APPENDIX K2

2023 QIA Inspections and Baffinland's Responses

(Pages K2-1 to K2-214)

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Qikiqtani Inuit Association

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Connor Devereaux
Environmental Manager
360 Oakville Place Drive
Suite 300, Oakville, Ontario, Canada
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September 18, 2023

Re: Baffinland Iron Mines Corporation's Mary River Project – Qikiqtani Inuit Association June 2023 General Site Inspection Findings and Recommendations

Connor,

Consistent with requirements under Schedule E, Item 12 of the Commercial Lease No.: Q13C301 (CPL), issued to Baffinland Iron Mines Corporation (Baffinland) by the Qikiqtani Inuit Association (QIA), the QIA conducted a Site Inspection (Inspection) of the Mary River Mine (Project) in late June, 2023. Conor Goddard of QIA conducted the Inspection with technical support provided by Joe Cavallo of LGL Ltd. AND Lois Boxill of MIS Ltd. An overview of the inspectors' findings and recommendations is provided below. Photographs associated with the findings and recommendations are provided in Appendix A & B. Additional figures accompanying requested actions are provided in appendix C.

Sincerely,

Conor Goddard
Manager, Project Compliance and Monitoring

September 14, 2023

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Dear Conor:

Re: Water License 2AM-MRY1325 - Mary River Project
Follow up Report to June 28 and 29 Environmental Inspection
LGL Limited and Mining Impact Specialists Ltd.
Commercial Lease Q13C301

Introduction

Consistent with requirements under Schedule E, Item 12 of the Commercial Lease issued to Baffinland Iron Mines Corporation (Baffinland) by the Qikiqtani Inuit Association (QIA), LGL Limited (LGL) and Mining Impact Specialists Ltd. (MISL), along with QIA representative, Conor Goddard, conducted the first Annual Environmental Site Inspection (Inspection) of the Mary River Mine Project (Project) on June 28 and 29, 2023. Joseph Cavallo conducted the Inspection on LGL's behalf, and Lois Boxill, Ph.D., P.Eng. conducted the Inspection on behalf of MISL.

The governing objective of this report is to identify issues that in any way undermine or compromise QIA's mission to safeguard "the land, waters and resources" that sustain Qikiqtani Inuit within the Inuit homeland. "Requested actions" describe measures deemed necessary to be taken by Baffinland to arrest identified conditions of concern. In response to this report, Baffinland is requested to indicate how each "requested action" will be addressed. Additionally, this report tracks where requested actions from the 2022 Inspection have not been addressed.

Report Structure

Photographs associated with the findings and requested actions made by LGL are provided in **Appendix A**. Photographs associated with the inspection and assessment completed by MISL are provided in **Appendix B**. Additionally, Figures accompanying MISL's requested actions are provided in **Appendix C**. A description of documents reviewed, an overview of site visit activities, Inspector findings, and requested actions follow.

Documents Reviewed

Prior to the site visit and while preparing this report, spill reports, associated "Follow-up" reports, and other reports were reviewed. Highlights from each reviewed report are summarized in **Table 1**.

A Water Licence Monthly Surveillance Network Program (SNP) Report dated July 30 was also provided which summarized no water quality exceedances in Sewage Treatment Plant (STP) monitoring but did record numerous exceedances of Total Suspended Solids (TSS) in the Surveillance Network Program (SNP) surface water monitoring stations.

Overview of Site Visit Activities

The location of the Mary River Mine and the general limits of areas inspected are provided on **Figure 1** and **Figure 2**. On Wednesday, 28 June, after completing the requisite site safety orientation, representatives of QIA, LGL, and MISL completing the first annual environmental inspection (Inspectors) were outfitted with PPE and prepared to travel via light duty truck from Sailiivik camp (also referred to as the Mary River Mine site and seen in **Figure 2** and **Figure 3**) to Milne Port via the Tote Road (Figure 3 and Figure 4). The Inspectors were driven by a member of Baffinland's Site Services department with Mr. Todd Swenson, Environmental Superintendent (Baffinland), accompanying.

During the drive along the Tote Road, Inspectors stopped to inspect most culvert and bridge crossings as well as observing the tundra adjacent to the road and any visible wildlife (alive or deceased). It should be noted that the skeletal remains of a Sandhill Crane (*Antigone canadensis*) was observed approximately 100 m from the road limits. Inspectors also observed Tote Road operations, paying special attention to dust generation associated with haul truck use, and evidence of dust mitigation efforts. Inspectors also observed operation of existing culverts and presence of "dust" on snow adjacent to the Tote Road.

After taking lunch at the Milne Port site (**Figures 5 to 7**), Inspectors and Superintendent Swenson were toured around Milne Porte infrastructure by a member of the Environment department assigned to Milne Port. After touring this area, the Inspectors and Superintendent Swenson boarded a helicopter that transported them south to the helicopter landing area just west of the Sailiivik Camp. Inspectors ended the day by reviewing main observations from the day and sharing key highlights with Mr. Swenson and Environmental Manager, Conor Devereux.

On Thursday, 29 June, Inspectors were again accompanied by Mr. Swenson but driven by Mr. John Beaver, a member of the Environment Department at the time of the Inspection, sharing responsibilities for operating the Water Treatment Plant adjacent to the Waste Rock Facility. The tour started at the Surface Water Management Pond and Water Treatment Plant (WTP) located at the northern extent of the Active Mining Area (Figure 8). At the WTP, the Inspectors were introduced to Mr. Jesse Jackson, who shared WTP operation responsibilities. The next stop on the tour was the KM 106 Stockpile (**Figure 9** and **Figure 10**). While at the site, the MISL Inspector observed a swath of ultrafines that appeared to have flowed from the top of the stockpile (Photo 13). This finding was unexpected as Spill Report #23-276 (dated 23 June 2023), identified "contact water" as the substance that had been released. The serious nature of this event and its potential for resulting in a fatality was immediately identified and reiterated at the closeout meeting held with senior mine managers prior to the Inspectors' departure from site on the morning of June 30.

After a change in drivers, the Inspectors then toured the area within and downstream of the KM 105 Sedimentation Pond and its two embankments (**Figure 10**, **Figure 11** and **Figure 12**). The area north and east of the Mines Site Complex (**Figure 13**) as well as the area west and downstream of the Mine Site Tank Farm (**Figure 13**) were then inspected. The Inspectors were then driven to an area identified as Laydown 2 (**Figure 14**) where they inspected inflows to Sheardown Lake.

