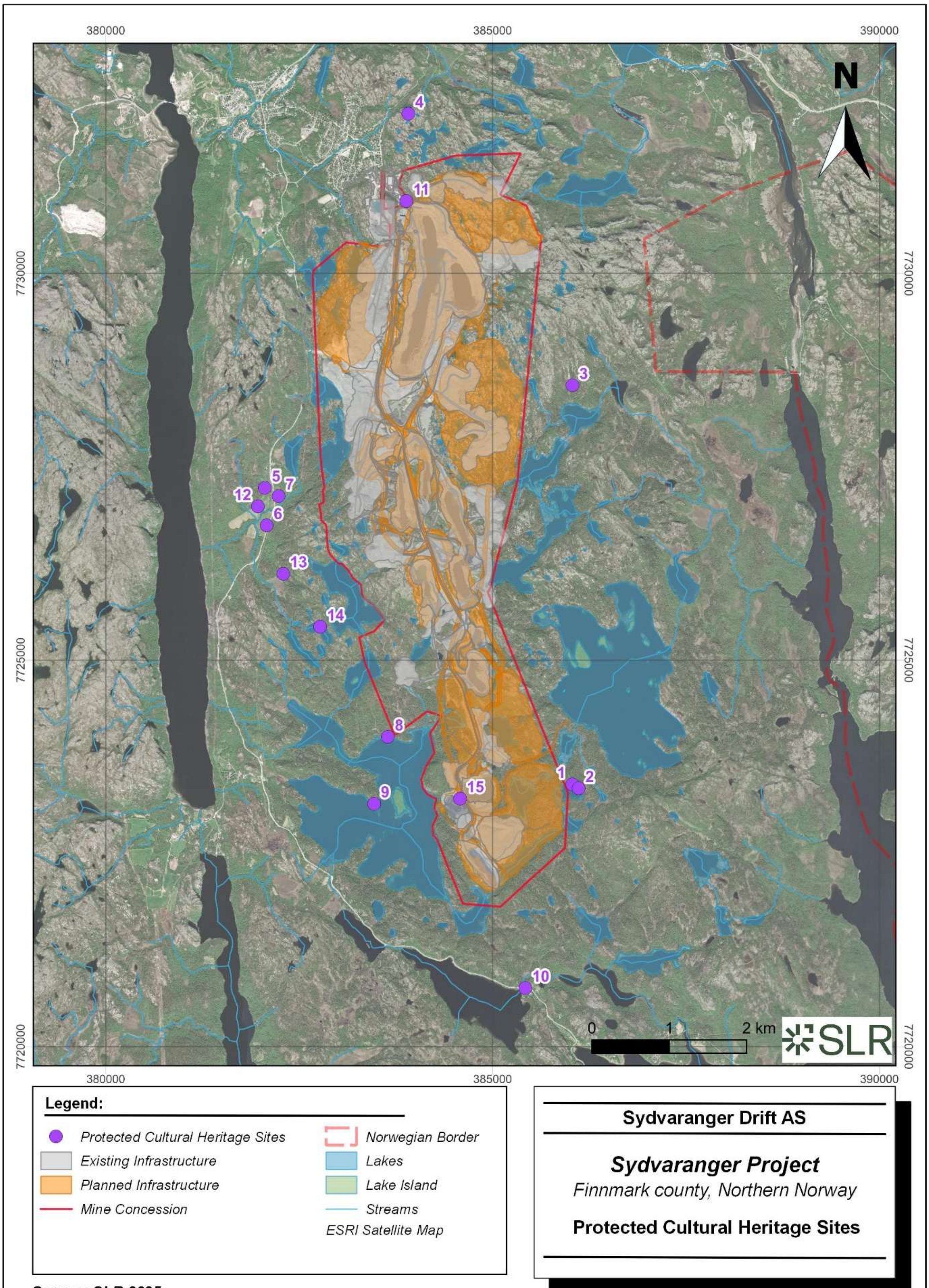
6.10.1 Baseline Conditions

The study area contains several protected heritage sites, including the Rørbua building and the 1944 Bjørnevatn Tunnel (see Section 6.6), both nationally protected due to their historical significance during World War II. These sites are located within the mine concession area and are integral to Norway's liberation history. The location of all protected sites is shown in Figure 6-9.

