Executive Summary

Introduction and Project Setting

Please refer to **Chapter 1.0** for full detail. In May 2018, Nordic Iron Ore AB ("the Company" or "NIO") commissioned Golder Associates AB, ("Golder") to undertake and complete a Feasibility Study ("FS" or "Study") for the Blötberget Mining Project ("Blötberget" or "Project"), located in central Sweden.

Nordic Iron Ore AB

Nordic Iron Ore AB is a mining company owning iron ore deposits in the Bergslagen mining district; Blötberget, Håksberg, and Väsman, collectively known at the Ludvika Mines. Its aim is to develop the deposits in Phases into operational mines with good long-term profitability that can supply high quality products to steel mills in Europe and other parts of the world. NIO intends to expand its mineral resources and upgrade them to iron ore reserves of the Väsman-field; ultimately connecting Blötberget, Håksberg and Väsman. The initial phase of this plan is to re-open Blötberget.

Blötberget

NIO aims for Blötberget to become a significant new iron ore producer within the established Bergslagen mining region of Sweden. The project has the potential to become a strategic supplier of high-quality iron ore concentrate to European and Eurasian markets, while providing a boost to local, regional and national economies.

The initial development, Blötberget, is planned as an underground post pillar cut and fill ("PPCF") mine utilising backfill to reduce surface impact and to maintain the high-grade of the run-of-mine ("ROM") ore after extraction. Construction is envisaged to take a period of approximately 2 years, with a ramp up to full production of ca. 3 million tonnes ("Mt") ROM per year equating to ca. 1.4Mt of saleable ca. 62% Magnetite 38% Hematite iron ore concentrate in year 2 of a 12-year life-of-mine ("LoM"). The LoM is based on a Reserve of 34.1 Mt of Run of Mine ("ROM") ore.

Blötberget last closed in 1979; NIO aim to open the "new" Blötberget whilst utilising the available historic assets.

All Swedish mining regulations, and international best practice with respect to health, safety and environmental considerations, have been considered and incorporated into the FS designs as well as to the relevant cost estimates for this project.

Ludvika Mines

Blötberget (Phase I) is the initial deposit that will be developed as part of the Ludvika Mines, which will subsequently include Väsman (Phase II) and Iviken/Håksberg (Phase III); see **Figure 1**. The deposits run from Blötberget in the south to the north section of the Håksberg field which cover a ~25 km strike length. Due to the close proximity to Blötberget, it is planned that much of the infrastructure will be shared between the different phases of operations, and subsequently expanded to accommodate the increased throughput. In particular the processing facility, rail terminal (and loading), tailing facility and mobile mining fleet. Thus, a significant proportion of the capital expenditure for Blötberget can be utilised to help reduce the future capital intensity and reduce the OPEX per tonne product at the Ludvika Mines.

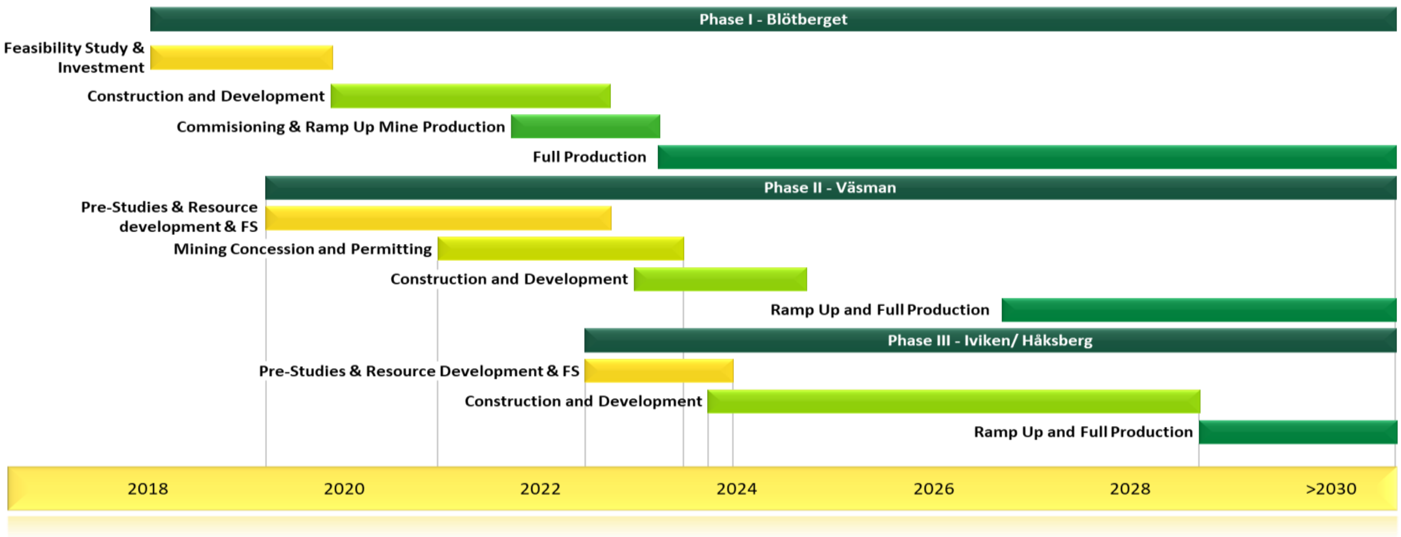


Figure 1: Ludvika Mines timeline (truncated to 2030).

Figure 1 shows an idealised overall development plan that NIO could follow should funding, permitting and feasibility studies for Phases II and III move ahead.

Blötberget Deposit and Historic Mining

The Blötberget deposit comprises several mineralised units named Kalvgruvan ("Kalv"), Flygruvan & Hugget (collectively known as the "Hugfly"), Carlsvärdsgruvan, Sandell, Kompanigruvan, Guldkannan and Fremundsberget. The Kalvgruvan and Hugfly units are mined to approximately 250 m and 350 m depth and make up the "historic mining" zone. The mineralised zones dip towards the southeast between 60° and 55° in the mined-out areas; below that depth they grade from 55° dip down to 25° at 700 m below ground level.

- Kalvgruvan (predominantly magnetite mineralisation);
- Hugfly (magnetite-hematite mineralisation); and
- Sandell (magnetite-hematite mineralisation).

Study Participants

Several international and nationally based consultants have been engaged by NIO to execute the FS. The study lead was Golder, who was responsible for key aspects of the project and overall FS delivery, supported by a number of specialist consultant groups.

The list of the consultants and their areas of responsibility is presented in **Table 1**.

Table 1: Blötberget Feasibility Study Consultants

Consultant	Activity
Golder Associates AB ("Golder") (including input from Golder Associates (UK) Ltd.)	Geological Resource Update, Geotechnical Analysis, Mine Planning and Mineral Reserve Estimation, Hydrogeology, Materials Handling, Tailings Storage Facility Design, Environmental and Social, Financial Modelling, Study Management, and Risk Assessment
GBM Engineering UK Ltd ("GBM")	Processing Plant Design and Costs
Delta Built Environment Consultants ("DeltaBEC")	Underground Infrastructure, Ventilation, Surface Infrastructure, Water Balance and Management
Wood Mackenzie Ltd ("WoodMac")	Market Study
Trafikverket Sweden AB ("TRV")	Railway Infrastructure, Logistics and Costs
RailCargo Group Austria ("RailCargo")	Logistics and Costs
Port of Oxelösund AB (OxPort")	Port Logistics and Costs
Bossert KPO (Pty) Ltd. ("Bossert")	Costs Estimator and compilation

Country and Regional

Location and Access

The Blötberget Project, is located in Dalarnas County in south central Sweden, shown in **Figure 2** (60° 7'8.57"N; 15° 4'34.16"E). The Blötberget orebodies are some 800 m to the SE of Blötberget village. The Project is located in an area dominated by arboreal forest with the local terrain consisting of gently undulating hills, except for the area around Blötberget, which is predominantly flat and marshy. The elevation in the Project area varies between 150 m and 250 m above sea level.

The planned surface infrastructure (process plant and tailings facility) is situated to the south west and near to the village of Skeppmora. The area is serviced by the main railway line "Bergslagsbanan" and the Route 50 highway which runs past the mine site and through the nearest town of Ludvika. The electrical power required for mining and milling operations at Blötberget will be sourced from the main power line (50 kV), operated by VB-Energi, which is approximately 1 km to the north east of Blötberget, and crosses over the planned mine area, whilst water for the industrial areas and process plant can be sourced from nearby lakes.

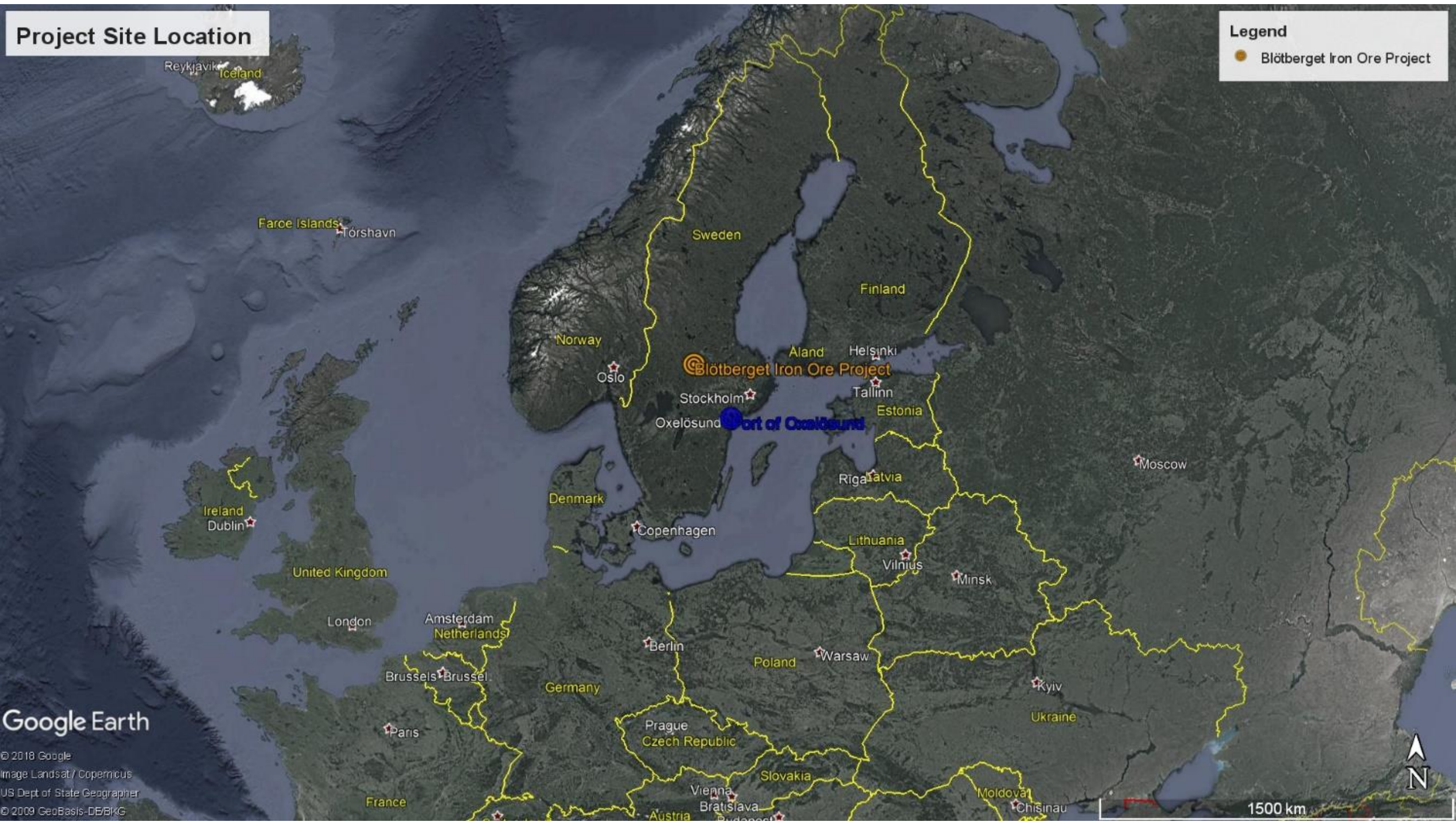


Figure 2: Project location map, also showing Port of Oxelösund.

NIO has an advantage over many mining projects due to the existence of the logistics and services from the previous mining operations in the region. The rail lines, for example Ludvika-Grängesberg-Oxelösund and Ludvika-Falun-Gävle, were originally built for iron ore freight, connecting the former iron ore mining area around Ludvika to the ports on the East coast of Sweden. Each of the mines in the region had its own rail connections and terminals, including mines at Blötberget.

It is planned that NIO will take advantage of the existing rail line between Ludvika and the Port of Oxelösund. This rail line is part of the national, state-owned, railway network and is upgrading to 25 ton axle load and higher capacity. The timetable for development is covered in the **Chapter 21.0 - Project Execution Plan.**

Significantly, NIO can purchase the services from the owners and operators of the railways and the ports purely as an OPEX cost and without NIO contributing to any major investment. The only capital required by NIO is for the rail terminal at the mine head at Skeppmora.

From Oxelösund, NIO will be able to supply the global steel industry buyers in ships up to “baby-Cape capacity”. Furthermore, there is a competitive fleet of smaller vessels and barges that operate in the Baltic regions, providing an alternative efficient supply chain to reach many of the potential European customers of NIO

Strategic Access to Export Markets

The Blötberget Mine is located adjacent to the national rail network and connected to the nearby Port of Oxelösund; both servicing the planned project and supporting bulk commodity movement at competitive rates into traditional Swedish and international markets. Given the availability of nearby well-established transport infrastructure, the project is well positioned to provide a significant new strategic supply of iron ore concentrate from Sweden (**Figure 2**). Further details of markets and marketing can be accessed in **Chapter 17.0 - Products and Market**.

NIO will produce some of the highest quality iron ore concentrates available in the world and will expect to command a premium price, especially into selected markets, and be able to maximise its production cost vs revenue margins into nearby European markets where there significant transport advantages over competitors.

Geology and Resources

Exploration

Please refer to **Chapter 2.0** for full detail. During the 1950s and 1960s, ground-based and airborne geophysical surveys respectively were carried out over the Project area before the mining ceased around the late 1970's. These have been carried out predominantly by the Swedish Geological Survey (SGU). In 2009, Kopparberg Mineral AB carried out a more detailed magnetometry survey over a limited part of the Blötberget area on behalf of NIO (**Figure 3**) and has allowed NIO to gain knowledge of the area. Much of this work and the surface sampling exercises allowed NIO to identify several sampling locations. Samples were extracted to represent and be typical of mined ores, especially in the early years of production.

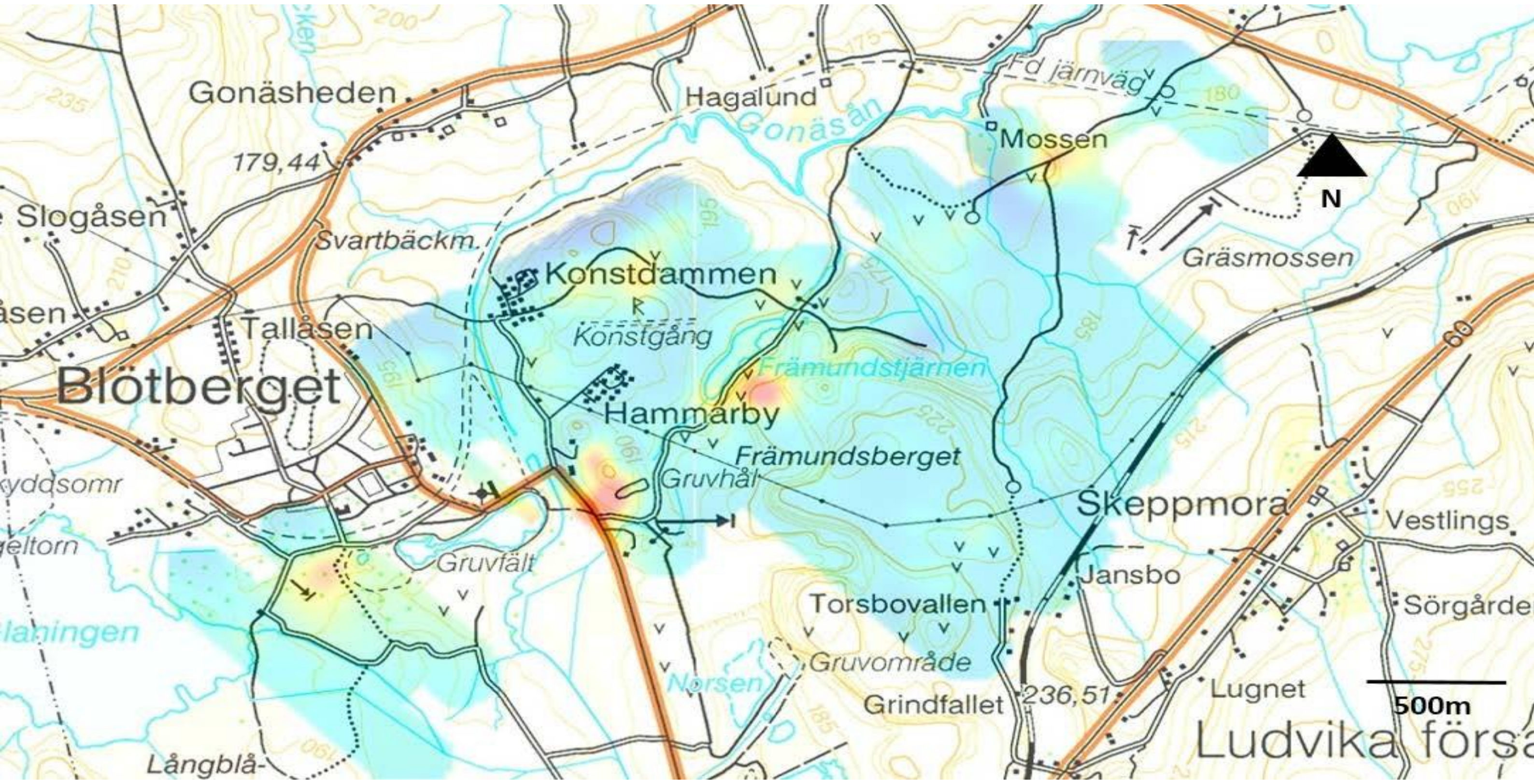


Figure 3: Ground magnetic anomaly map (November 2009)

2012 Drill Programme

A drilling programme was undertaken by NIO was completed in November 2012 (**Figure 4**). This 16-hole programme included twinned drilling to confirm the quality of historical drilling data, as well as infill and step-out drilling, and totalled 7,430 m. This was also the start of constraining some of the magnetic data, which continued in the next planned campaign of drilling.