Table 1: Overview of Documents Reviewed to Support 1st Annual Environmental Inspection

Area	Event Date	Nature of Event and/or Key Information	Report Date	Spill ID
KM 105 - Sedimentation Pond	20-May-23	Uncontrolled release of mine contact water downstream of the KM-105 embankment dam. The spill report indicates that the entry point (ingress) for the release was not at the same area that was repaired in Q4, 2022, but "adjacent" to it. Baffinland also stated that "based on observations to date...seepage is flowing through the porous geologic structures adjacent to and below the dam structure, and they impacts has not impact on dam integrity.	21-May-23	#23-208
		- Attempts to use bentonite plugs to stop seepage were unsuccessful - Seepage is described as "flowing through the porous geologic structures adjacent to and below the dam structure." - The amount of water released was not quantified - At least two seepage ingress areas were identified - upstream of the seepage ingress site identified for the 2022 release event. - TSS levels of 200 mg/L and 192 mg/L were measured on water samples collected on the day of the spill (MDMER criteria: 30 mg/L, Water Licence criteria: 15 mg/L) - A third party engineering firm has been retained by Baffinland to develop a remedial repair plan	20-Jun-23	
KM 106 - Ore Storage Facility (OSF)	22-Jun-23	Uncontrolled Release of ore ultrafines and entrained pore water from OSF to area downstream of OSF containment berm (constructed in 2020). Report indicates that the only "Product Spilled" was "Contact Water" when evidence of an ultrafines flow failure was observed during the site visit.	23-Jun-23	#23-276
Tote Road	12-Jun-23	At crossings CV-040 and BG-32, sediment transported by melting snowpack resulted in a greater than 50 mg/L increase in TSS in the downstream sample when upstream TSS concentrations are less than 250 mg/L.	25-Jun-23	#23-258
		CV-040(KM 72): By 25 June 2023 the difference between DS and US TSS concentrations was measured as 3.7 mg/L (i.e., <50 mg/L) **BG-32**(KM 78): By 25 June 2023 the difference between DS and US TSS concentrations was measured as 0.4 mg/L (i.e., <50 mg/L)	16-Jul-23	
	01-May-23	Snowmelt runoff containing sediment entered Sheardown Lake Tributary	02-May-23	#23-177

Sheardown Lake Tributary (SDLT)		Samples taken at location **SDLT-OUT** had elevated levels of TSS. Water pumping, diversion and culvert steaming were completed to reduce sediment loading.	01-Jun-23	
Sailiivik WWTP	02-Jun-23	Loss of a programmable logic controller at the WWTP caused a tank at the receiving station to overflow approximately 5,000 liters of untreated sewage onto the ground directed adjacent to the WWTP.	02-Jul-23	#23-238
Milne Port	06-Jun-23	Water at sampling location **MP-C-B** was found to have elevated TSS. The exceedance was believed to result from overland flow of melting snow that was laden with ultrafines.	07-Jun-23	#23-245

While not formally included in the Inspection, the Airstrip (**Figure 15**) was generally observed by the Inspectors during arrival and departure from the site. Additionally, the Helicopter Hangar and Helicopter Pad (**Figure 16**) were observed by the Inspectors on June 28 following their arrival via helicopter transport from Milne Port.

Inspector Findings & Preliminary Recommendations

The increased number of Spill Reports and the numerous TSS exceedances in surface water that had occurred prior to the first 2023 Inspection - compared to those brought to the attention of the LGL and MISL Inspectors who participated in the 2022 Inspection - is noteworthy. Conditions of elevated TSS described in the spill reports reviewed - especially concerning KM 105 – Sedimentation Pond and along the Tote Road, especially south of KM 100 in the mine area - were consistent with those observed during the June 28 and 29 Inspection.

Prior to departure from Site on June 30, the Inspectors provided members of the Senior Site Management Team with an overview of the most critical observations/findings made during the Inspection as well as preliminary Recommended Actions. These observations and preliminary recommendations are summarized in Table 2.

Detailed description of Inspector findings made during the Inspection are provided in the tables immediately following the signature page of this Executive Summary report and supported by cited photos provided in **Appendix B** (App B, LGL) and **Appendix C** (App C, MISL). Recommended actions from the 2022 Inspection that have not been addressed are also clearly indicated. Additionally, the comment tracking table containing both Baffinland's and QIA's responses to the 2022 Site Inspection report is provided in **Appendix D** (App D).

Table 2: 1st 2023 Inspection Summary of Critical Findings & Preliminary Recommended Action

Area	Finding	Preliminary Recommended Action
KM 105 Sedimentation Pond	Sediment-laden water was steadily leaking from the downstream toe of the NW Embankment and had been routed from the seepage outfall along the right abutment contact – consistent with the seepage outfall observed during the 2022 Inspection – to pool in an area downstream of the embankment toe's contact with the left abutment (App C - Photo 1B, Photo 3). Water entering the sedimentation pond was heavily sediment-laden upstream (App C – Photo 6) and downstream (App C – Photo 5) of the silt fence that had been installed. It was also noted that the 2023 seepage ingress sites were upstream of the seepage ingress site identified during the 2022 Inspection (App C – Photo 4), along the same geologic material forming the lower reaches of the right abutment sidewall upstream of the NW embankment's cross-valley centerline, and upstream of the area repaired in Q3-Q4 2022 intended to stop further leaking through and downstream of the embankment.	Assign dedicated personnel to be responsible for and oversee sediment management for the entire mine site, especially along the mine haul road, downstream of KM 105 Sedimentation Pond, and along the Tote Road. Provide secondary containment for any sediment reporting downstream of the KM 105 Sedimentation Pond (Figure 10). Characterize the complete alignment of the seepage mechanism including the pond bottom and north side wall (Area C & C' on **Figure 17**) to enable confirmation of the adequacy of proposed measures to remediate seepage bypass of the NW Embankment.
Area Downstream of KM105	The water by-passing the dam was highly sediment-laden (App C – Photo 3) and could be compared to clear surface water from an adjacent drainage collecting undisturbed mountain-side runoff (App C – Photos 1B & 2)	
KM 106 Ore Storage Facility (OSF)	Evidence of a large unreported slide of ultrafine ore (red-coloured material) was observed (App C – Photo 13). Red-coloured fine-grained ore was observed to have flowed along and the OSF containment berm, breaching it in two locations with release to the tundra in one instance (Figure 9). The size and nature of the flow failure, the imprecise and incomplete reporting of the event, and the general proximity of the OSF to the Mary River Mine are notable.	Have a Qualified Professional review the practice of placing ore fines within the OSF to ensure that geotechnical stability of any areas of the OSF, human health and safety, or the environment are compromised. Review should at minimum include an update of the Operations Procedures for how and where ultrafines are placed in the OSF and what health and safety procedures must be in place to reduce the likelihood of harm or fatality to mine personnel at this location.

Tote Road & Mine Haul Road	**In Mine Area:** Sediment-laden run off in the roadside ditches along the Mine Haul Road (south and east of KM 97, Camp Lake). Existing ditches were observed carrying snowmelt runoff from the higher elevations of the mine and picking up ultrafines and fine sediments from the surrounding rock and mine haul roads. This water reported to the KM 105 Sedimentation Pond with an unsealed foundation enabling seepage bypass.	Design and install well engineered drainage ditches that provide means of collecting sediment that can be periodically cleared during and following annual freshet.
Sheardown Lake Tributary	**Tote Road (~KM 103 & east):** Evidence of surface water runoff from the lower elevations of the road at the crossing, entering the tributary under spring freshet conditions was observed. **Entrance to Sheardown Lake (near SDLT-OUT, Figure 14):** difference in the turbidity of the tributary and the lake was apparent. A turbidity curtain was effectively separating the sediment -laden water of the tributary from the clear water of the lake. The sediment-laden water was entering the lake through gaps in the turbidity curtain at the shoreline of Sheardown Lake.	Assign dedicated personnel to be responsible for and oversee sediment management for the entire mine site, especially along the mine haul road, downstream of KM 105 Sedimentation Pond, and along the Tote Road. Provide secondary containment for any sediment reporting downstream of the KM 105 Sedimentation Pond (Figure 10).