Additional heritage features include archaeological sites linked to Sámi traditions, such as bark harvesting marks and a historic firepit, as well as SEFRAK-listed farmhouses and cabins within 750 m from the Mine Concession Area boundary. While no sacred Sámi sites ('*seida'*) were identified within the Mine Concession Area, the protection of intangible heritage, particularly reindeer herding practices, is of high significance. Of particular importance is the fact that the Mine Concession Area is located within the summer grazing zone for Reindeer Herding District 5A/C, with migration routes crossing the mine footprint (this is discussed further in Section 6.9.2.1).

No sites of high archaeological potential or historic mine workings are known within the Mine Concession Area, but precautionary measures are required for chance finds during excavation.

Figure 6-9: Location of Protected Heritage Sites



Source: SLR 2025

6.10.2 Impact Assessment and Mitigation

6.10.2.1 Damage to War Memorials due to Blasting and Mining Activities

The proximity of the Rørbua and 1944 Bjørnevatn Tunnel to Pit 1 (Site 11, Figure 6-9), means that both sites are risk of damage due to vibrations resulting from blasting (Figure 6-10). There has already been encroachment on the area designated for the protection of the tunnel. The proximity of the tunnel is of key concern, as Pit 1 has already encroached on the area designated for the protection of the tunnel. Although future mining has specifically excluded the area to avoid further encroachment, the proximity of future expansion may still result in damage to both the sites and expansion of Pit 1 may result in damage to the tunnel if not carefully managed. Any impact to these protected structures would be considered major in significance.

Nitro Consult undertook an assessment to assess the risk on these structures because of blasting in Pit 1. The mitigation measures required to protect the sites from vibrations are discussed in Section 6.6.2.2. Heritage impacts will be managed and monitored through a Heritage Management Plan which specifically address the protection of these sites.

6.10.2.2 Disturbance of Sámi Heritage Sites due to Encroachment of Mining Activities

Two protected Sámi Heritage sites (Site 1 and Site 2, Figure 6-9) are located approximately 200 m from the Jern Tippen South WRD. These sites (trees with signs of bark removal) are listed as non-sacred but since they are nationally protected, they are to be safeguarded from damage. The development of the WRD will not alter the sites as they are located outside of the Mine Concession Area boundary but the development of the WRD may impact the heritage setting of the site because of changes to the landscape.

As discussed in Section 6.11.2.1, the establishment of vegetation on the WRDs, post-closure will serve to reduce landscape impacts which will also mitigate the impact on the heritage setting. The Heritage Management Plan is to include measures to ensure mine planners are aware of the site and precautions are taken to protect the site.