2014 Drill Programme

The 2014 drilling programme was designed to investigate the area between Flygruvan/Kalvgruvan and Hugget (formally known as "the Wedge" or Betsta area) and to infill the intermediate depth extension of Hugget, (-320 m to -66 m; measured from surface depth and relating to mining blocks) in order to improve the confidence of the geological model.

Larger diameter "metallurgical" drill holes were recovered to assist with completing more metallurgical testing whilst retaining geological core.

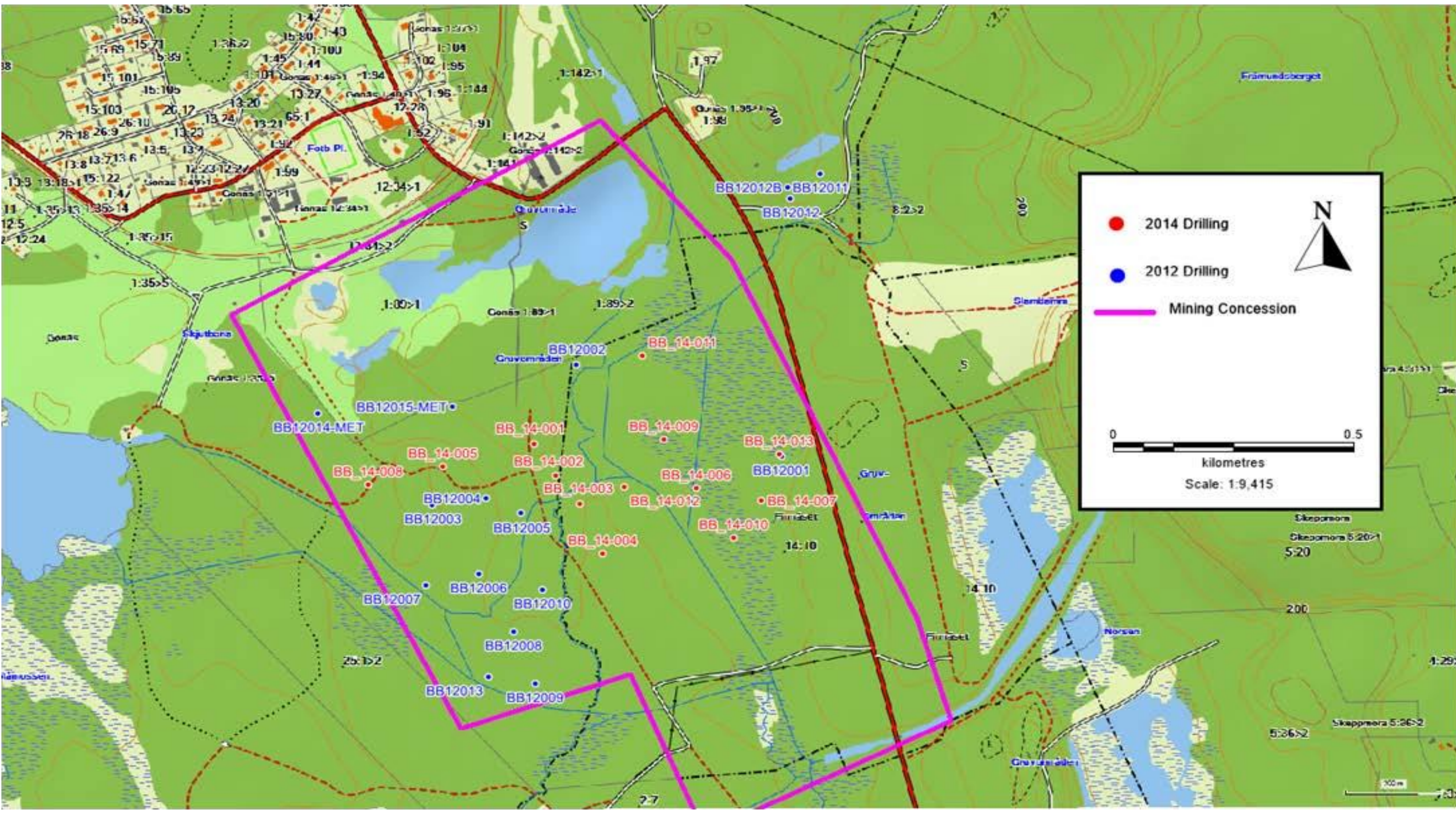


Figure 3: 2012 and 2014 Drill hole Locations

Mineral Resource

DMT Consulting Ltd. UK (“DMT”) prepared an updated Mineral Resource estimate for the Blötberget Project in July 2017 which was slightly revised in January 2019 once the methodology used was reviewed and accepted by Golder. As previously, the new cut-off-grad (“COG”) calculations confirm the previous 25%Fe value adopted in 2017.

The total Measured and Indicated Resource estimated for the Blötberget Project, at a preliminary economic cut-off Grade of 25% Fe, is 55.07Mt at a grade of 40.7% Fe (Total) and 0.5% P. Of the total estimated resources containing Fe, the magnetite proportion is estimated at 62% and the hematite at 38%.

DMT has reported all the material of magnetite-rich ore of KALV and hem-rich ore of HUGFLY and SAND contained within the resource block model limited by the licence area and excluding the material mined out by historical mining activities. DMT considers all the material reported as Measured and Indicated Resources to have ‘reasonable prospect of economic extraction’ given appropriate economic and technical considerations.

Table 2 summarises the Mineral Resource estimate for the Blötberget Project as of July 2019.

Table 2: Measured and Indicated Resources for the Blötberget Iron Project - July 2019

Cut-off Grade (%)	Tonnage (MTonnes)	Fe (%)	P (%)
25	55.1	40.7	0.49

Notes:

1) *JORC 2012 definitions were followed for estimating Mineral Resources;*
2) *Mineral Resources are estimated at a Cut-off Grade of 25% Fe;*
3) *Mineral Resources are estimated using a five-year historical average price of US$ 100 per tonne (Source: IndexMundi); and;*
4) *Figures may not total due to rounding errors.*

Hydrology and Hydrogeology

Please refer to **Chapter 3.0** in the main report.

Portal and Decline Design

Please refer to **Chapter 4.0** in the main report.

Mine Geotechnical

Please refer to **Chapter 5.0** for full detail.

Geotechnical Setting

Three mineralised bodies make up the Blötberget deposit; Kalvgruvan ("Kalv"), Hugget/Flygruvan ("Hugfly") and Sandellmalmen ("Sandell"). The orebodies are generally striking ENE – WSW and dipping to the SSE at 45° whilst shallowing out at depth. The rock mass is generally strong and moderately jointed. NIO has been undertaking geotechnical logging of boreholes completed in 2012 and 2014 using Barton's Q System.

The rock mass at Blötberget is strong, moderately jointed with three joint sets per domain, dominated by the foliation which parallels the orebody strike and dip. The rock mass characterisation shows that the rock mass is generally uniform with the majority of the logging intervals.

Mine Geotechnical Summary

Underground empirical and finite element analysis has shown that the following underground mining criteria can be used at Blötberget for mine design:

- Crown pillar minimum vertical thickness of 10 m.
- Sill pillars: Above 500 m depth: 1.00 to 0.70 (orebody thickness to width down dip)
- Sill pillars: Below 500 m depth: 1.00 to 1.00 (orebody thickness to width down dip)
- Span size: Maximum unsupported 12.5 m. Equates to 10 m cross cuts and 10 m slots (though these can change to suit mining)
- Pillar size: Minimum 7 m x 7 m pillars.

Mining

Please refer to **Chapter 6.0** for full detail. The Blötberget mine will be accessed by a 1:7 conveyor/truck decline which extends from surface to -280 m bgl (below ground level). Below -280 m the decline will split into a conveyor decline extending to a primary crusher station located at -380 m and a truck decline extending to -820 m. The mine decline will provide connection to the new development located at approximately -310 m (the BS shaft will be utilised for an exhaust airway and dewatering). The decline will be 8 m wide by 5.7 m high to accommodate LHDs, underground haul trucks and the conveyor. Ore transportation will take place by hauling product with 65 t capacity mine trucks from production faces to the underground primary crusher station feed grizzly located at -370 m level with subsequent conveyor transport of ore to the surface.

A conveyor (detailed in **Chapter 8.0 - Material Handling**) runs in the decline and connects the crusher station to the surface. Lighting, cable support hooks (for electricity and communication cables) and pipes (for potable, process (from the crusher facility), firewater and dewatering) will be installed in the decline.

Decline and Portal

Figure 4 shows the typical Decline Cross Section. A vehicle by-pass will be developed every 300 m on the decline to make provision for vehicles passing other vehicles.

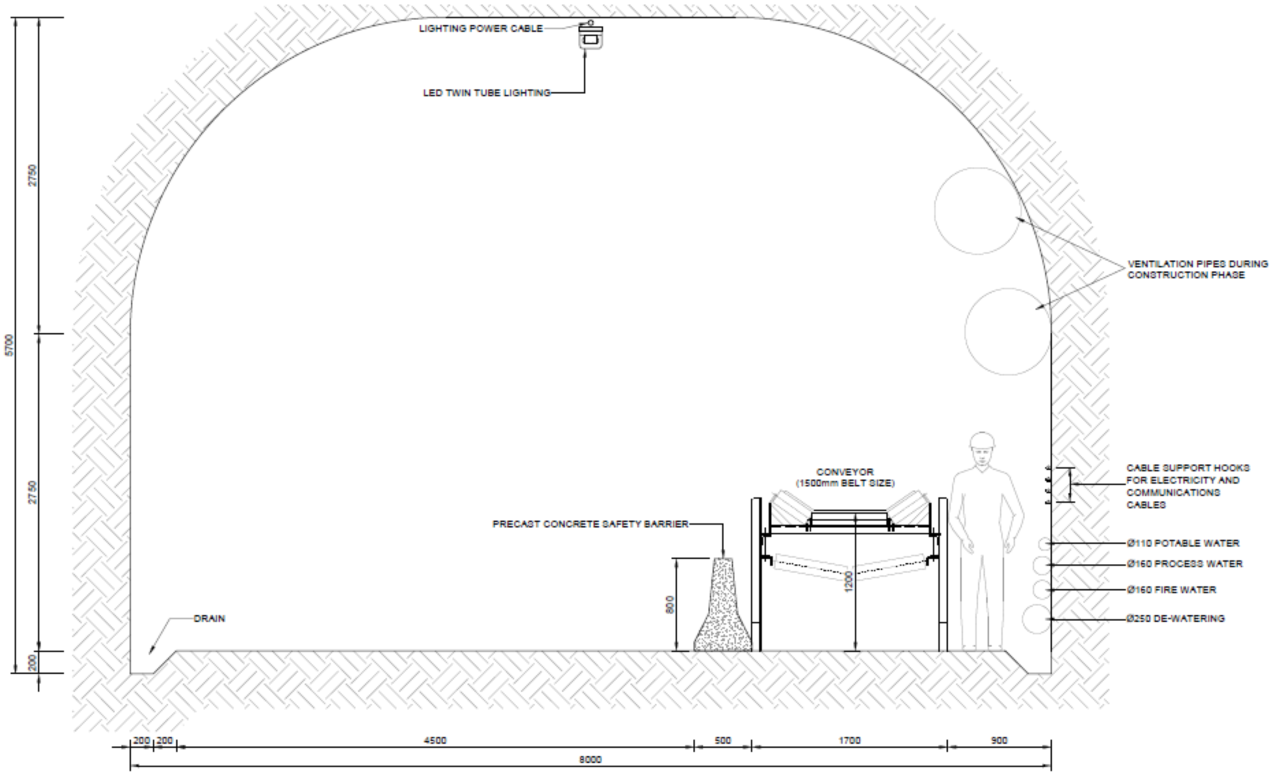


Figure 4: Decline Cross Section

After the portal structure, the decline will continue down to ~400 m below ground level ("bgl"). The decline will be located within predominantly competent rock, therefore, wedge failure along discontinuities will likely be the failure mechanism. The support along the length of the decline is likely to be rock bolts, and mesh with localised sprayed concrete liner sections where ground conditions deteriorate.

Review of the BS shaft indicated that whilst the BS shaft can be used for exhaust ventilation, costs associated with remediation and headframe installation preclude it from active dewatering and being used as secondary egress.

Post Pillar Cut and Fill Mining Method

PPCF is a form of overhand cut and fill mining for wider deposits, utilising a room and pillar layout (**Figure 5**). Mining advances up-dip (overhand) via a series of horizonal production slices of the deposit. Backfill is utilised to maintain a working platform in-stope and provide confinement to the pillars as they become tall and slender.

The method is highly adaptable to both changes in deposit dip and width, so long as the minimum deposit horizontal width is equal to the combined room and pillar width proposed (17.0 m). In zones below 17.0 m horizonal width, the mining method would revert to conventional overhand cut and fill with a maximum 12.5 m room width.

This mining method is adaptable to variations in deposit geometry and dip. It also eliminates the support issues related to the Kalv/Hugfly parting as the interburden zone between the two deposits remains fully supported during mining. It also provides the opportunity to stow internal waste as backfill within the production stope.

The PPCF mining method has resulted in the following;

- A 62% ore recovery;
- A head grade of 36.27%Fe;
- Pillar ore losses of 17%;
- A total of 13% waste dilution;
- A backfill dilution of 4%;
- Overall magnetite to hematite ratio of 62:38;
  - Sandell 26:74;
  - Hugfly 36:64;
  - Kalv 91:09; and
- Mining cost of USD12.7/t ROM.

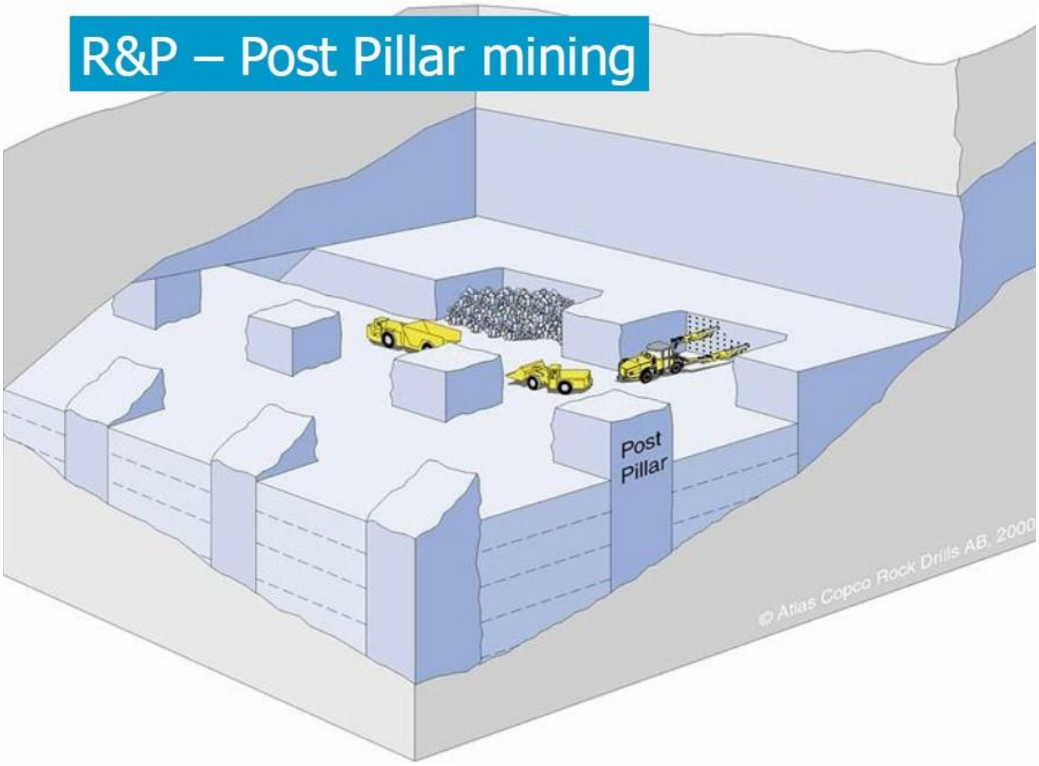


Figure 5: PPCF Illustrative Drawing

Mineral Reserves

Blötberget Measured and Indicated Resources defined by DMT 2017 are 55.1 Mt @ 40.7% Fe at a 25.0% Fe Cut-off Grade. The mine resource block and wireframe model were prepared by DMT and presented in the Mineral Resource Update report, dated May 2017. The DMT Resource was reviewed and endorsed by Golder in 2019.

MI&I Resource tonnes, at a 25% Fe mining Cut-off Grade, reporting to the mining stope model were 40.69 Mt @ 38.43% Fe, prior to the application of mining method modifying factors (including 0.12 Mt Inferred, not carried forward into the reserve estimation).

