Appendix A

TREK Geotechnical. 2021a. Minago Nickel Mine Geotechnical Assessment. Letter report to Silver Elephant Mining. September 17, 2021.

TREK Geotechnical. 2021b. Minago Nickel Mine, Technical Input for Notice of Alteration. Report prepared for Silver Elephant Mining Corp., Vancouver, BC, December 13, 2021.

Stantec Consulting Limited. 2021. Minago Project – Surface Water Management Update. Memo to Robert Van Drunen, Silver Elephant Mining Corp. December 11, 2021, in TREK Geotechnical, Minago Nickel Mine, Technical Input for Notice of Alteration. Report prepared for Silver Elephant Mining Corp., Vancouver, BC, December 13, 2021.

September 17, 2021 Our File No. 0789-001-00

Mr. Rob Van Drunen
Minago project Manager
Silver Elephant Mining Corp.

RE: Minago Nickel Mine Geotechnical Assessment

INTRODUCTION

This report summarizes TREK's geotechnical assessment of the proposed Tailings and Waste Rock Management Facility (TWRMF) for the Minago Nickel Project. TREK has carried out an independent review of documentation to identify key geotechnical risk factors that could impact project costs or schedule. A secondary task was to identify if present license requirements will be met to avoid delays associated with obtaining an amended Environment Act Licence for the project. The terms of reference for the review are summarised in our proposal to Silver Elephant Mining Corp. (SEMC) dated July 27, 2021. The scope of work included:

1) A desktop review of documentation provided by SEMC including a 2010 Feasibility Study Report (Wardrop, 2010), a 2013 Conceptual Design Report (Foth, 2013), the existing Environment Act Licence No. 2981, and Environmental Impact Statements supporting an Environment Act Proposal to amend the existing Licence,
2) A visual site inspection, and
3) Reporting.

SUMMARY

Identified risk factors, categorized as being one or more of regulatory, design, construction, or operational, are summarized below. Readers are referred to the appropriate sections within this report for a more complete description of these risks in terms of likelihood and consequences (the combination of which provides a more qualitative assessment of risk).

Regulatory

- Revised dam classification (CDA).
- Acceptance of natural clay liner across base (Manitoba Environment).
- Insufficient detail for mine water, surface water, and peat management plans.

Design

- Crest settlement leading to overtopping of TWRMF dams.
- Deformation of dam impacting earthworks components and seepage barriers.

Construction

- Slow dissipation rate of excess porewater pressures in foundation soils.
- Failure of peat under starter dam/pre-load.
- Compaction methods/equipment may not be compatible with clay liner thickness.

Operational

- Ongoing maintenance associated with settlement of dam crest.

PROJECT SITE LOCATION, HYDROLOGY, AND DRAINAGE

The Minago Property is located 220 km south of Thompson Manitoba on the west side of Highway 6 in the Thompson Nickel Belt within the Nelson River sub-basin which contains the Minago River, Hargrave River, and William River with the Oakley Creek tributaries (Foth, 2013). The Minago and Hargrave Rivers flow to the northwest into Cross Lake (before entering the Nelson River) while Oakley Creek flows into the William River before draining into Limestone Bay on Lake Winnipeg (Figure 01).

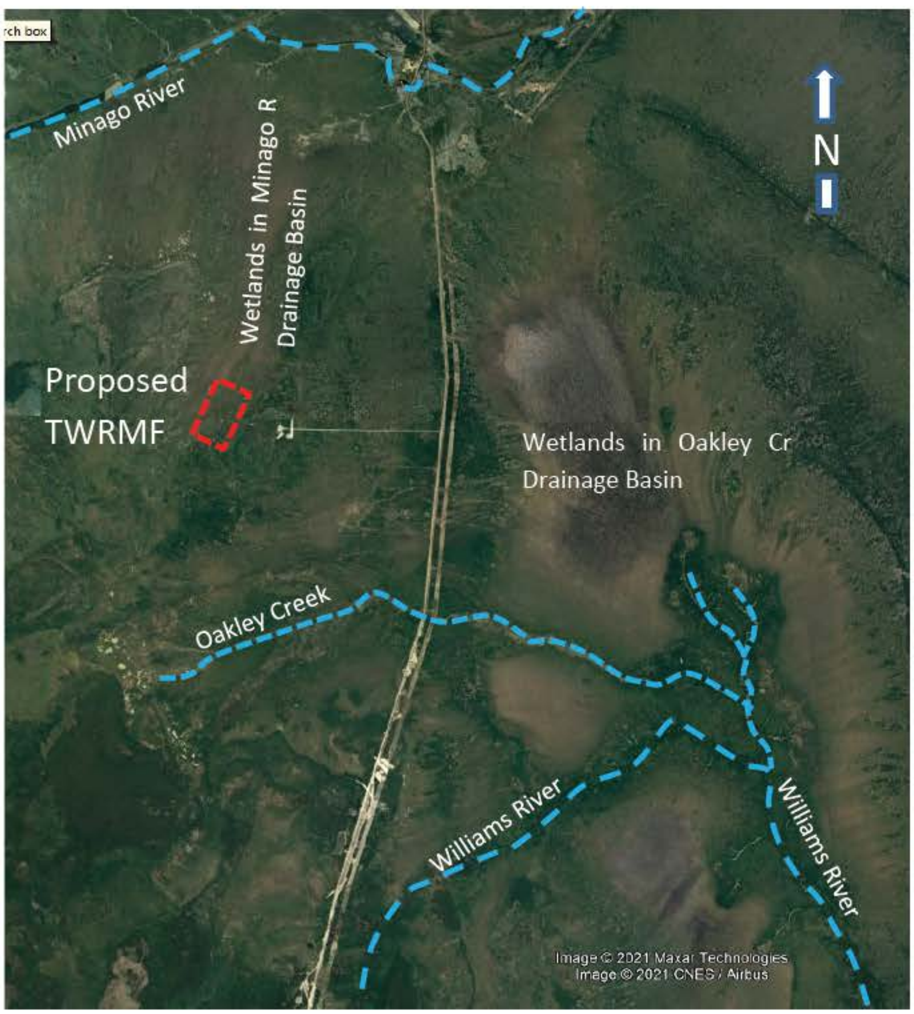

Figure 1 Property Location and Major Rivers and Creeks (Source Google Earth)

SITE GEOLOGY

The mine site is situated within a topographically low, swampy area covered by peat and forest. Elevated limestone outcrops exist as ridges on the property (referred to as the east and west limestone ridges within this report) with the valley area between the ridges consisting almost entirely of muskeg and sparse tree cover. A quarry located on the east side of the east ridge provided rockfill for the construction of a 4 km access road into the mine site. Outside of the ridges, the overburden generally consists of 1 to 2 m of peat overlying 1.5 to 10.7 m of intermediate to highly plastic clay, sporadic till, approximately 53 m of dolomitic limestone, and 7.5 m of sandstone followed by crystalline basement rocks (*e.g.*, granite) including the Thompson Nickel Belt (igneous, metavolcanic). The overburden, dolomitic limestone, and sandstone are considered non-acid generating (NAG) material with minimal potential for metals leaching (Foth, 2013). Although in general, the granite is considered NAG, there may be localized areas considered to be Potentially Acid Generating (PAG) as are the metavolcanic rocks of the Thompson Nickel Belt.

SITE INSPECTION

A site inspection was carried out on August 13, 2021 by Ken Skaftfeld, M.Sc., P.Eng. and Ruslan Amarasinghe, Ph.D., EIT (BC) of TREK Geotechnical. The purpose of the inspection was to gain a general understanding of surficial conditions and topography. Time was spent in the general area of the east limestone ridge focussing on the existing quarry (Figure 2) and the west edge of the ridge where the proposed TWRMF ties into the high ground. Photographs were taken in the areas visited and an aerial drone video was taken at the existing quarry; high winds prevented an expanded aerial survey. Previous test pits along Transect VNEE002 excavated along east ridge bounding the TWRMF were used as a reference (Foth, 2013). One of these test pits (believed to be TP06) was open, allowing the peat, upper clay profile, and groundwater table to be examined (Figure 3). Bedrock samples were taken from the quarry and from previous test pit spoil piles along the transect.

Figure 2 View SW at Limestone Quarry with E Edge of Quarry in Inset

Figure 3 View NW at TP06, Transect VNEE02

PREVIOUS AND PROPOSED MINE SITE DEVELOPMENT

A Feasibility Study Report for the previous mine site development was completed in 2010 (Wardrop, 2010). The development plan consisted of an open pit, Tailings and Waste Rock Management Facility (TWRMF), polishing pond, overburden disposal facility, a dolomite (limestone) dump, and a country (granitic) rock dump, all situated between the east limestone ridge and Highway 6 (Figure 4). Discharge water from the polishing pond was to be directed into either Oakley Creek or Minago River. Environmental Act Licence (EAL) No. 2981 was issued to Victory Nickel Inc. in August 2011 based on this Feasibility Study Report.

A Conceptual Design Report was subsequently completed in November 2013 with the TWRMF relocated to the valley between the limestone ridges as shown on Figure 5 (Foth, 2013). It is our understanding that the proposed location accommodates potential open pit expansion to the northeast and avoids periodic discharge of mine site water from the polishing pond into the Oakley Creek watershed (2010 EAP/EIS). Potential storage areas for clay and peat are included in the conceptual design and the configuration of the open pit, overburden dump, dolomite dump, and country rock dump are generally unchanged, although the size may vary. The Conceptual Design Report was submitted as supporting documentation for an Environment Act Proposal to Amend Environment Act Licence (EAP/EAL) No. 2981 (Victory Nickel, 2013) and Victory Nickel responded to questions/comments from a Technical Advisory Committee (TAC) in July 2014. It is our understanding that at the present time, an amended licence has not been issued to SEMC.

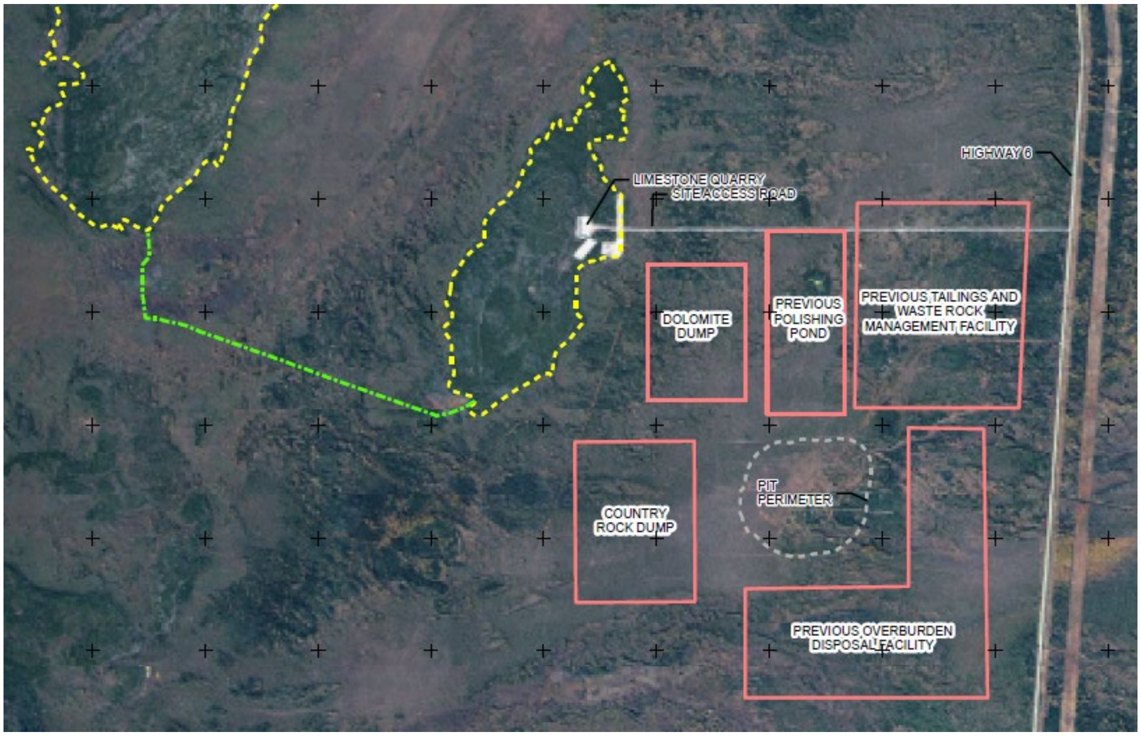

Figure 4 General Site Plan of Previous Site Development (Foth, 2013)

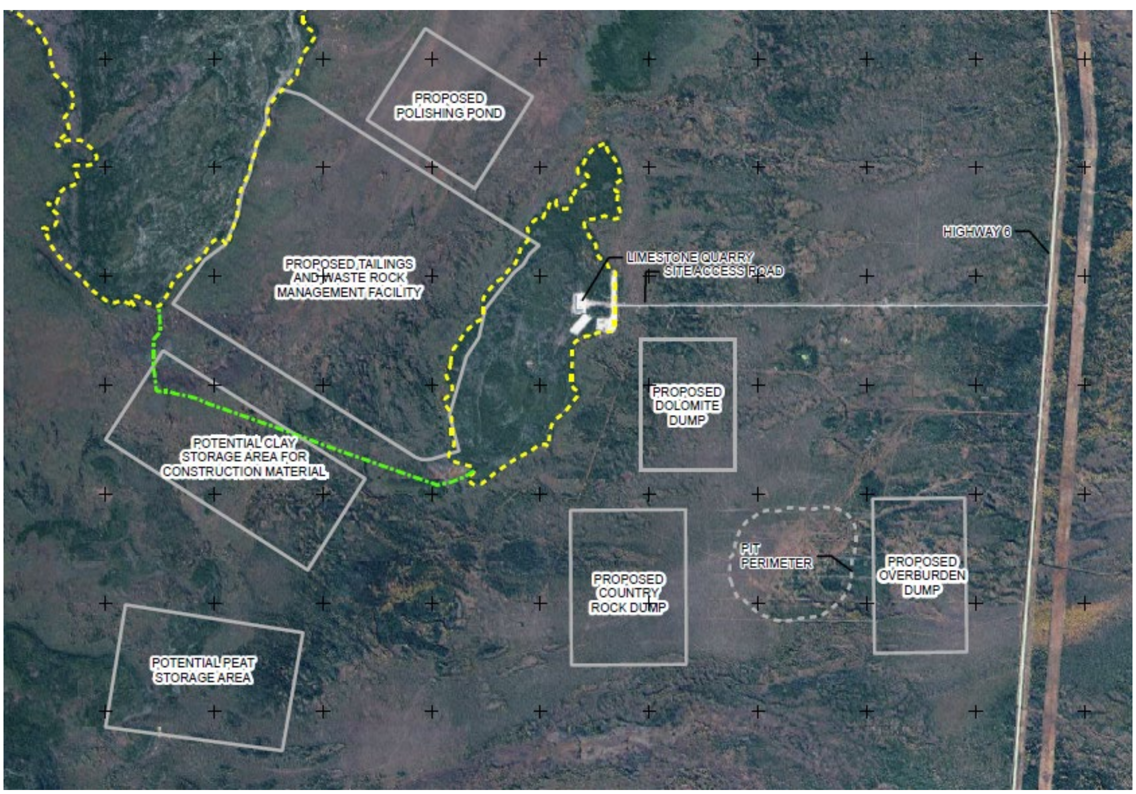

Figure 5 General Site Plan of Proposed Site Development (Foth, 2013)

Waste Rock and Tailings Disposal

Both the previous and proposed TWRMF utilize concurrent disposal of PAG waste rock and tailings in a containment facility to mitigate potential Acid Rock Drainage (ARD). Both facilities are situated in areas of muskeg overlying clay with primary containment provided by natural clay liner across the base and a 1 m thick compacted clay liner on the upstream face of each dam, keyed into clay around the perimeter. However, there are also differences, including the underlying clay thickness, facility size, dam heights, construction staging, etc. Since the previous TWRMF had been vetted by Manitoba Conservation prior to issuance of EAL No. 2156, a comparison of key geometric, design, and construction details for the previous and proposed facilities has been summarized in Table 1, followed by a discussion of these differences in terms of risk factors. The table also provides separate comments on the polishing ponds (PP) associated with the TWRMF.