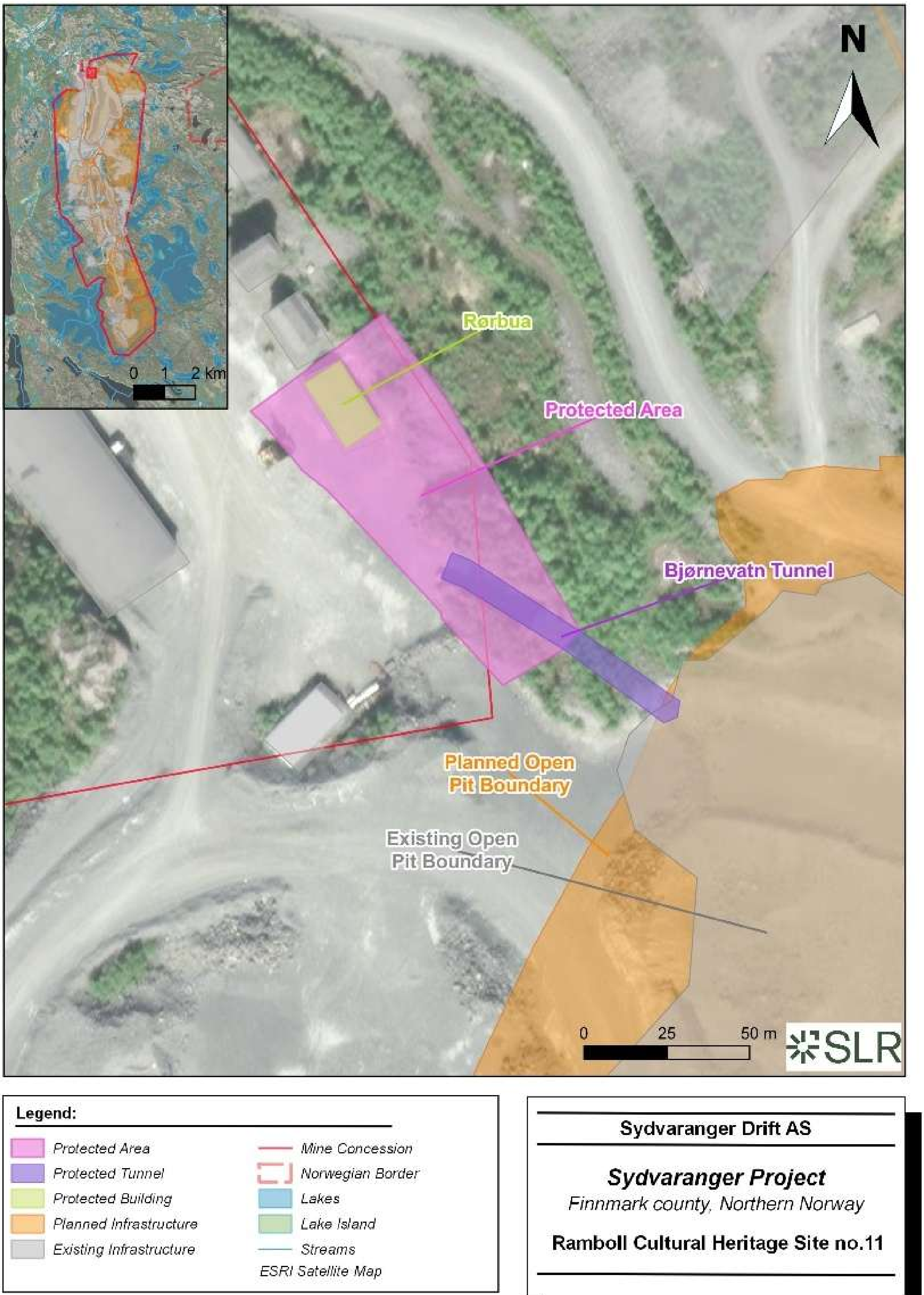
6.10.2.3 Damage to Protected Structures due to Blasting

Due to the proximity of protected Site 8 (a protected cabin) to Pit 7 (less than 800 m), there is a risk of damage to this site. This relates to the potential for the formation of structural cracks due to vibrations caused by blasting in Pit 7, as the vibration limits are likely to be exceeded. Measures to reduce the impact of vibrations are discussed in Section 6.6.2.2 and are applicable to this impact.

6.10.2.4 Accidental Disturbance of Heritage Artefacts by Mining Activities

As for all sites where excavations occur, there is a possibility that heritage artefacts may be unearthed during excavations undertaken for construction and mining activities. To avoid damage to any potential artefacts that may be unearthed, it is necessary to have a Chance-Find Procedure. This includes the actions to be taken should any material suspected of being of heritage importance be exposed during project activities. e The Chance-Find-Procedure will be implemented by SYD as part of the Heritage Management Plan.

Figure 6-10: Location of War Memorials relative to Mine Infrastructure



Source: SLR 2025

6.11 Landscape and Visual

6.11.1 Baseline Conditions

The Project is located within a sub-Arctic landscape shaped by a combination of natural processes and long-term anthropogenic activity, principally mining, which has been present in the area for more than 100 years. As a result, the receiving landscape is not wholly undeveloped but reflects an established balance between wilderness characteristics and industrial land use, particularly within and around the Mine Concession Area.