Mineable Reserve Statement

The mineral resource estimate has a 25% Fe Cut-off Grade applied. A 25% Fe Cut-off Grade has been used for the mineral reserve statement. Blötberget reserves are estimated at 34.1 Mt @ 36.27% Fe. Blötberget Proven and Probable Reserves are given in **Table 3**:

Table 3: Blötberget Proven and Probable Reserves

By Category	Tonnes	Fe %	P %
Proven	29,397,865	37.32	0.46
Probable	4,665,731	29.72	0.43
Total	34,063,596	36.26	0.46

Mine Design and Layout

Figure 6 illustrates the mine access layout. The general arrangement is as follows:

1. Conveyor/Access decline from surface to the underground crusher station
2. Truck ramp branching off the conveyor decline for access to the production sublevels
3. Production sublevels accessing the stopes along strike from the footwall
4. Stope access crosscuts ramping from the sublevel into the stope
5. Internal ventilation raises connecting between the sublevel ends forming a ventilation circuit with the truck ramp
6. Ventilation raise-bored shafts to surface and a backfill supply raise-bored shaft to surface
7. Emergency egress shaft raise-bored to surface

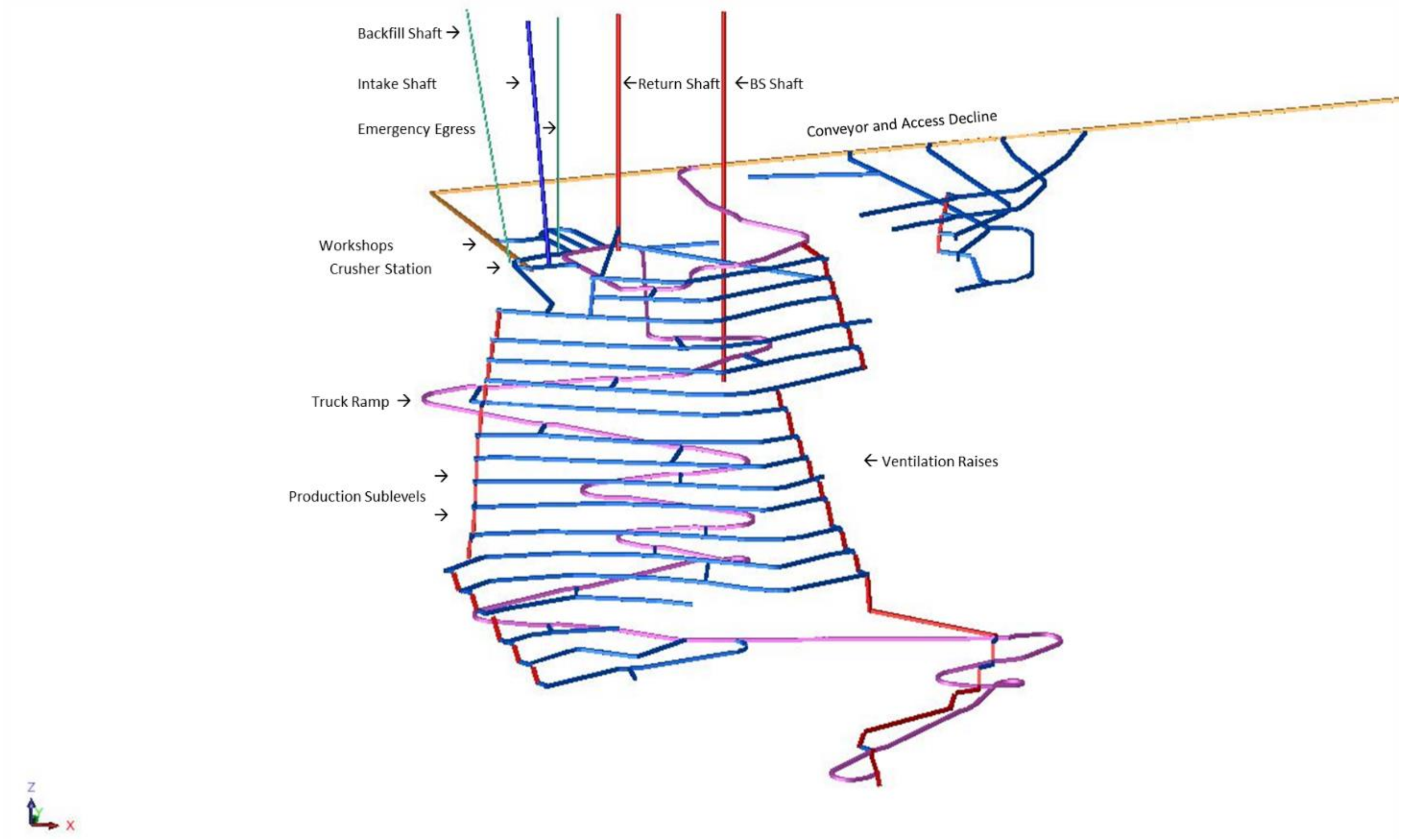


Figure 6: Underground Access Layout

Blötberget mine will be accessed by a 1:7 gradient conveyor/truck decline, extending from surface to -281 m bgl. At -281 m bgl the decline divides into a conveyor decline extending to the crusher station located at -380 m bgl and a truck ramp accessing the production sublevels, extending to -820 m bgl.

Development will complete each level (and associated sublevels) prior to production commencing. Therefore, development will be in advance of production and only waste transport will overlap with production during waste transport into stopes for backfill. Initial development will be required to complete Levels 1, 2 and 3 with Level 4 also beginning production during Year 1.

Mineral transportation will comprise 65t capacity mine trucks hauling from production faces to the underground crusher station feed grizzly located at -371 m bgl, with subsequent conveyor transport of crushed ore to surface. During initial mine development, waste rock will be transported to surface by mine truck, to be stockpiled at the backfill stockpile area for future crushing and use underground for backfill. Upon the commencement of production, on-going underground development waste will be transported directly to stopes for placement as backfill.

Ramp crosscuts will access footwall sublevels developed every 22.5 m vertically. The footwall sublevels provide access to the stopes via stope access crosscuts. Two internal ventilation raises (intake and return) connect between the footwall sublevels at the sublevel extremities along strike.

The historical mining operations were accessed via 4 shafts, two vertical and two inclined. The principal shaft, BS shaft, will be utilised for return ventilation duty during development and early production. Two additional raise bored ventilation shafts, acting as an intake airway and emergency egress, will connect close to the underground crusher station. Ventilation is covered in **Chapter 7.0 - Underground Infrastructure**.

A raise bored backfill shaft, inclined at 79°, will connect close to the crusher station so that ore haul trucks, after discharging, can load directly with backfill prior to returning to the stopes. Development waste will be delivered directly to stope backfill during production operations. The backfill raise has been located in the orebody footwall to avoid the historical workings.

Production Schedule

The mine production target is 8,220 tpd for a 3.0 Mtpa production rate with 365 working days per annum, which equates to 43 m of advancement per day.

Over the LoM, the magnetite percentage increases due to an increasing magnetite content in the Hugfly orebody with depth. This change results in a steady increase in magnetite and a reduction in hematite over the LoM.

Table 4: General mining equipment specifications.

Machine work cycles	75% efficiency
Machine mechanical availability	85%
Work hours per day	18.1 hr
Effective work hours per year	6,397 hrs

Underground Infrastructure

Refer to **Chapter 7.0** for full detail. The following services required for underground mining operations will be supplied:

- Water supply;
- Power supply; and
- Ventilation.

Underground Facilities

The underground operations will necessitate the construction of service bays, a tyre bay, pump station, office, crushing station and a rescue safe room to allow mining operations to be carried out efficiently and safely. Services such as a pump station, office, tyre bay, service bays as well as underground parking will be provided. Emergency Rescue rooms will also be installed. The underground parking area consists of 11 parking bays that will be used by service vehicles making use of the tyre bay and service bays. **Figure 7** illustrates the location of the Underground Infrastructure Area, provided separately as **Technical Drawing 1899608-1005-100-LYD-1006**.

Dewatering

Peak flow rates (of 328 l/s) are encountered at the start of construction due to the removal of water from existing flooded workings and the initial development of the decline. The discharge rate will be attenuated to 300 l/s via ponds. These peak rates will be lower if the permitted rates are less.

Following completion of the early dewatering, the mine inflow rates are approximately 70 l/s, the main contribution being the flows to the historical mine at 40 l/s and 25 l/s from the ongoing development of the main decline.

The mine inflow rates then increase gradually to approximately 100 l/s around year 5, and then further to a maximum of 117 l/s towards the end of the mine life. The increase relates to development of access as the mine progresses and new levels are developed. At the end of the mine life, the new mine development will contribute 77 l/s versus 40 l/s from the old workings. Dewatering will be supplied by making use of 250 mm diameter Class 16 HDPE pipes and pumping stations.

Servicing

Service bays and wash bays have been designed to provide servicing and maintenance for the mobile mining fleet and underground vehicles. the bays can undertake servicing and maintenance of parts of the underground primary crusher that require servicing (e.g. screen, grinding mill, classifier, magnetic separator, and gravity separator). The service bays will be a base for maintenance of other pieces of (fixed) underground infrastructure, such as ancillary elements of the rescue chambers and crusher station equipment.

A portal fuelling station with 5,000 litre capacity has been designed to meet the needs of the steady-state production equipment.

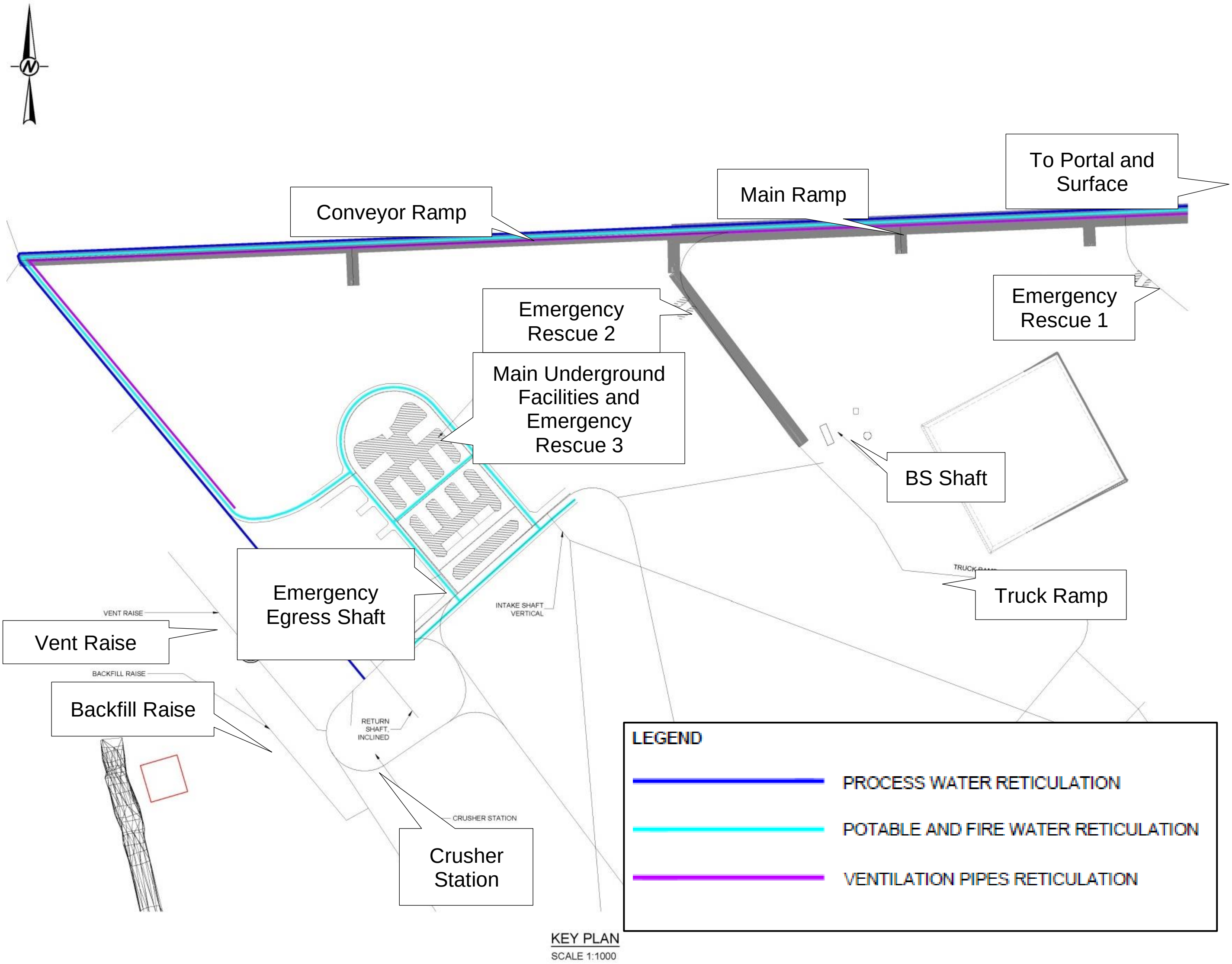


Figure 7: Underground Infrastructure Area

Underground Mine Ventilation

The new mine is planned to be ventilated independently from the historic mine. Existing infrastructure (from the old mine workings) to be used in the new ventilation scheme will be the BS shaft as a return air duct for the Sandell orebody. Maximum production from the overall mine will be approximately 270 kt/month utilising a post pillar cut and fill mining method to a maximum depth of 840 m below surface. Mined out production areas will be backfilled on completion.

Ventilation Design Criteria

Steady-state production will be 270 kt/month on average. The vehicle fleet planning parameter is set at 0.05 m³/s/kW. The vehicle fleet tier classification is at least such that a factor 0.05 m³/s/kW ventilation will be sufficient for adequate dilution of exhaust gases.

The operation of diesel equipment in an underground mine significantly impacts overall ventilation requirements as well as heat production in working places which can result in adverse thermal conditions. Sufficient ventilation volumes are required to dilute diesel exhaust fumes. It is internationally accepted that a ventilation flowrate of 0.05 m³s/kW at point of operation will dilute exhaust fumes to acceptable contaminant limits, i.e. level limit value of 20 ppm carbon monoxide and 1 ppm carbon dioxide.

Ventilation System Requirements

As well as a new dedicated FAR system, the mine is proposed to be equipped with a new Return Air Raise (RAR) shaft system. Old shafts were also considered in the new mine ventilation scheme, but only the BS Shaft was identified as a possible return.

Air will return to the main RAR extending to the surface via underground return raises. The emergency rescue area and all other underground services facilities will be ventilated with fresh air that will return to surface via the conveyor decline. Ventilation strategy in summary:

- Fresh air supply via the FAR.
- Return air via sublevel raises to the RAR from the production areas.
- Return air via the access decline from the underground operations and emergency facilities.
- Return air via the BS Shaft for the Sandell-Ore.
- The crusher station will be ventilated via a dedicated route to the RAR circuit.

Material Handling

Refer to **Chapter 8.0** for full detail. The designs for material handling for the Nordic Iron Ore AB (“NIO”) Blötberget Iron Ore Mine includes requirements for the following materials:

- Underground development waste;
- Underground ore production;
- Plant tailings;
- Underground backfill supply; and
- Magnetite and hematite concentrates.

Mine transportation covers the following areas:

- The transport of underground development waste to a surface stockpile or its direct use underground as backfill;
- Ore transport from stope to the point of discharge into the plant crusher circuit on surface; and
- Mine backfill supply from surface and its distribution underground.

Plant transportation covers the following products:

- Coarse tailings for use as mine backfill;
- Fine tailings to the tailings dam; and
- Magnetite and hematite concentrate to market.

A description of the conveyor specification and design is provided. A site schematic material flow diagram is given below (**Figure 8**). Please note that dry tonnages are reported unless specified otherwise. Also refer to drawings **1899608-1005 -200-GAD-1021** to **1899608-1005-200-GAD-1032** for additional detail.

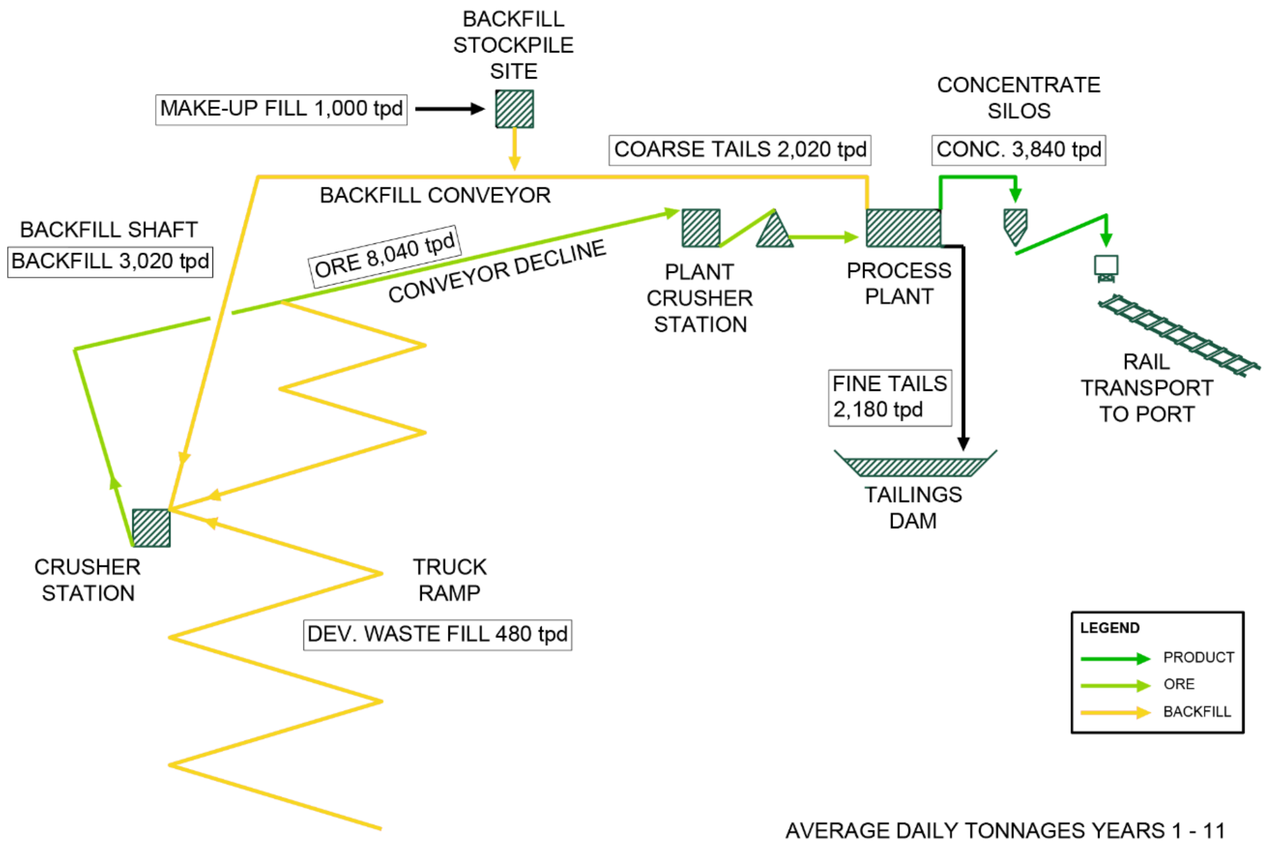


Figure 8: Blötberget Material Flow Schematic

Development Waste Transport

Development waste will be loaded at the face, or via mucking bay, utilising 17 t LHDs and 45 t mine trucks. During the pre-production phase, the waste will be truck hauled to surface and dumped adjacent to the historical tailings dam for future use as mine backfill. After the commencement of production, all on-going underground development waste will be transported directly to the working stopes for use as backfill.

Ore Transport in the Mine

Ore will be loaded at the production face utilising 21 t LHDs and 65 t mine haul trucks for transport to the underground crusher station. The crusher will reduce the maximum lump size to -250 mm and feed the crushed mineral onto a 1,000 mm wide conveyor for ore transport to surface; it is then transferred onto the processing plant conveyance system.

The underground decline conveyor is in two sections, a 290 m 200 kW conveyor transferring onto a 2,400 m 1,600 kW conveyor that runs to surface. Conveyor design capacity is 750 tph with a 1:7 gradient decline.

Ore Transport on the Surface

Primary crushed ore (-250 mm) will be transferred from the Decline Conveyor System onto the secondary crusher feed conveyor. The secondary crusher feed conveyor will feed ore onto a vibrating screen. The vibrating screen and cone crusher will operate in closed loop to control crushed ore size. Oversize from the vibrating screen will feed the cone crusher, while undersize will transfer directly onto the stockpile feed conveyor. Crushed ore from the cone crusher will be returned to the vibrating screen/cone crusher closed loop.

The crushed ore stockpile will have a nominal live capacity of 5000 tonnes, equivalent to 13 hours of Process Plant Capacity. The stockpile size will allow for a constant feed to the process plant of 375 tph. Additional storage capacity available ore from the 'dead' area of the stockpile can be pushed into the reclaim feeder draw-down areas by a front-end loader. Three apron feeders in the reclaim tunnel will draw secondary crushed ore from the stockpile onto the HPGR feed conveyor, and this conveyor will feed crushed ore into the Mineral Processing Plant.