TABLE 1 COMPARSION BEWTEEN PREVIOUS AND PROPOSED TWRMF AND PP

ITEM	PREVIOUS TWRMF/PP	PROPOSED TWRMF/PP
GENERAL DESIGN AND CONSTRUCTION CONCEPTS/DETAILS		
Construction material for TWRMF as part of initial mine development.	Initial shortage identified until stripping completed.	Sufficient materials (clay and dolomite) can be stockpiled during pre-stripping, however, peat and clay storage areas are required.
Overburden removal (peat, clay)	Peat and clay removed using hydraulic dredging then pumped as a water and solids slurry to Overburden Disposal Facility (ODF) where carriage water is recirculated back to dredge. Dredged clay may be considered for construction of clay liner.	Mechanical – Assumed to be excavators and trucks hauling material to potential storage pads.
General soil stratigraphy	Initial cover of muskeg overlying clay.	
Peat thickness	~0.5 to ~3 m	
Clay foundation thickness	~3 to 4m (TWRMF), ~10m (PP)	~15m (TWRMF), ~20m (PP)
TWRMF size (including decant cell)	~290 ha	~530 ha
TWRMF dam height	~19 – 21m	~ 9 - 13m
PP size	~ 100 ha	
PP dam height	~ 4 – 6 m	~ 2 – 3m

ITEM	PREVIOUS TWRMF/PP	PROPOSED TWRMF/PP
TWRMF dam side slopes	2.5H:1V Upstream 2H:1V Downstream	3H:1V Upstream 3H:1V Downstream
TWRMF dam - additional features	Upstream and downstream Stabilizing berms.	Initial starter dam/pre-load.
Fill placement	Staged fill placement over 2 Yr period.	1 Yr - Starter dam/pre-load and PP during warm months. 1 Yr - Ultimate dam during warm months.
TWRMF primary containment	Natural clay liner across facility base with peat left in place. One metre thick clay liner on upstream face of containment dams keyed into clay foundation and eventually water cover to minimize potential metals leaching and improve effluent water quality.	
PP primary containment	Geocomposite Clay Liner (Bentofix®) on upstream face of dikes anchored into clay foundation.	Natural clay liner (1.0 m thick) across facility base with peat left in place. Clay liner on upstream face of containment dams keyed into clay foundation.
ODF primary containment	Rock fill dyke with zoned construction. Polishing pond has 0.5 m clay liner on dykes.	NA
Clay source for liner	Mainly clay found below peat layer in open pit area.	
Environmental considerations accounted for in geotechnical design	Concurrent disposal of tailings and waste rock to mitigate Acid Rock Drainage and Metals Leaching and ensure regulatory compliance with Metals Mining Effluent Regulations (MMER) discharge criteria.	
Rockfill	Initially from the limestone bluff at west site limit, (believed to be the east ridge) then from stripping at open pit.	Pre-stripping open pit.
Dam classification (CDA)	Significant	Low
Dam foundation	Peat remains in place in upstream portion of dam (except for key trench) and removed with 1 m of clay in downstream portion.	Peat remains in place across entire width/length except for key trench.

ITEM	PREVIOUS TWRMF/PP	PROPOSED TWRMF/PP
SETTLEMENT		
Estimated total settlement under maximum TWRMF fill height.	~1m	Not provided
SEEPAGE		
Runoff collection (seepage and precipitation in contact with dams)	Pumped back to TWRMF	
Estimated seepage from TWRMF (m^3/day)	250	23
Hydraulic conductivity of compacted clay liner on upstream slope (m/sec) used in seepage model	$1.36x10^{-10}$	$1.0x10^{-10}$
MATERIAL PROPERTIES USED FOR STABILITY ANALYSIS – CLAY (CI)		
Unit weight (kN/m^3)	21	20
Cohesion (kPa)	20	14 (CU triaxial testing)
Phi (deg.)	29	29 (CU triaxial testing)
MATERIAL PROPERTIES USED FOR STABILITY ANALYSIS – CLAY (CH)		
Unit weight (kN/m^3)	18	18
Cohesion (kPa)	10	12 (CU triaxial testing)
Phi (deg.)	25	21 (CU triaxial testing)
DESIGN TARGETS - GEOTECHNICAL		
Slope stability FS - construction	Static – 1.3, Pseudo Static – 1.05	
Slope stability FS - operation	Static – 1.3, Pseudo Static – 1.05	
Slope stability FS - closure	Static – 1.5, Pseudo Static – 1.05	
Seismicity - operating	1:475 year return, 0.021 PGA	
Seismicity - closure	1:2,475 year return, 0.059 PGA	
Seepage	< 250 m^3/day	< 50 m^3/day

ITEM	PREVIOUS TWRMF/PP	PROPOSED TWRMF/PP
DESIGN TARGETS - HYDROTECHNICAL		
Construction diversion peak flow	1:20 yr – 24 hr rainfall. Seepage collected via ditches reporting to overall water management system.	
Operation peak flow	1:200 yr – 24 hr rainfall.	1:200 yr – 24 hr rainfall. Runoff segregated from seepage
Closure spillway and diversion peak flow	1:1,000 yr – 24 hr rainfall.	
Freeboard - operational	1.0 – 2.0 m	1.0 m
Freeboard - closure	1.0 m on the top of closure spillway wet section for 1:200 yr runoff	
Closure flood	1:1,000 yr – 24 hr rainfall	
Water storage (PP)	Minimum 5 days retention or 1.5m of water level at all times, whichever is higher	Minimum 7 days
Closure cover	Minimum of 0.5m of water cover on top of the final tailings at the containment structure at all times.	Minimum of 0.5 m of water cover in the permanent tailings pond at closure, minimum 1.0m of saturated tailings and water over PAG waste rock at all times.

Readers are referred to the 2010 Feasibility Study Report for a detailed discussion of the previous TWRMF and associated mine site infrastructure. The proposed TWRMF and polishing pond are within the wetland valley bounded on the east and east sides by the limestone ridges (Figure 6). The ultimate dams are in the order of 9 m (south dam) to 13 m high (north dam) as shown on Figure 7. The east and west side dams are in the order of 5 m high since they abut higher ground along the limestone ridges. Primary containment is provided by the underlying clay and an inclined clay liner. Granular filters on the upstream face provide seepage control. The clay liner is keyed into the underlying natural clay around the entire perimeter. Across the base, an initial lift of about 2 m of rock fill is planned to allow for initial compression of the peat, development of strength gain in the clay, and access for further dam construction.

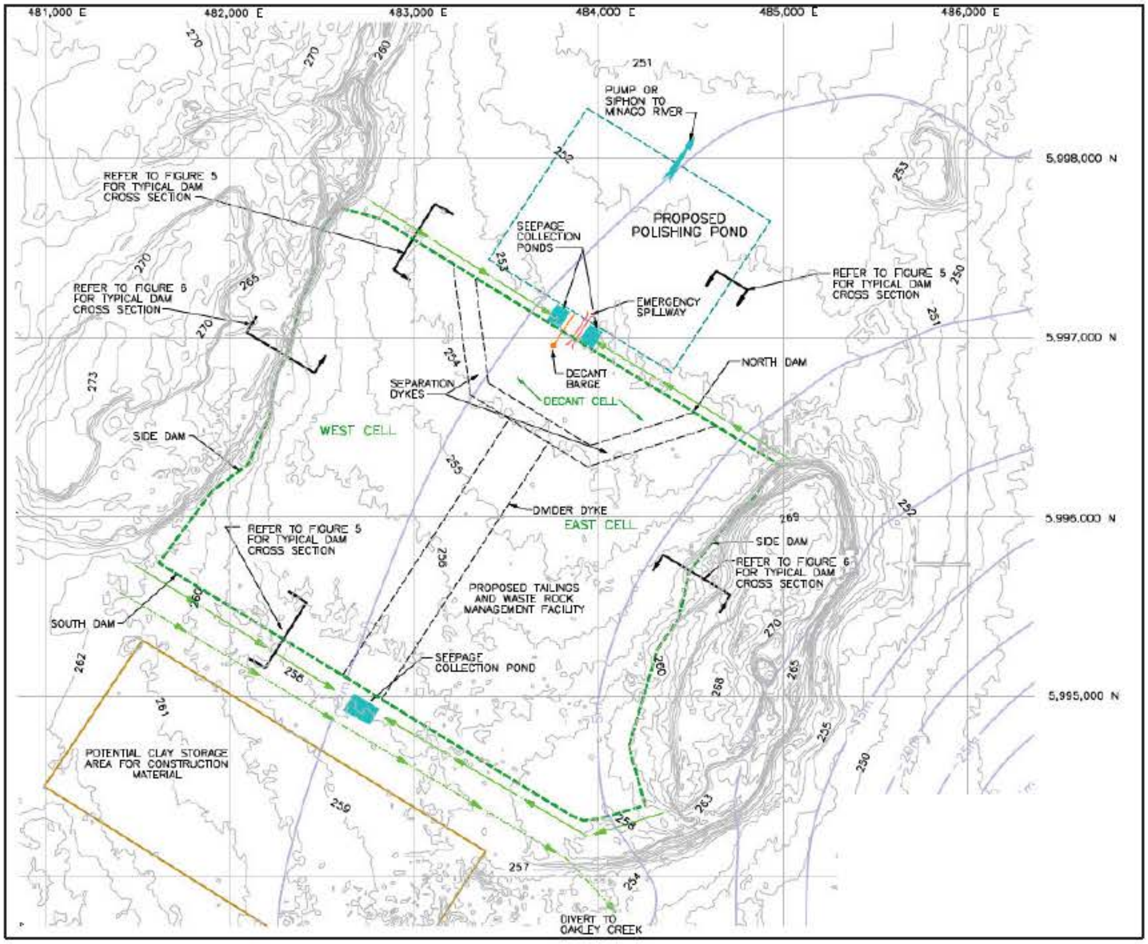

Figure 6 Proposed TWRMF Layout (Foth, 2013)

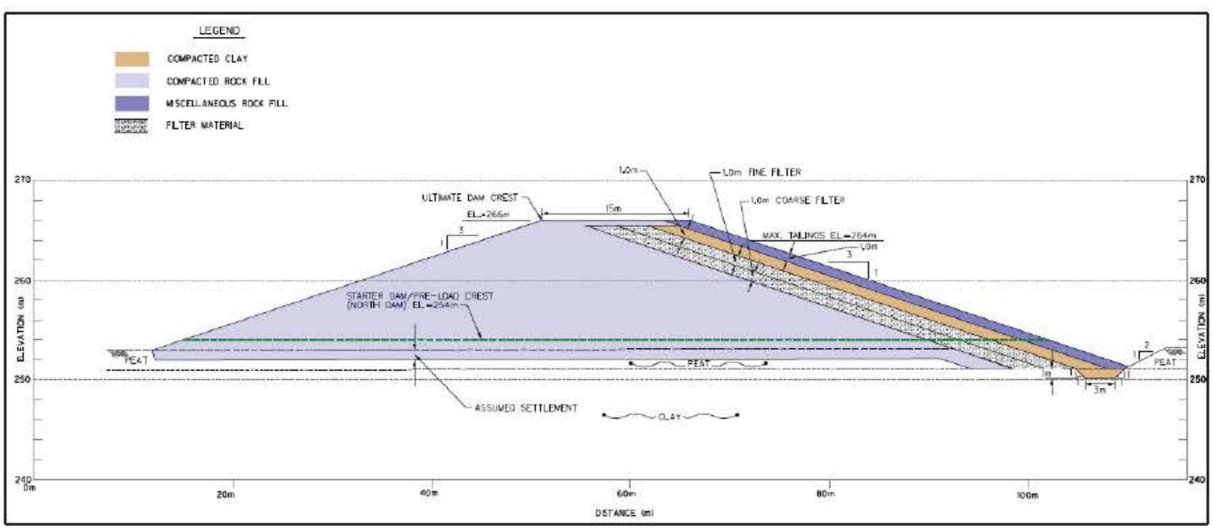

Figure 7 Proposed TWRMF Dam Cross Section (Foth, 2013)

The co-mingled waste rock and tailings will be deposited into three containment cells within the TWRMF to allow operational flexibility and progressive closure. Portions of the facility will be water covered. Drainage water will report to a decant pond at the north end of the TWRMF before discharging into the polishing pond where it will be held until all water quality standards for discharge to the environment are met. All discharge water will enter the Minago River drainage basin and ultimately the Minago River.

WATER MANAGEMENT

Ditches on the north and south ends of the TWRMF will collect seepage water through the dams and convey this water to collection ponds where it will be pumped back (recirculated) into the facility (Figure 6). Overburden from stripping at the open pit is expected to provide enough material (some processed) for dam construction. A diversion channel south of the south dam will intercept runoff from the head of the valley where the potential clay storage area is located. This water will be diverted to the site drainage system around the open pit, into a silt trap at Highway 6, and ultimately into the wetland area on the east side of the highway in the Oakley Creek Drainage basin. It is not clear how water that collects between the side dams and natural ground will be directed although it appears that it would be into the seepage collection ditches at either the north or south ends where it will be pumped into the TWRMF.

Little detail has been provided as to the methods and means of managing stormwater and drainage water from the major facilities (dumps and storage areas). It is our understanding however, that a Site Water Management Plan and an Erosion and Sediment Control Plan will be implemented to mitigate detrimental effects on surface water. Metal Mining Effluent (MMER), Canadian Council of Ministers of the Environment (CCME), and Manitoba Guidelines (Manitoba Water Stewardship, 2011 and CCME, 2011) will be respected during all project phases and adaptive management measures will also be implemented (FOTH EIS, 2013).

RISK FACTORS

The conceptual plan appears well considered and generally compliant with the existing license requirements. The three project components where the most significant risk factors were identified are related to the performance (behaviour) of the north and south dams (more so the north dam) during construction, the mine water management plan, and peat management plan. This is not unexpected at the conceptual design stage, but we consider these factors to have the potential to impact schedule and capital cost. There are several risk factors associated with each of the three components categorized as being related to regulatory, design, construction, or operational aspects of the project, as will be described in the following sections.

Tailings and Waste Rock management Facility (TWRMF)

Failure of tailings dams can generally occur from overtopping, piping, foundation settlement and slope instabilities and any of these modes (mechanisms) can be equally damaging. The conceptual design of the dam has considered a failure mode whereby there is a failure of the downstream slope of the dam under static and seismic loading conditions. The potential for piping has been addressed with an inclined chimney filter along the upstream slopes, however, there is no discussion of overtopping associated with settlement which we consider to be a design risk factor.

Reclassification of the dam in accordance with the Application of Dam Safety Guidelines to Mining Dams (CDA, 2014) from Significant (as for the previous TWRMF) to Low may be appropriate given the physical isolation from Highway 6 and the open pit/mine site area. However, consideration should be given to the possibility of a change in classification to significant based on a more comprehensive Feasibility Study Update. Based on the reasonably conservative parameters assumed for the geotechnical (slope stability/seismic) and hydrotechnical (spillway design) evaluations, we do not consider this to be a significant regulatory risk factor in terms of requiring design modifications should the classification be increased (to significant).

A construction risk factor that could significantly impact project cost or schedule is unexpected porewater pressure response to loading and deformation (settlement) of the ultimate dam, particularly in the proposed location where the thickness of compressible cay is almost double that of the previous location. Loading on the foundation soil will induce temporary excess porewater pressures in the peat and clay with an associated loss of strength which could negatively impact bearing capacity or global stability. With time, these excess porewater pressures will dissipate with an associated strength gain in the soil, but there is some uncertainty as to the time dependency of this behaviour. The stability of the downstream slopes of the ultimate TWRMF dam was analyzed using reasonable assumptions for coefficients of excess porewater pressure (B-bar of 0.5 and 0.7 for intermediate and lower clay respectively).