Three designated Norwegian landscape character regions occur within the study area. The Pasvik Landscape Region lies to the south and is characterised by gently undulating terrain, wide basins, lakes, wetlands and extensive forest cover, with land uses including forestry, dispersed settlement, reindeer husbandry and existing mining. The Fjords of Finnmark Landscape Region incorporates the northern part of the Mine Concession Area, Kirkenes, the process plant and port facilities, and includes fjord systems, smooth inland landforms, coastal hills and a concentration of settlements and infrastructure along transport routes. The Finnmark Plateau (Finnmarksvidda) Landscape Region occurs to the west within the wider area of influence and comprises broad, low-lying hills, extensive watercourses and sparse development; the Project does not physically extend into this region. The Mine Concession Area itself comprises a highly modified mining landscape, including historical open pits, existing WRD, haul roads and associated infrastructure. Despite its denuded and degraded condition, the mine forms part of the prevailing landscape context and contributes to local identity and sense of place.

Existing open pits typically occur below surrounding ground levels and are largely screened by landform and vegetation, limiting their influence on the wider landscape. In contrast, existing WRDs are the most visually prominent manmade landforms and are primarily located around the periphery of the Mine Concession Area. The visibility of the WRDs is frequently constrained, particularly within low lying settlements. More open views occur from elevated ground, lakeshores and parts of Road 8850, where mining features are typically experienced as background elements rather than dominant features. The process plant and port facilities in Kirkenes are visually prominent within the town but form part of a well-established urban industrial landscape where largescale infrastructure is characteristic.

6.11.2 Impacts and Mitigation

6.11.2.1 Changes to Landforms

During the operational stage of the Project, open pits will be excavated to depths of between 120 and 410 metres below ground level. As an inherent by product of this process, waste rock will be generated which will require storage elsewhere. SYD's current plan is to further develop 5 existing WRD (North Tippen, Gokkmokk Tippen, Jern Tippen North, Jern Tippen South and Museum Tippen) and expand these both laterally and horizontally. The percentage height increases upon existing scenarios for the 5 WRDs vary between 178% (Museum Tippen: current height 100 m vs proposed max height 178 m) and 1000% (Jern Tippen North: current height 20 m vs proposed max height 200 m). Owing to the significant height increases and barren nature of the WRDs, the impact on the landscape will be substantial.

Currently, rehabilitation involving the establishment of vegetation is only planned for the northern sides of both Museum Tippen and Nord Tippen (see Section 5.5). At present, it is unclear how much natural re-vegetation may naturally establish on the remaining areas of the WRDs. Additional mitigation measures including efforts to encourage natural re-vegetation (e.g. additional sourcing of topsoil) or planned planting would help to blend in the

WRD with the wider landscape which would help reduce the visual impact of the WRD. It is important to introduce planting and shades of green to continue to break up the view of the landscape in the Project area. Planting may not be required to fully cover the WRD, rather, planting may be beneficial even if it only targets areas of the WRD to encourage a breakup of the block grey colours of the WRD.

6.11.2.2 Impact on Views from Surrounding Communities

For some residents, particularly those near the communities of Steinli and Krokmyr, as well as the cabin residents in this area, the tangible visual changes arise from the partial intrusion of Jern Tippen South and Jern Tippen North's flat tops in the background view like a plateau which is unvegetated. The presence of the WRD introduces a new element within the wider rolling hill terrain, which does change the composition of the views. While there is evidence of existing WRD in the background, these are more sympathetic with the existing rolling hills landscape. The flat-topped peaks are also relatively uncharacteristic (compared to the wider rolling hills) and visible within the view. While views may already be heavily modified by the presence of the mine site at certain vantages, the WRD will become prominent features within the background dominating the view.

Mitigation related to rehabilitation of the WRDs to promote the establishment of vegetation will also serve to reduce the impact. In addition, continuous engagement with stakeholders will help instil a sense of ownership and value in the future landforms so that they become part of fabric of the landscape and visual environments for the area. This will help visual receptors to adjust to a changing environment if their ideas on closure are continually sought, recognised and embedded into the Project. It will help them recognise and view the legacy of the Project as something which was shaped by the community and thereby becomes part of their community's landscape tapestry. It is also important that where feedback from stakeholders has been incorporated into the Project that it is communicated back to them.