Plant Tailings

Plant tailings will be split into two streams:

1. Coarse tailings to be utilised for mine backfill; and
2. Fine tailings to be discharged to the tailings dam.

The combined tails stream will be passed to the "Dewatering Cyclone", and the underflow product will concentrate the coarse fraction of the tailings stream into a high solids density sand slurry containing between 90 and 106 t/h of the coarse tailings (approximately 49% of the total tailings). This will be dewatered by a vacuum filter and will then be discharged onto the backfill conveyor feeding the mine backfill shaft.

The cyclone overflow (consisting of the majority of the water together with fines which will be between 90 tph (Magnetite case) and 100 tph for the hematite case) will feed to the tailings thickener. This product will be pumped to the tailings dam.

Backfill Transport

The underground mine has three surface sources of backfill in addition to the ongoing development waste:

- Plant coarse tailings;
- Historical mine tailings; and
- Development waste rock stockpiled on surface.

The principal backfill source is plant coarse tailings; historical tailings and crushed mine waste that provide make-up volumes of backfill. Surface backfill transport utilises a series of conveyors, running from the process plant via a backfill stockpile site to the mine backfill shaft. Under normal operation the plant will provide approximately 2,020 tpd of coarse tailings. An additional backfill make-up quantity of approximately 1,000 tpd will be added to the backfill conveyor at the backfill stockpile site. The principal make-up material will comprise tailings excavated from the historical tailings dam.

Iron Concentrate Handling and Loading

Plant production averages 3,840 tpd of dry concentrates (~4,070 wet tonnes per day). The magnetite and hematite will be separately handled by two separate product shuttle conveyors. The shuttle conveyors will feed separate magnetite and hematite product stockpiles under dome structures, capable of holding 12,000 t each.

The product stockpile capacity will allow up to 7 days of concentrate production to be stored on-site. An underground bunker / tunnel will reclaim and feed the concentrate from the stockpiles onto conveyor transporting the material to the rail loading facility. A rapid rail loading facility will allow a full 18 wagon train to be loaded within 2 hours. This ensures that the train loading rate will be 1,080 – 1,102 tph.

Rail transport will utilise 138 t capacity wagons giving a total train capacity of 2,484 t (wet tonnes). Rail journey time is 4 to 5 hours to the Port of Oxelösund. An average of 1.6 rail loadings per day are required. Further information on rail transport and the product handling at the port is covered in **Chapter 14.0 - Transport and Logistics.**

Processing

Refer to **Chapter 9.0** for full detail. The history of the testwork and pilot plant level programs have been completed for the Blötberget Iron Ore Project. A summary of the key developments and findings are presented below.

Table 5: Summary of development and Pilot Plant level programs undertaken

Report Date	Organisation	Description
08/2011	Minpro AB, Sweden	Davis Tube (DT) tests on drill core composites from Blötberget and Håksberg; Recovery of a 'sinter fines' product on - 5 mm material by dry LIMS
08/2012	Minpro AB, Sweden	Extraction of a 'sinter fines sized' product for non-metallurgical applications
21/05/2014	Tata Steel Consulting	To develop a mineral processing flowsheet to produce satisfactory Iron ore concentrates with low Phosphorus content.
30/9/2014	GTK Mintec	Phase 1 – Bench scale testing of Flygruvan composite sample originating from BB12015-MET003
08/01/2015	GTK Mintec	Phase 2 – Bench scale Variability testing Identify Phosphate and rare earth element minerals, determine liberation and to find if Iron oxides carry Phosphorus.

Report Date	Organisation	Description
05/03/2015	Metso York Test Plant	Standard Jar Mill Test conducted on the sample received for the Tata: Nordic Iron project
10/03/2015	Metso Minerals AB	Laboratory Vacuum and Pressure Filtration Test work
13/05/2015	MBE Coal & Minerals technology	Jones WHIMS performance
23/05/2016	WEIR Minerals Comminution	A test program consisting of a series of locked (closed) cycle tests using a pilot size HPGR
25/05/2016	Studiengesellschaft für Eisenerzaufbereitung -SGA	Pilot scale testwork for upgrading the Iron content and reduce the Phosphorus content and laboratory scale test work.

Summary of Pilot Plant Results

The pilot scale results and some selected results from laboratory scale have been described previously and the final combined Magnetite/Hematite concentrate results are given in **Table 6**.

Table 6: Combined Final Concentrates (Second pilot scale flotation test for Apatite removal)

	Unit	Feed	Products		
		ROM sample	Cleaner LIMS Concentrate Material 5	Flotation Hematite Concentrate Material 8	Calc. balance
Weight	%	-	61.2	38.8	100.0
Fe total	%	37.60	70.55	66.44	68.96
Fe_{rec}	-		62.6	37.4	100.0
Fe_{rec}	$\%_{v/o}$	100.0	57.4	34.3	91.7
SiO_2	%	35.35	1.15	2.92	1.84
P	%	0.236	0.033	0.083	0.052
TiO_2	%	0.185	0.084	0.310	0.172
V	%	0.022	0.057	0.010	0.039
D_{80}	mm		0.131	0.110	0.123
D_{50}	mm		0.052	0.058	0.054
Spec Surface	Blaine		830	845	836
Spec weight	g/cm^3		5.09	5.05	5.07

$_{rec}$ = recovery

Process Design Criteria

The combined test programs resulted in the definition of the ore characteristics to be treated in the future plant design and these are summarised in **Table 7**, whilst the overall operating schedule required for the installed plant is shown in **Table 8**.

Table 7: Ore Characteristics - Design Criteria

Ore Characteristics	Unit	Detail
Ore Source		Underground
Average Fe Feed Grade	%	33.6
Design Fe Feed Grade	%	37.0
Magnetite/Hematite ratio		between 100 & 60%
Specific Gravity - Magnetite	g/cc	5.18
Specific Gravity - Hematite	g/cc	4.9 - 5.3
Bond Ball Work Index, WI_B	kWh/t	18.80
Stirred Mill Index - Magnetite	kWh/t	6.9
Stirred Mill Index - Hematite	kWh/t	11.0
Abrasion Index, Ai	g/kg	0.30
JKTech drop weight parameters		
Concentrate grade - Magnetite	Fe - %	70.5
Concentrate grade - Hematite	Fe - %	66.6

Table 8: Plant Operating Data

Item Description	Unit	Detail
Annual throughput – Nominal	t/y	3,000,000
Operating days	d/y	365
Operating hours	h/d	24
Primary Crushing – Utilization	%	60
- Running time	h/y	5,256
- Nominal Capacity	t/h	571
Process Plant – Utilization	%	91.3
- Running time	h/y	8,000
- Nominal Capacity	t/h	375

Process Plant Development

The engineering design has been developed from the combined operation design and the individual unit process requirements developed from the bench and pilot plant programs.

Flowsheet and Material Balance

The process flowsheet is typical of Iron deposits containing Magnetite-Hematite mineralization. The ore will be processed in industry standard circuits comprising:

a) Comminution - Primary crushing (Jaw – located underground), Secondary crushing (Cone – located on surface), Tertiary size reduction High Pressure Grinding Rolls – (HPGR) (replacing tertiary crushing and rod mill)

a) The primary mineral concentrating circuit is Magnetic Separation which is the industry wide method used for the recovery of Magnetite. This is achieved in 3 stages, with the first recovering all the magnetic components and associated gangue minerals, while the non-magnetics containing the Hematite form the feed to the following process.

b) The primary magnetic concentrate is reground to fully liberate the entrained and associated 'non-magnetics' and passed through a 'cleaner' separation stage. The cleaner tails (non-magnetics) report to the final tailings stream while the remaining contained gangue minerals liberated after the regrind stage are removed by a flotation stage to produce a final Magnetite product at the required specifications.

c) The secondary concentrating circuit separates takes the primary tails from the primary magnetic separators and uses the specific gravity characteristics, using 'Spiral' concentrators to generate a hematite concentrate. The hematite will be processed by rougher and cleaner gravity separation.

d) Two reverse flotation stages will reject Apatite, containing Phosphorus, from each of the Magnetite and the Hematite concentrates when required.

e) The two concentrates will then be thickened and filtered ahead of product storage and load-out.

The approximate material balance on average is that there will be around 62% magnetite concentrate and 38% hematite. The process flowsheet is depicted in **Figure 9**.

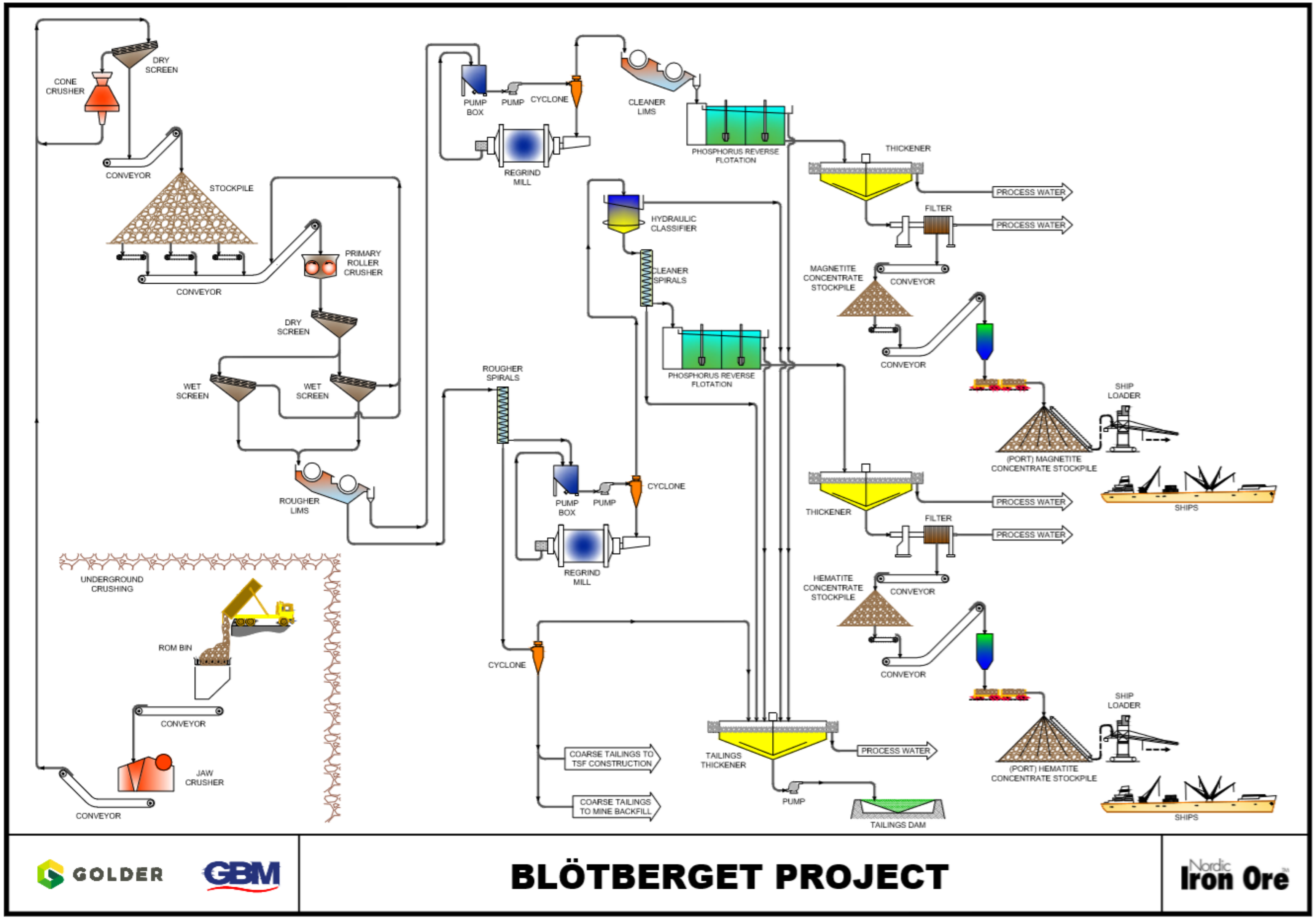


Figure 9: Process Block Flow Diagram

Production Forecasting

The results from the mass balancing and unit process development have been extrapolated for the range of the feed scenarios expected throughout the operation. This has enabled the variations at the extremes of the iron mineral contents to be allowed for, and the finalised parameters are listed in **Table 9**.

Table 9: Recovery/Grade Parameters

	Magnetite	Hematite
Concentrate - grade, %	70.50	66.60
- Fe Content	72.40	70.00
Overall Recovery	95.67	82.87

The ranges of the feed proportions have been provided from the Preliminary Mine Plan on a yearly basis for the Life of Mine (LoM).

Process Plant Layout

The selection of process equipment obviously had an impact on the layout. Vertimills were specified for the Low Intensity Magnetic Separators (LIMS) and Spirals Regrind in the Requests for Quotations (RFQs), but two of the three manufacturers invited quoted ball mills to provide the necessary flexibility for the variation in feed. The third manufacturer failed to submit a quotation before the closing date.

Ease of access for operations and maintenance of equipment was a major influence on the layout. All elevated equipment is provided with permanent platforms and stairways. Where possible platforms are 1 metre wide. The use of ladders has been avoided throughout.

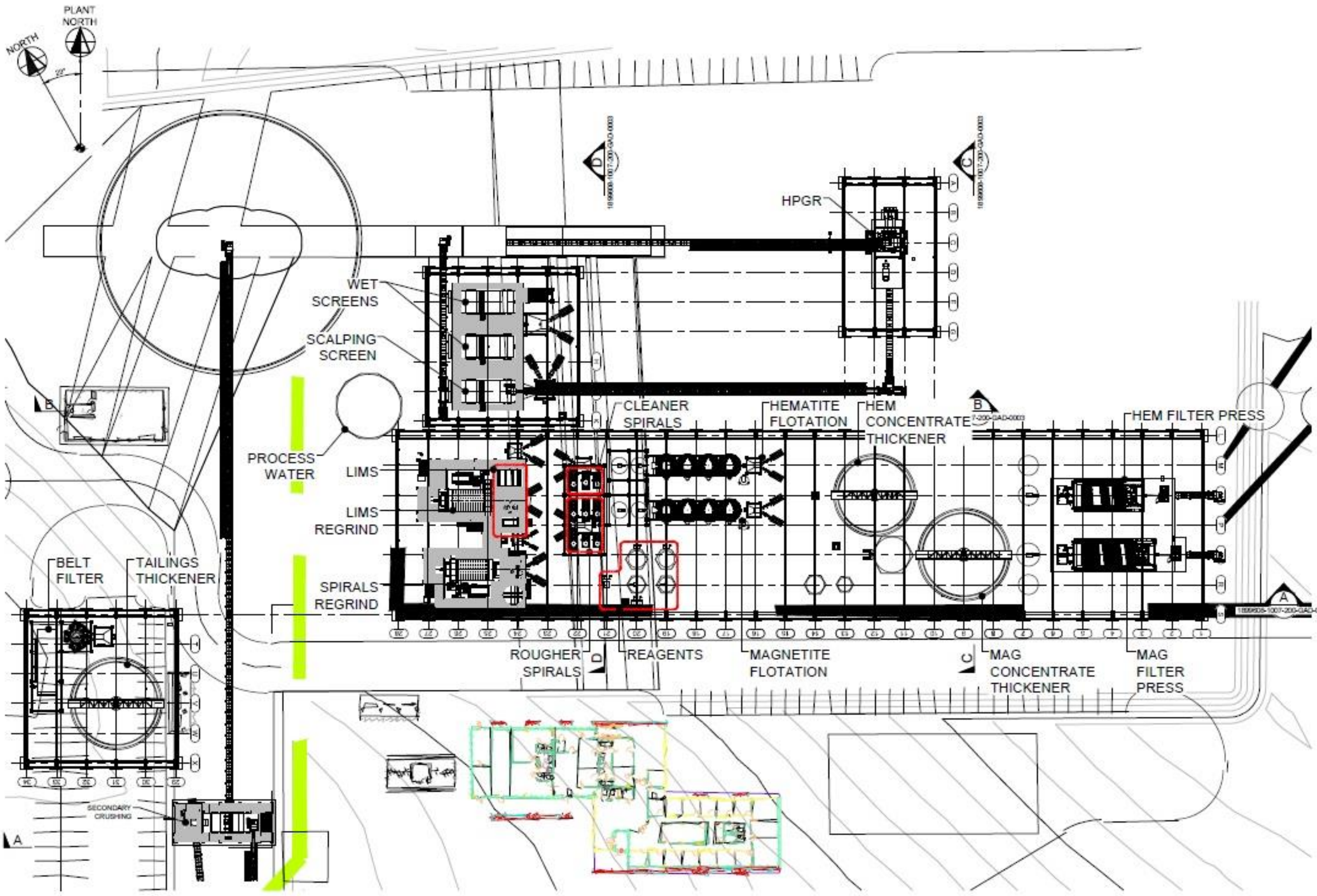


Figure 10: Plant Layout

The process plant performance criteria to be used for unit process design have been developed from the extensive pilot plant and laboratory programs completed previously and comprehensively documented in the DMT Technical Report. The work has been reviewed, and there are no gaps in the metallurgical information provided.

The data generated from the last pilot plant tests (SGA, 2016) has been used to confirm both the requirements for each unit process included in the flowsheet, and the basis of the current plant design. With this as the basis, the information has been interrogated to ensure the major pieces of equipment have been sized and appropriately specified for the vendor quotation.

The pilot plant test program on which the current plant design has been conducted was completed on the best samples available at the time, including drill core of the major horizons and bulk surface outcrop samples.

The mineralogical recoveries recorded were approximately 95-98% for the Magnetite mineral component, and approximately 82% for the Hematite. A further round of characterisation testing is recommended on drill core composites representing the early mine (say first year) plan to both confirm the Magnetite recoveries at the grind size selected (80% passing size of approximately 1mm) and to investigate the potential of improving the Hematite recovery.

Based on the Laboratory and Pilot Plant Testwork conducted, subject to the caveats noted in Study Limitations, GBM confirms that the Process Plant is suitable to produce the quantities of concentrate stated in this report. Production forecasting from the feed material is also confirmed, provided that the feed material conforms to the grades of Magnetite and Hematite found in the samples used in the Testwork, and that the tonnages of feed material are as specified in the Mining Chapter of the report.

Tailings

Refer to **Chapter 10.0** for full detail. The work involves analysis and assessment of tailings characteristics, ground conditions, storage requirements and stability, which is used to develop a design for an upstream construction Tailings Storage Facility (“TSF”). The area proposed is located approximately 5 km west of the town of Ludvika and 1.5 km west of the industrial area with the process plant. The PFS proposed two separate tailings storage facilities, separated by the small constructed canal which flows into a tunnel at the north-eastern end of the canal.