The primary construction risk is a scenario where B-bar values measured in the field are higher than assumed in the design, meaning that dissipation rates of excess porewater pressures are lower than expected. Left unchecked, placement of additional fill would temporarily reduce the level of stability, possibly to below the design criteria. Mitigative measures during construction would likely include extending the wait time between stages of fill placement and/or a toe berm/slope flattening to increase the level of stability. Longer staged loading time intervals would extend the construction period, possibly into another season. Construction of a toe berm or slope flattening would require additional fill (possibly up to 25%) and extend the construction window (although perhaps not as significantly). Unless accounted for in design, the toe berm would also require realignment of the seepage collection channels (both N and S dams) and surface water diversion ditch upstream of the south dam and possibly relocation of the polishing pond downstream of the north dam. One measure to reduce construction delays would be to assume a higher B-bar value in subsequent designs, however, this would likely result in a requirement for a more stable geometry (e.g., flatter side slopes, stabilizing berms). An alternative would be to install vertical drains prior to fill placement to reduce the likelihood of critical porewater pressures being reached, however, this would significantly increase construction costs.

Significant settlement of the dam can be expected from compression of the peat and consolidation of the clay. Compression of the peat is expected to be up to 50% of the layer thickness (approximately up to 1 m of compression). Although this is unlikely to be entirely realized under the initial load from the starter/pre-load dam, it will almost entirely (and rapidly) occur during the raise to the ultimate height. It is considered appropriate to limit the initial fill thickness to 2 metres to reduce the potential to fail the peat, which could have significant (negative) impacts to both schedule and cost. One approach to mitigate this construction risk would be to excavate the peat beneath the dams and replace it with crushed rock providing that short term stability can be maintained. This replacement strategy would eliminate a large portion of the total settlement that would have otherwise occurred due to compression of the peat.

Consolidation settlement of the clay will occur over a much longer time due to its low hydraulic conductivity and the (significant) thickness of the layer. Although not quantified in the report, simple calculations suggest consolidation settlement in the range of 0.5 to 1.0 m could occur with as little as 10% of this takin place during and shortly after fill placement. The remaining settlement will take place over many years, perhaps extending beyond the operational life of the mine unless measures are taken to accelerate settlement (*e.g*., using vertical drains). Note that this is consistent with the settlement behaviour predicted in the Feasibility Study report (Wardrop, 2010), albeit for a higher dam and thinner foundation clay section.

One operational/regulatory risk is a failure mode associated with deformation (settlement) of the dam and the loss of freeboard, increasing the potential for over-topping. Associated with this may be cracking of the upstream clay liner and increased seepage through the dam. Deficiencies in the crest elevation can be addressed through routine maintenance (placing fill). Particular attention to the condition of the spillway will be important as it will also undergo movement; structural repairs may be necessary. Cracking of the clay liner may not represent a failure mode since a filter is provided, however, additional seepage losses will report to the seepage collection ditches and pond, requiring more frequent pumping of water back to the pond. This would not necessarily affect the water balance however, since it is essentially a closed system. A thicker clay liner or a central vertical clay core may be more compatible with the potential settlement and less likely to crack. From a design/constructability risk perspective, a thicker liner and filter zones may be necessary to accommodate the size of equipment that will be used for placing and compacting the fill on a 3H:1V slope.

Clause 17 of the EAL No. 2981 stipulates that "*the licensee shall construct and maintain the TWRMF such that the entire base and inner banks of the intended tailings depository within the TWRMF are lined with a minimum 1 m thickness of compacted clay, or other material acceptable to the Director, possessing a maximum hydraulic conductivity of* $1x10^{-7}$ *m/s*". The proposed design incorporates an uncompacted natural clay liner below the peat and a 1.0 m thick layer of compacted clay on the upstream face of the dams keyed into the clay foundation. Since this was the same method as presented in the Feasibility Study on which the existing EAL was issued, it is reasonable to assume that this would remain an acceptable containment strategy for an amended Licence application and therefore the regulatory risk is low. However, if this is not the case, the financial consequences to the project could be considerable as the alternative (1m thickness of compacted clay across the base) may not be constructable. However, in our opinion and based on clay thickness and measured hydraulic conductivities, the natural clay layer across the base is likely to be viewed as being equal or superior to a 1 m thick liner with a maximum hydraulic conductivity of $1x10^{-7}$ m/sec.

The hydraulic conductivities assumed for the seepage analysis are based on measured material properties and are at least two orders of magnitude lower than the maximum value permitted in the Licence ($1x10^{-7}$ m/s). However, it is worth noting that Manitoba Conservation typically stipulates a maximum hydraulic conductivity of $1x10^{-9}$ m/sec (equivalent to $1x10^{-7}$ cm/sec) for clay liners in solid and liquid waste facilities. Were this the case, the design values used would still exceed this more stringent requirement. Thus, the risk associated with a regulatory change in the hydraulic conductivity is considered low.

Mine Water Management Plan

EAL No. 2981 defines mine water as "*fluids pumped to the surface from underground mine workings or from an open pit, or fluids used to transport tailings, or contaminated runoff or leachate from ore or waste rock stockpiles exposed to precipitation, or polluted mine site run-off, or seepage or run-off losses from tailings deposits stored on the surface of the land, or any combination thereof*". Although not explicitly stated, it should be anticipated (at least at this stage of planning) that mine water also includes runoff from overburden, country rock, dolomite, clay and peat dumps or storage areas. Runoff that contacts natural or reclaimed areas not exposed to mining activities should be diverted around the mine site (otherwise it will become mine water and require treatment).

At this conceptual stage, the overall management plan for mine water and unaffected run-off (off-site water) lacks sufficient detail on the staging of pit stripping and reuse/storage of peat, clay, and limestone from the pit area and as such, is considered a regulatory and operational risk factor. For example, stripping the area of the open pit will generate large volumes of peat, clay, and limestone but the timing of this relative to construction of the TWRMF is unclear as are the specific location and details for measures to mitigate sediment laden water from storage or stockpile areas. Some of this material will be used for site infrastructure, some for construction of the TWRMF (including the polishing pond), and some for use in site reclamation (e.g., peat and clay). It is our understanding that a Memorandum of Understanding (MOU) with a nearby First Nation may advance the stripping of the open pit. This pre-stripping is likely to generate large volumes of material that will have to be temporarily stockpiled on the mine site property so there may also be differences between short and long-term water management strategies.

In the 2013 EAP/EIS to amend EAL No. 2981, the proposed end of pipe effluent from the proposed TWRMF will be discharged into the Minago River only (via a channel from November to April) or into the wetland area in the remaining months. The remainder of the mine water will be discharged into the Oakley Creek watershed via the surface water diversion ditch along the south TWRMF dam and the open pit perimeter ditch which will connect to a silt trap on Highway 6 and ultimately to the wetland areas east of Highway 6 (Foth, 2013). The 2113 EIS indicated "*Limestone Bay is considered a very sensitive fish habitat based on the comments raised during the 12010 consultations with the various Communities of Interest (COI)". Therefore, relocating the TWRMF to the Minago River watershed is considered a form of accommodation*" (Victory Nickle, 2013). Given this identified concern, there is a possibility that any plan to discharge water from the mine site into Oakley Creek (which drains into Limestone Bay) will be challenged (possibly from a regulatory perspective). It may be worth investigating if all mine water could be directed into the Minago River watershed via a drainage ditch along the east and north sides of the limestone ridge; a cursory interpretation of the terrain and topography suggests this may be possible.

At the Conceptual Design stage, the timing and cost implications for measures required to manage mine water or surface water with total suspended solids (TSS) exceeding the licence limit are somewhat uncertain and therefore present a risk from a regulatory perspective. For example, it may be desirable to construct the polishing pond in advance of the TWRMF to act as settling pond for runoff from peat and clay storage areas created as the open pit is stripped. Although this would require revisions to the proposed construction schedule, the cost for the pond has already been carried. This could also delay excavation of the diversion ditch and open pit perimeter ditch, silt trap, etc. prior to completing the pre-stripping and during infrastructure development.

If water is diverted around the east limestone ridge and into the Minago River watershed, it may also be possible to utilize the existing quarry as a settling basin (providing quarry expansion is not contemplated).

A portion of the potential clay storage area and nearly all of the peat storage area appear to occupy the Oakley Creek watershed. Regulatory risk factors include the uncertainty associated with approval to discharge runoff into this, rather than the Minago River watershed, and the possible requirement for settling ponds, significant rerouting of runoff water, etc. It is also unclear as to how the areas will be prepared in terms of tree clearing and construction of a pad, in particular to keep material intended for re-use above the water table in low-lying wetland areas. Stability of stockpiles may require limitations on fill heights and slope angles which may be of significant consequence to the size of the pads. Based on the descriptions provided, the peat and clay will be excavated using excavators and access into these areas and possibly the storage areas may require the construction of heavily reinforced haul roads (*e.g.*, rock fill on a woven geotextile).

Peat Management Plan

Little information has been provided on a management plan for peat excavation, transportation, and stockpiling. Correct storage is considered a regulatory risk factor since it is critical in preventing adverse environmental impacts such as sediment laden runoff water entering water course and peat slides. Depending on the reclamation plan, separation of the vegetation turf from the organic surface horizon may be an important consideration. Separate stockpiles may be required for peat and mineral soils and these storage areas may be of considerable size given the saturated condition and low shear strength of the material. There may also be unanticipated costs associated with the mechanical excavation, transporting, handling, and stockpiling of the very wet peat, despite efforts to dewater the layer in advance of the excavation work. Sedimentation/settling ponds will likely be necessary to dewater wet sub-surface peat and to enable sediment retention and drying out. The ponds may require filtration facilities prior to connecting to the surface water management system. This is an important consideration since the viability of reusing peat after storage depends on how appropriately it has been stored and how much water has drained from the pile.

CLOSURE

TREK Geotechnical Inc. (TREK) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied, is made. All information provided in this report is subject to our standard terms and conditions for engineering services, a copy of which is provided to each of our clients with the original scope of work or standard engineering services agreement. If these conditions are not attached, and you are not already in possession of such terms and conditions, contact our office and you will be promptly provided with a copy.

This report has been prepared by TREK Geotechnical Inc. (the Consultant) for the exclusive use of Silver Elephant Mining Corp. (the Client) and their agents for the work product presented in the report. Any findings or recommendations provided in this report are not to be used or relied upon by any third parties, except as agreed to in writing by the Client and Consultant prior to use.

[redacted]

Kind Regards,

TREK Geotechnical Inc.

[redacted]

Ken Skaftfeld, M.Sc., P.Eng.
Geotechnical Specialist
Tel: 204.975.9433

Reviewed By:

[redacted]

[redacted]

Kent Bannister, M.Sc., P.Eng.
Senior Geotechnical Engineer
Tel: 204.975.9433

December 13, 2021

Our File No. 0789 001 00

Robert Van Drunen, COO
Silver Elephant Mining Corp.
Suite 1610 – 409 Granville Street
Vancouver, BC
V6C 1T2 Canada

RE: Minago Nickel Mine
Technical Input for Notice of Alteration

A revised final report for the above referenced project is attached. This report provides additional information and updated drawings associated with the conveyance of water from the sedimentation and polishing ponds to the Minago River. Please contact the undersigned should you have any questions or require any clarification or additional information.

Sincerely,

TREK Geotechnical Inc.
Per:

[redacted]
Engineering Specialist

Encl.

Revision History

Revision No.	Author	Issue Date	Description
0	KMS	November 30, 2021	Draft Report
1	KMS	December 8, 2021	Final Report
2	KMS	December 12, 2021	Revised Draft Report
3	KMS	December 13, 2021	Revised Final report

Authorization Signatures

[redacted]

Prepared By:

[redacted]

[redacted]

Ken Skaftfeld, M.Sc., P. Eng.
Senior Geotechnical Engineer

Ruslan Amarasinghe, Ph.D., EI
Geotechnical Engineering Intern

Reviewed By:

[redacted]

Kent Bannister, M.Sc., P. Eng.
Senior Geotechnical Engineer

[redacted]

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1.0 Introduction

This report provides technical input to support a Notice of Alteration (NoA) being submitted to Manitoba Environment by Silver Elephant Mining Corp. (SEMC) to amend existing Environment Impact License (EAL) No. 2981 for the proposed Minago Nickel Mine. Alterations to the License are necessary to address changes in the facility layout associated with the relocation of the Tailings and Waste Rock Management Facility (TWRMF). The technical input was specifically required to prepare/provide:

1. A conceptual mine site water management plan with the goal of directing all mine site water to the Minago River watershed,
2. Information on proposed excavation methods, locations, and conceptual size of storage areas for peat, clay, limestone, and country rock,
3. Staging for construction activities associated with Items 1) and 2), and
4. Commentary on the suitability of using the low-permeability natural clay deposit below the TWRMF in place of a compacted clay liner.

This work has been carried out jointly by TREK Geotechnical (TREK) and Stantec and in consultation with SEMC who provided supporting documentation. A separate report addressing Item 1) above was prepared by Stantec and is appended to this report. The general terms of reference for TREK's portion of this assessment are provided in our proposal to SEMC dated November 9, 2021, with some modifications based on subsequent discussions with SEMC. Stantec provided a separate proposal to SEMC for their portion of the work.

Our recommendations are based on a reasonably complete understanding of geotechnical and hydraulic conditions at the Minago site. It is expected the results from future field investigations, any outcomes of permitting discussions with Manitoba Environment, and design criteria established as part of overall mine site development (by others) will be used to advance the design concepts presented in this report. However, we consider that the concepts presented herein have been advanced far enough to reduce the likelihood of any significant modifications during more advanced design stages.

2.0 Background

A Feasibility Study Report for the previous mine site development was completed in 2010 (Wardrop, 2010). The development plan included an open pit, Tailings and Waste Rock Management Facility (TWRMF), Polishing Pond (PP), overburden disposal facility, a dolomite dump, a country (granitic) rock dump, and plant and infrastructure facilities, all situated between the east limestone ridge and Highway 6. Discharge water from the PP was directed into either Oakley Creek or Minago River. Environmental Act Licence (EAL) No. 2981 was issued to Victory Nickel Inc. in August 2011 based on this Feasibility Study Report.

A Conceptual Design Report was subsequently completed with the TWRMF relocated to the wetland valley between the limestone ridges as shown on Figure 1 (Foth, 2013). It is our understanding that the proposed TWRMF location accommodates potential open pit expansion to the northeast and avoids periodic discharge of mine site water from the polishing pond into the Oakley Creek watershed. The relocated TWRMF utilizes concurrent disposal of Potentially Acid Generating (PAG) waste rock and tailings (Figure 2). Primary containment is provided by a natural clay deposit across the base and a one metre thick compacted clay liner on the upstream face of each dam, keyed into native clay around the perimeter (Figure 3). The conceptual design also identified potential storage areas for clay and peat immediately south of the TWRMF), and proposed areas for the overburden dump, dolomite dump, and country rock dump.