6.12 Ecosystem Services

6.12.1 Baseline Conditions

The ecosystems within the study area support a range of significant services that underpin local cultural practices, recreation, and ecological functioning.

Natural products people obtain from ecosystems, include wild food resources (i.e. hunting, fishing, and foraging), although these are primarily cultural and recreational rather than essential for subsistence. Hunting for species like elk, partridge, and hare is common and mainly practised for leisure by residents and association members. Recreational fishing is also common, with lakes near the concession area providing trout and char. Foraging for berries and mushrooms also forms part of local outdoor traditions, though this practice is informal and dispersed.

Reindeer herding, however, represents a far more sensitive ecosystem service. As discussed in Section 6.9.2.1, the Mine Concession Area overlaps established grazing areas and a traditional migration corridor used by RHD 5A/C, where reindeer move freely year-round. These landscapes rely on intact ecological functions to sustain forage availability and safe migratory passage, making them highly sensitive ecosystem service receptors.

Habitats such as old-growth forests, heathlands, and wetlands are important for ecosystem services as they contribute to carbon sequestration and microclimate regulation, forming part of the local climate-regulating system. Vegetation also plays an important role in filtering air pollutants and particulates, which is notable given the proximity of communities and natural habitats to the Mine Concession Area. Soil stability is naturally limited by thin, rocky soils and areas of anthropogenic fill, making erosion control an ecosystem process with relevance but low sensitivity in this already disturbed setting. The natural filtration functions of wetlands and soils contribute to water purification, an important service given that some cabin owners and land users draw lake water directly for consumption.

Recreation and outdoor use (i.e. skiing, hiking, fishing, dog sledging, and swimming) are firmly rooted in local identity and occur year-round across the landscapes surrounding the Mine Concession Area. Landscape character and sense of place are equally significant, shaped by the interplay of wilderness, waterbodies, and Sámi cultural landscapes, all of which contribute to community well-being and attachment to the area.

6.12.2 Impact Assessment and Mitigation

6.12.2.1 Reduced Provisioning of Reindeer Grazing Pastures and Migration Routes

The Project will have an adverse impact on the provisioning of reindeer grazing pastures and migration routes during all phases. While mitigation measures, such as maintaining a year-round bio-corridor, limiting WRD footprints, and concentrating future development within the existing footprint, will reduce risks. This impact will be managed through the Reindeer Herding Cooperation and Compensation Agreement as well as measures already described for impacts on biodiversity, air quality, noise and indigenous people. No additional mitigation measures are considered necessary.

6.12.2.2 Reduced Regulation of Air Quality

The Project will result in the removal of vegetation, resulting in exposed ground which can contribute to entrainment of dust and thus reduced air quality. Implementing the mitigation measures outlined for the prevention of biodiversity and air quality already consider this ecosystem service.

6.12.2.3 Reduced Access to Recreational and Outdoor Use

The Project will restrict access to areas traditionally used for skiing, hiking, swimming, dog sledding, snowmobiling, fishing and other outdoor activities. Measures aimed at rehabilitation and restoration of areas may allow for future use of the area for recreation post-closure.