Critical Recommended Actions

As in 2022, fugitive dust (now suspected to be ultrafines), mobilized mainly by haul truck activity along the Tote Road, and coating snow and ice on the adjacent tundra vegetation, continues to be observed. Although the Tote Road contained more moisture at the time of the Inspection than was observed during the late summer Inspection conducted in August 2022, the amount of dust was still significant enough to be observed throughout. Additionally, contrary to stated commitments of maintaining a fleet of three water trucks to support dust abatement along the Tote Road, only one water truck was observed during this first 2023 Inspection. The difficulty to settle sediment laden runoff combined with the pervasiveness of the dust problem along the Tote Road it is believed to indicate that parts of the ore break down to create ultrafines. This is significant as these materials are known to require special management and focused attention, especially within mining contexts.[1]

It is our professional opinion that some of the concerns, namely the exceedances of TSS and the sustained high concentrations of high levels of TSS could be in contravention of section 34(1) *deleterious substance* of the federal *Fisheries Act*. All areas a few hundred metres downstream of KM 105 pond, directly support fish and fish habitat, and as such, increased priority should be placed on preventing sediments from entering these waters. Additionally, while it is understood that Baffinland has engaged a new EOR and independent engineering consultant to support design and implementation of additional remediation for the continued leaking of the KM 105 Sedimentation Pond, it is our opinion that proactive measures should be taken to

[1] Somasundaran, P. (1986). An Overview of the Ultrafine Problem, in Mineral Processing at a Crossroads, B. Wills, and R. Barley, eds., NATO ASI Series E – Applied Sciences No. 117.

ensure that effective sediment capture is provided downstream of the NW Embankment prior to onset of the 2024 freshet, in the event that leaking from this facility persists. In short, the extent of sediment loading into Sheardown Lake is unacceptable and effective measures taken to rectify all sediment transport conditions observed during the June 2023 Inspection.

We also recommend a more robust implementation of erosion and sediment control (ESC) and other mitigation measures when concerns are noted. Part of this process is the immediate identification of issues with the potential to impact waterbodies or other sensitive environmental areas, prior to them occurring. This should be followed by clear plans and implementation of measures that are demonstrably effective.

While we appreciate and applaud Baffinland for the abundance of surface water and other monitoring being completed, and especially register the diligence demonstrated by Mr. John Beaver and Mr. Jesse Jackson in their management of the Waste Rock Facility WTP, implemented measures and responses to the severe sediment loading observed in the Mine area during the June Inspection, does not register as being executed at the same level. We suggest that specialist or at least fully dedicated personnel be assigned to the implementation of preventative and mitigative sediment control and capture measures, throughout the project area. Mr. Beaver and Mr. Jackson demonstrate the type of leadership, willingness, and dedication we believe is necessary to proactively manage sediment at the site. Implementation of effective and, where necessary, redundant measures, coupled with fewer spill events reporting extreme TSS release will demonstrate that the desired changes in this regard have registered and are being delivered upon by Baffinland.

As noted earlier, the tables immediately following this portion of the report, describe identified concerns, may of which are associated with observations reported following the August 2022 inspection. Due to the number of observations and to enable easier tracking, the LGL table includes an additional column which describes whether the concern and requested actions from 2022 were addressed, partially addressed or not. In that table, new or updated recommended actions are written in **bold**.

Should you wish to discuss any aspects of this letter, please feel free to contact either of the undersigned.

Sincerely,

Lois Boxill, Ph.D., P.Eng.
Principal Mining Geotechnical Engineer
Mining Impact Specialists Ltd.

Joseph Cavallo
Senior Biologist
LGL Limited

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern – UPDATED FROM JUNE 2023 VIST (BOLD)**	**QIA Requested Action – UPDATE FROM JUNE 2023 VISIT (BOLD)**	**Has the Concern Been Addressed from 2022 Recommendations**
1	KM105 Pond Sedimentation Pond (North Embankment)	Seepage under the constructed dam structure related to the incident on July 14/15, 2022, and May 20, 2023.	See table with MISL Recommended Actions based on their technical review of embankment seepage issues.	Yes, but attempts to repair have been unsuccessful
2	KM 105 Sedimentation Pond (South Embankment)	Significant failure of the upstream slope	See table with MISL Recommended Actions based on their technical review of slope failure issues.	No action observed
3	Throughout the project area but particularly along the Tote Road	Excessive amounts of dust from heavy equipment and haul trucks observed throughout the project areas, but particularly along the Tote Road. The road was dry due to lack of precipitation or water spraying, contributing to the large dust plumes observed from both the air (helicopter) and from the ground (driving along the Tote Road (Appendix A Photos 1 and 2). The dust appears to be originating from the road surface and is mobilized by the tires. During our travel on the Tote Road, only one water truck was observed spraying the road surface. Tundra vegetation including shrubs, grasses, mosses, sedges, and lichens were observed with considerable amounts of road dust	We understand that dust suppressants have been used, however their effectiveness during our visit was questioned. We suggest the following: • Regular schedule of water trucks to continually spray the road surface to discourage any mobilization of dust (depending on time of year). • Increase the number of water trucks available at any given time. We only observed four trucks on the entire length of the Tote Road – not all were actively spraying. • An effective early notification system is required to alert managers when dust levels are increasing.	No effective dust suppression action observed

LGL Limited – Ecological Review of the Mary River Project				
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		coating their surfaces which could inhibit their ability to photosynthesize, grow and propagate.	• Regularly wash heavy equipment to remove sediments and dust. • Monitor airborne dust levels and the accumulation of dust on the tundra. • Develop a monitoring methodology for dust dispersion to determine 'hot spots' and to determine various levels of impacts. • Monitor the long-term health of tundra vegetation within an area of impact determined on the above. **We understand dust suppressant (Dust Stop) will continue to be used) however, we ask that the concentration of the mixture should be evaluated to see if the presence of ultrafines on the Tote Road is altering the effectiveness at the concentration previously used.** **The number of water trucks and the amount of water being sprayed on the roads is still far below recommended.**	

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern – UPDATED FROM JUNE 2023 VIST (BOLD)**	**QIA Requested Action – UPDATE FROM JUNE 2023 VISIT (BOLD)**	**Has the Concern Been Addressed from 2022 Recommendations**
			We ask that a summary of the impacts to tundra vegetation be provided.	
4	Immediately downstream of pond KM105	Fine sediments (silt/clay) were observed in the areas downstream of the KM105 dam. These sediments are believed to be a result of the dam bypass incident of July 14/15, 2022, and May 20, 2023 (Appendix A Photos 3 and 4). The sediments appear to be fine silts/clays, likely from imported construction material. These introduced fine sediments have the potential to change the shallow soil characteristics (nutrient balance, pH, and other edaphic characteristics) and have an altering effect on the native vegetation.	• Remediation of the KM105 pond dam and upstream channel (in progress) will minimize the amounts of fine sediments able to travel downstream. • Continue to monitor turbidity, water levels and chemical parameters in pond KM105. • **Increased ESC controls should be employed to minimize entrained sediments and encourage settling (turbidity curtains, silt fencing, filter logs, etc.)**	Yes, but attempts to repair Km105 pond have been unsuccessful
5	Immediately south of the mine road adjacent to the Sheardown Lake Tributary	The mine road is immediately adjacent to the Sheardown Lake tributary for approximately 200 m on the south side of the mine road. There is a potential for sediments from the road to directly enter the tributary following rain and snowmelt events (Appendix A Photo 5, 6 and 7). **This concern for potential sediment movement in the 2022**	• Sediment control fencing or other method of erosion and sediment control (ESC) should be installed at the base of the road to minimize/prevent future sedimentation impacts.	No action observed. The installation of sediment control fencing or other ESC measure subsequent to the 2022 recommendation could have prevented a release.