As part of this study, Golder reviewed the locations proposed by Ramboll, noting the high embankment volumes to store the required tailings volumes. This was identified in the Ramboll report, which particularly identified the northern facility which is an existing tailings facility. For the Feasibility Study, the use of the coarser tailings for underground backfill reduced the quantity of tailings to be stored in the facility which had the benefit of reducing the footprint area required for tailings storage. The two sites were evaluated and a reduced footprint that only required the southern area was selected for storage of the project tailings. Further discussion of the TSF design development, relative to the permit conditions is provided in **Chapter 15.0 - Environmental and Social**.

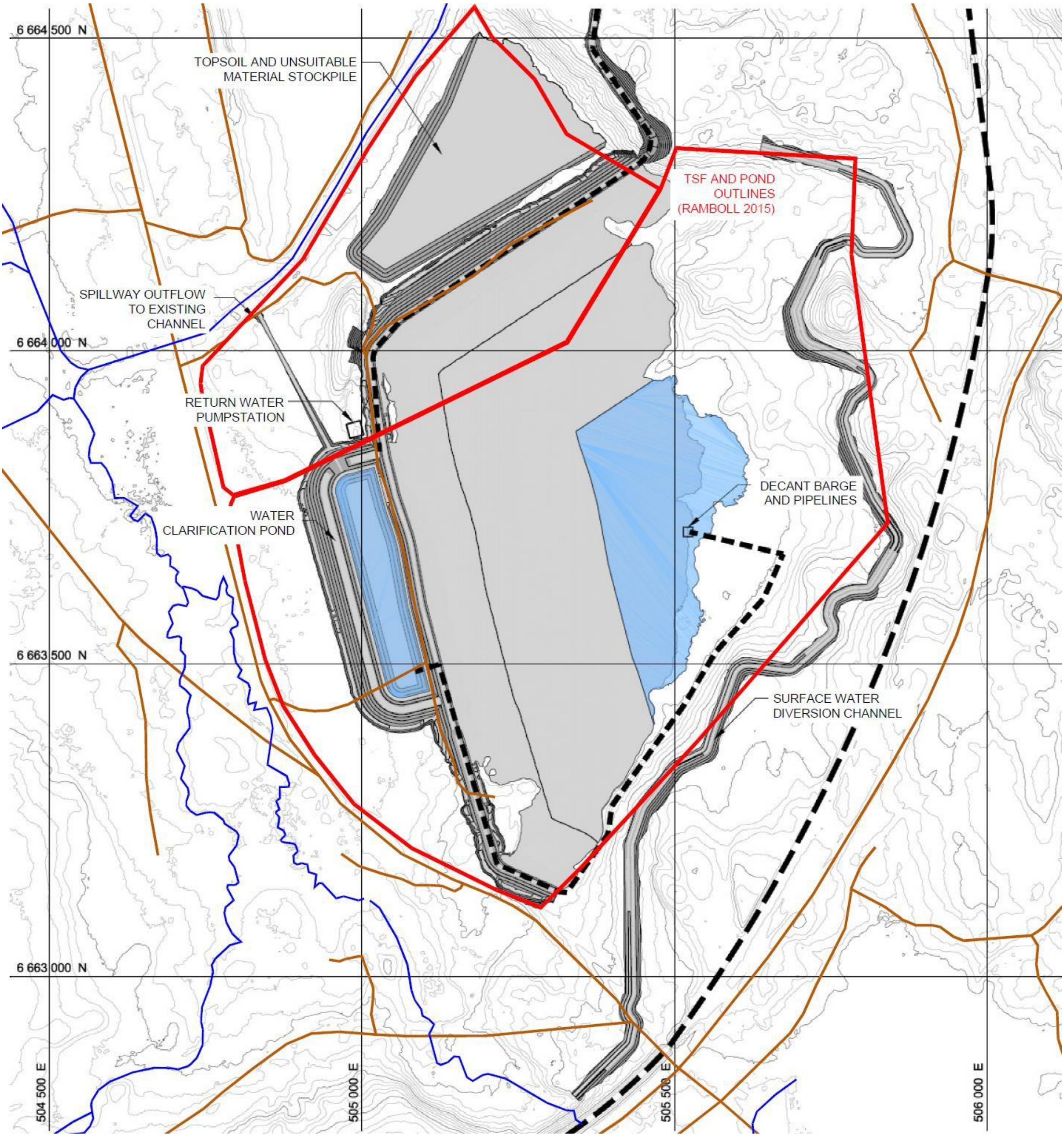


Figure 11: TSF location

TSF Design

The Blötberget TSF will be developed as a side valley tailings storage facility, which will entail the construction of an initial starter wall to accommodate tailings deposition during the first two years of production, followed by the phased development of wall raises to increase the storage of the facility.

Following review of the pre-feasibility level design of the two proposed Tailings Management Facilities (TMF North and TMF South), Ramboll (2014), Golder has proposed a new, single-facility design to the south of the existing canal, within the footprint of the originally proposed 'TMF South'. The proposed TSF design, unlike the previous ring-dyke style facilities, will utilise the natural topography of the Grindfallet in a side-hill valley impoundment; comprising of two main embankments, the Main Embankment to the north, a Saddle Embankment along the west and two smaller embankments to the south.

TSF Water Management

Tailings slurry is pumped from the process plant to the Tailings Storage Facility (TSF) and is deposited in the tailings impoundment from its north and west embankments. Decant water from the tailings is collected in a supernatant pond within the impoundment together with runoff from an up-gradient area of natural catchment and direct precipitation falling on the tailings beach and surface of the pond. Water collecting in the supernatant pond is pumped to a clarification pond located on the western side of the impoundment. The clarification pond provides polishing of the water before it is pumped back to the plant site for use in ore processing or discharged to the environment.

The TSF will be equipped with a storm water diversion and spillways. The storm water diversion channel is designed to intercept clean storm water from the valley side above the TSF and divert it around the TSF and is located to the eastern side of the facility. The clarification pond is also provided with a spillway for extreme flows. Further information on water management together with a water balance including the TSF is provided in **Chapter 11.0 - Site Water Management**.

Site Water Management

Refer to **Chapter 11.0** for full detail.

Site Wide Water Balance

This section documents the development of and predictions from the site wide water balance for the Project. More specifically, it presents the methods used to predict the quantity of water required for potable and mine processes. Considerations were made to surface water entering the mine reticulation system from underground dewatering, process excess and surface water run-off / snowmelt. The water balance is intended to provide greater efficiency, maximise reuse, ensure mine water releases are managed holistically and to reduce water-related risks. The primary purpose of the site wide water balance model is to better understand and characterise water storage and conveyance within the Nordic Iron Ore mine site and Lake Glaningen watershed and to support planning decisions for the Mine.

The site wide water balance and thus water management system and reticulation for the Project Site is presented conceptually in **Figure 12**.

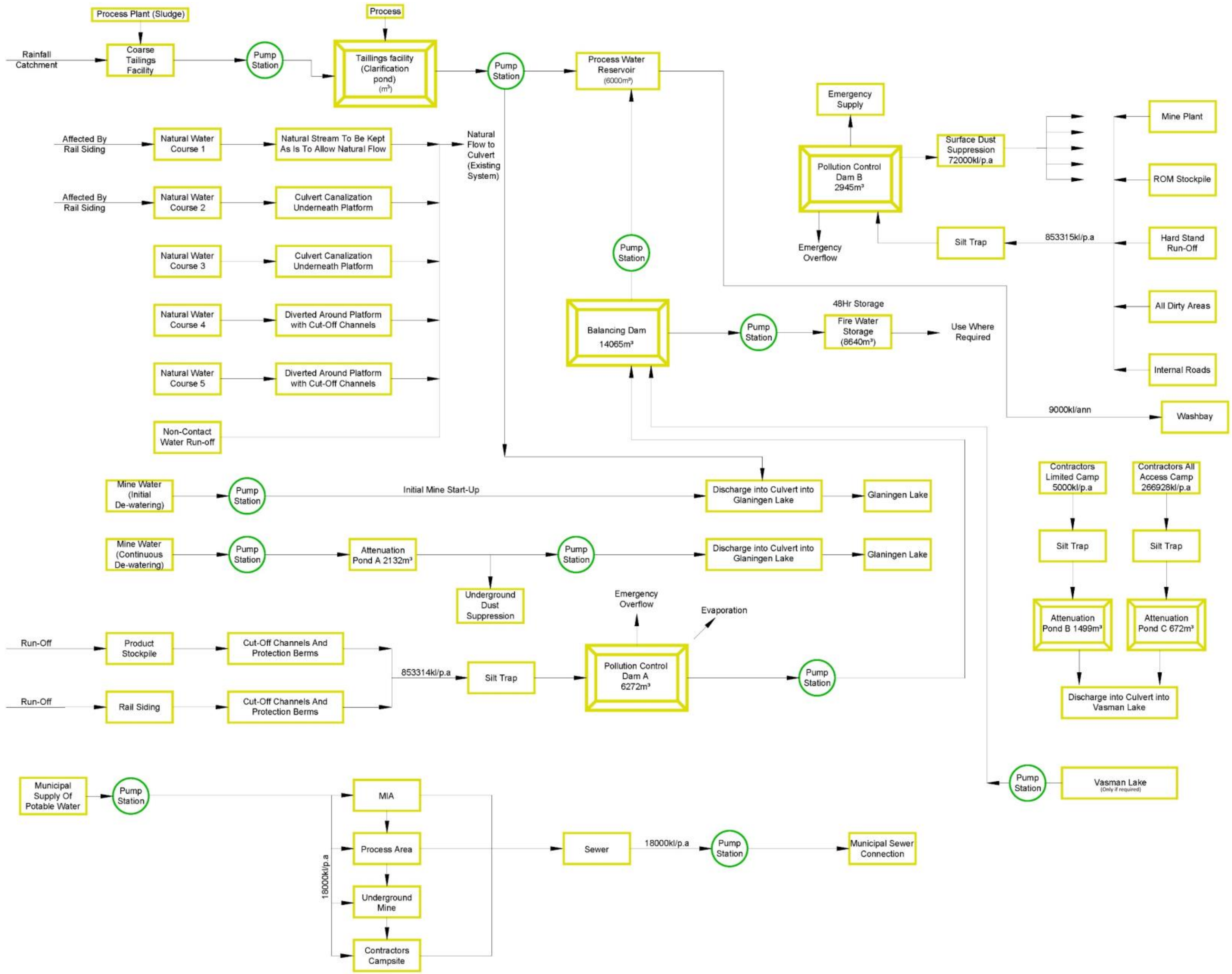


Figure 12: Site wide water balance flow diagram

Mine Dewatering

- Peak flow rates (of 328 l/s) are encountered at the start of construction (at -1.5 years of the mine life) due to the removal of water from existing flooded workings and the initial development of the decline. The discharge rate will be attenuated to 300 l/s via ponds.
- Following cessation of the early dewatering the mine inflow rates are approximately 70 l/s, the main contributions to this being the flows to the historical mine at 40 l/s and 25 l/s from the ongoing development of the main decline.
- The mine inflow rates then increase gradually to approximately 100 l/s around year 5, and then further to a maximum of 117 l/s towards the end of the mine life. The increase relates to development of access as the mine progresses and new levels are developed.
- At the end of the mine life, the new mine development would contribute 77 l/s versus 40 l/s for the old workings.

Water Management Ponds, Control Dams, and Ponds

The TSF supernatant pond and clarification pond are the largest facilities used to balance water affected by mining and process. Water supply and demand will also be managed at the plant site at the pollution control dams, attenuation ponds and balancing pond.
Polluted or contact run-off from the following areas will be directed to Pollution Control Dams (A & B):

- Product stockpiles;
- Rail sidings (diverted via the cut-off channels and protection berms);
- Mine plant;
- ROM Stockpile;
- Infrastructure hardstand;
- Internal roads; and
- All outstanding polluted areas.

Attenuation facilities have been proposed for each of the contractor's campsites. The run-off from these campsites will be diverted into the attenuation facilities using stormwater channels and earthworks. Water attenuated in each of the ponds will then be released into interceptor canal 1 which runs between the two campsites.

Lastly, a balancing pond is to serve as a collection point for all the water which could be used for mining processes. Water collected at the balancing dam will then be transferred to the process water reservoir. This water is to be used for mining activities, processes, dust suppression and within the wash bays.

Water Use

The estimated water usage (Water Demand Values) for the Project for both dust suppression and the ore processing plant has been summarised in **Table 10**.

Table 10: Summary of Water Usage

Water Intake			
Specifications	**Peak m³/s**	**l/s**	**L/annum**
Dirty Water Areas (A) - Stormwater	4.495	4 495.2	61,199,889
Dirty Water Areas (B) - Stormwater	5.288	5 287.8	49,376,107
Non-contacted water	12.276	12 275.7	111,449,457
Total Water Intake		22 058.7	222,025,454
Water Output			
Specifications	**Peak m³/s**	**l/s**	**L/annum**
Dust Suppression (A) - Grey water	0.005	4.9	1,513,111
Dust Suppression (B) - Grey water	0.003	3.4	1,037,700
Plant raw water requirements	0.042	41.7	10,980,088
Underground Water demand	0.001	0.5	135,420
Washbay usage	0.001	1.4	9,000,000
Fire Water Demand	0.2	200	34,560,000
Total Water Intake		251.8	57,226,319

Surface Infrastructure

Summary

A rendered schematic of the Mine Infrastructure Area ("MIA") is shown in **Figure 13**. Standard international design practices were employed in all designs whilst adhering to applicable Swedish regulations. Buildings include:

- Explosive storage;
- Process plant;
- Site access control;
- Offices;
- Ventilation buildings;
- Workshops;
- Fuel storage; and
- Store.

Internal road and pavement networks include both asphalt and gravel surfacing.

Water reticulation includes; potable water (sourced from the municipality), firewater, processing waster, as well as sewage design.

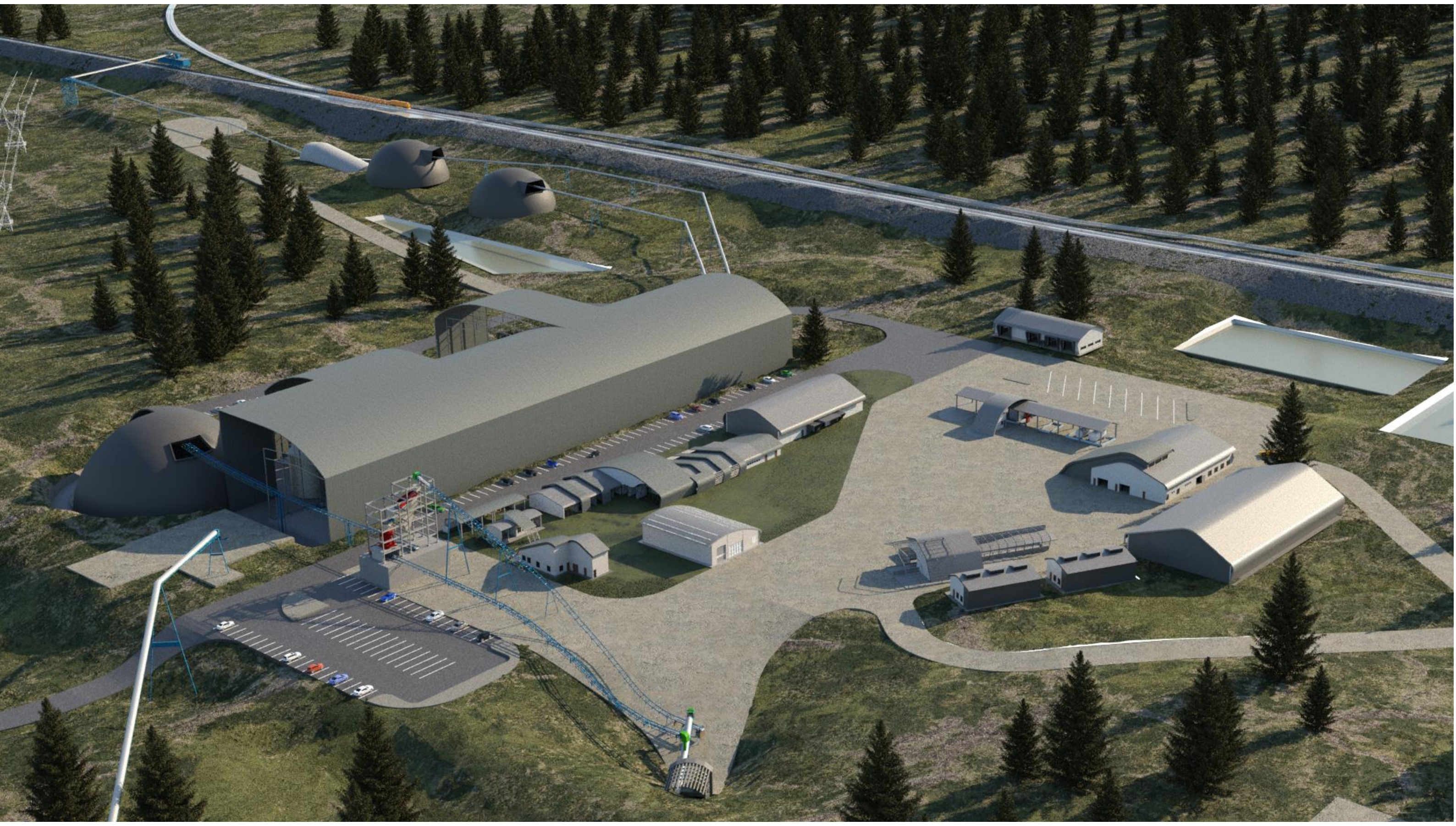


Figure 13: Rendered schematic of the surface infrastructure

The mine substation will be fed by a 50 kV line operated by VB Energi. A 15 MW connection has been approved. A single 12 kV distribution substation feeds 3 separate distribution rings; (1) processing plant, (2) surface infrastructure and (3) underground infrastructure. The total max power demand is 17,000kVa / 13,590kW. The table below shows the estimated power load.

Table 11: Power Loading

COMBINED LOADS	kVA
SURFACE LOADS	11,122.00
UNDERGROUND LOADS	10,112.00
TOTAL (undiversified)	21,234.00
Diversity / coincidence factor	0.8
TOTAL (diversified)	16,987.00

Offsite Infrastructure

Please refer to **Chapter 12.0** in the main report.

Transport and Logistics

Refer to **Chapter 14.0** for full detail.

Railway Infrastructure Skeppmora - Oxelösund

The trains loaded with iron ore concentrate will operate from Skeppmora terminal through Frövi – Arboga – Valskog – Eskilstuna – Flen – to Oxelösund. After unloading in Oxelösund the trains will return with empty wagons to Skeppmora terminal on the same route. The distance between Skeppmora and the Port of Oxelösund is approximately 270 km. No changing or recirculation of the locomotives is required on the route.