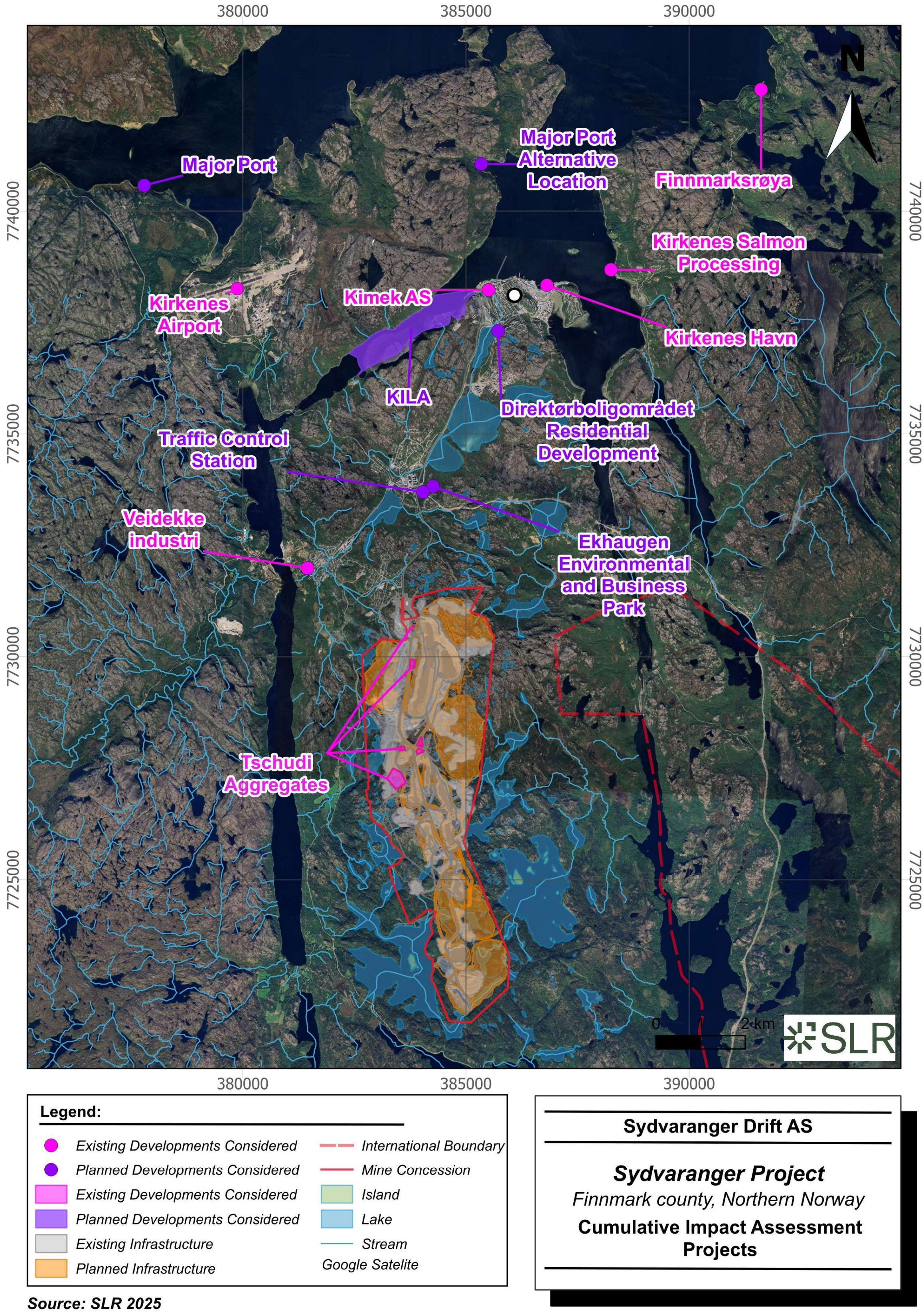
6.12.2.4 Reduced Landscape Character and Sense of Place

The Project will irreversibly change the landscape within the Mine Concession Area (see Section 6.11). Additionally, the removal of natural vegetation and habitats can reduce the sense of place and landscape character. Mitigation measures described in Section 6.11 are thus relevant to reducing the impact on this ecosystem service.

6.13 Cumulative Impacts

Environmental and social risks and impacts may arise because of cumulative impacts from multiple projects and activities occurring concurrently. Separately, these impacts may be insignificant, however cumulatively they may have regional or global consequences. The ESIA thus has considered other proposed developments and activities in the region (see Figure 6-11) to assess where there will be cumulative effects on the environment or communities as a result of such developments.

Figure 6-11: Projects Considered in the Cumulative Impact Assessment



Source: SLR 2025

Note that existing developments have already been considered when assessing the impacts of the Project as these form part of the baseline environment. Only future proposed developments were thus considered in terms of the potential for cumulative impacts.

The most significant of the development under consideration is a major port within the Bøkfjorden. If this goes ahead any impacts on water quality resulting from development of the new port may add to Project related impacts and this may in additional risks to marine biodiversity. However, the location within the Bøkfjorden is not the preferred location for the development of the port and thus such impacts may never be realised. The Project is to mitigate any potential future impacts of a development of a port within the Bøkfjorden engagement with port developers to ensure that SYD is kept up to date with planning and that any potential cumulative impacts, if the project proceeds are managed collaboratively.