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern – UPDATED FROM JUNE 2023 VIST (BOLD)**	**QIA Requested Action – UPDATE FROM JUNE 2023 VISIT (BOLD)**	**Has the Concern Been Addressed from 2022 Recommendations**
		inspection report was not addressed and sediment has entered the Sheardown Lake Tributary.		
6	Along the streambanks of the Sheardown Lake tributary upstream of the inlet to Sheardown Lake	Fine sediments were observed accumulating along the streambanks immediately upstream of the confluence with Sheardown Lake. These sediments are likely due to the dam bypass in July 2022 and May 2023 (Appendix A Photo 8 and 9).	• Remediation of the KM105 pond dam and upstream channel will minimize the amounts of fine sediments able to travel downstream. • Continue to monitor turbidity, water levels and chemical parameters in pond KM105. • **Install ESC measures where road sediments are entering the tributary**	No action observed
7	Phillips Creek crossing at KM17	The face of the sheet piles on the old bridge abutments are damaged. These are on the south side of the Tote Road on the east and west side of the stream. Find sediments are exposed to erosion and have the potential to enter Phillips Creek (Appendix A Photos 10 and 11).	• Place ESCs at the base of the abutments to prevent any fine sediments from entering Phillips Creek. • Remove the old abutments and the fine materials from these two areas **– old abutments are still in place**. • Place coarse rock in disturbed areas to stabilize slopes and prevent fine sediments from entering Phillips Creek.	No action observed

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern – UPDATED FROM JUNE 2023 VIST (BOLD)**	**QIA Requested Action – UPDATE FROM JUNE 2023 VISIT (BOLD)**	**Has the Concern Been Addressed from 2022 Recommendations**
8	Waste Rock Facility Water Treatment Plant at top of Mine Site	We observed the Treatment Plant at the top of the Mine Site where ferric-flocculant- lime treatment train was in use to mitigate low pH runoff from the mining areas. Effluent was discharged several hundred metres to the east onto the tundra. No issues were noted on the date of observation. **Conditions were snow covered and the plant was not yet running.**	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances. • Ensure contingency plan in the event of large quantities of runoff exceeding capability of the treatment infrastructure.	Work on this facility has been completed to improve the function of the treatment plant
9	Pond KM107	Pond MS107 used to treat runoff from ore stockpile. Our understanding is that treatment is mainly for TSS. **New concern is the failure of the slope containing ultrafine ore material along the stockpile (Appendix A Photos 12 and 13).** **A channel adjacent to the pond appears to collect runoff unmitigated and appears to discharge to the tundra (Appendix A Photo 14.**	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances. • Ensure contingency plan in the event of large quantities of runoff exceeding capability of the treatment infrastructure. • **The ultrafine ore material should be removed from the stockpile where it is at risk of additional failure along the slope and stored in a containment facility.** • **Measures should be placed in the adjacent drainage channel (i.e., rock check dams, sediment control**	No. Ultrafine ore material nearly made its way to Mary River via a significant slope failure which was not contained by the constructed berms.

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern – UPDATED FROM JUNE 2023 VIST (BOLD)**	**QIA Requested Action – UPDATE FROM JUNE 2023 VISIT (BOLD)**	**Has the Concern Been Addressed from 2022 Recommendations**
			fencing, rock berms, etc.) to prevent sediment-laden water form entering this drainage.	
10	SDCT-1 Tributary at Km63	In 2022, Ninespine Stickleback (*Pungitius pungitius*) were stranded in a pool downstream of two perched CSP's on the west side of the mine road (Photo 13). Small Arctic Char (*Salvelinus alpinus*) were observed feeding on emerging insects in the main stem of the watercourse. **Streambank erosion has occurred downstream of the two CSP culverts due to scour (Appendix A Photos 15 and 16)**	• Mitigate the perched condition of the CSP's to ensure free passage of fish through the structure.	No action observed. We understand these CSP's will be placed at proper elevation to remove the barrier to fish.
11	Milne Port Treatment Ponds	Two treatment ponds were observed to treat the lump and fine ore stockpiles. Lump ore treatment pond was observed discharging clear water. No discharge occurring from the fine ore stockpile treatment pond. Water observed water clear (Appendix A Photos 17).	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances.	No action required
12	Milne Port Loading Area	No loading of ships or shipping occurring at time of observation (Appendix A Photos 18).	• Although not observed at time of inspection, the dust levels should be minimized on the loading infrastructure (conveyors, chutes, etc.),	No action required

LGL Limited – Ecological Review of the Mary River Project				
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			stockpiles and in other areas to prevent dust from dispersing.	
13	Sewage treatment pond on mine site	Effluent from the STP treatment pond appears to be high in nutrients based on vigour of vegetation at discharge location.	• Continue to monitor nutrients, turbidity and other chemical parameters of effluent and ensure no exceedances or impacts to the Mary River a short distance downstream.	This site was not inspected in June 2023

LGL Limited – Ecological Review of the Mary River Project NEW ISSUES BASED ON JUNE 2023 VISIT			
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**
1	Ditches along the Mine Haul Road	The informal ditches are collecting road and hillslope runoff and is flowing downstream unchecked and with no controls for high flow periods.	As discussed, the ditches should be reconstructed and sized to convey high flows, and rock check dams should be installed per typical specifications to reduce velocities, allow for settling and to reduce erosion in the ditches. Reduction of TSS entering Km105 pond in upstream catchment will significantly aid in reducing treatment issues in the control pond.
2	Km97 Stream Crossing	Fine sediments are entering the stream due to deteriorated sediment control fencing (Appendix A – Photo 19)	More robust ESC controls should be implemented and maintained. A maintenance staff and program are recommended to respond to issues in a timely and effective manner.

			Issues should be proactively addressed (i.e., prior to spring freshet).
3	Km85 Stream Crossing	Fine sediments are entering the stream and causing turbidity (Appendix A – Photo 20)	More robust ESC controls should be implemented and maintained. A maintenance staff and program are recommended to respond to issues in a timely and effective manner. Issues should be proactively addressed (i.e., prior to spring freshet).
4	Km80 Stream Crossing	Fine sediments are entering the stream due to deteriorated sediment control fencing (Appendix A – Photo 21)	More robust ESC controls should be implemented and maintained. A maintenance staff and program are recommended to respond to issues in a timely and effective manner. Issues should be proactively addressed (i.e., prior to spring freshet).

MISL Environmental Associates – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**
1	KM105 Sedimentation Pond	**2022**: Steady water flow emerging from downstream toe of the Northwest Embankment adjacent to its North Abutment - believed to have resulted from the piping phenomena that led to the spill incident on July 14/15, 2022. [App B MISL Photos: 1A,4] **2023:** Steady water flow emerging from downstream toe of the Northwest Embankment adjacent to its North Abutment at the same location as the seep observed in 2022 (Figure 17). While the 2023 ingress is upstream of the ingress site in 2022 (Figure 17), the location of the seep outfall suggests that at least some portion of the flow path used in the 2022 event continues to be accessed by the 2023 seep. Consequently, any remediation plan should demonstrate how seepage will be contained with any proposed mitigation. [App B MISL Photos: 1B, 3, 5, 6, 7]	**2023:** Develop a new remediation plan that ensures cut-off of sedimentation pond water from the pond foundation upstream of the embankment's foundation. The plan should indicate how confirmation of known and probable seepage pathways will be characterized so that appropriate mitigation can be developed. Provide secondary containment for any sediment reporting downstream of the KM 105 Sedimentation Pond (Figure 10). Assign dedicated personnel to be responsible for and oversee sediment management for the entire mine site, especially along the mine haul road, and downstream of KM 105 Sedimentation Pond.
2	KM105 Sedimentation Pond - Northwest Embankment	**2022:** Possible melting of upper reaches of permafrost, and creation of a progressive thawing front along the entirety of the contact between the North Abutment's base and the Northwest Embankment.	**2022:** Request map showing the location and installation depth of thermistors at locations DT2040-02660, DT2040-02871 (TH21-03), DT2040-02873 (TH21-04 & TH21-05) and DT2040-02876 (TH20 —12 & TH20-13).