Maximum permissible axle load (“STAX”) is 22.5 tonnes and metre weight (“STVM”) is 6.4 tonnes/m. Maximum speed is 80 km/h for freight trains and for passenger trains the speed limit is between 80 and 160 km/h (some short speed reductions may occur at some stations). The route is in medium to good condition; costs for investment which are underway are not applicable to NIO.

Train Parameters

Rail Cargo´s proposed train type to be used for product transportation from Skeppmora terminal to the port of Oxelösund is comprising 18 Innowagon designed wagons per train set. The train length is 481 m plus 40 m locos. The Innowagon is 26.7 m long and comprises of 6 containers given a capacity of around 138 tonnes per wagon. This results in a total capacity of around 2,500 tonnes ore of each train set.

The proposed train which has an axle load of 22.5 tonnes and a metre weight of max 6.7 tonnes/metre means that there will be little or no restrictions in speed applied to the train. However, an application to Swedish Transportation Administration department Special Transports (Specialtransporter) with the exact load and type of wagons is required before operation, according to standard procedure for this kind of transports.

Table 12: Summary of train parameters

Wagon	**80 ft Innowagon (6 container)**
Length:	26.7 m (80 ft)
Axle load:	22.5 tonnes/axle
Weight/meter:	6.74 tonnes/m
Container	**Container INFU-SCM03-00-000**
Length:	3/96 m (13 ft)
Weight (empty):	1.9 tonnes
Volume:	15.3 m^3
Train	**18 wagons/train set**
Length	481 m
Gross weight/train set	3,240 tonnes

Railway Infrastructure Port of Oxelösund

In Oxelösund the train is required to shunt from the station (Oxelösund main yard, owner STA) uphill to the upper port yard (Höjdbangården, owner Oxport). The containers with iron ore concentrate will be unloaded from the train by forklift and transported to hopper for unloading, see unloading place to the left in the figure below. The iron ore concentrate is transported from the hopper to the storage area via conveyor.

Port of Oxelösund

The Port of Oxelösund is 50% owned by the municipality and 50% by SSAB Oxelösund AB. Oxelösund has previously been a major shipping port for iron ore from Bergslagen and has been designed as a dry commodity bulk handling port, with iron ore and coal as the main commodities. The port currently operates at around 5.5Mt/y of dry bulk cargos as well as a significant amount of wet cargos.

NIO can purchase the services from the port purely as an OPEX cost, which includes transport of the iron ore concentrate from the hopper to the storage area via conveyor, covered storage, transport from the storage area and loading of vessels. The cost includes all access charges and fees, financing cost and maintenance and logistics operation and staff (including forklift staff); these are covered in **Chapter 19.0 - Operating Costs.**

After unloading the iron ore concentrate it is transported from the hopper to the storage area via conveyer. The planned storage capacity in Oxelösund Port assigned to NIO is approximately 30,000 m^2 for up to 250,000 tonnes capacity; which approximately corresponds to up to 2-3 shipment vessels. The port will enable separate handling and storage of the products to prevent losses of product and cross contamination. The port will provide covered storage to prevent ingress of water from rain and snow.

The material is transported by the Port of Oxelösund from the storage area and loaded on vessels up to 50,000 dwt via the conveyor and the loadout crane. For larger vessels up to 90kt, the material will be trucked from the storage area to the lower harbour plane for crane loading.

The current loading capacity of the port is estimated at an average rate of 2,000 tph via the loadout crane via the conveyor belt from the storage area. The existing loadout conveying, and crane have a nominal annual capacity of 2.5 Mt/y. This is more than sufficient for Blötberget.

Shipping

The Port of Oxelösund has a draft of 16.5 m, capable of handling vessels up to baby Cape size. The port will initially handle Panamax vessels, expanding to larger units when the port upgrades the mooring size and loading equipment. The major restriction in the region is the draft available through the Straights of Denmark at 15.7 m, limiting vessel size to typically Panamax size or around 120,000 dwt for wide bodied Max vessels.

However, the major advantage of the Port of Oxelösund is in the potential cost-effective handling of vessels to the major European markets, especially those in the Baltic Region. Here flexibility could be the key as well as cost effective ballast trips, where it is possible to use even barges or small geared vessels for deliveries to certain markets, for example in Poland and Germany. LKAB, an iron ore producer in the North of Sweden, uses barges (around 13,000t dwt) from Luleå for deliveries of pellets to steel producers; SSAB, Rukki and Ovako. Ports in the Baltic Region also use an efficient fleet of Handy and Handymax size vessels ranging from around 20,000-50,000 dwt.

The use of barges opens the possibility of direct deliveries by canal/rivers into Germany and other parts of Europe. NIO's use of Oxelösund will prove to be highly competitive to these markets, with a significant advantage compared to Europe's main suppliers in Brazil, South Africa and Canada, who would have to either unload the iron ore in Rotterdam for transhipping by barge or rail, use Panamax vessels or partially unload in Rotterdam to deliver into the heart of Europe. Even Voest Alpine, an Austrian steel producer, has iron ore transportation coming in from Rotterdam on small trains. NIO has competitive advantage to deliver to most markets in Europe and the Middle East and North Africa region (MENA) region, where Panamax vessels with the higher valued iron ore concentrates are more common.

Environmental and Social

Refer to **Chapter 15.0** for full detail. Nordic Iron Ore AB ("NIO") applied for a permit under the Environmental Code for the mining of iron ore at a previously closed mine in Ludvika. The permit was granted in 2014 and covered the actual Blötberget mining concession called Blötberget K Nr 1, located approximately 6 km southwest of Ludvika town in the county of Dalarna.

An Environmental Impact Assessment report was completed by Golder (2012); it has been reviewed by Golder considering the design changes as part of the 2019 Feasibility Study. There are no major environmental concerns and the majority of mitigation measures from the 2012 EIA report are still valid as part of the 2019 design.

The Project is expected to cause no significant harmful impacts to human health and is expected to have a positive social impact.

NIO has engaged in communications with the local stakeholders, including several public meetings; reception to the Project is positive and has not met strong opposition. Draining of the mine will affect a number of drinking water and energy wells in the zone of influence of the mine, though mitigation is planned.

Closure Plan includes decommissioning and rehabilitation of the industrial areas, which includes controlled flooding of the underground mine. The tailings area will be covered, and the clarification pond will be drained; both will be seeded to promote vegetation.

Project is in compliance with the requirements of the Equator Principles III framework.

Compliance with Environmental Permit

A summary of the main aspects in regards to permit compliance is provided in **Table 13**. Mitigation measures from the 2012 EIA report that require review with respect the 2019 project design are described; there may be a requirement to update the environmental permit, though they do not prevent the project from starting construction.

Table 13: Changes to environmental impacts and/or mitigation measures based on 2019 project design. Section 15.4 should be referenced for full details.

Aspect	Changes to environmental impacts and/or mitigation measures based on 2019 project design
Ground Vibrations	The mitigation measures from 2012 remain relevant with the 2019 project design as charge will have to be reduced near residential buildings. However, a review of ground vibrations may be required taking into consideration the mining area K Nr2 and new roadways in the 2019 project design.
Nature	A review of the nature values and key biotopes is required to ensure the study area from the 2012 assessment covers all areas of the new project footprint (TSF and roadways). The compensation plan will also require updating based on the findings of the new nature values and key biotopes assessment.
Cultural Environment	A review of the impact the project will have on ancient remains will be required based on the 2019 design layout to ensure the archaeological study area includes all areas of the new project footprint (TSF and roadways).

Summary of Existing Permits

Table 14 lists details of the current and applied permits for the Blötberget area. The table contains the details for Håksberg K nr 1 and Södra Väsmanfältet K nr 1 mining concessions, however, these are not included in this Study. The environmental permit granted in 2014 covers both Blötberget K nr 1 and Håksberg K nr1, however Håksberg is not included in the study.

Table 14: Summary of existing and applied permits by NIO in the Blötberget area

	Date granted	Expiry date	Area (ha)	License ID
Exploration Permits				
Ludvikafältet nr 1	2019-05-06	2022-05-06	913,65	2019:45
Blötberget nr 4	Not granted, applied 2019-06-17		453,76	000770/2019
Mining Concessions				
Blötberget K nr 1	2011-08-03	2036-08-30	126,4287	2010001141
Blötberget K nr 2	2017-08-14	2042-08-14	38,65	2016000339
Södra Väsmanfältet K nr 1	2017-12-21	2042-12-21	115,39	2015000563
Håksberg K nr1	2011-12-15	2036-12-15	136,2986	2011000319
Environmental Permit				
Blötberget and Håksberg	2014-03-20			M 3812-12

Current Environmental Permit

NIO applied to the Environment Court for an environmental permit at Blötberget in September 2012 and was granted the permit in March 2014.

The permit grants permission for the following according to Chapter 9 of the Environmental Code:

- Mining of a maximum of 3 million tonnes of ore per annum at Blötberget;
- Deposition of tailings from the processing plant; and

- The erection, construction and operation of installations necessary for the work, including shafts, drifts, ramps and other rock work required for the mining, installations for the transport and storage of mined ore and waste rock above and below ground (tunnels, roads, shafts, conveyor belts, hauling devices, mucking arrangements, intermediate store etc), plant for crushing above and below ground, a processing/ concentrating plant, plant for transporting and loading raw ore and finished products (railways terminals etc), an installation for transporting waste out of the processing/ concentrating plant and a tailings storage facility including clarification pond, all in the municipality of Ludvika and mainly in accordance with what was stated in the application.

The permit grants permission for the following according to Chapter 11 of the Environmental Code:

- To remove the water present in the mine and to erect the installations which this removal requires (pumps, settling basins, pipes to the Gonäsån River);
- Via the above-mentioned installations, to discharge the surface water and groundwater leaking into the mines during regular operation;
- On part of the section between Lakes Glaningen and Väsman, to divert the Gonäsån River from its natural bed to excavated channels and rock tunnels under the communities of Blötberget and Främundsberget respectively, and for this purpose to cut off the natural outlet of Lake Glaningen with a barrage, open the inlets to the channels and tunnels, block the Gonäsån river at the properties Gonäs 1:35, Gonäs 1:142 and Finnäset 14:10, block off Hyttbäcke (stream) at the property Finnäset 14:10, demolish existing embankments at the properties Gonäs 1:35 and Ludvika gård 8:2, carry out cleaning work in the channels and rock tunnels, construct a culvert over the southern channel at the property Gonäs 25:1, construct a culvert under Klenshyttevägen at the property Finnäset 14:10 and construct and demolish settling dams respectively during the construction period;
- To drain land in an area south east of the Blötberget Mine and for this purpose erect a pumping station at the property Finnäset 14:10;
- To construct and operate dams and associated devices for the tailings disposal and settling plants; and
- To abstract up to a maximum of 100 l/s of water from Lake Väsman and erect the installations required for this, all mainly in accordance with what was stated in the application.

The Land and Environmental Court grants NIO the right, according to Chapter 28, § 10, first paragraph, points 2 and 6 of the Environmental Code, to make use of land and water areas that belong to the properties Gonäs 1:35, Gonäs 25:1, Finnäset 14:10, Skeppmora 2:9, Skeppmora 4:29, Skeppmora 4:31, Skeppmora 5:20, Skeppmora 5:36, Skeppmora 7:3, Ludvika gård 8:2 and Klenshyttan 4:1, as well as the communities OUTR:1 and Skeppmora SAMF:2.

The compulsory right now applies to licensed installations and measures for dams for the tailing's disposal and clarification, and for land drainage etc. within the areas marked in appendices 1-2 of the judgment.

Commencing Development Prior to Updating Permit

An application to change the existing permit will be required in order to accommodate the use of the historical tailings storage facility as a deposition area for waste rock, the reprocessing of historic tailings and the mining of concession area K nr 2. Some of these changes are improvements to the environmental performance e.g. by introduction of reduced tailings disposal and re-use of former mine waste and are not expected to be contentious.

However, as the current permit covers the majority of the steps planned the project can start development in parallel with updating the permit to cover the aforementioned items. Further details on the timing of the permit update is given in the **Chapter 21.0 - Project Execution Plan**. As the changes are improvements to environmental performance (e.g. introduction of reduced tailings disposal and re-use of former mine waste), it is considered that the updated permit can be achieved before the aforementioned items require commencement. The project execution plan schedules production to start roughly after 2 years of construction/development; the original permit application took 20 months.

The land to be used for waste rock deposition and historic tailings re-mining will be purchased by NIO early in the development timeline and included in an updated permit. Whilst considered unlikely, if there is a delay, then the contractor area can be used from the commencement of production as it is included in the environmental permit application and is permitted for the storage of waste rock. The re-mining for historic tailings is not required until 7 months into the first year of production; if the permit is not ready for then, material can be sourced from elsewhere, but it will not affect production.

The tonnages in the concession area K nr 2 equate to 1.6 Mt Reserve (at 29% Fe); these tonnages are currently planned to be extracted between months 27 and 68 (though not consecutively in that time period) after production starts. This is over 3 years after construction/development is finished, so it is considered that updating the permit to account for these tonnages can be made in time before mining them. If permitting is significantly delayed the mining areas in the K nr 2 concession can be deferred to be mined later in the mine life.

Human Resources

Refer to **Chapter 16.0** for full detail. Nordic Iron Ore AB ("NIO") plans to employ an owner-operated labour strategy during steady state operations, with contractors utilised during construction and initial development. During detail engineering this strategy can be re-evaluated based on discussions with prominent service and equipment suppliers.

The workforce is anticipated to comprise of local skilled and unskilled labour residing in offsite accommodation in the surrounding areas, most likely the town of Ludvika situated approximately 12 km to the east. Whilst onsite accommodation is not provided or accounted for, parking is adequate for the employee numbers due on site each day.

At full production approximately 311 staff will be directly employed by the project (including coverage for holiday, absenteeism and sickness). The proportion of Swedish nationals is anticipated to be more than 95% due to the mature local mining industry and readily available experienced workforce. In addition, Nordic Iron Ore will form partnerships with educational institutes (such as Luleå Technical University, University of Dalarna in Falun and Bergshögskolan in Filipstad) to commence the process of upskilling the current workforce and members of nearby communities, and to develop a sustainable talent pipeline.

Products and Market

Refer to **Chapter 17.0** for full detail.

Market Summary

Wood Mackenzie ("WoodMac") was tasked by NIO to undertake a Products and Market analysis for Blötberget. WoodMac is a global energy, chemicals, renewables, metals and mining research and consultancy group with an international reputation for supplying comprehensive data, written analysis and consultancy advice.

The Blötberget Iron Ore Project ("the Project") is planning to produce two products; a 70.5% Fe magnetite concentrate and 66.6% Fe hematite concentrate. The physical specifications of the two products suggest that they will both be suitable for sale as a pellet feed and potentially as a component included in blends for sinter-plant operations. The seaborne pellet feed market is expected to grow at a moderate rate over the next 20 years (2019-2039), with imports growing at a compound annual growth rate ("CAGR") of 3.2% from 89 Mt in 2018 to 168 Mt in 2039. The majority of this growth will come from China and India.

Based on the product chemical composition WoodMac estimate that NIO's 70.5% Fe magnetite concentrate will command a VIU adjusted premium of US$ 29.8 /t CFR China over 65% Fe Fines (CFR China) in 2019. In the long run (2020-2030), this translates to an average premium of US$ 20.4 /t over 65% Fe Fines benchmark average price, thus placing the product at US$ 99.9 /t CFR China in 2019-real terms. NIO's 66.6% Fe hematite product is expected to have a premium of US$ 15.5 /t in 2019 and a long-term (2020-2030) average premium of US$ 9.2 /t over 65% Fe Fines benchmark price, thus placing the product at the average price of US$ 88.6 /t CFR China in the long run (2019 real).

Overall, the chemical composition of the magnetite product compares favourably with existing seaborne pellet feed suppliers. When compared with a peer group of pellet feeds sold in the seaborne market, the magnetite product has relatively high phosphorus, but Wood Mackenzie does not expect it to be directly penalised for this. NIO's hematite product also compares favourably with existing pellet feed suppliers and is equal or superior to other competing products.

Nordic Iron Ore should target pellet feed consumers in Bahrain, the Netherlands, Algeria and India with the Project's products. Although China's pelletizing plants are expected to increase seaborne imports, the country has a lower appetite for high-grade feed, and this together with relatively high seaborne freight is reflected in a relatively modest assessment of the netback price for NIO's products from this market. Another driver of magnetite product demand is regulatory restrictions around emissions. As China adopts stringent emission regulations, Wood Mackenzie expects domestic pelletizers to prefer magnetite ore over hematite, which could provide an entry route for NIO's magnetite concentrate into China in the long term.

Although not considered by Wood Mackenzie, the supply of high-grade concentrates to the sinter plant operators, especially in Europe, should also be considered. Nordic iron Ore has held discussions with European sinter plant operating steel companies who will use a percentage of concentrates in their sinter feed blends, and indeed, some testwork has been carried out in this use where NIO products have been found to be suitable additions to sinter blends up to levels of around 10%. The main benefits of using NIO products is the lift in Fe content provided by the high grade. The immediate focus for Nordic Iron Ore should be on specific European sinter-plant operators and Bahrain and the Netherlands, which are mature markets with a preference for high- grade pellet feeds. The medium to long-term focus, however, should be India and Algeria because of their expected demand growth. The competitiveness of NIO's products in these markets will be governed by both the quality of the products and freight rates. WoodMac expects that NIO's magnetite product will be highly sought after in Bahrain, and eventually in India and Algeria because of DR grade pellet feed requirements in these countries. WoodMac believe that Nordic Iron Ore will be able to position its magnetite product competitively in these locations and at favourable netback prices.

The immediate competition for NIO's magnetite product will come from Brazil, Chile, Mauritania and Peru. NIO's magnetite product is higher-grade and benefits from lower freight rates to Europe, the Netherlands, Bahrain, India and Algeria in particular, relative to products from Chile and Peru. As such, it is expected that NIO's magnetite product will be able to compete strongly in these markets. This dynamic may be impacted if potential high-grade projects in Australia, such as Hawsons and Iron Bridge are commissioned. These projects will provide stiff competition to NIO's magnetite product due to the comparable specifications and significantly lower freight rates from Western Australia to Bahrain, China and India.

There are many products with similar characteristics to NIO's hematite product, and WoodMac expects the product to face strong competition in all the target markets, including the Netherlands. However, the relative proximity of Sweden to the Netherlands and the rest of Europe provides some competitive advantage. Hence, the hematite product should be targeted to the Netherlands's pellet feed market, as well as a blended feed into the sinter markets of Germany, France, Austria and Poland. Based on market expectation for sinter fines, it is believed that NIO, if it was to sell its product to sinter makers, would not be able to attract the premium for hematite concentrate as estimated above. NIO can use the cost-efficient vessels in the Baltic sea to export goods to northern Germany and Poland, where the freight advantage from utilising such low-cost vessels is likely to off-set at least some of the loss in premium both for magnetite and hematite. United Kingdom steel producers is also a potential market.