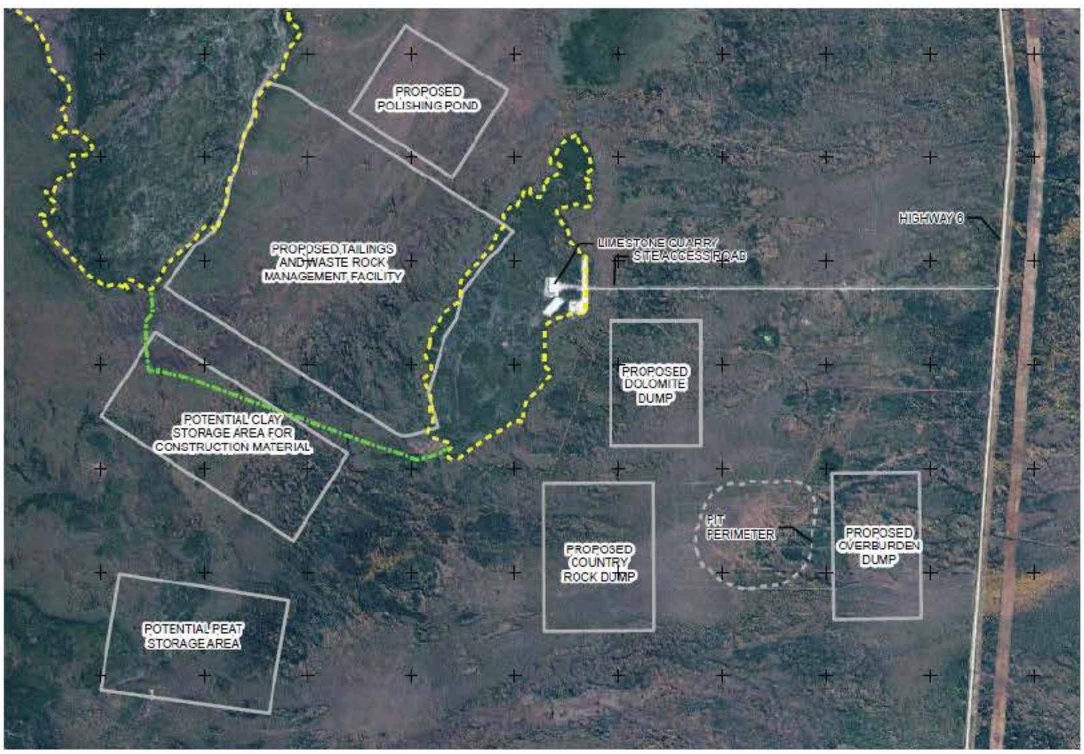


Figure 1 General Site Plan of Proposed Site Development (Foth, 2013)

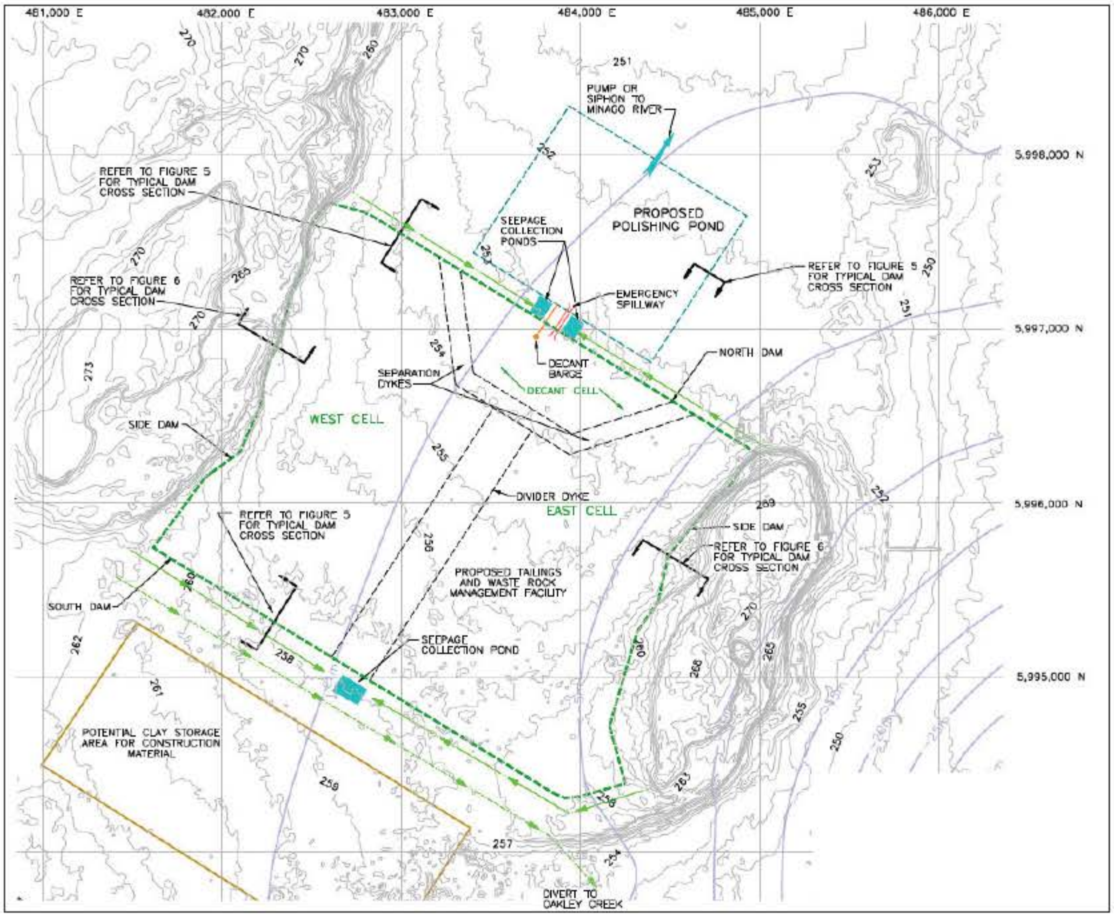


Figure 2 Proposed TWRMF Layout (Foth, 2013)

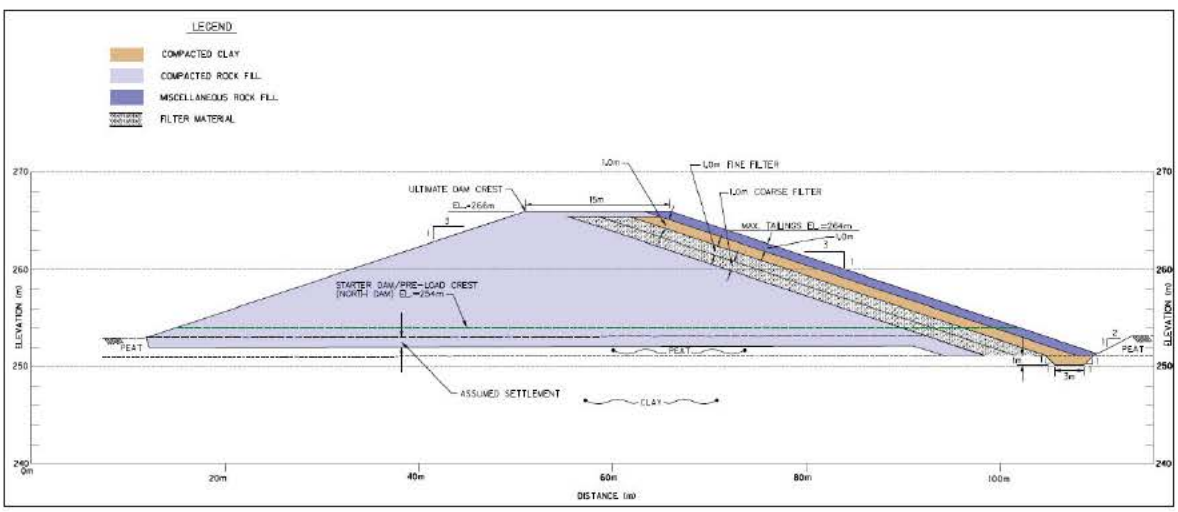


Figure 3 Proposed TWRMF Dam Cross Section (Foth, 2013)

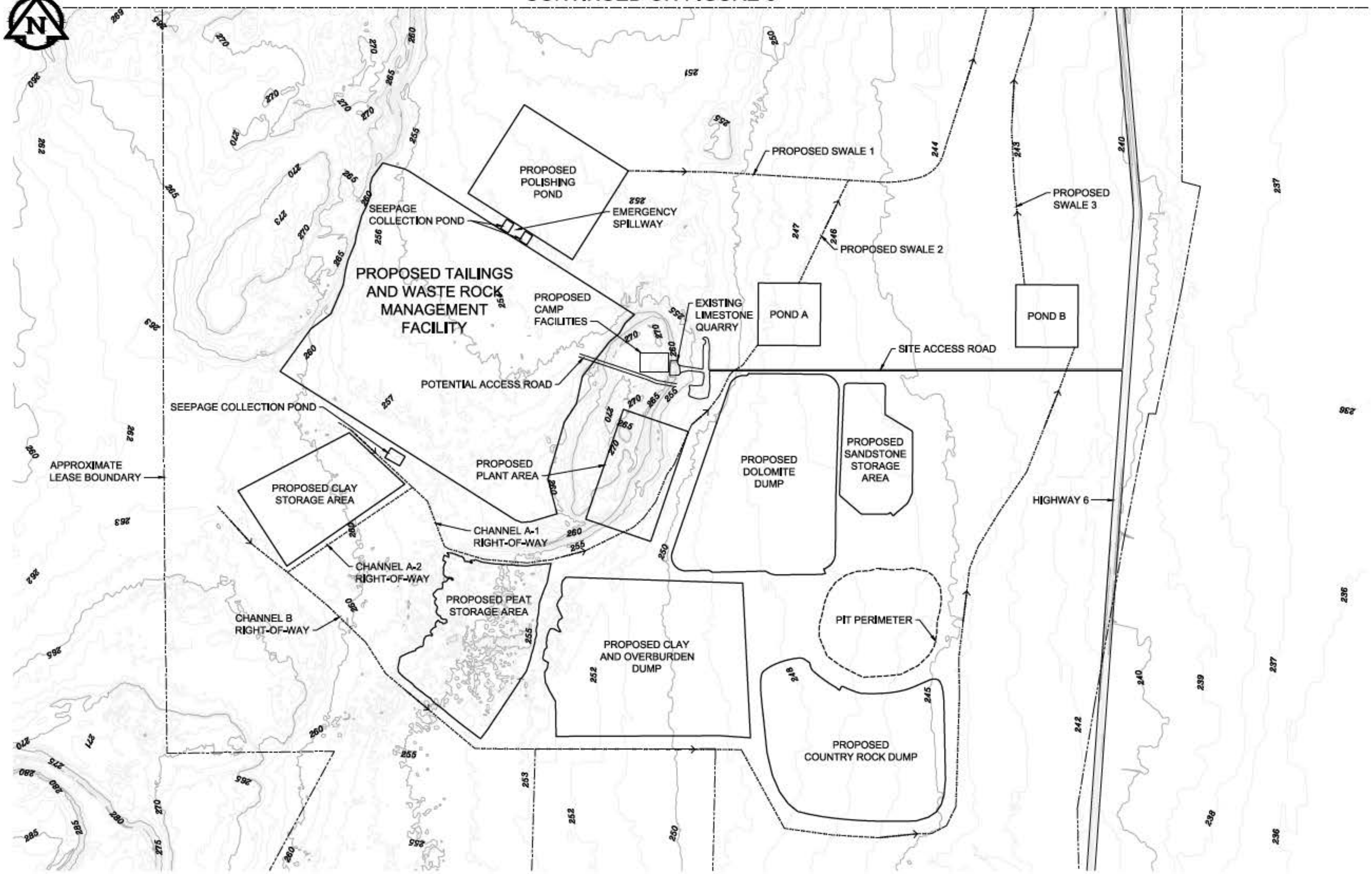
The Conceptual Design Report was submitted as supporting documentation for an Environment Act Proposal to Amend Environment Act Licence (EAP/EAL) No. 2981 (Victory Nickel, 2013) and Victory Nickel responded to questions/comments from a Technical Advisory Committee (TAC) in July 2014. SEMC has asked TREK to provide technical support for their NoA submission. In the report contained herein, there are no proposed alterations to the TWRMF layout or design, or the open pit perimeter shown in the Foth 2013 Conceptual Design Report. Some changes to the location and size of the waste storage and stockpile areas are proposed based on optimizing material handling and to suit the proposed layout of the site drainage.

3.0 Water Management Concepts

A conceptual water management plan prepared by Stantec is appended to this report (Appendix A). This plan provides additional detail on the site water management plan and an erosion and sediment control plan identified in the 2013 Conceptual Design Report to mitigate detrimental effects on surface water (Foth, 2013). All surface water leaving the mine site will be directed to the Minago River following temporary storage and possible treatment. The updated concept also takes the proposed site infrastructure into consideration, including the plant site, access road, laydown areas, accommodation, and office facilities, etc.

Surface water from the south will be diverted around the TWRMF via two channels. Runoff from the mine site and material stockpile areas will report to these channels which will terminate at two sedimentation ponds north of the open pit (Pond A and B). The ponds are sized for sufficient retention time to allow for sediment removal and/or possible treatment before being discharged to the Minago River drainage course. Discharge from the two sedimentation ponds and the polishing pond at the TWRMF will be directed northwards towards the Minago River along a series of shallow swales. The preliminary layout of the water storage and drainage plan is shown Drawing 1 (Sheets 1 and 2) in Appendix A and replicated in part on Figure 4 and 5 in this report. A trail paralleling the drainage channels and swales is proposed for inspection and maintenance purposes.

CONTINUED ON FIGURE 5



NOTES:

1. CONTOUR INTERVAL = 5m.
2. FOR MORE DETAIL ON MATERIAL STORAGE AND STOCKPILE AREAS AND SITE DRAINAGE FEATURES, REFER TO DRAWING 1, APPENDIX A.

SITE PLAN

SCALE : 1 : 17 000

0 500 1000 1500 2000 m

SCALE = 1 : 17 000

NO.	REVISIONS	YYYY/MM/DD	DRAWN	DESIGNED	CHECKED	APPROVED
2	ISSUED FOR REVISED FINAL REPORT	2021/12/13	CT	RA	KS	KS
1	ISSUED FOR FINAL REPORT	2021/12/08	CT	RA	KS	KS
0	ISSUED FOR DRAFT REPORT	2021/11/30	CT	RA	KS	KS

PRELIMINARY DRAWING

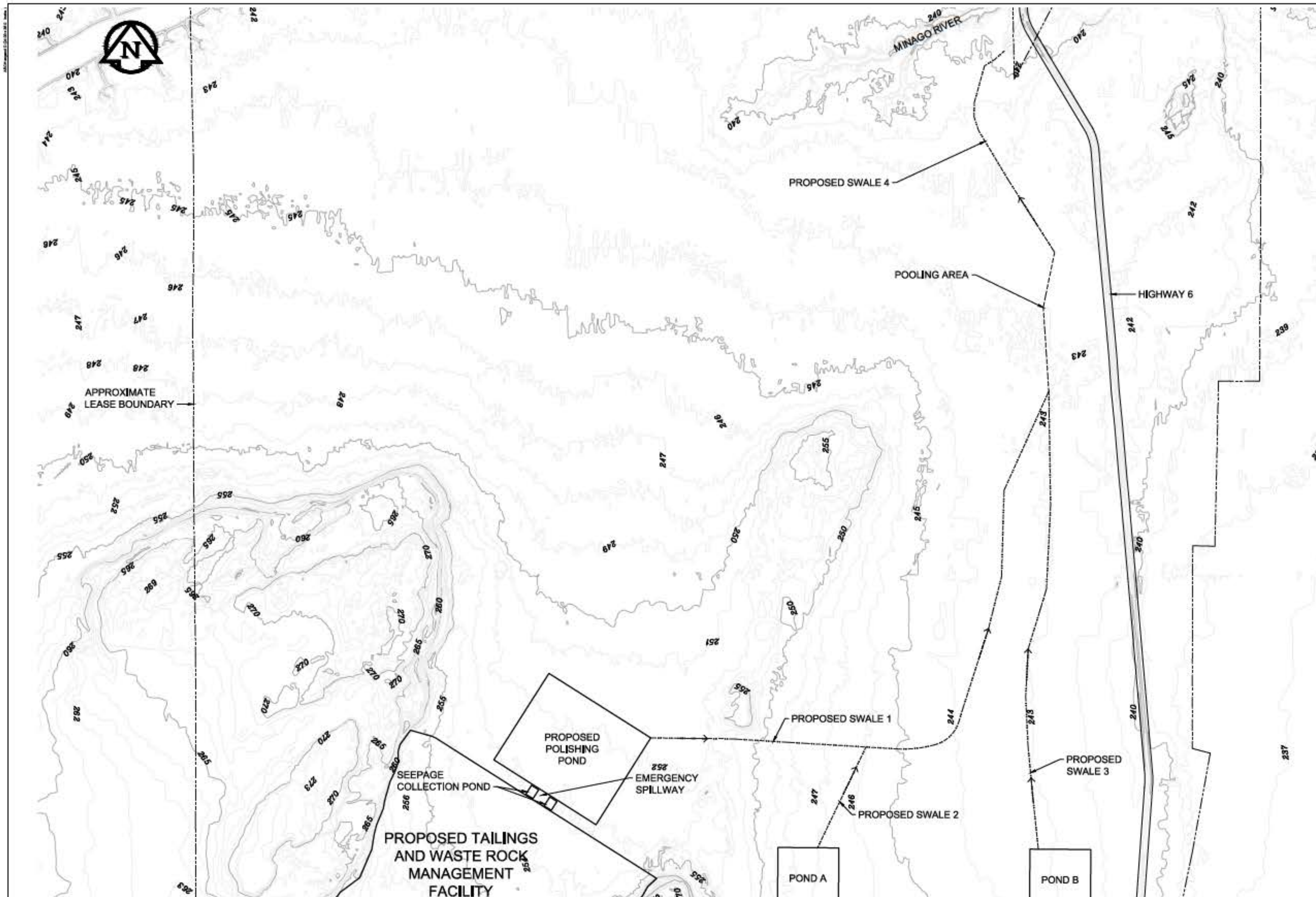
NOT TO BE USED FOR CONSTRUCTION

TREK GEOTECHNICAL Quality Engineering | Valued Relationships

SILVER ELEPHANT MINING CORPORATION
MINAGO NICKEL MINE - NOA SUPPORT

PROPOSED WASTE STORAGE AND STOCKPILE AREAS AND SITE DRAINAGE FEATURES

PROJECT NO. 0789-001-00 | FIGURE 4 | SCALE AS NOTED



CONTINUED FROM FIGURE 4

SITE PLAN
SCALE : 1 : 17 000

0 500 1000 1500 2000 m
SCALE = 1 : 17 000

NOTES:

1. CONTOUR INTERVAL = 5m.
2. FOR MORE DETAIL ON MATERIAL STORAGE AND STOCKPILE AREAS AND SITE DRAINAGE FEATURES, REFER TO DRAWING 1, APPENDIX A.