MISL Environmental Associates – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**
			Install additional thermistors at the locations proposed (Figure 17) at depths where the top of the permafrost horizon is thought to exist beneath the base of the Northwest Embankment if thermistors have not already been installed at the proposed locations. Based on temperature measurements, determine if mitigative actions are necessary to avoid further or accelerated thawing of permafrost (if possible), and whether melting permafrost may impact the structural integrity of the Northwest Embankment's foundation and superstructure.
		2023: The fact that the 2023 seep reports to the same location as the 2022 seep suggests that some portion of the open structure conveying seepage flows during 2022 continues to be used.	**2023:** The requested thermistor locations have not been received. As such, it is difficult to ascertain whether there is any coincidence between the warming profiles indicated for TH21-03 (Figure 18) and the location of the seepage conduit along the base of the right embankment abutment. Characterize the complete alignment of the seepage mechanism including the pond bottom and north side wall (Area C & C' on Figure 17) to enable confirmation of the adequacy of proposed measures to remediate seepage bypass of the NW Embankment.

MISL Environmental Associates – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**
3	KM105 Sedimentation Pond - South	**2022:** Extensive slumping of the upper third of the upstream slope (App B Photo 10, App C Figure 19) **2023:** While the area with exposed geomembrane observed during the 2022 Inspection was repaired, slumped material has not been tied into embankment crest materials. Initial formation of erosion gullies was observed (App B Photo 3).	**Response provided to Baffinland's response to the 2022 Requested Action:** While the distinction between structural fills and those placed to increase an embankment's thermal capacity is understood, it should also be noted that placement of any type of fill, especially on the upstream faces of embankments must be done in a way that does not allow those materials to be eroded (especially during annual rainy periods) and allowed to accumulate as sediment within the limits of the sedimentation pond the embankments were designed to contain. As such, it is requested that any loose fills that could be at risk of erosion during the 2023 rainy period be secured prior to the start of that period and the ability of those placed fills to withstand runoff associated with 2023 rainfall events be evaluated. **2023:** Given the unheeded warning provided about the potential for erosion of this area in 2022, providing proper tie in between the uppermost slumped materials of the upstream slope and the embankment crest is requested to be completed ASAP and before commencement of heavy snow accumulation in this area as freshet meltwater can exacerbate the nascent erosional features observed. An as-built report documenting the nature of remediation that was completed at this location is still requested.

MISL Environmental Associates – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**
4	KM106 Ore Storage Facility	**2023:** Significant catastrophic flow failure of ultrafine ore (red-coloured material) was observed (App C – Photo 13). This flow failure was not mentioned or appropriately identified in Spill Report #23-276. During meetings on-site and in the related Spill Report, it was reported that it is common practice to place ultrafines materials at a designated location in the OSF. Red-coloured fine-grained ore was observed to have flowed along and the OSF containment berm, breaching it in two locations with release to the tundra in one instance (Figure 9). The size and nature of the flow failure, the imprecise and incomplete reporting of the event, and the general proximity of the OSF to the Mary River Mine are notable.	**2023:** Have a Qualified Professional review the practice of placing ore fines within the OSF to ensure that geotechnical stability of any areas of the OSF, human health and safety, or the environment are compromised. Review should at minimum include an update of the Operations Procedures for how and where ultrafines are placed in the OSF and what health and safety procedures must be in place to reduce the likelihood of harm or fatality to mine personnel at this location.

Appendix A
LGL Photographs

Appendix B
MISL Photographs

Appendix C
Report Figures

Appendix D
Baffinland's and QIA's responses to the 2022 Site Inspection report

March 5, 2024

Conor Goddard
Manager, Project Compliance
Qikiqtani Inuit Association
P.O. Box 1340
Iqaluit, NU X0A 0H0

RE: QIA June 2023 General Site Inspection Findings and Recommendations - Response

Baffinland Iron Mines Corporation (Baffinland) provides the Qikiqtani Inuit Association (QIA) with the following response to their June 27 - 30 General Site Inspection Findings and Recommendation's report dated September 18, 2023.

The attached Table 1 provides Baffinland's responses to the QIA June 2023 General Site Inspection findings and recommendations.

Should you have any additional concerns or questions regarding the attached responses, please to not hesitate to contact the undersigned at your convenience.

Regards,

Todd Swenson
Environmental Superintendent

Cc: Megan Lord-Hoyle, Lou Kamermans, Tim Sewell, Martin Beausejour, Francois Gaudreau, Connor Devereaux, Katie Babin, Allison Parker, Dale Kristoff (Baffinland)

Attachments

Table 1 – Baffinland Responses to QIA June 2023 General Site Inspection Findings and Recommendations

Attachment 1

Baffinland Responses to QIA June 2023 General Site Inspection Findings and Recommendations

Table 1: Baffinland Responses to QIA's June 2023 General Site Inspection Findings and Recommendations

Item No. #	Project Location	Description of Concern Updated from June 2023 Visit (Bold)	QIA Requested Action Updated from June 2023 Visit (Bold)	Has the Concern Been Addressed from 2022 Recommendations	Baffinland's Response
QIA-1	KM105 Pond Sedimentation Pond (North Embankment)	Seepage under the constructed dam structure related to the incident on July 14/15, 2022, and May 20, 2023.	See table with MISL Recommended Actions based on their technical review of embankment seepage issues.	Yes, but attempts to repair have been unsuccessful	A geotechnical drilling program was completed to obtain detailed data relating to the subsurface conditions. This information has been used to develop a comprehensive remediation plan that involves installing a grout curtain to provide a seepage barrier to reduce seepage through the dam foundation. This remediation program has been initiated with an objective to be completed prior to Freshet 2024.
QIA-2	KM 105 Sedimentation Pond (South Embankment)	Significant failure of the upstream slope	See table with MISL Recommended Actions based on their technical review of slope failure issues.	No action observed	Baffinland received advice from the third-party EOR recommending re-grading the cover material by pulling material up from below the exposed area to re-establish the cover. This will reduce the cover thickness at the crest of the slope, without increasing load on the slope which would likely result in further translational sliding of the cover material. The EOR noted that since the cover material is highly pervious, there should not be an expectation of a significant reduction in infiltration of water. Alternatively, the EOR recommended leaving the geo-membrane exposed to allow for survey and measurement of the strain in the geo-membrane for comparison with the technical specifications of the geo-membrane to determine if it is nearing some form of failure. Baffinland will be undertaking our chosen remediation activity once conditions and materials are no longer frozen, to avoid damage to the liner material.
QIA-3	Throughout the project area but particularly along the Tote Road	Excessive amounts of dust from heavy equipment and haul trucks observed throughout the project areas, but particularly along the Tote Road. The road was dry due to lack of precipitation or water spraying, contributing to the large dust plumes observed from both the air (helicopter) and from the ground (driving along the Tote Road (Appendix A Photos 1 and 2). The dust appears to be originating from the road surface and is mobilized by the tires. During our travel on the Tote Road, only one water truck was observed spraying the road surface. Tundra vegetation including shrubs, grasses, mosses, sedges, and lichens were observed with considerable amounts of road dust coating their surfaces which could inhibit	We understand that dust suppressants have been used, however their effectiveness during our visit was questioned. We suggest the following: • Regular schedule of water trucks to continually spray the road surface to discourage any mobilization of dust (depending on time of year). • Increase the number of water trucks available at any given time. We only observed four trucks on the entire length of the Tote Road – not all were actively spraying. • An effective early notification system is required to alert managers when dust levels are increasing. • Regularly wash heavy equipment to remove sediments and dust. • Monitor airborne dust levels and the accumulation of dust on the tundra. • Develop a monitoring methodology for dust dispersion to determine 'hot spots' and to determine various levels of impacts. • Monitor the long-term health of tundra vegetation within an area of impact determined on the above.	No effective dust suppression action observed	Baffinland conducted investigations into the effectiveness of various dust suppressants used in 2023, and will be implementing a solution using calcium chloride and water along the entirety of the Tote Road at application rates proven to drastically improve the stability of the driving surface and to be the most effective at reducing dust with re-application as required. Regarding impacts to the tundra vegetation, we invite QIA to review the findings reported in the Terrestrial Environment Annual Monitoring Report, Section 9.0 Vegetation, which provides a summary of monitoring completed and evaluates potential impacts to the tundra vegetation.