Based on Nordic Iron's chemical specification, the magnetite product has a higher iron content (70.5% Fe) than its competitors (ranging between 65-70%). With relatively low levels of impurity elements SiO2, Al2O3 and S, the chemical composition of Nordic Iron's magnetite product compares favourably against existing seaborne pellet feed suppliers (**Table 15**).

Nordic Iron Ore's blended option, which is made up of 63% of the Magnetite (70.5% Fe) and 37% of the Hematite (66.5-66.6% Fe), also compares favourably with impurities within the range exhibited by a few high-grade mines.

The high-grade magnetite product sits outside the typical range for iron content even for high grade 66% Fe indices, which spans up to 70% Fe. The penalty limit for phosphorus may therefore be marginally reduced for the 70.5% Fe magnetite product particularly. However, there is sufficient headroom at 0.039% P for the magnetite product (and the 0.035% P blended option) given that they are not close to the upper allowable specification of 0.06% P.

Wood Mackenzie does not expect either product to be directly penalised at the specified phosphorus levels.

Table 15: Magnetite specification benchmark

Country	Sweden	Sweden	Australia	Australia	Australia	Chile	Ukraine	Russia
Company	Nordic Iron Ore	Nordic Iron Ore	CITIC Pacific	Hawsons	Iron Bridge	CMP	Metinvest	Metalloinvest
Ore type	Magnetite	Blend (63% Mag, 37% Hem)	Magnetite	Magnetite	Magnetite	Magnetite	Magnetite	Magnetite
Fe content (%)	70.5	69	68	69.9	67.2	65-68	65-68	68-70
SiO2 content (%)	1.31	1.93	5.6	1.99	5.5	2.2-6.5	4.9-9.3	2.8-4.8
Al2O3 content (%)	0.24	0.37	0.2	0.29	0.25	0.65-0.9	0.2-0.6	0.1-0.2
P content (%)	0.039	0.035[3]	0.04	0.01		0.04-0.28	0.02-0.1	0.01
S content (%)	0.002	0.004	0.01			0.08-0.09	0.01	
H2O content* (%)			9	9	8	2-8.5	8.5	1.5

*Source: Nordic Iron Ore, Wood Mackenzie. *Note: NIO hematite and magnetite products are planned to have <6% moisture*

Chemical specification of NIO product is superior to competitors'
Chemical specification of NIO product is inferior to competitors'
Chemical specification of NIO product is similar to competitors

Table 16: Hematite specification benchmark

Country	Sweden	Australia	Brazil	Brazil	Brazil	Brazil	Canada	Canada
Company	Nordic Iron Ore	Ansteel	Vale	Samarco	Anglo American	CSN	Champion Iron Ltd	Rio Tinto
Ore type	Hematite	Hematite	Hematite	Hematite	Hematite	Hematite	Hematite	Hematite
Fe content (%)	66.6	65.14	65-67	67.3	67.5	64-67.5	66.2	65-66
SiO2 content (%)	3	4.75	1.4-2.7	1.6	2.5	1.7	4.44	
Al2O3 content (%)	0.6	0.08	0.7-1.7	0.495	0.6	0.6	0.2	0.2
P content (%)	0.02	0.01	0.04	0.045	0.05	0.05-0.07	0.01	0.01
S content (%)	0.008						0.01	
H2O content* (%)		8		1.5	8.5	8-8.5	3.2	2-2.5

*Source: Nordic Iron Ore, Wood Mackenzie. *Note: NIO hematite and magnetite products are planned to have <6% moisture*

Chemical specification of NIO product is superior to competitors'
Chemical specification of NIO product is inferior to competitors'
Chemical specification of NIO product is similar to competitors

Brazil is the main supplier of hematite iron ore pellet feed product, with key producers including Vale, Anglo American and Companhia Siderurgica Nacional (CSN) exporting to the main markets of China, Middle East and Europe.

Phosphorus levels in NIO's hematite product is generally lower than competing products from Brazil, which could place the product at a competitive advantage over Brazilian seaborne pellet feed supply. Compared to hematite supply from Canada, NIO's phosphorus content is however marginally higher. The iron content of NIO's hematite product falls within the range available from competing producers (64-67.5% Fe content), although the content of silica and alumina is somewhat higher.

Ultimately, the chemical specification of NIO's hematite product indicates that it will be an attractive alternative to competing products due to its low phosphorus content (especially for plants able to handle the higher levels of silica and alumina).

Table 17: Nordic product specifications versus published thresholds

	Product Specification			Threshold	Index Maximum	
Product / Index	Nordic Magnetite	Nordic Hematite	Nordic Blend	65% Fe VIU Thresholds	MBIOI - 66% Fe Conc. CFR	MBIOI – 65% Fe Fines CFR
Fe content (%)	70.5	66.6	69	-	70	66
SiO2 content (%)	1.31	3.0	1.93	3.5	9.0	3.7
Al2O3 content (%)	0.24	0.6	0.37	1.8	2.0	1.6
P content (%)	0.039	0.02	0.035	0.8	0.06	0.06
S content (%)	0.002	0.008	0.004	0.02	0.10	0.05
H2O content* (%)				4.0	11.0	10.0

*Source: Nordic Iron Ore, Wood Mackenzie. *Note: NIO hematite and magnetite products are planned to have <6% moisture*

Product Pricing

Most pellet feed is sold under bilaterally negotiated long-term contracts, with little transparency on pricing. The spot market is limited and not necessarily representative. Typically pellet feed is priced using a recognised 65% Fe fines index with an "adjustment" on value-in-use ("VIU"). The "adjustment" is part formulaic and part negotiated and varies between different producers and consumers.

The Blötberget mine's magnetite product features chemical properties that are either better or in-line with the range of top-quality products in the market. It is believed that both the products will attract significant VIU premia due to their high Fe content and low impurities. Wood Mackenzie have estimated the VIU premium for the products using their price spread model. In addition, they have also added an indicative value for magnetite premium. A grinding premium has been excluded as it would depend on multiple locations, process and client-specific conditions, although could represent an upside scenario.

The Wood Mackenzie model estimates that the 70.5% Magnetite concentrate will get a price of US$ 126.1 /t in 2019, CFR China, 2019-real terms. This is a US$ 29.8 /t (31% premium) over 65% Fe Fines benchmark price in 2019.

For the 66.6% Fe Hematite product, the Wood Mackenzie model estimates the 2019 price at US$ 111.8 /t, CFR China. This is a premium of US$ 15.5 /t (16% premium) over 65% Fe Fines benchmark price in 2019.

Potential Market

The sustained growth of the pellet feed market provides a unique opportunity for Nordic Iron Ore's high-grade magnetite and hematite products. The potential markets for NIO have been categorised into large, mature markets, and growth markets. The key long-term growth market is India, which is expected to become a net importer of pellet feed products from 2025.

Based on independent analysis, China, India, Bahrain, Netherlands and Algeria are potential market for NIO's products. **Table 18** provides an estimate of the price that would place Nordic Iron Ore's two products competitively in the target market, which is described in detail for each country below. Proximity and freight costs will be a key driver of attractiveness in each market. Nordic Iron Ore should target China, Bahrain and Netherlands now and going forward Algeria and India.

Table 18: Estimated competitive pricing for NIO products in 2019 (real terms)

Market	Seaborne Pellet Feed Imports (Mt)				Competitive price, US$/t FOB Sweden, 2019 (real)		Pelletizing plants output (pellets type)
	2019	2024	2029	2035	Magnetite concentrate	Hematite concentrate	
China	59.5	65.0	67.4	70.6	100.4	86.0	BF
India	0.0	0.0	5.3	26.6	111.4	91.1	DR & BF
Bahrain	7.7	7.7	7.7	7.7	103.8	89.4	DR
Algeria	0.0	2.2	3.3	4.1	113.8	95.9	DR
Netherlands	4.6	4.6	4.6	4.6	109.4	91.5	BF

NIO products will continue to see strong competition from the leading pellet feed suppliers. There are a few projects in the feasibility stage around the world with products that could compete with Nordic's magnetite and hematite, notably Hawsons project and Iron Bridge project in Australia.

In particular, it is expected that NIO's hematite concentrate will see more competition than its magnetite product in the pellet feed space. For its hematite ore, NIO can also target an alternative product market. Given the proximity advantage of Sweden, Wood Mackenzie believe that the sinter fines market in Germany and Poland can be potential addressable markets for NIO.

Capital Costs

Refer to **Chapter 18.0** for full detail. The purpose of this Basis of Estimate is to document and record in detail the basis and methodology that was used to compile the Total Cost Estimate. Once reviewed by the Project Team and approved by Nordic Iron Ore, this Basis of Estimate will become the main input document for Estimate Validation and Estimate Review purposes.

This Capital Cost Estimate includes both Initial Capital and Sustaining Capital (“SC”) cost requirements.

The Blötberget scope of works includes mine surface infrastructure with associated services, tailings storage facility, underground mine development that includes surface and underground systems, process plant, material storage and rail loadout systems and owner’s costs on the capital portion of the works.

Initial Capital expenditure will predominantly take place within the first two years of the start of project, followed by Sustaining Capital, which will be a continuation of the capital requirements. The Sustaining Capital will also include closure costs until final closure scheduled for January 2034.

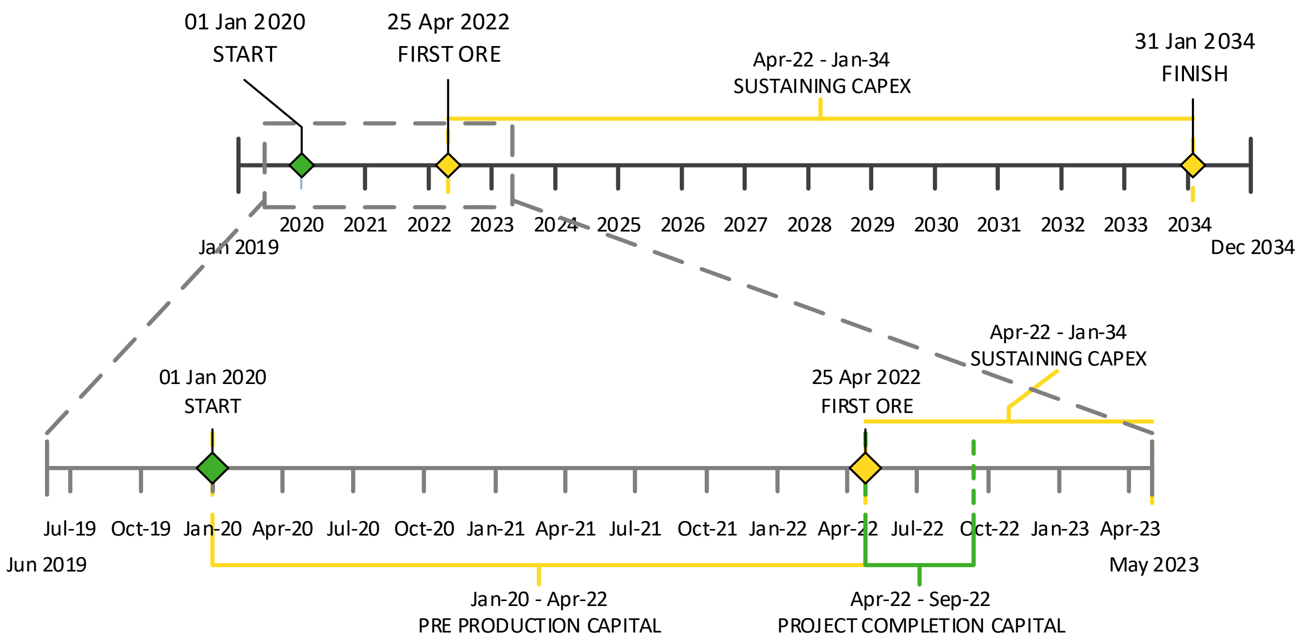


Figure 13: Key milestones for initial and sustaining capital

Capital and Sustaining Cost Estimate

The Initial Capital Expenditure (CAPEX) for the Blötberget project has been defined as costs related to the establishment of the site (Year -2, Year -1). Capital costs incurred during operations (Year 1 onwards) is defined as Sustaining Capital ("SC").

Budget quotes, rates supplied by the client and escalated tender rates were used to compile the CAPEX estimate. The estimates contained within this report and associated accuracies are fixed as per July 2019.

Below is a high-level overview on the various cost categories, excluding escalation and taxes. Note that Sustaining Capital also excludes any contingency allowances.

Table 19: Capital Estimate Overview

Aspect	USD (,000)
Mining	101,665
Processing	33,778
Infrastructure	73,823
Indirect Costs (e.g. EPCM)	24,752
Contingency	20,995
Total	255,020

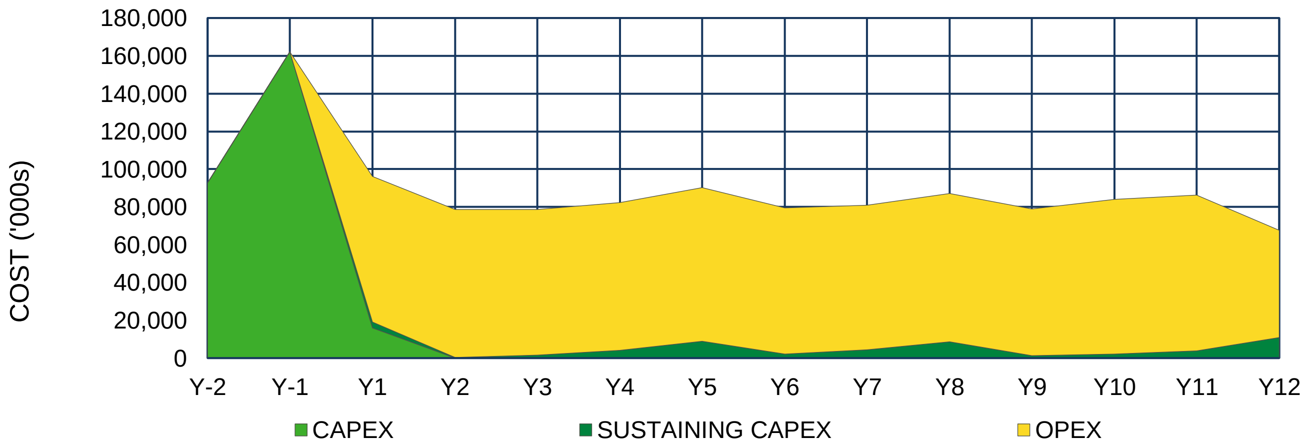


Figure 14: CAPEX, Sustaining Capital and OPEX Cost Distribution (Currency: USD)

Operating Costs

Refer to **Chapter 19.0** for full detail. Operating Costs ("OPEX") expenditure is defined as recurring expenditure for operating and maintaining the Blötberget mine. The expenditure includes mining, processing, site general and administrative (G&A) costs, freight costs including port logistics. All operating cost expenditure which are incurred up to construction/commissioning completion by the 22nd of September 2022 are capitalised in the financial model.

Blötberget intends to make use of a contractor to develop the initial decline and underground work. Access to ore will signal the start of the OPEX phase of the project. The current mining plan indicates that this milestone is achievable within the first 28 months after the start of construction.

Operating Costs ("OPEX") expenditure will commence at the start of run-of-mine ("ROM") production. The anticipated First Ore date is April 2022.

Operational Cost Estimate

The OPEX estimate have been developed by the Golder team according to a scheduled mine model developed in Geovia Surpac mine planning software. Processing costs have been developed by GBM, transport costs developed by Rail Cargo Logistics, with product loadout at the (All Inclusive) Port of Oxelösund. G&A and water management costs are developed by Golder. The average cost per OPEX ROM tonne, is detailed in **Figure 15** (note this does not include USD0.1/t for Royalties). The OPEX Cost per ROM tonne is divided into three main categories namely; mining at USD 12.66/t, process at USD 3.55/t and infrastructure systems at USD 10.9/t. The total cost for ROM tonnes is USD 27.11/t (not including Royalties).

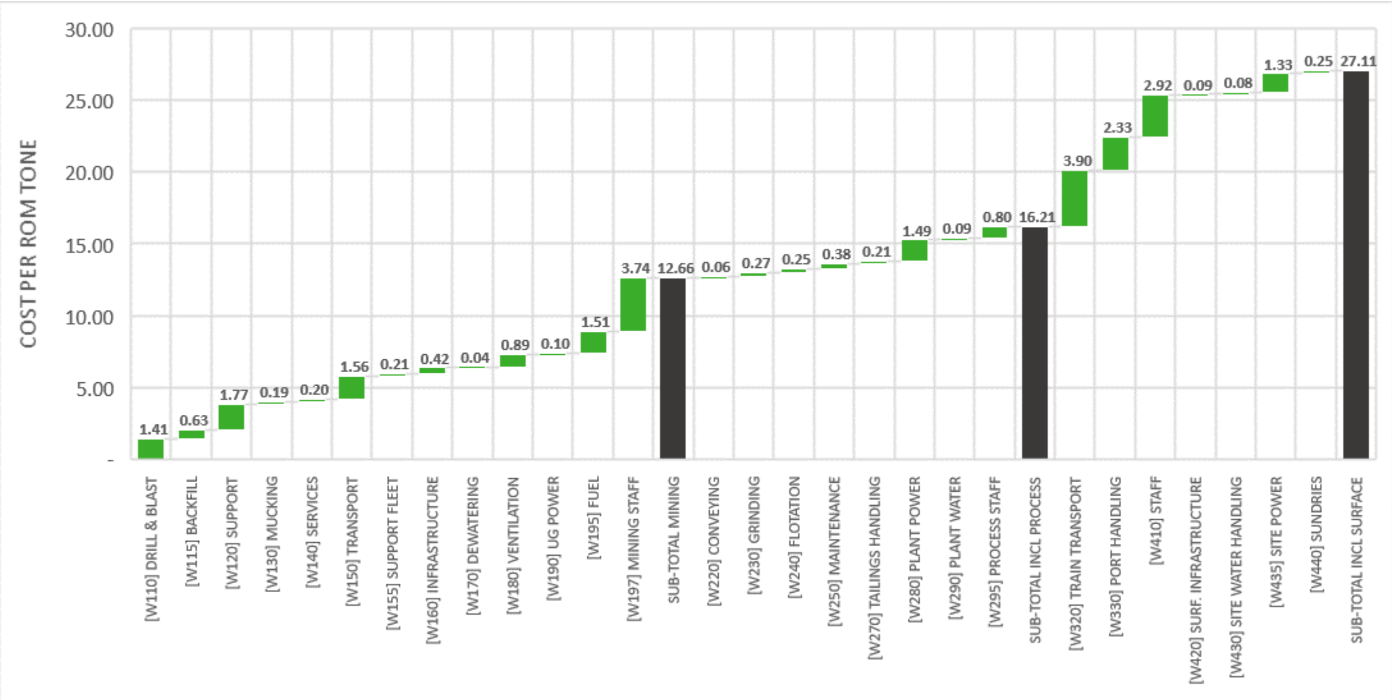


Figure 15: OPEX Cost Distribution per ROM tonne

The OPEX summary is published according to a Work Breakdown Structure and includes the scheduling of the OPEX scope of work.