NO.	REVISIONS	YYYY/MM/DD	DRAWN	DESIGNED	CHECKED	APPROVED
0	ISSUED FOR REVISED FINAL REPORT	2021/12/13	CT	RA	KS	KS

PRELIMINARY DRAWING

NOT TO BE USED FOR CONSTRUCTION

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SILVER ELEPHANT MINING CORPORATION
MINAGO NICKEL MINE - NOA SUPPORT
PROPOSED CONVEYANCE ROUTES FOR DISCHARGE WATER

PROJECT NO. 0789-001-00 | FIGURE 5 | SCALE AS NOTED

4.0 Waste Storage and Stockpile Concepts

The proposed location and geometry of the proposed waste storage and material stockpiles are shown on Drawing 1 in Appendix A with their footprints replicated on Figure 4 in this report. These areas have been revised from what was shown in the previous (2013) Conceptual Design Report and are based on minimizing the footprint by maximizing the height and slope angles through staged construction and additional engineering analysis. The following sections discuss the rationale for the selection of these areas and provides the general approach for water management. Further detail on the management of runoff water from the areas is provided in Stantec's report (Appendix A). A brief discussion is provided on the staging of critical construction activities that if delayed, could significantly impact the overall project schedule, for example diversion channels, sedimentation (settling) ponds, etc.

Waste storage and stockpile areas are situated where limited (or no) site investigations have been carried out. Based on the nearby geotechnical information however, it is expected that the overburden will generally consist of about 2 m of peat overlying a relatively thick layer of highly plastic clay in the wetland valley and a thinner layer east of the east limestone ridge. Settlement of up to about 50% of the peat thickness can be expected during and shortly after placement of fill. Some secondary settlement of the peat and longer-term consolidation settlement of the clay can also be expected, although this will be relatively small in comparison to the initial settlement of the organic layer. Staged loading (like that recommended for dam construction) is expected to be necessary to maintain adequate levels of dump and stockpile slope stability (particularly for waste rock) and avoid the need to expand the proposed footprints.

Recommendations for staged loading will be provided in future designs based on more detailed stability analysis but it is anticipated that the proposed stockpile areas will be sufficient to accommodate staged loading, or any geometric modifications deemed necessary. The staged loading will consider the thickness of and sequencing successive lifts such that sufficient time for consolidation (and strength gain) is provided.

Quantities provided in the report are approximate considering that segregation of material types will be challenging, and some mixing of soil, rock, and organics will be unavoidable. An example is separating the lower (amorphous) peat horizon and the underlying highly plastic clay.

4.1 Preliminary Slope Stability Assessment

Slope stability analyses were conducted to determine preliminary waste dump and stockpile geometries including maximum heights and side slopes. A limit-equilibrium slope stability model (Slope/W) from the GeoStudio 2016 software package (Geo-Slope International Inc.) was used. Critical local and global slip surfaces were identified using a grid and radius slip surface method. Table 1 summarizes the assumed engineering properties for the soil units in the slope stability analyses which are based either on the geotechnical data included in the Feasibility Study Report (Wardrop, 2010) and the Conceptual Design Report (Foth, 2013) or judgement based on our experience with similar soils. Overburden soil layer thicknesses have been (conservatively) assumed based on available test hole information. A static piezometric (groundwater) line at ground surface was assumed in combination with a coefficient of excess porewater pressure (B-bar) of 0.7 for the in-situ clay soils.

Table 1 Soil Properties used in Slope Stability Analysis

Soil Description	Unit Weight (kN/m^3)	Cohesion (kPa)	Friction Angle (deg.)
CL Clay (Weathered)	17	2	13
CH Clay	17	12	21
Peat	12	12	0
Limestone	19	0	40
Country Rock	19	0	40
Clay Fill	17	1	13

Table 02 summarizes the recommended maximum heights and slopes each of the stockpiles based on a minimum target factor of safety of 1.3.

Table 2 Stockpile Slope Stability Analysis Results

Stockpile	Maximum Height (m)	Maximum Slope Gradient (H:V)	Additional Requirements
Peat	3	5:1	-
Clay	5	6:1	Granular pad beneath stockpile at TWRMF
Limestone	40 (See Note 1)	2:1	10 m high by 80 m wide bench at the toe
Country Rock	40 (See Note 1)	2:1	10 m high by 80 m wide bench at the toe

Notes:

(1) Final height will depend on the results of detailed analysis for staged construction

4.2 Peat Storage Area

Peat is found across most of the mine site area except for the two limestone ridges where it is absent. The peat is generally described as fibrous grading downward into granular and then amorphous organic material (Foth, 2013). The water table in the peat is at or within about 0.5 m of ground surface and field water contents[1] range from 43% to 1,184%. Once a final reclamation plan has been developed, the need to separate the fibrous vegetative turf from the organic surface horizon should be determined, however, the proposed storage area should be sufficient to accommodate separate stockpiles if necessary. Mechanical excavation and trucks for hauling material are proposed.

Increased difficulty excavating, transporting, and stockpiling peat and significant inflow of water into

[1] Ratio of weight of water to dry weight of solids

excavations can be expected unless pre-excavation measures are implemented to drain the peat. These measures could include trenches through the peat that are dewatered using pumps or tied into diversion channels excavated as part of the site-wide water management system. Pre-excavation dewatering will also reduce the amount of drainage water from the peat when stockpiled which may be an important consideration since the viability of reusing peat after storage depends on how appropriately it has been stored and how much water has drained from the pile. Pre-construction dewatering of the peat would likely be completed during the winter (for access and trafficability).

The 2.5 m thick peat layer above the open pit mine translates to approximately 2.5 Mm^3 of stripping. Some of this material will be used for site reclamation and to optimize material handling for this purpose, a centrally located stockpile location has been proposed. Based on low shear strength, uncertainty in its mineral/organic composition, and the presence of water and possibly ice, a maximum stockpile height of 3.0 m with side slopes no steeper than 5 Horizontal to 1 Vertical (5H:1V) and possibly as flat as 10H:1V will likely be required. Assuming a bulking factor of 20%, the stripped peat will require a stockpile footprint of approximately 1.5 Mm^2 (Figure 4). The need for a granular pad below the peat stockpile can be assessed during future design stages, however, if deemed necessary, the quantities would be in the order of 2 Mm^3.

Based on a volumetric water content[2] of 70% (calculated from existing laboratory test results), the volume of water in the peat (before any dewatering), is estimated to be in the order of 1.8 Mm^3. Assuming an average water yield coefficient[3] of 0.5 (Boelter, 1968), the potential volume of water that will be captured by either pre-construction dewatering and/or drainage from the stockpile(s) is in the order of 900,000 m^3. In the case of a stockpile, drainage water from the peat will appear at the exterior side slope or toe of the stockpile although some will be lost to the underlying peat foundation. The total volume of water reporting to the drainage channel will include run-off from the stockpile due to precipitation and snow melt.

Drainage water and run-off from the peat reporting to the diversion ditches will contain suspended solids (TSS) and potentially elevated levels of elements such as iron that may exceed regulatory or License limits (Wardrop, 2010). Published literature shows a potentially wide range of TSS in drainage waters from disturbed peat areas (Gregory et al, 1984) depending on the amount of disturbance, the presence of silt traps, etc. Values ranging from 35 to 127 mg/l were reported. Initial drainage channel installation (including that for peat dewatering) is likely to be one of the primary sources of sediment. However, once this installation is complete, erosion and turbidity are expected to decline, possibly to much lower levels. It is also likely that suspended sediment concentrations and turbidity will decrease as drainage water flows from the stockpile and along the drainage channels to the pond because of settling of suspended sediment and dilution.

Given the variability and uncertainty in the water quality from the peat stockpiles, it is recommended that the drainage channels and settling ponds associated with the overall site water management system

[2] Ratio of water volume to total sample volume
[3] Ratio of the water volume drained to the total water volume

be in operation prior to draining peat areas or stockpiling peat. This will provide the ability to remove solids and/or implement any other water treatment that may be necessary prior to discharging into the receiving environment.

4.3 Clay Dump/Storage Areas

The clay layer at the open pit is approximately 13 m thick, translating to a total volume of approximately 10 Mm^3 (11.5 Mm^3 after bulking). Approximately 1.5 Mm^3 will be required for the construction of the clay liners for the TWRMF and Polishing Pond (PP) dams leaving a net balance of ~ 10 Mm^3. It is recommended that the clay required for construction of the TWRMF, and PP dams be stockpiled adjacent to the TWRMF south dam (Figure 4). The remaining clay (10 Mm^3) could be stored adjacent to the mine pit for future use (reclamation, etc.).

Clay dumps and stockpiles in the storage area should be constructed with a maximum height of 5.0 m with slopes no steeper than 6 Horizontal to 1 Vertical (6H:1V). To allow for material processing, modifications to the liner and cell/pond sizes during more advanced design stages, and possible slope flattening of the stockpile, a footprint of approximately 980,000 m^2 is recommended for the clay storage area adjacent to the TWRMF south dam. Accordingly, a footprint of approximately 2.7 Mm^2 will be required for the clay dump (Figure 4). A granular pad is recommended beneath the clay stockpile at the storage area adjacent to the TWRMF south dam. This will provide a stable foundation underneath the clay stockpile so that settlement of the peat does not offset the usable volume of clay required for the TWRMF construction and to support construction equipment. The pad could be quarried rock, perhaps topped with processed granular material. Since only a portion of the clay storage area at the TWRMF may be needed, pad preparation may be staged.

Some free water can be expected in the excavated clay. Although this volume will be relatively small, it will contain solids and possibly elevated levels of some elements, as will the surface water run-off from the stockpile. For these reasons, it is recommended that the drainage ditches and settling ponds associated with the overall site water management system be in operation prior to depositing clay in the two areas. This will provide the ability to remove solids and/or implement any other water treatment that may be necessary prior to discharging into the receiving environment.

Unsuitable overburden materials are classified as those which are not suitable for any of the identified works, but which may be used for site reclamation (e.g., infilling, etc.). This includes mixed material (e.g., organics mixed with clay), till, soil containing deleterious material (from clearing and grubbing), etc. There should be sufficient room in the clay dump area to segregate any unsuitable material.

4.4 Waste Rock Dumps

The Minago Project will produce waste rock consisting of 111 M tonnes of dolomite, 122 M tonnes of predominantly Precambrian granitic country rock, (Wardrop, 2010). There is also a sandstone unit present, which may be classified as waste rock if it is not processed on or off-site for frac sand. Approximately 15 M tonnes of sandstone may require stockpiling. The sandstone, dolomite, and granitic country rock are considered non-acid generating (NAG) and can therefore be stockpiled on the mine site without the requirement for a seepage collection or liner system. Seepage water can either report to the natural environment or be captured by the nearby water management system.

Approximately 40 – 50 Mm^3 of dolomite, 59 Mm^3 of country rock, and 8 Mm^3 of sandstone are the volumes expected for the waste rock dumps/stockpiles (Wardrop, 2010). The final volume of dolomite will depend on the amount taken from the existing quarry for construction of mine site infrastructure. Waste rock dumps should be constructed using benches with side slopes no steeper than 2H:1V. Ultimate heights should not exceed 40 m. Footprints of about 2.4 Mm^2, 2.1 Mm^2, and 0.7 Mm^2 will be required for the dolomite, country rock, and sandstone storage areas respectively. The dolomite dump is situated in the vicinity of the access point across the ridge on the east side of the TWRMF (northwest of the mine pit) to facilitate loading and transportation for dam construction or off-site use. The country rock dump is located immediately southwest of the mine pit (Figure 4). The sandstone stockpile area is immediately east of the dolomite dump. Approximately 10 Mm^3 of dolomite will be required for the construction of the TWRMF and PP dams and the dump is expected to be of sufficient size to accommodate equipment for material processing (crusher, screeners, etc.) although this could also be located nearby on the limestone ridge.

5.0 Construction Staging

5.1 Conceptual Design Report (Foth, 2013)

Based on mill tailings production in the middle of Year 1, the simplified construction schedule provided in the Conceptual Design Report (Foth, 2013) showed site preparation beginning early in Year -2 (winter). Main activities throughout Year -2 included clay and dolomite production (from open pit stripping), construction of the starter (pre-load) dam for the TWRMF and construction of the polishing pond. In Year -1, clay and dolomite production continued and sandstone and country rock production began – all these activities continued until at least Year 3. The ultimate TWRMF dams were to be completed in Year -1. Peat stripping was not identified. Although not identified as discrete tasks on the schedule, water management was broken down in the report into the following phases:

Phase 1: Construction - Years -2 to -1

Phase 2 and 3: Normal Operations – Years 1 to 10 (Phase 2) and post-closure operations from Years 7 to 10 (Phase3)

Phase 4 – Post-closure – After Year 10

5.2 Recommended Schedule Alterations

Based on the proposed material management strategies outlined herein, consideration should be given to completing or initiating several tasks prior to peat dewatering at the TWRMF (part of site preparation in the first half of Year -2) and overburden stripping at the open pit. Both activities are expected to produce significant volumes of drainage water and material for stockpiling (primarily peat and clay in Year -2). In preparation, it is recommended that the site drainage system (drainage channels and ponds) be operational and stockpile areas (at least for peat and clay) be prepared early. Preparation works would include tree removal, clearing and grubbing, pad preparation, access road improvements, and construction of haul roads to and from stockpile areas. We anticipate that these activities are best performed in the winter when frost will allow for construction equipment access on the peat. For these reasons, we recommend that site preparation activities begin in Year -3, well ahead of overburden stripping. This will also provide additional time for peat dewatering at the TWRMF and open pit. It may also be possible to advance the starter (pre-load) dams for the TWRMF and reduce the risk associated with a delayed consolidation response (TREK, 2021).

To facilitate site preparation and construction activities beginning in Year -3, expansion of the existing limestone quarry or the development of a second quarry on the east limestone ridge is recommended. Although the quantity of granular fill is uncertain (pending more advanced design), some assumptions can be made with respect to haul road geometry, construction, and use of typical mining equipment (graders, rock trucks, etc.) assuming widths to permit passing, safety berms, etc. Based on the proposed layout of stockpile areas and quantity estimates provided for preliminary site development (Wardrop, 2010), we estimate that up to about 2 Mm^3 of quarried rock will be required (which includes ~ 0.8 Mm^3 for the starter dams). A portion of this rock (perhaps 50%) will require processing (e.g., for starter dams, traffic gravel, etc.). An additional 2-3 Mm^3 will be required for the clay storage area and there may be additional quantities needed should similar pads be considered for other storage/dump areas. The proportion of quarried rock from the existing limestone ridge and the open pit stripping will depend on construction staging which will be evaluated further in subsequent design stages.

Construction of the drainage works could start early in Year -3 (winter) to allow equipment access. Quarry development could likely begin simultaneously to provide some material for these early tasks and in for site preparation (pads, haul roads, etc.) in the second or third quarter of Year -3. The remainder of the construction activities shown in the Conceptual Design Report could then be initiated as planned.