Item No. #	Project Location	Description of Concern Updated from June 2023 Visit (Bold)	QIA Requested Action Updated from June 2023 Visit (Bold)	Has the Concern Been Addressed from 2022 Recommendations	Baffinland's Response
		their ability to photosynthesize, grow and propagate.	**We understand dust suppressant (Dust Stop) will continue to be used) however, we ask that the concentration of the mixture should be evaluated to see if the presence of ultrafines on the Tote Road is altering the effectiveness at the concentration previously used.** **The number of water trucks and the amount of water being sprayed on the roads is still far below recommended.** **We ask that a summary of the impacts to tundra vegetation be provided.**		
QIA-4	Immediately downstream of pond KM105	Fine sediments (silt/clay) were observed in the areas downstream of the KM105 dam. These sediments are believed to be a result of the dam bypass incident of July 14/15, 2022, and May 20, 2023 (Appendix A Photos 3 and 4). The sediments appear to be fine silts/clays, likely from imported construction material. These introduced fine sediments have the potential to change the shallow soil characteristics (nutrient balance, pH, and other edaphic characteristics) and have an altering effect on the native vegetation.	• Remediation of the KM105 pond dam and upstream channel (in progress) will minimize the amounts of fine sediments able to travel downstream. • Continue to monitor turbidity, water levels and chemical parameters in pond KM105. • **Increased ESC controls should be employed to minimize entrained sediments and encourage settling (turbidity curtains, silt fencing, filter logs, etc.)**	Yes, but attempts to repair Km105 pond have been unsuccessful	A geotechnical drilling program was completed to obtain detailed data relating to the subsurface conditions. This information has been used to develop a comprehensive remediation plan that involves installing a grout curtain to provide a seepage barrier to reduce seepage through the dam foundation. This remediation program has been initiated with an objective to be completed prior to Freshet 2024. Baffinland has recently hired two individuals with CISEC certifications to oversee the implementation of an enhanced ESC response strategy.
QIA-5	Immediately south of the mine road adjacent to the Sheardown Lake Tributary	The mine road is immediately adjacent to the Sheardown Lake tributary for approximately 200 m on the south side of the mine road. There is a potential for sediments from the road to directly enter the tributary following rain and snowmelt events (Appendix A Photo 5, 6 and 7). **This concern for potential sediment movement in the 2022 inspection report was not addressed and sediment has entered the Sheardown Lake Tributary.**	• Sediment control fencing or other method of erosion and sediment control (ESC) should be installed at the base of the road to minimize/prevent future sedimentation impacts.	No action observed. The installation of sediment control fencing or other ESC measure subsequent to the 2022 recommendation could have prevented a release.	This area was addressed and improvements observed during the QIA September inspection.
QIA-6	Along the streambanks of the Sheardown Lake tributary upstream of the inlet to Sheardown Lake	Fine sediments were observed accumulating along the streambanks immediately upstream of the confluence with Sheardown Lake. These sediments are likely due to the dam bypass in July 2022 and May 2023 (Appendix A Photo 8 and 9).	• Remediation of the KM105 pond dam and upstream channel will minimize the amounts of fine sediments able to travel downstream. • Continue to monitor turbidity, water levels and chemical parameters in pond KM105. • **Install ESC measures where road sediments are entering the tributary**	No action observed	This area was addressed and improvements observed during the QIA September inspection.

Item No. #	Project Location	Description of Concern Updated from June 2023 Visit (Bold)	QIA Requested Action Updated from June 2023 Visit (Bold)	Has the Concern Been Addressed from 2022 Recommendations	Baffinland's Response
QIA-7	Phillips Creek crossing at KM17	The face of the sheet piles on the old bridge abutments are damaged. These are on the south side of the Tote Road on the east and west side of the stream. Find sediments are exposed to erosion and have the potential to enter Phillips Creek (Appendix A Photos 10 and 11).	• Place ESCs at the base of the abutments to prevent any fine sediments from entering Phillips Creek. • Remove the old abutments and the fine materials from these two areas **– old abutments are still in place**. • Place coarse rock in disturbed areas to stabilize slopes and prevent fine sediments from entering Phillips Creek.	No action observed	This area was addressed and improvements observed during the QIA September inspection.
QIA-8	Waste Rock Facility Water Treatment Plant at top of Mine Site	We observed the Treatment Plant at the top of the Mine Site where ferric-flocculant- lime treatment train was in use to mitigate low pH runoff from the mining areas. Effluent was discharged several hundred metres to the east onto the tundra. No issues were noted on the date of observation. **Conditions were snow covered and the plant was not yet running.**	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances. • Ensure contingency plan in the event of large quantities of runoff exceeding capability of the treatment infrastructure.	Work on this facility has been completed to improve the function of the treatment plant	*No Action required*
QIA-9	Pond KM107	Pond MS107 used to treat runoff from ore stockpile. Our understanding is that treatment is mainly for TSS. **New concern is the failure of the slope containing ultrafine ore material along the stockpile (Appendix A Photos 12 and 13).** **A channel adjacent to the pond appears to collect runoff unmitigated and appears to discharge to the tundra (Appendix A Photo 14.**	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances. • Ensure contingency plan in the event of large quantities of runoff exceeding capability of the treatment infrastructure. • **The ultrafine ore material should be removed from the stockpile where it is at risk of additional failure along the slope and stored in a containment facility.** • Measures should be placed in the adjacent drainage channel (i.e., rock check dams, sediment control **fencing, rock berms, etc.) to prevent sediment-laden water from entering this drainage.**	No. Ultrafine ore material nearly made its way to Mary River via a significant slope failure which was not contained by the constructed berms.	As discussed during the September inspection, Baffinland believes that ultrafines management has changed to the satisfaction of QIA inspectors/advisors, and we acknowledge the guidance provided to ensure capacity of the KM 106 stockpile is maximized through effective removal and replacement of the ultrafines remaining on the stockpile slope with coarse ore, as opportunities allow.
QIA-10	SDCT-1 Tributary at Km63	In 2022, Ninespine Stickleback (*Pungitius pungitius*) were stranded in a pool downstream of two perched CSP's on the west side of the mine road (Photo 13). Small Arctic Char (*Salvelinus alpinus*) were observed feeding on emerging insects in the main stem of the watercourse. **Streambank erosion has occurred downstream of the two CSP culverts due to scour (Appendix A Photos 15 and 16)**	• Mitigate the perched condition of the CSP's to ensure free passage of fish through the structure.	No action observed. We understand these CSP's will be placed at proper elevation to remove the barrier to fish.	Identified fish passage deficiencies at crossing BG-50 are being addressed in the Tote Road Crossings Remediation Plan that will be provided to QIA before April 30, 2024. The feature that is proposed at this crossing is a plate arch culvert. Note to author that this is part of the Ravn River watershed and not linked to Sheardown Lake Tributary as noted in the inspection report.