Financial Analysis

Refer to **Chapter 20.0** for full detail. The financial evaluation of the Blotberget Feasibility Study has been prepared by Golder using a cost model that combines all the technical and financial inputs detailed in this report. The model translates all the technical, costs and commercial inputs and assumptions which are expected to have an impact on the forecasted cashflows and results in a post-tax, un-geared economic evaluation as presented in this chapter.

The overall accuracy is estimated to be ±10-15% which reflects the level of detail available for the cost inputs required to meet the accuracy required for a Class 3 estimate.

Four market scenarios have been assessed:

1) Conservative case – using Wood Mackenzie market forecasts which are considered conservative compared with consensus. Assumes selling into the Netherlands marketplace.

2) Current Market case – valuing the project based on 2019 real market estimates of the product value, provided by Wood Mackenzie, and selling into the Algerian market. Includes positive freight advantages over other suppliers factored into the forecast.

3) Consensus Market case ("Base Case") – using consensus market data for a benchmark 62% Fe CFR product and applying the premium and Value in Use (VIU) assumptions from the Conservative case to derive a price for the 70.5% and 66.6% concentrate products. Assumes selling into the Baltic market.

4) Upside case – using consensus benchmark 62% Fe forecasts combined with real 2019 VIU figures to account for the premium product. This has been labelled as an 'upside' scenario although there is a wealth of information available to suggest that the demand for high grade Iron Ore will attract a higher premium over the next 10-15 years rather than less. The Upside case assumes selling into the Baltic market to derive a FOB price.

Financial Model

The project has been modelled to generate post-tax cash flows to determine the Net Present Value at real discount rates of between 4% and 10%. Pre-tax estimates of project values are also shown for comparative purposes.

The Internal Rate of Return (IRR) and capital efficiency measures, including the Payback Period (time, measured in years, to recapture the initial capital funding requirement). The model further enables evaluation of the Project's sensitivities to changes in price, concentrate recovery, operating costs, and capital costs to determine their relative importance as drivers of project economics and investor returns. Sensitivity to foreign exchange fluctuation has also been performed.

Summary Results

Using Scenario 3 (Consensus Market case) as the base case it can be concluded that the Project is economically viable with a post-tax IRR of 13% and an NPV of USD 70.5M at a discount rate of 8%. Payback is estimated to occur within 5.6 years from first production.

Highlights from the analysis include:

- The post-tax un-geared IRR of the base case is 13%.
- NPVs have been calculated with a range of discounts, the most relevant NPV_4 being $161M and NPV_8 being $70.5M.
- The model demonstrates that, for a capital funding requirement of $261M (including pre-production capital, capitalised operating costs, and negative working capital), the after-tax undiscounted payback period would be 5.6 years from first ore.
- Annual revenue of approximately $140M at steady state production;
- Annual EBITDA margins of 44% of total revenues, with EBITDA equating to approximately $63M during steady state production years;
- Unit operating costs of $27.2/t ROM or $56.9/t product (including Royalties).

The following table summarises the results of the financial evaluation.

Table 19: Financial Evaluation Summary

Physicals	Unit	Value
Mine Life	Years	12
Total ROM tonnes	Mt	34.1
Magnetite concentrate	Mt	10.1
Hematite concentrate	Mt	6.1
Total concentrate production	Mt	16.3
Mag : Hem ratio	%:%	62%:38%
Average Fe grade	%	36.3
Economic Results		**M USD**
Sales Revenue		1,626
Total Capex		315.4 (inc. 24.7 contingency)
Initial Capex		255.0 (inc. 21.0 contingency)
Total Opex		923.4
Gross Pre-Tax Income (EBITDA)		702
Profit Margin (%)		43%
Net Present Value (NPV)	**Discount rate**	**M USD**
Pre-Tax	4%	219.2
	6%	159.6
	8%	110.9
Post-Tax	4%	161.1
	6%	110.9
	8%	70.5

Project Execution Plan

Refer to **Chapter 21.0** for full detail. The Project Execution Plan (PEP) presents how Nordic Iron Ore AB ("NIO") will successfully complete the development of the Blötberget Project to operational level. The PEP specifies the approach, tasks and schedule as well as identifying and addressing any unique challenges facing the project. The Project will be designed and constructed to industry and regulatory standards and will address all environmental and safety issues. Adherence to the PEP will ensure that the Project is completed on time and within budget.

The PEP covers the plan for engineering, procurement, underground and surface construction and project commissioning and will be followed to accomplish the following objectives:

- Develop and deliver a Project that meets the needs of NIO and the community with zero accident and minimum impact on the environment;
- Design for a safe, reliable, environmentally compliant facility to meet construction, commissioning and operating requirements;
- Construct the Project based on efficient and economic use of energy and materials seeking to minimise the Project environmental footprint and reduce costs;
- Deliver a capital efficient Project in compliance with all environmental requirements;
- Implement operational readiness to ensure a seamless transition from construction through commissioning to production ramp-up; and
- Complete the Project on schedule and within budget.

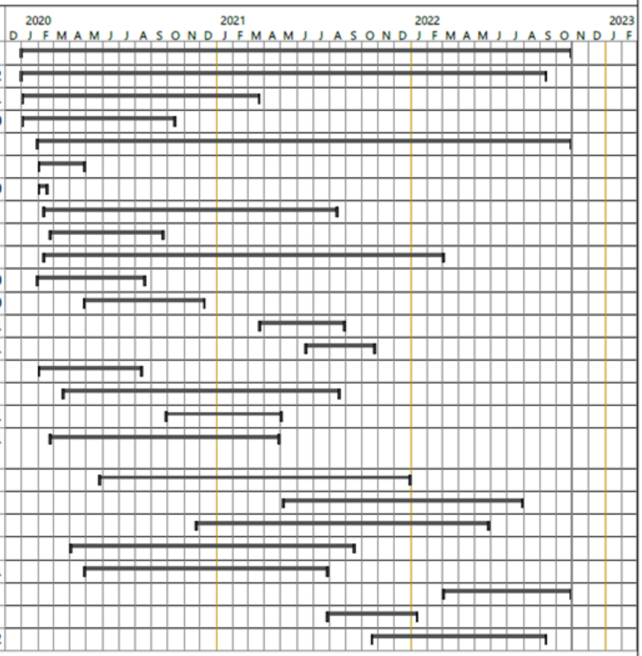
It is proposed that the Project development will be managed by a Project Team. The Project Team will comprise an integration of the Owners (NIO) Team and a primary engineering, procurement, construction and management (EPCM) Contractor team. The EPCM contractor will be responsible for and carry out the Project development work. The primary EPCM contractor will, subject to NIO approval, sub-contract out appropriate smaller EPC packages with local contractors and specialist technology vendors and suppliers.

The PEP is expected to take a period of 36 months to full production and can be separated into an initial Early Works phase followed by Full Project Execution. The initial phase will commence following NIO corporate approval. Full Project Execution will commence following Final Project Approval and completion and approval of all permitting.

A summary of the Project Execution Schedule is shown in **Figure 16**.

Blötberget Iron Ore Mine High Level Project Execution Plan Schedule

ID	Task Name	Duration	Start	Finish
1	BLOTBERGET PRE-PRODUCTION PLAN	720.5 days	Wed 01/01/20	Fri 28/10/22
2	MILESTONES	686.38 days	Wed 01/01/20	Mon 12/09/22
39	ENGINEERING AND PROCUREMENT	310 days	Thu 02/01/20	Mon 22/03/21
93	EARLY WORKS	200 days	Thu 02/01/20	Wed 14/10/20
97	CONSTRUCTION	701 days	Thu 30/01/20	Fri 28/10/22
98	Establishment	60 days	Mon 03/02/20	Tue 28/04/20
101	Mobilise Dewatering Drilling Equipment	11 days	Mon 03/02/20	Mon 17/02/20
134	Dewatering	383 days	Wed 12/02/20	Sun 15/08/21
144	Box Cut	148 days	Mon 24/02/20	Tue 22/09/20
147	Decline	525.5 days	Wed 12/02/20	Thu 03/03/22
174	Excavation and Foundations	140 days	Thu 30/01/20	Wed 19/08/20
178	Structural Steel	160 days	Mon 27/04/20	Wed 09/12/20
181	Mechanical and Piping Installation	111.5 days	Tue 23/03/21	Mon 30/08/21
185	Electrical and Instrumentation Installation	91.5 days	Fri 18/06/21	Mon 25/10/21
189	Bulk External Infrastructure	135 days	Mon 03/02/20	Thu 13/08/20
192	Surface Infrastructure	360 days	Thu 19/03/20	Thu 19/08/21
211	Surface Water Management	150 days	Mon 28/09/20	Mon 03/05/21
216	Tailings Storage Facility and Water Clarification Pond	298.06 days	Mon 24/02/20	Wed 28/04/21
224	Underground Infrastructure	412 days	Wed 27/05/20	Fri 31/12/21
237	Ventilation	315.44 days	Thu 06/05/21	Fri 29/07/22
242	Rail	383 days	Tue 24/11/20	Fri 27/05/22
253	Conveyors	370.56 days	Thu 02/04/20	Thu 16/09/21
261	Mineral Processing Plant	317.25 days	Wed 29/04/20	Wed 28/07/21
310	Mining	167 days	Thu 03/03/22	Fri 28/10/22
315	OPERATIONAL READINESS	120 days	Wed 28/07/21	Thu 13/01/22
319	COMMISSIONING	227.88 days	Wed 20/10/21	Mon 12/09/22



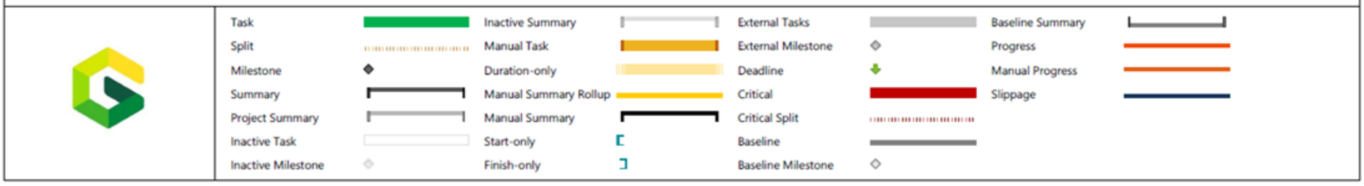


Figure 16: Project Execution Plan Summary

Project Development Schedule

A preliminary project development schedule has been constructed which details all the activities required to achieve the development of the Blötberget project, and which is aligned to the logical sequence of processes and activities described in this document.

The development schedule will undergo review and significant expansion to cover all aspects of the construction and commissioning of the Blötberget project to operational level. The review and expansion of the schedule, which may include revisions and modifications, will be undertaken by the EPCM contractor in conjunction with Owners Team during the Early Works phase of the PEP.

The following assumptions have been assumed to construct the development schedule.

The working calendar used assumes:

- Construction will start once final project funding is received and Final Project Approval is provided.
- A five-day work week comprising one 88-hour shift per day for engineering. Double shifts during continuous pouring of large foundations civils works.
- A seven-day work week 24-hour workday (3 shifts of 8 hours or 2 shifts of 12 hours) for de-watering, decline and underground mining works activities.
- A five-day work week for fabrication, delivery and start-up activities;
- Activity durations are estimated based on similar historical projects and the judgement of the Project Team;
- Construction work has been assumed to continue throughout the winters months and consideration will be given to limit certain activities, e.g. concrete placement, to non-winter work;
- Any environmental impacts will be considered in the planning of the development schedule;
- The schedule is logically driven with as few constraints as possible;
- The schedule follows all normal critical path method best practices and works to limit lag whenever possible. The Critical Path indicated in red.

Key development milestone dates are shown in the table below and the full schedule is shown in **Appendix 21-C**.

Table 20: Key Project Development Milestone

Project start date (following project funding and NIO approval)	January 2020
Award EPCM Contract	January 2020
Operational Readiness Complete	January 2022
First Ore to Plant	January 2022
Completion of Mining Production Ramp-up to full Production	September 2022
Start of commissioning	February 2022
C3 Commissioning, Plant Sign-off and Start of Ramp-up to Full Production	July 2022

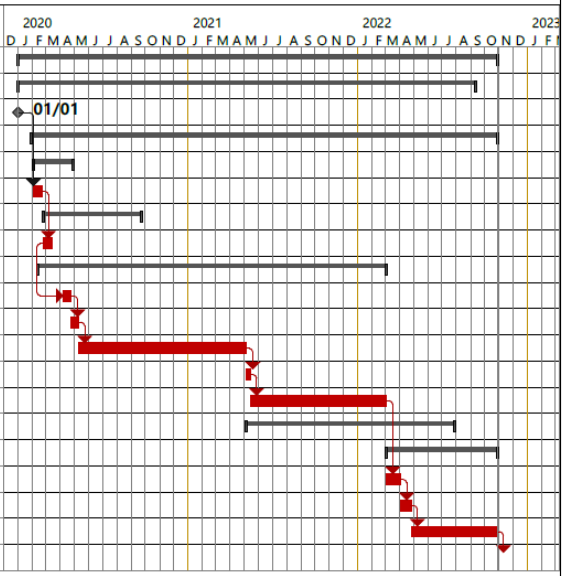
Critical Path

The figure below shows the critical path for the construction of the Blötberget project to operational level and represents the longest sequence of dependent activities that must be completed to achieve project completion in the shortest time period.

The critical path for the Blötberget project is associated with the establishment of underground operations to provide ore for plant commissioning and production ramp-up to ensure that the project can achieve design plant throughput and meet the planned cashflow targets.

Blötberget Iron Ore Mine Critical Path

ID	Task Name	Duration	Start	Finish
1	**BLOTBERGET PRE-PRODUCTION PLAN**	**720.5 days**	**Wed 01/01/20**	**Fri 28/10/22**
2	**MILESTONES**	**686.38 days**	**Wed 01/01/20**	**Mon 12/09/22**
3	Receive Funding & Start FEED	0 days	Wed 01/01/20	Wed 01/01/20
97	**CONSTRUCTION**	**701 days**	**Thu 30/01/20**	**Fri 28/10/22**
98	**Establishment**	**60 days**	**Mon 03/02/20**	**Tue 28/04/20**
99	Contractors Establishment & Site Preparation	15 days	Mon 03/02/20	Fri 21/02/20
144	**Box Cut**	**148 days**	**Mon 24/02/20**	**Tue 22/09/20**
145	Establishment	15 days	Mon 24/02/20	Fri 13/03/20
147	**Decline**	**525.5 days**	**Wed 12/02/20**	**Thu 03/03/22**
149	Excavation of portal entrance	15 days	Mon 06/04/20	Fri 24/04/20
150	Portal Structure	14 days	Fri 24/04/20	Sat 09/05/20
151	Decline construction 0-300 m depth	349 days	Sat 09/05/20	Thu 06/05/21
170	Connection to BS Shaft	7 days	Thu 06/05/21	Fri 14/05/21
172	Truck Ramp development 300-500m depth	285 days	Fri 14/05/21	Thu 03/03/22
237	**Ventilation**	**315.44 days**	**Thu 06/05/21**	**Fri 29/07/22**
310	**Mining**	**167 days**	**Thu 03/03/22**	**Fri 28/10/22**
311	Establish Underground Operations	30 days	Thu 03/03/22	Sat 02/04/22
312	First ROM Material to Surface Plant	20 days	Sat 02/04/22	Mon 25/04/22
313	Production Ramp-Up	180 days	Mon 25/04/22	Thu 27/10/22
314	Stable State	1 day	Thu 27/10/22	Fri 28/10/22



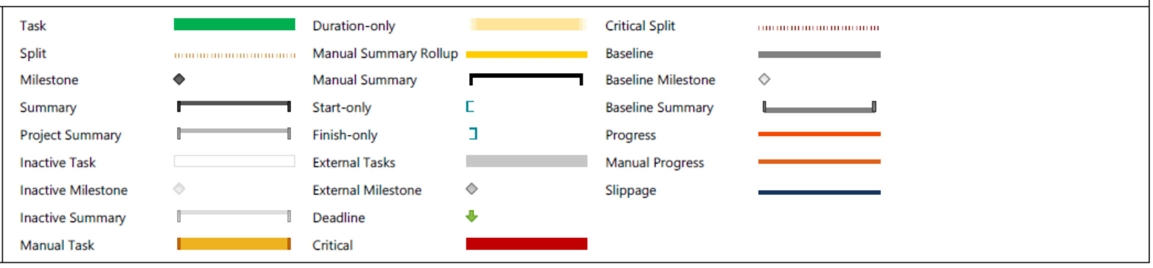


Figure 17: Blötberget Critical Path

Risks

Refer to **Chapter 22.0** for full detail. Minimising risk is a key component of any feasibility assessment and project risk has been considered throughout the duration of the Study. Mitigation strategies have been incorporated into the design work where possible. A full Risk Assessment process allowed for the identification, qualitative assessment, and development of treatment strategies/actions for key project risks. In order to adequately communicate and rank the consequence of perceived risks, a quantitative assessment is utilised when evaluating the Likelihood and Impact.

Opportunities

Refer to **Chapter 23.0** for full detail. Whilst the Blötberget Feasibility Study has worked upon all recognised positive prospects and incorporated them into the design, potential future opportunities are identified that are to be explored by Nordic Iron Ore AB ("NIO"). These are listed below and can be explored in the development construction phase of the Project to be incorporated into production without major impact on the project timeline.

- Expansion of Resources and Reserves through exploration during development and mining (including historical mining areas);
- Mining
  - Ventilation efficiency improvements (such as pre-heating air using heat exchangers from mine/process water);
  - Equipment optimisation;
  - Electrification of mine fleet;
  - Operational efficiency increases;
  - Designing in automation;
- Processing;
  - Simplification of plant design
  - Phased capex purchases,
  - Operational efficiency increases;
  - Designing in automation;
- Infrastructure and Tailings
  - Lowering mine area to reduce/eliminate material fill requirements,
  - Dry-stack tailings can be explored;
  - Load trains via FELs,
  - Remove service track from Skeppmora;
  - Quarrying rather than material import for construction;
- Timeline and Financing;
  - Increased mine access development rates,
  - Use contractors to transfer CAPEX to OPEX,
  - Identify specialist high grade (>71%Fe) magnetite markets;
  - Current by-products, such as phosphorous, apatite and Rare Earth Elements ("REE") could be a source of revenue in the future.
- The Ludvika Mines shared resources with Blötberget;
  - Skeppmora rail terminal;
  - Processing plant expansion;
  - Expansion of tailings storage; and
  - Mobile mining fleet.