6.0 Clay Liner for TWRMF

Clause 17 of the EAL No. 2981 stipulates that "the licensee shall construct and maintain the TWRMF such that the entire base and inner banks of the intended tailings depository within the TWRMF are lined with a minimum 1 m thickness of compacted clay, or other material acceptable to the Director, possessing a maximum hydraulic conductivity of 1x10^{-7} m/s". The feasibility report/drawings submitted for the original license application (and subsequently the Conceptual Design of the proposed TWRMF) departed from this requirement by the peat (across the floor) in place, thus relying on the natural (uncompacted) clay deposit to serve as a base liner. This report section presents the technical basis for considering the natural clay deposit as meeting or exceeding the design intent of a compacted clay liner across the base of the facility.

Twenty-two test holes were drilled in the combined TWRMF and polishing pond footprints in January 2012 (Foth, 2013). In descending order from ground surface, the subsurface profile below the proposed TWRMF in the wetland valley bounded by the limestone ridges generally consists of:

- Peat (PT) – coarse to fine fibrous varying in thickness from 0.8 to 2.3 m,
- Upper Clay (CH) – soft to stiff, grey to brown, highly plastic (CH) varying in thickness from 1 to 2 m,
- Intermediate Clay (CL) – firm to stiff, grey to brown, mottled, slightly weathered medium plastic clay (CL) with a consistent thickness of approximately 5 m,
- Lower Clay (CH) – very soft to firm, grey to brown, reaching a thickness of 16 m in the center of the valley.

Detailed soil descriptions can be found on the test hole logs included in the 2013 Conceptual Design Report (Foth, 2013). A laboratory testing program carried on samples recovered from the subsurface investigation included hydraulic conductivity testing of both undisturbed and recompacted clay samples. Testing services were provided by Golder Associates. The clay profile and properties in the previous TWRMF location (east of the east limestone ridge) are generally similar, although the maximum thickness of the clay layer is significantly less than at the proposed location. Seepage analysis was conducted for the proposed TWRMF using assumed saturated hydraulic conductivities based on the field and laboratory data (Foth, 2013) and used in Wardrop, 2010. Similar analysis was carried out for the previous facility but without the most recent data provided in the 2013 Foth report. The hydraulic conductivities used in the model and pertinent to the discussion herein are shown in Table 03.

Table 3 Saturated Hydraulic Conductivities Used in Seepage Analysis (Foth, 2013)

Material	K_{sat} (m/s)	Comment
Compacted Clay	1 x 10^{-10}	Liner
Intermediate Clay (CI)	7.5 x 10^{-11}	Upper portion weathered
Lower Clay (CH)	5 x 10^{-11}	2:1
Peat	1 x 10^{-5}	Including partially compressed peat

Compacted clay liner thicknesses ranging from 0 (no liner) to 2 m were considered on the upstream face of the dams (keyed into the clay at the toe). The approximate seepage flux through the entire dam perimeter based on a 1 m thick compacted clay liner (compliant with the License) is ~ 23 m^3/day. There was little increase in seepage flux for thicker liners indicating that horizontal seepage below the dams would dominate. This model also demonstrates the most likely seepage pathway will be through or beneath the dam, as compared to vertically through the natural clay base which reinforces the need to extend the upstream liner through the peat and weathered portion of the intermediate clay (if present) and into lower permeability intermediate or highly plastic clays.

CCME Guidelines for hazardous waste landfills state that natural deposits may be more variable in their properties than engineered clay liners (*e.g., a compacted clay liner*) and contain natural fractures, therefore a greater thickness of natural material is typically required to allow for this (CCME, 2006). The suitability of the natural clay deposit can be demonstrated further by comparing theoretical vertical seepage losses for a 1 m thick compacted clay liner ($k = 1 \times 10^{-7}$ m/sec) with that for a natural clay deposit with an average hydraulic conductivity of 1×10^{-10} m/sec which is about one order of magnitude higher than the reported values. This also assumes no horizontal flow which is unlikely even in the middle of the facility. The sensitivity of seepage losses for varying thicknesses of the natural clay deposit was also examined.

The results show a theoretical seepage flux of ~ 0.13 m^3/day per square metre through a 1-metre-thick compacted clay liner. In comparison, the vertical seepage flux through the natural clay deposit beneath the TWRMF ranges from 1.3×10^{-4} to 0.3×10^{-4} m^3/day per square metre for clay thicknesses ranging from 1 to 6 m. This relationship is illustrated on Figure 6 which shows very little increase in seepage losses beyond a thickness of 2 m.

Based on the above discussion, it is our professional opinion that the natural clay deposit across the facility base satisfies the design intent of a compacted clay liner.

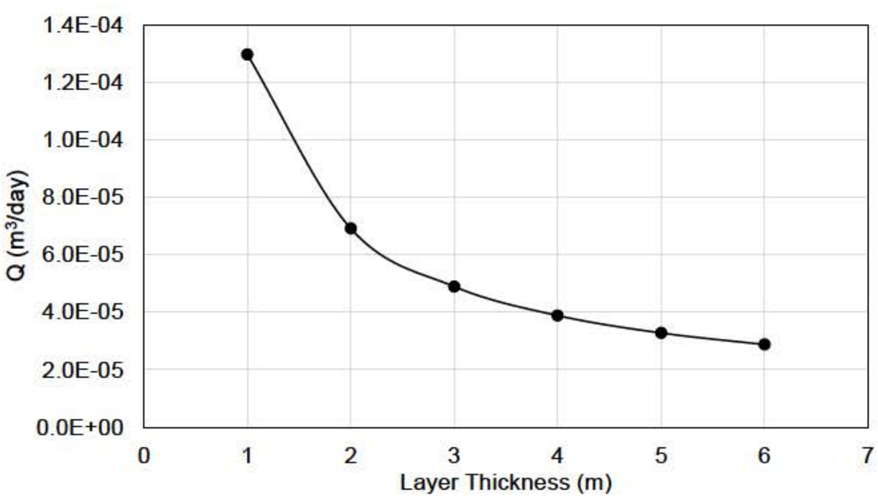

Figure 6 Theoretical Vertical Seepage Flow Rate Through the Natural Clay Deposit

7.0 Closure

The geotechnical information provided in this report is in accordance with current engineering principles and practices (Standard of Practice). The findings of this report were based on information provided (field investigation and laboratory testing). Soil conditions are natural deposits that can be highly variable across a site. If subsurface conditions are different than the conditions previously encountered on-site or those presented here, we should be notified to adjust our findings if necessary.

All information provided in this report is subject to our standard terms and conditions for engineering services, a copy of which is provided to each of our clients with the original scope of work or standard engineering services agreement. If these conditions are not attached, and you are not already in possession of such terms and conditions, contact our office and you will be promptly provided with a copy.

This report has been prepared by TREK Geotechnical Inc. (the Consultant) for the exclusive use of Silver Elephant Mining Corp. (the Client) and their agents for the work product presented in the report. Any findings or recommendations provided in this report are not to be used or relied upon by any third parties, except as agreed to in writing by the Client and Consultant prior to use.

LIST OF REFERENCES

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APPENDIX A

STANTEC MEMO

Stantec

Memo

To:	Robert van Drunen	From:	Sean Ennis
	Silver Elephant Mining Corp.		Vancouver - Dunsmuir
Project:	129500463	Date:	December 11, 2021

Reference: Minago Project – Surface Water Management Update

INTRODUCTION

Silver Elephant Mining Corporation (SEMC) is the owner of the Minago nickel property located in north-central Manitoba approximately 100 km north of Grand Rapids. SEMC has asked Stantec to support their Notice of Alteration (NoA) submission to Manitoba Conservation and Climate (MCC) for the Minago property (Environmental Act License (EAL) No. 2981). The current NoA will be supplemental to a submission made in 2014 by the previous property holder, Victory Nickel Inc.

The Minago project is a proposed open-pit nickel mining and processing operation which had a feasibility study completed in 2010 (Wardrop Engineering) and which received a provincial environmental license (#2981) in 2011. Subsequent to this license, re-evaluation of the project footprint led to the proposed relocation of the project's Tailings and Waste Rock Management Facility (TWRMF) as documented in a 2013 report completed by Foth Canada Corp. (Foth, 2014). A NoA was submitted to the provincial government in 2013 based on the revised footprint and initial regulatory review was undertaken. The revised project footprint is shown in Figure 1 taken from the Foth report. The TWRMF location was revised to avoid drainage to the south of the property into William River watershed. Design of the TWRMF has now been assigned to Trek Geotechnical, who are providing an updated layout and design for the facility. This memorandum is intended to support the work being completed by Trek Geotechnical and the overall NoA submission by SEMC by providing updated conceptual designs for the surface water management system.

HYDROLOGICAL CONDITIONS

The 2010 feasibility study and this memorandum reference the baseline hydrologic study completed by Golder Associates in 2009 (Golder, 2009). The Golder report summarized the site conditions as follows:

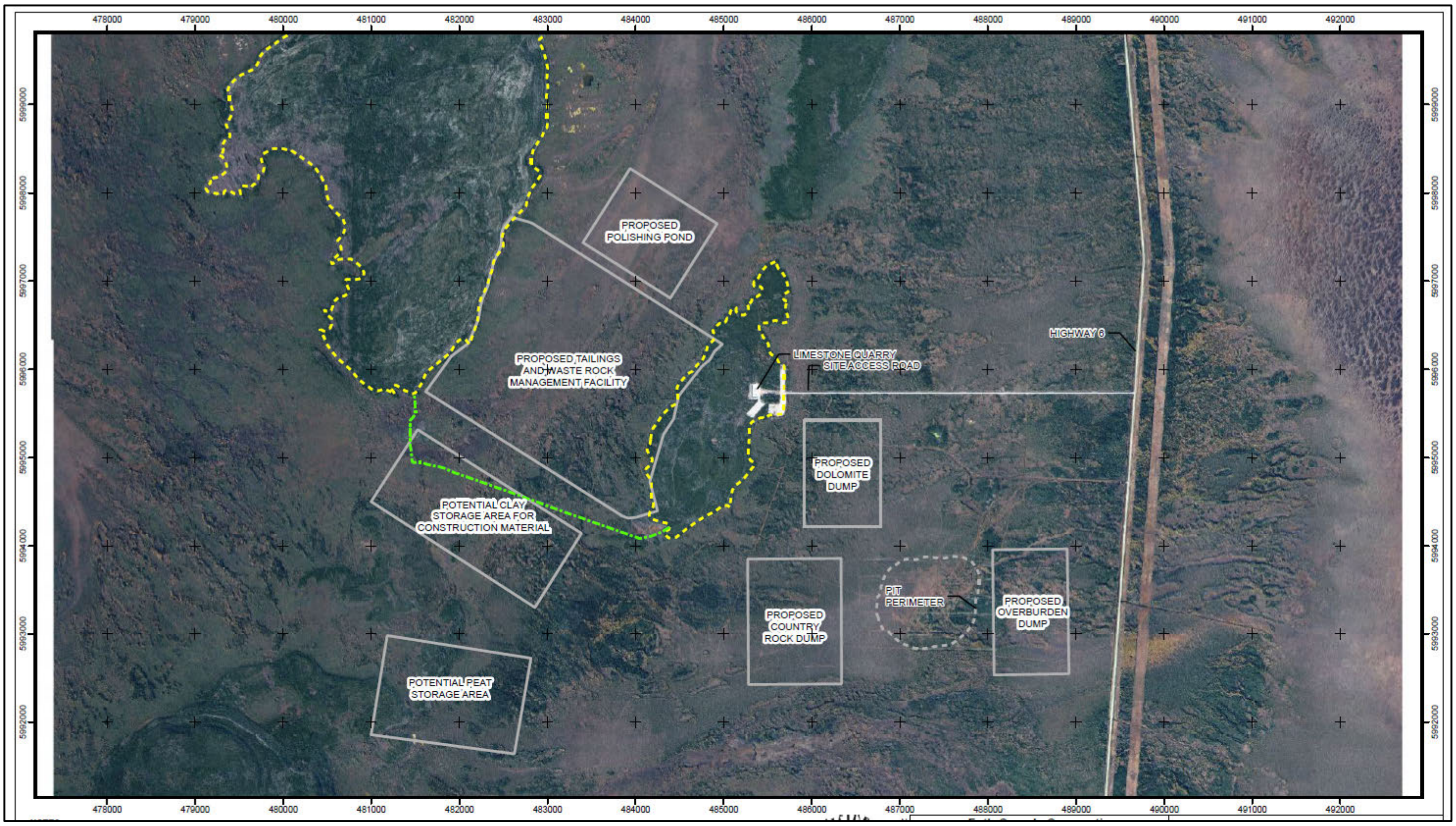
> *The mine is at the boundary between the Minago and William River watersheds, which are both within the Nelson River hydrographic system.*
>
> *The topography in the Minago and William River watershed varies between elevation 210 and 300m. The watersheds are located within the Mid-Boreal Lowland eco-region. This eco-region is a relatively flat, low-lying area with extensive wetlands covering approximately half the area. The cold and poorly drained fens and bogs are covered with tamarack and black spruce.*
>
> *Underlain by flat-lying, limestone bedrock, the project site area is covered almost entirely by a glacial and lacustrine overburden of fine material, and extensive peat deposits. The combination of the low gradient topography, wetland vegetation and surficial soil of fine material would be indicative of a poorly drained terrain.*

Climate data summarized by Golder reported an annual mean site temperature of about 0ºC but with significant seasonal variations. For example, mean monthly temperatures are in the range of -20C in January increasing to +20C in July. The mean annual total precipitation ranges between 400 – 600 mm with an annual snowfall range of between 1 – 2m. The 2010 feasibility study estimated an annual precipitation for the

Reference: Minago Project – Surface Water Management Update

site of 474 mm with 77% falling as rain falling between June and September (Wardrop, 2010). The more recent 2013 Foth report stated an annual average precipitation total of 510 mm with 72% falling as rain. Both values fall within precipitation range noted in the Golder report and the annual rainfall estimate is 366 mm +/- 1mm when calculated for either study.

Figure 1 – 2013 Minago Site Layout (from Foth, 2013)



PROPOSED MINAGO PROJECT FOOTPRINT

An updated project footprint plan has been jointly prepared between Trek Geotechnical and Stantec. The footprint includes the following structures:

- Open pit footprint based on the 2010 FS pit design
- Updated peat storage area footprint using quantities from the 2010 FS
- Updated clay storage area/dump footprints using the 2010 FS quantities and construction estimates from Trek Geotechnical based on their 2021 designs

- Updated dolomite and country rock dump footprints based on quantities from the 2010 FS
- TWRMF footprint based on Trek Geotechnical 2021 report
- Major sedimentation and polishing ponds for contact water retention (3 ponds)

The proposed project footprint with the major structures is shown in Drawing 1 - Sheet 1 (attached). In addition to the major structures, mine areas will include the access and haulroads, processing plant and office/shop/warehouse complex and facilities associated with the handling and processing of sand and dolomite rock. Run-off will be collected from all these areas and routed to one of the sedimentation ponds prior to discharge to the Minago River north of the proposed mine site area. Discharge will be via swale channels which will direct overflow from the ponds through the poorly drained area north of the site and ultimately into the Minago River (Drawing 1 – Sheet 2 attached).

Based on the presently proposed mine footprint, the catchment area that will be captured is approximately 30 km^2. The areas of the TWRMF and stockpiles structures are summarized in Table 1. Further discussion of the surface water management configuration is described in a following section.

Table 1 – Area of Major Structures

Structure	Area (ha)*
Peat stockpile	150
TWRMF construction clay stockpile	100
Main clay and overburden dump	275
Dolomite (limestone) dump	245
Mine rock dump	220
Sand stockpile	75
Tailings and waste rock storage facility	600
Total	**1,665**

**Note – areas rounded up.*

DESIGN BASIS

The direction given to Stantec by SEMC was to collect mine contact water from the mining area (pit, stockpiles, mine rock dumps and TWRMF area) and direct it to sedimentation ponds for retention prior to discharge into the Minago River catchment. Non-contact water was to be diverted away from the mine areas and could be discharged into either the Minago River or William River watersheds.