Item No. #	Project Location	Description of Concern Updated from June 2023 Visit (Bold)	QIA Requested Action Updated from June 2023 Visit (Bold)	Has the Concern Been Addressed from 2022 Recommendations	Baffinland's Response
QIA-11	Milne Port Treatment Ponds	Two treatment ponds were observed to treat the lump and fine ore stockpiles. Lump ore treatment pond was observed discharging clear water. No discharge occurring from the fine ore stockpile treatment pond. Water observed water clear (Appendix A Photos 17).	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances.	No action required	*No Action Required*
QIA-12	Milne Port Loading Area	No loading of ships or shipping occurring at time of observation (Appendix A Photos 18).	• Although not observed at time of inspection, the dust levels should be minimized on the loading infrastructure (conveyors, chutes, etc.), stockpiles and in other areas to prevent dust from dispersing.	No action required	*No action required*
QIA-13	Sewage treatment pond on mine site	Effluent from the STP treatment pond appears to be high in nutrients based on vigour of vegetation at discharge location.	• Continue to monitor nutrients, turbidity and other chemical parameters of effluent and ensure no exceedances or impacts to the Mary River a short distance downstream.	This site was not inspected in June 2023	*No action required*
LGL-1	Ditches along the Mine Haul Road	The informal ditches are collecting road and hillslope runoff and is flowing downstream unchecked and with no controls for high flow periods.	As discussed, the ditches should be reconstructed and sized to convey high flows, and rock check dams should be installed per typical specifications to reduce velocities, allow for settling and to reduce erosion in the ditches. Reduction of TSS entering Km105 pond in upstream catchment will significantly aid in reducing treatment issues in the control pond.	N/A	Ditches are typically for the conveyance of water and not sedimentation control. Construction planned for 2024 includes ditch design and construction that will ensure ditch stability and integrity is maintained, reducing the additional sediment load to the KM 105 Pond. Additional ESC controls will be installed as and where required, as per the SWAEMP. Regardless of ditch construction remediation of the KM 105 Dam seepage and installation of the contingency water treatment system will ensure improved water quality leaving the facility.
LGL-2	Km97 Stream Crossing	Fine sediments are entering the stream due to deteriorated sediment control fencing (Appendix A – Photo 19)	More robust ESC controls should be implemented and maintained. A maintenance staff and program are recommended to respond to issues in a timely and effective manner. Issues should be proactively addressed (i.e., prior to spring freshet).	N/A	As observed during the September inspection, considerable work was completed at multiple locations along the Tote Road to improve/maintain ESC.
LGL-3	Km85 Stream Crossing	Fine sediments are entering the stream and causing turbidity (Appendix A – Photo 20)	More robust ESC controls should be implemented and maintained. A maintenance staff and program are recommended to respond to issues in a timely and effective manner. Issues should be proactively addressed (i.e., prior to spring freshet).	N/A	As observed during the September inspection, considerable work was completed at multiple locations along the Tote Road to improve/maintain ESC.
LGL-4	Km80 Stream Crossing	Fine sediments are entering the stream due to deteriorated sediment control fencing (Appendix A – Photo 21)	More robust ESC controls should be implemented and maintained. A maintenance staff and program are recommended to respond to issues in a timely and effective manner. Issues should be proactively addressed (i.e., prior to spring freshet).	N/A	As observed during the September inspection, considerable work was completed at multiple locations along the Tote Road to improve/maintain ESC.

Item No. #	Project Location	Description of Concern Updated from June 2023 Visit (Bold)	QIA Requested Action Updated from June 2023 Visit (Bold)	Has the Concern Been Addressed from 2022 Recommendations	Baffinland's Response
MISL-1	KM105 Sedimentation Pond	**2022**: Steady water flow emerging from downstream toe of the Northwest Embankment adjacent to its North Abutment - believed to have resulted from the piping phenomena that led to the spill incident on July 14/15, 2022. [App B MISL Photos: 1A,4] **2023:** Steady water flow emerging from downstream toe of the Northwest Embankment adjacent to its North Abutment at the same location as the seep observed in 2022 (Figure 17). While the 2023 ingress is upstream of the ingress site in 2022 (Figure 17), the location of the seep outfall suggests that at least some portion of the flow path used in the 2022 event continues to be accessed by the 2023 seep. Consequently, any remediation plan should demonstrate how seepage will be contained with any proposed mitigation. [App B MISL Photos: 1B, 3, 5, 6, 7]	**2023:** Develop a new remediation plan that ensures cut-off of sedimentation pond water from the pond foundation upstream of the embankment's foundation. The plan should indicate how confirmation of known and probable seepage pathways will be characterized so that appropriate mitigation can be developed. Provide secondary containment for any sediment reporting downstream of the KM 105 Sedimentation Pond (Figure 10). Assign dedicated personnel to be responsible for and oversee sediment management for the entire mine site, especially along the mine haul road, and downstream of KM 105 Sedimentation Pond.		A geotechnical drilling program was completed to obtain detailed data relating to the subsurface conditions. This information has been used to develop a comprehensive remediation plan that involves installing a grout curtain to provide a seepage barrier to reduce seepage through the dam foundation. This remediation program has been initiated with an objective to be completed prior to Freshet 2024.See attached documentation that outlines this remedial plan as developed by our third party consultant and EOR in Appendix A (Sent via KiteWorks).
MISL-2	KM105 Sedimentation Pond - Northwest Embankment	**2022:** Possible melting of upper reaches of permafrost, and creation of a progressive thawing front along the entirety of the contact between the North Abutment's base and the Northwest Embankment. **2023:** The fact that the 2023 seep reports to the same location as the 2022 seep suggests that some portion of the open structure conveying seepage flows during 2022 continues to be used.	**2022:** Request map showing the location and installation depth of thermistors at locations DT2040-02660, DT2040-02871 (TH21-03), DT2040-02873 (TH21-04 & TH21-05) and DT2040-02876 (TH20 —12 & TH20-13). Install additional thermistors at the locations proposed (Figure 17) at depths where the top of the permafrost horizon is thought to exist beneath the base of the Northwest Embankment if thermistors have not already been installed at the proposed locations. Based on temperature measurements, determine if mitigative actions are necessary to avoid further or accelerated thawing of permafrost (if possible), and whether melting permafrost may impact the structural integrity of the Northwest Embankment's foundation and superstructure. **2023:** The requested thermistor locations have not been received. As such, it is difficult to ascertain whether there is any coincidence between the warming profiles indicated for TH21-03 (Figure 18) and the location of the seepage conduit along the base of the right embankment abutment. Characterize the complete alignment of the seepage mechanism including the pond bottom and north side wall (Area C & C' on Figure 17) to enable		These thermistors were installed as per the IFC Drawings submitted to the QIA. The suggested characterization of the alignment of the seepage mechanism was completed by Tetra Tech following a geotechnical drilling program conducted in September, 2023.