Other planned commercial and industrial developments may result in cumulative social impacts (see Section 6.8.2) due to additional influx of persons to the area, which will cumulatively place pressure on local utilities and services, lead to more traffic and congestion and associated community risks.

Additional housing will be needed, and a shortage of supply, in particular housing may push up housing and rental costs and thus increases in local living costs. Influx can also result in the loss of the current sense of place, tourism value and possible risks to local culture including that of the Sámi people. Engagement and a collaborative approach between Sør-Varanger Municipality, the Project and future developments are required to ensure that impacts related to influx are predicted, planned for and managed as required.

7.0 Conclusions

The Project will deliver significant economic benefits at national, regional and particularly local level. The closure of the mine in 2015, the ongoing war in Ukraine and the resultant sanctions on Russia, has brought significant disruption to the local population. The flow of Russian labour and cross-border trade has stopped; many businesses have shut down and persons have left in search of employment elsewhere. The Project will thus result in a much-needed injection into the local economy.

As for all mining projects, the realisation of socio-economic benefits, introduces a range of social and environmental risks that require proactive management.

The project's footprint will require the clearance of natural habitats. Whilst the management measures proposed will reduce the impact, the residual impact needs to be addressed. A Biodiversity Action Plan focussed on achieving no net loss of biodiversity will be developed. Certain habitats, such as old-growth forests may take decades or centuries to regain their full natural value, but the measures in the BAP should improve their resilience to impacts and the likelihood of a full recovery in the long-term. The BAP will also investigate additional opportunities for restoring habitats withing the Mining Concession and surrounding areas, to achieve the 'no net loss' objective.

Impacts of subsea disposal of tailings are of concern, particularly as a result of sedimentation and potential toxicity. The tailings material does not present a source of metal contamination and the flocculants used have been demonstrated to have no potential for toxic impacts. Increased turbidity in water column due to suspended solids can also disrupt migratory routes for salmon and other fish. Moderate impacts on fish were predicted, but there are sufficient alternative routes for their migration; essential functions will be maintained; and the impacts will be diluted in the large fjord system.

Various alternative tailings disposal options have already been considered with the current disposal option having merged as the preferred technical, environmental and social alternative to date. Dependent on monitoring results, an alternative option for marine discharge could be considered. The work is however on going and alternatives for tailings disposal continue to be investigated.

There is concern that pit dewatering and continuous discharge from the mining operation may negatively impact the quality of surface water environments due to nitrogen. There is a potential for increased nitrogen levels which may lead to eutrophication of the surface water which will detrimentally affect aquatic biodiversity. Feasible alternatives of the management of water to prevent impacts have already been identified and these will be implemented by the Project.

Reindeer herding is key maintaining Sámi culture. While the mine area itself holds limited grazing value, its strategic location within a migration corridor makes access critical. A Cooperation and Compensation Agreement ensure the arrangement of safe passage enabling reindeer to cross the Mine Concession Area. The mine layout provides for an open migration corridor across the mine where the reindeer can pass from east to west towards the winter grazing areas. This measure is specifically intended to protect a key natural migration route used by reindeer moving from Peskvann toward the south.

The proposed activities at Sydvaranger Mine could further impact on cultural heritage if blasting is not managed to protect war memorial sites (Rørbua and 1944 Bjørnevatn Tunnel) due to their proximity to Pit 1. Vibrations could potentially impact the integrity of these sites. Controlled blasting and monitoring will be required by the project to allow for mining activities in the pit to continue without impacts.

Stakeholder and community engagement are essential for the Project going forward to provide updates and feedback to effected persons. SYD has prepared a Stakeholder Engagement Plan and a Communications Strategy to manage communications to and from all stakeholders. This provides for continuous dialogue with prioritised stakeholder groups. The existing Grievance Management Mechanism will also be updated and implemented to ensure stakeholders’ concerns, complaints and general feedback are registered, tracked, responded to, and managed in a professional, transparent, and accountable manner.

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