Run-off flowrates and volumes for channel design and pond sizing were estimated from values provided in the 2009 Golder report as well as volumes provided in the 2010 Wardrop report. The Golder report estimated flows for both the freshet and summer/fall period for the existing natural catchments. The freshet estimates were used for design estimates as they represented the more conservative (higher) values. Given that the Golder estimates were for the existing site conditions, a factor was applied to represent the increased run-off from mine-affected areas which will affect approximately half of the total catchment (16.7 km^2 - see Table 1). Peak values based on the 1 in 10-year flood flow were used for sizing the sedimentation ponds while channels were sized with capacity based on the 1 in 100-year flood flow discharge rates. Tables 2 and 3 summarize the forecasted values used as the basis for catchment flow estimation for the minesite area.

Table 2 Run-off Productivity Estimates

Case	Peak Productivity (m3/day/ha)		
	2-Year	10-Year	100-Year
Natural catchment	41.2	77.1	156.1
Mine-affected	*70*	*131*	*265*

Table 3 Peak Discharge Flow Estimates

Case	Peak Discharge (m^3/s / km^2)		
	2-Year	10-Year	100-Year
Natural catchment	0.05	0.09	0.18
Mine-affected	*0.08*	*0.15*	*0.31*

Channel and Swale Design

Detailed channel and swale layouts will be completed as the mine configuration is finalized. However, for the purposes of the current regulatory submittal, design sections for channels routing water from the larger areas were developed. Typical channel sections were developed for 100-year peak flows for flowrates of 1, 2 and 5 m^3/sec which correspond to catchments of approximately 300, 600 and 1500 hectares, respectively (see Table 4). Gradients across the minesite for the larger areas are expected to have shallow gradients in the range of 0.1 – 0.2% except for channels located directly on mine waste structures.

The channel and swale designs assume excavation through the peat and into the upper clay which is classified as a low plastic clay (CL) based on earlier site investigations (Wardrop, 2010). Channel cross-section designs were based on a trapezoidal earthen channel. Design parameters included a Manning's n value of 0.025 which is the maximum for earth channels that are clean after weathering (Chow, 1959). The channel side slopes are shallow at 5H:1V given the excavation in clay with a minimum freeboard of 0.3m. The calculated flow velocities for the design flows are low enough that the channels do not require armouring/riprap based on current understanding of the soil properties.

Swale designs from the sedimentation and polishing ponds are based on having relatively shallow depth with larger flows (up to 10 m^3/sec) and having to traverse shallow gradient areas. The typical cross-sections for the major swales are summarized in Table 5.

Table 4 - Major Channel Cross-Sections

Flowrate (m^3/sec)	Channel gradient (%)	Max. depth (m)	Minimum Required Channel Sizing	Flow Depth (m)	Flow Velocity (m/s)
1	0.1	1	0.8m deep 2.0m base width	0.44	0.55
2	0.2	1.5	0.9m deep 2.0m base width	0.52	0.85
5	0.15	2	1.2m deep 2.0m base width	0.84	0.97

Note – All channels have a 5H:1V side slope.

Table 5 - Major Swale Cross-Sections

Flowrate (m^3/sec)	Channel gradient (%)	Max. depth (m)	Minimum Required Channel Sizing	Flow Depth (m)	Flow Velocity (m/s)
10	0.15	1.5	1.5 m deep 2 m base width	1.2	1.2
10	0.03	1.5	1.5 m deep 8 m base width	1.2	0.6

Note – All swales have a 5H:1V side slope.

Sedimentation Ponds

Sediment yields from the natural area were reported as low based on the sampling completed by Golder (years 2006 – 2007) where the low yield values were deemed to be indicative of lower rates of land erosion in the Oakley Creek and Minago River watershed. While natural sediment yield is low, the disturbance caused by mining is expected to increase sediment loading in run-off water. The surface water management system will include small local sumps near the main waste structures as well as large sedimentation ponds (Ponds A and B) which are intended to provide retention for mine contact water sufficient to allow entrained sediments from mine areas to settle out prior to discharging water. The ponds will be sized to contain the flow from a 1 in 10-year, 24-hour flood event following guidance for design of mine sedimentation ponds (BC MELP, 1996). The Wardrop feasibility study noted that ponds with a surface area of approximately 75 ha were designed for sediment control. The main pond was located north of the existing access road. The 2013 Foth report also included a polishing pond north of the relocated TWRMF. Based on the updated mine footprint and catchment area, a combined run-off retention capacity of 400,000 m^3 for the two sedimentation ponds (Ponds A and B) has been estimated which also provides capacity for on-going pit dewatering. The TWRMF area will require its own dedicated pond with capacity for contact water run-off as well as water pumped from the TWRMF. The Foth report showed a pond size in the range of 115 ha indicating capacity in excess of that required for run-off water.

SURFACE WATER MANAGEMENT CONFIGURATION

The proposed alignments of major catchment channels and swales and footprint for the main sedimentation ponds are shown on Drawing 1 – Sheets 1 and 2. The site has been delineated into three major catchments with two covering the pit and stockpile/dump area and one covering the tailings storage area. Discussion of the channel and pond layouts are summarized below.

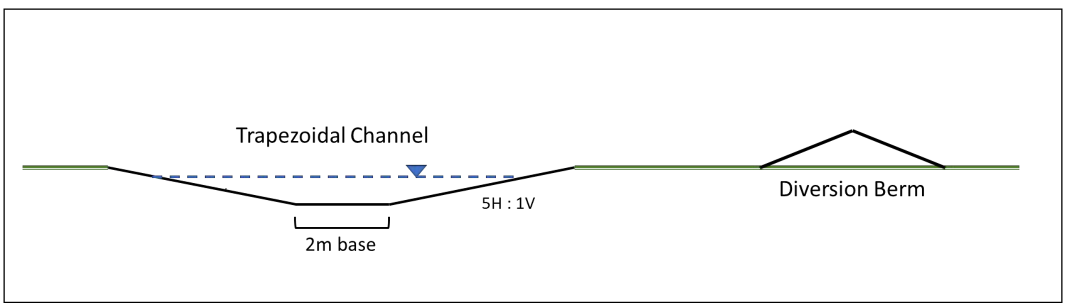
Contact water channels

The Central (Channel A) and Southeastern (Channel B) channels would both direct contact water to the northern sedimentation ponds. Channel B would also have a compacted berm structure running parallel along the property boundary to establish clear delineation between off-site non-contact water and mine affected contact water (see schematic section in Figure 2). Clay material excavated during channel construction could be used to construct the compacted berms with heights in the range of 1 – 1.5m being judged sufficient to establish the drainage boundary.

Channel A runs a distance of approximately 5.6 km before reporting to its associated sedimentation pond (Pond A) as shown in Drawing 1. A profile section of the channel is shown in Drawing 2. Channel A is shown as overlapping with the process plant complex but this will be resolved as a more detailed layout for the plant and office-maintenance-warehouse complex is developed. Channel B essentially follows the length of the southern and eastern property boundaries for a distance of 13.1 km as shown in Drawing 1 and discharges to Pond B. A profile section of this channel is shown in Drawing 3. Both channels are sized to handle in excess of 5 m^3/s as a peak flow volume. The right-of-way for the channels will include 22m width for the channel excavation as well as a 4m wide maintenance road running alongside the channels. The catchment berm required for Channel B will have a base width of approximately 6 – 8m.

A network of smaller collector channels will collect water from the mine stockpiles, haulroad and working areas and direct this run-off to the main drainage channels. Future detailed designs will include small sumps (ex. 10m wide x 40m long by 2m depth) to settle out coarse particles be excavated adjacent to the major stockpiles and mine rock dumps. This will allow for easier clean-out of accumulated sediment and reduce maintenance and clean-out requirements on the larger channels.

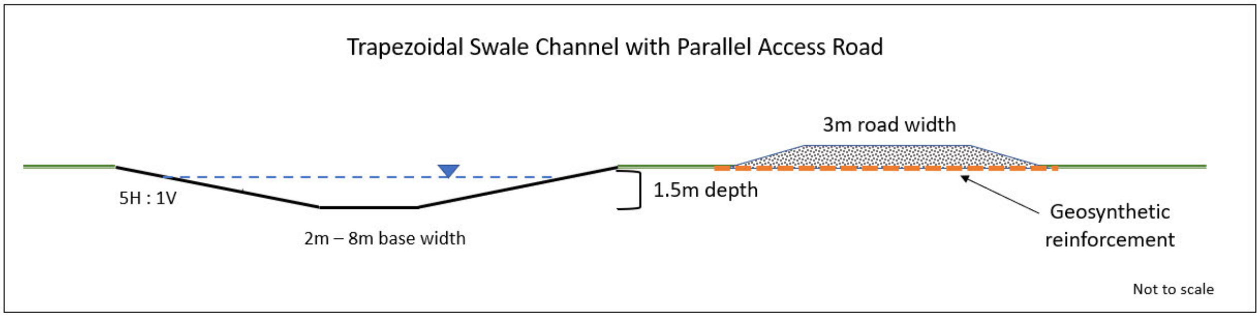
Figure 2 – Trapezoidal Channel and Diversion Berm Schematic Cross-section



Discharge Swales

The purpose of the proposed discharge swales is to convey overflow water from the sedimentation and polishing ponds to the Minago River. The swales have been configured as shallow, wide trapezoidal channels intended to carry flows up to 10 m^3/s during freshet or flood events. The distance of the Minago River from the site ponds (approx. 8 – 9 km) and gentle topography mean that gradients in the swales may be very shallow at some points. This results in portions of the swales having larger widths (up to 8m) to convey flow in order to offset the shallow gradients. Proposed swale alignments are shown in Drawing 1 – Sheets 1 and 2 and profiles for the swales are shown on Drawing 4. In order to allow for inspection and maintenance of the swales, the design proposes to have an inspection/service road parallel the swale right-of-way as shown schematically in Figure 3. Clay and soil excavated during channel construction would be used to develop the road platform. Geosynthetic reinforcement material (ex. geogrid, geotextiles) may be required to support the road embankment in areas of muskeg or soft ground. This method of road construction is common in northern regions where peat or muskeg is prevalent.

Figure 3 – Swale and Inspection Road Schematic Cross-section



Sedimentation ponds

The shallow gradient of the natural topography and soft clay foundation limit the opportunities for use of natural features to provide water impoundment. Instead, an approach of utilizing large, shallow retention areas with low containment berms (≤2.5m) has been adopted. This approach should allow for the provision of sufficient sedimentation pond capacity without requiring high dam embankments to be constructed. Sedimentation ponds will require engineered inlet and outlet/spillway structures to handle peak flow events while also providing sufficient capacity to retain the 1-in-24 hour, 1-in-10 year run-off volumes. Pond depths have been estimated in the range 0.75 - 1m while still allowing a 1m freeboard during peak flows. The ponds will include a series of inner dykes to increase the flow path through the ponds which will enhance retention time. Three major ponds will be required to manage the surface run-off and pit dewatering:

- Pond A – 35 ha area for containment of run-off from the plantsite, clay and peat stockpiles and portions of the rock dumps
- Pond B – 35 ha area for containment of run-off from the mine rock dumps, pit dewatering and eastern mine area
- TWRMF Polishing Pond – 120 ha area for containment of run-off from the TWRMF and recovered water from the TWRMF pond. Foth (2013) stated a design retention time of minimum seven (7) days.

The discharge from the three ponds will be directed northwards towards the Minago River. Given the relatively shallow gradients of the area north of the proposed mine site, excavation of conventional discharge channels may not be practical. Similar to the Foth 2013 report, the proposed designs would incorporate an open channel/spillway from the ponds leading to wide swales which would discharge down-gradient of the pond structures during months where the temperature is above freezing. During winter months, although discharge is expected to be significantly lower, insulated, heat-traced pipe systems from each pond would direct water to the swale channels, which ultimately discharge to the Minago River. Preliminary alignments are shown in Drawing 1 – Sheets 1 and 2, based on the high-level topographic contours.

Detailed designs for the embankments, inlets, outlets and other infrastructure associated with the sedimentation ponds has not been completed. Culvert structures will be required where the channels intersect the access and haul roads. The configuration of these culvert structures will be determined based on the channel size as well as the traffic loading for a given crossing.

Construction

The 2013 Foth report noted a construction period of approximately two years for the TWRMF and related infrastructure based on the known site conditions. A similar period of time is estimated for the development of water management structures for the overall site. Given the prevalence of muskeg across the site, the development of a network of drainage ditches in conjunction with the main drainage channels will be required. It is noted that a drainage ditch excavated in the proposed pit area in March 2012 proved very effective in reducing water levels in the pit area (Foth, 2013). Construction of channels and drainage ditch networks is expected to be most productive in the winter months when frozen conditions will improve trafficability.

Construction of the pond berms as well as major access roads will proceed following drainage and stripping of the muskeg material. Timing of construction will be dependent upon the progress of drainage and local trafficability. The use of geogrids or preloading may expedite construction in critical areas, if the additional cost is justified.

Light-duty access roads and non-water retaining berms could be constructed as fills on drained muskeg with allowance for settlement. However, embankment berms/dikes which impound water and access/haul roads being used by heavier vehicles are expected to be constructed on areas stripped of muskeg.

Construction of the discharge swales would be expected to be carried out in winter to allow for working over the softer ground and muskeg areas. The inspection/service road that will parallel the swales would be constructed using clays and soil material excavated from the channel as noted above. Stripped muskeg would be piled away from the channel. Geosynthetic reinforcement of the road embankment may be required in areas of softer ground or muskeg. In order to prevent the road from ponding natural flows, culverts or drain structures would be installed at regular intervals along the road alignment. Based on regional practice, a culvert/drain spacing in the range of 100 – 200m could be expected (FPInnovations, 2016) but this may vary depending on local drainage and flow conditions.

Reference: **Minago Project – Surface Water Management Update**

CLOSING

This report has been prepared to support the Notice of Alteration documentation being prepared by Silver Elephant Mining Corporation for their Minago Project. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Stantec Consulting Limited

[redacted]

Sean Ennis P. Eng. (British Columbia)
Vice President, Mining

Phone: 604-862-2458
Email: sean.ennis@stantec.com

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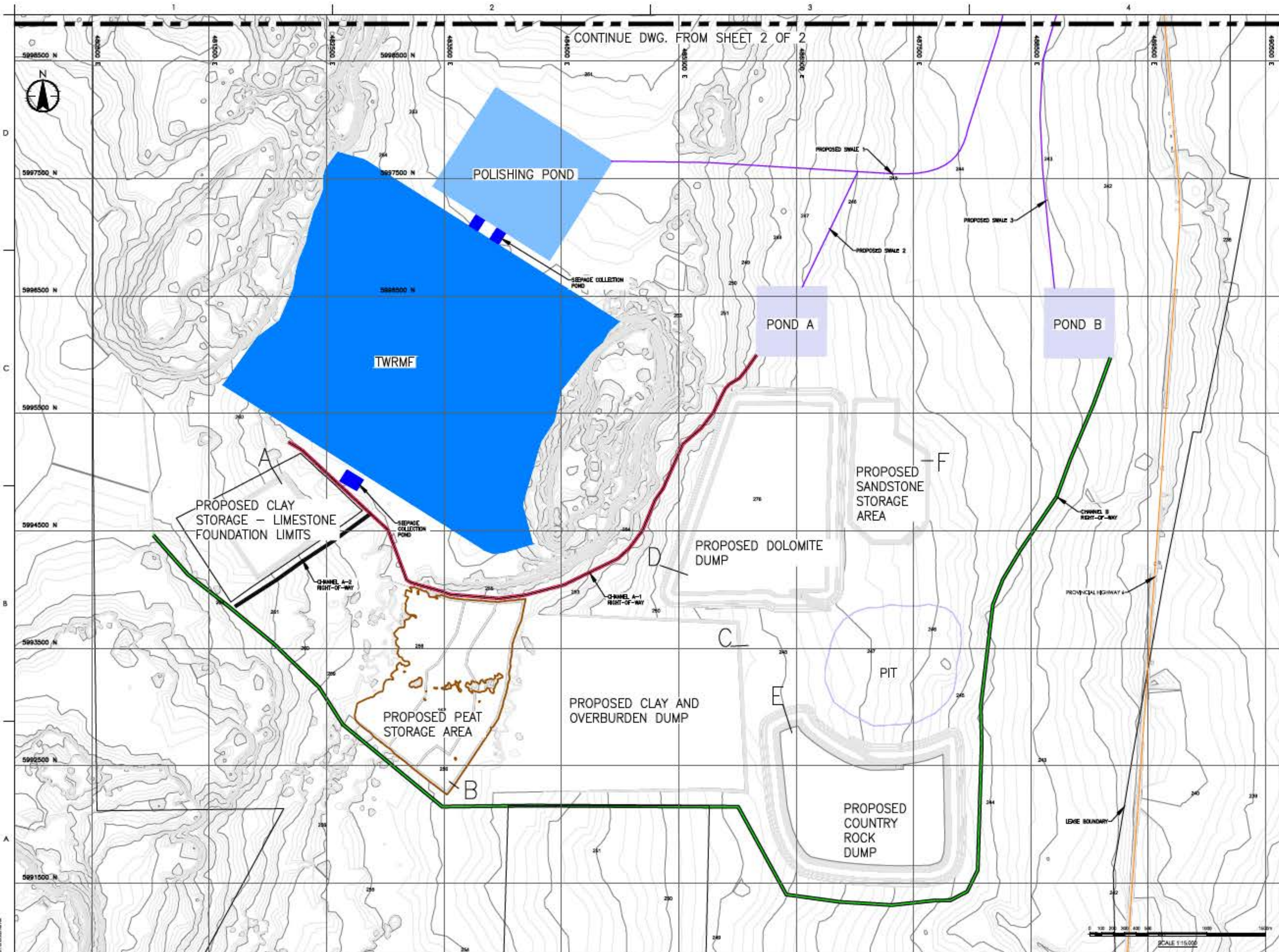
Attachment: Drawings 1 - 4



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200 – 325 25th Street SE
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PROVINCIAL HIGHWAY 6

Notes

1. COORDINATE SYSTEM IS UTM GRID IN ZONE 14N, USING NAD83 AS DATUM.

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Silver Elephant Mining

Minago Nickel Project - Notice of Alteration Support

Grand Rapids, Manitoba

Project No.: 129500463

File Name: MATERIAL STORAGE AND DRAINAGE PLAN

Scale: 1:15000

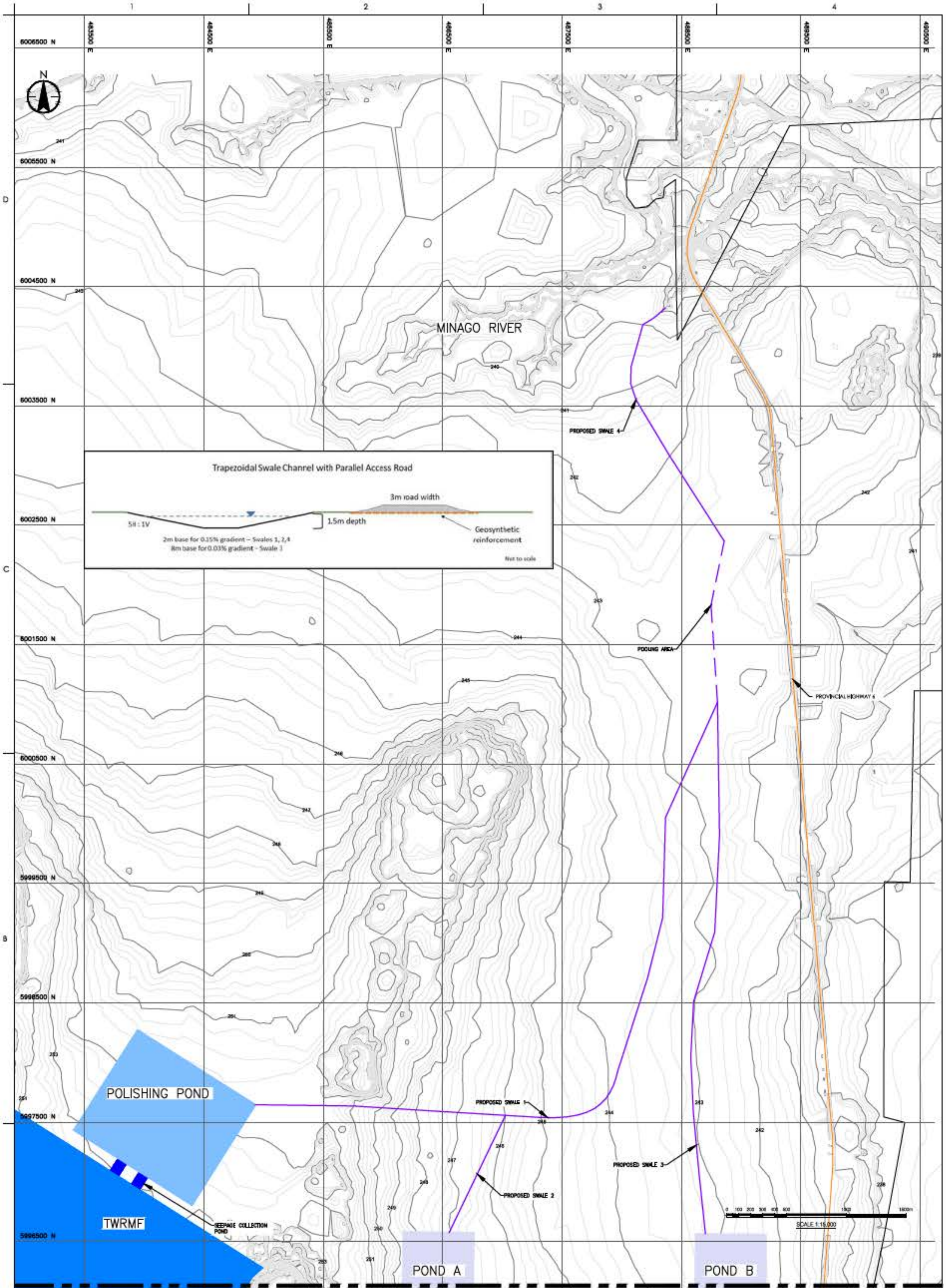
TV	LK	SE	2021.12.10
Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

Title

Material Storage and Drainage Plan

Revision: A Sheet: 1 of 2

Drawing No. 1



CONTINUE DWG. FROM SHEET 1 OF 2

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Silver Elephant Mining

Minago Nickel Project - Notice of Alteration Support

Grand Rapids, Manitoba

Project No.: 129500463

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Title
Material Storage and Drainage Plan

Scale: 1:15000

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
TV	LK	SF	2021.12.10

Revision: A Sheet: 2 of 2

Drawing No. 1

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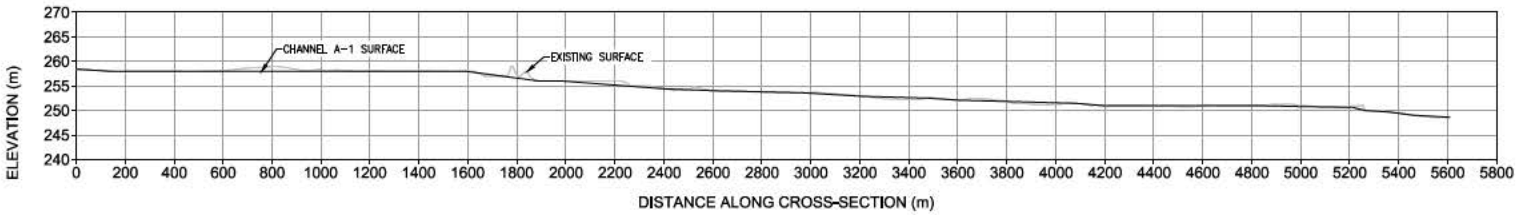

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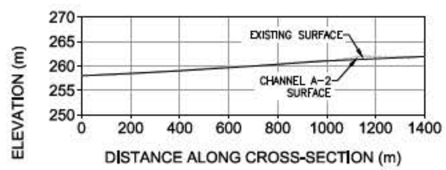

CHANNEL A-2
SCALE 1:15000

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Minago Nickel Project - Notice of Alteration Support

Grand Rapids, Manitoba

Project No.: 129500463

File Name: FIG 2 CROSS SECTIONS

Scale: As Shown

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Dwn.	Dsgn.	Chkd.	YYYY.MM.DD

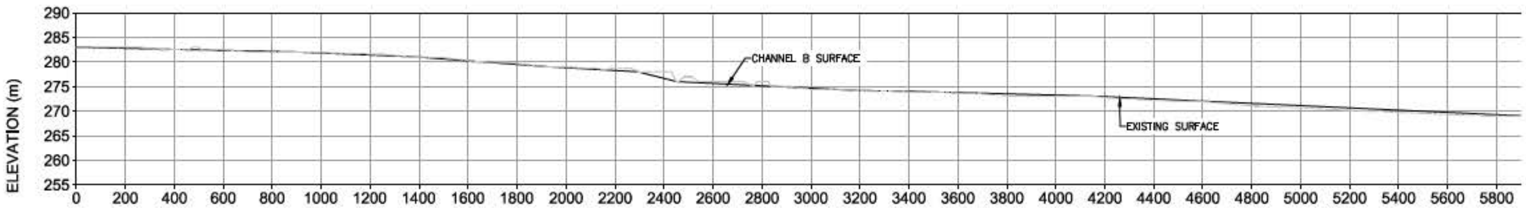
Title

Channel A-1 and Channel A-2 Longitudinal Section

Revision: A Sheet: 1 of 1

Drawing No. 2

ORIGINAL SHEET - ANSI C (17" x 22")



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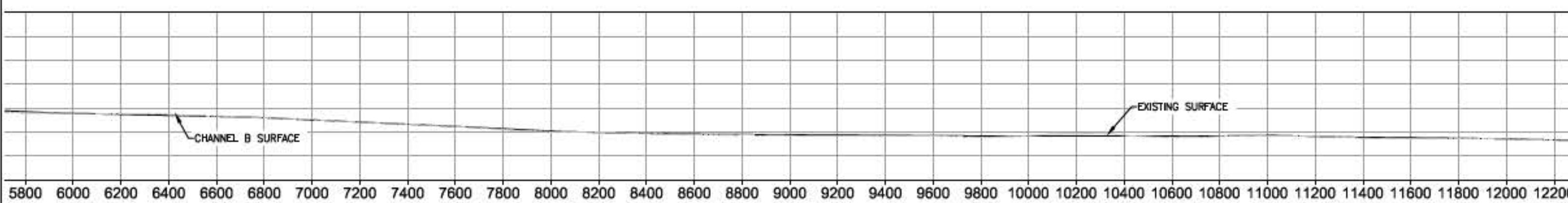

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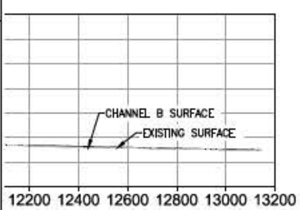

CHANNEL B
SCALE 1:15000

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Stantec
200 - 325 25th Street SE
Calgary, AB T2A 7H8
Tel:+1(403) 716-8000
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Minago Nickel Project -
Notice of Alteration Support

Grand Rapids, Manitoba

Project No.: 129500463

File Name: FIG 2 CROSS SECTIONS

Scale: As Shown

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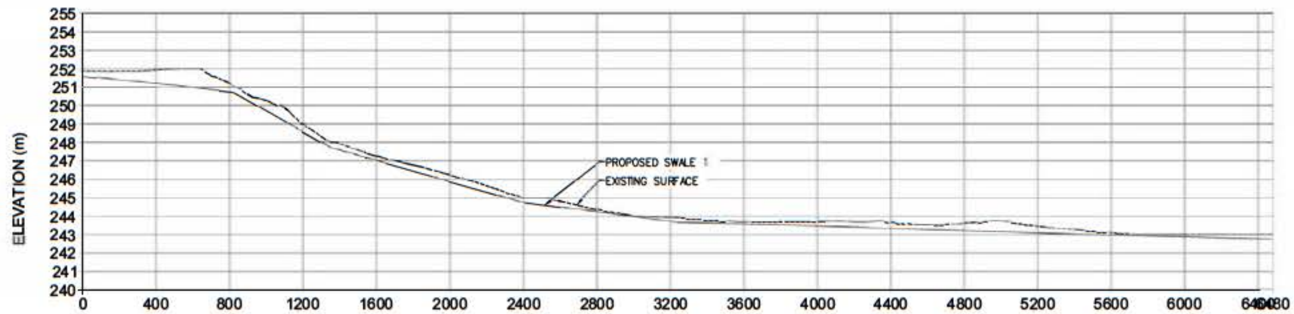
Title

Channel B Longitudinal Section

Revision: A Sheet: 1 of 1

Drawing No. 3

ORIGINAL SHEET - ANSI C (17" x 22")



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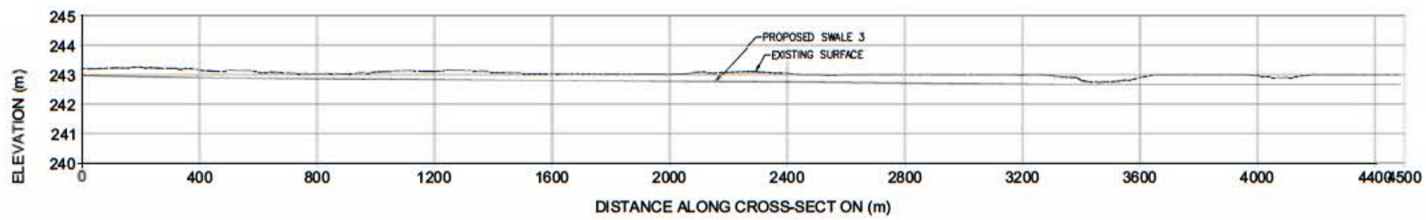

PROPOSED SWALE 3
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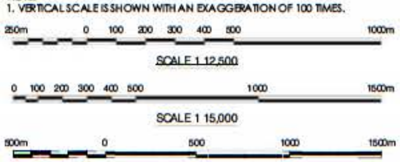
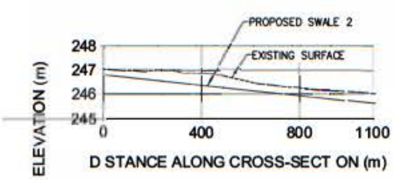
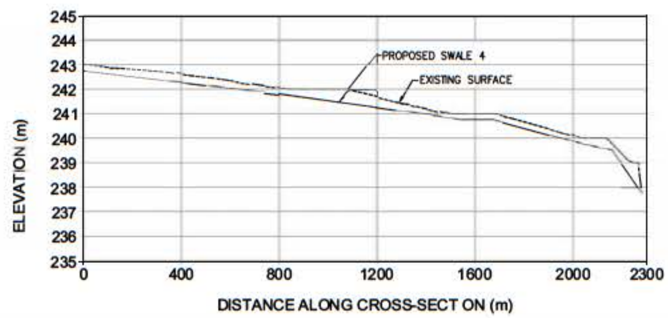
NOTE:
1. VERTICAL SCALE IS SHOWN WITH AN EXAGGERATION OF 100 TIMES.





PROPOSED SWALE 2
SCALE 1:15000



PROPOSED SWALE 4
SCALE 1:15000

Stantec
Stantec
200 - 325 25th Street SE
Calgary, AB T2A 7H8
Tel: +1(403) 716-8000
www.stantec.com

Legend

Notes

Issued	By	Appd	YYYY.MM.DD
Issued for Review	LK	SE	2021.12.10

Permit/Seal

Client/Project
Silver Elephant Mining

Minago Nickel Project - Notice of Alteration Support

Grand Rapids, Manitoba

Project No: 129500463
File Name: CROSS SECTIONS
Scale: As Shown

Dwn.	Dsgn.	Chkd.	YYYY.MM.DD
TV	LK	SE	202 . 2. 0

Title
Proposed Swale 1, 2, 3 and 4 Longitudinal Sections

Revision: A Sheet: 1 of 1
Drawing No. 4

ORIGINAL SHEET - ANSI C (17" x 22")