Item No. #	Project Location	Description of Concern Updated from June 2023 Visit (Bold)	QIA Requested Action Updated from June 2023 Visit (Bold)	Has the Concern Been Addressed from 2022 Recommendations	Baffinland's Response
			confirmation of the adequacy of proposed measures to remediate seepage bypass of the NW Embankment.		
MISL-3	KM105 Sedimentation Pond - South	**2022:** Extensive slumping of the upper third of the upstream slope (App B Photo 10, App C Figure 19) **2023:** While the area with exposed geomembrane observed during the 2022 Inspection was repaired, slumped material has not been tied into embankment crest materials. Initial formation of erosion gullies was observed (App B Photo 3).	**Response provided to Baffinland's response to the 2022 Requested Action:** While the distinction between structural fills and those placed to increase an embankment's thermal capacity is understood, it should also be noted that placement of any type of fill, especially on the upstream faces of embankments must be done in a way that does not allow those materials to be eroded (especially during annual rainy periods) and allowed to accumulate as sediment within the limits of the sedimentation pond the embankments were designed to contain. As such, it is requested that any loose fills that could be at risk of erosion during the 2023 rainy period be secured prior to the start of that period and the ability of those placed fills to withstand runoff associated with 2023 rainfall events be evaluated. **2023:** Given the unheeded warning provided about the potential for erosion of this area in 2022, providing proper tie in between the uppermost slumped materials of the upstream slope and the embankment crest is requested to be completed ASAP and before commencement of heavy snow accumulation in this area as freshet meltwater can exacerbate the nascent erosional features observed. An as-built report documenting the nature of remediation that was completed at this location is still requested.		Baffinland received advice from the third-party EOR recommending re-grading the cover material by pulling material up from below the exposed area to re-establish the cover. This will reduce the cover thickness at the crest of the slope, without increasing load on the slope which would likely result in further translational sliding of the cover material. The EOR noted that since the cover material is highly pervious, there should not be an expectation of a significant reduction in infiltration of water. Alternatively, the EOR recommended leaving the geo-membrane exposed to allow for survey and measurement of the strain in the geo-membrane for comparison with the technical specifications of the geo-membrane to determine if it is nearing some form of failure. Baffinland will be undertaking our chosen remediation activity once conditions and materials are no longer frozen, to avoid damage to the liner material.
MISL-4	KM106 Ore Storage Facility	**2023:** Significant catastrophic flow failure of ultrafine ore (red-coloured material) was observed (App C – Photo 13). This flow failure was not mentioned or appropriately identified in Spill Report #23-276. During meetings on-site and in the related Spill Report, it was reported that it is common practice to place ultrafines materials at a designated location in the OSF. Red-coloured fine-grained ore was observed to have flowed along and the OSF containment berm, breaching it in two locations with release to the tundra in one instance (Figure 9). The size and nature of the flow failure, the imprecise and incomplete reporting of the event, and the general proximity of the OSF to the Mary River Mine are notable.	**2023:** Have a Qualified Professional review the practice of placing ore fines within the OSF to ensure that geotechnical stability of any areas of the OSF, human health and safety, or the environment are compromised. Review should at minimum include an update of the Operations Procedures for how and where ultrafines are placed in the OSF and what health and safety procedures must be in place to reduce the likelihood of harm or fatality to mine personnel at this location.		As discussed during the September inspection, Baffinland believes that ultrafines management has changed to the satisfaction of QIA inspectors/advisors, and we acknowledge the guidance provided to ensure capacity of the KM 106 stockpile is maximized through effective removal and replacement of the ultrafines remaining on the stockpile slope with coarse ore, as opportunities allow.

Appendix A

IFU Remedial Package for KM105 Dam

(Submitted via KiteWorks)

TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To:	Jim Patterson	**Date:**	February 6, 2024
c:	Baruck Wile, Rudolf Dietrich, Emmanuel Ocran, Abid Najey	**Memo No.:**	
From:	Charlie Harrison	**File:**	704-ENG.EARC03209-10
Subject:	Revised the Issued for Construction (IFC) Drawings for the KM105 Sedimentation Pond Grout Curtain		

1.0 INTRODUCTION

Tetra Tech Canada Inc. (Tetra Tech) has revised the issued for construction (IFC) drawings for the KM105 Sedimentation Pond grout curtain, as requested by Baffinland Iron Mines Corporation (Baffinland). The scope of work for revising the IFC drawings is summarized in Tetra Tech's change order dated January 22, 2024. Tetra received authorization to proceed with the revision of the IFC drawings from Baffinland, via email, on January 23, 2024. The revised IFC drawings, indicated as Revision 1 on the drawings, are attached.

2.0 CHANGES TO IFC DRAWINGS

The changes to the IFC drawings are summarized as follows:

1. Revised alignment for the grout curtain: the grout curtain was shifted to the east by about 25 m to allow for the grout holes to be advanced through the existing geomembrane liner. This will accommodate a direct connection between the top of the grout curtain and the existing liner system for the pond.

2. Revised alignment of the temporary platform: the temporary platform was realigned to match the revised alignment of the grout curtain.

3. Temporary platform fill material: the central core material was changed to 19 mm minus crushed sand and gravel from 50 mm crushed sand and gravel to accommodate the change in drilling methodology, as recommended by Keller.

The changes are shown on the attached IFC drawings.

3.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Baffinland Iron Mines Corporation and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Baffinland Iron Mines Corporation, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

Tetra Tech Canada Inc.
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4.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

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/jf

Enclosure: Limitations on Use of this Document
Revised KM105 Sedimentation Grout Curtain IFC Drawings

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LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

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1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

1.16 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

1.17 SAMPLES

TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND
---- GROUT CURTAIN PROJECT

KEY PLAN
SCALE: NTS

SHEET LIST INDEX	
Number	**Title**
C001	Cover Page and Drawing List
C002	General Notes
C011	General Layout Plan View
C012	Work Area Layout Plan View
C021	Geological Boreholes Plan View
C022	Geological Profile Section View - Stick Logs
C023	Geological Profile Section View - Stratigraphy
C031	Grout Holes Layout Plan View
C032	Grout Holes Layout Profile View
C033	Primary Grout Holes Layout Plan and Profile View
C034	Secondary Grout Holes Layout Plan and Profile View
C035	Tertiary Grout Holes Layout Plan and Profile View
C041	Temporary Work Platform Layout Plan View
C042	Temporary Work Platform Profiles View
C043	Temporary Work Platform Sections and Detail View
C044	Grout Holes Number Layout Plan View
C045	Coordination of Grout Holes Number List
C046	Temporary Work Platform 3D View A and B

TETRA TECH

Issued for Construction

FEBRUARY 06, 2024

1. GEOLOGY

1.1. THE SUBSURFACE GROUND CONDITIONS ENCOUNTERED ALONG THE GROUT CURRENT ALIGNMENT ARE SHOWN ON THE DRAWINGS. THE DRAWINGS REPRESENT THE INTERPRETED GROUND CONDITIONS BUT COULD DIFFER FROM THE GROUND CONDITIONS ENCOUNTERED WHILE ADVANCING THE GROUT HOLES.

1.2. THE SUBSURFACE CONDITIONS SHOWN ON THE DRAWINGS SHOULD BE USED AS A GUIDE ONLY. ACTUAL GROUND CONDITIONS ENCOUNTERED DURING THE ADVANCEMENT OF THE GROUT HOLES WILL GOVERN THE SELECTION OF GROUT MIXES.

2. TEMPORARY PLATFORM FILL

2.1. MATERIAL PLACED ALONG THE ALIGNMENT OF THE GROUT CURTAIN SHALL HAVE A NOMINAL GRAIN SIZE SMALLER THAN ROQ.

2.1.1. MATERIAL PLACED ON EITHER SIDE OF THE GROUT CURTAIN ALIGNMENT SHALL CONSIST OF ROQ.

2.1.2. MATERIAL SHALL BE NOMINALLY COMPACTED USING THE AVAILABLE CONSTRUCTION EQUIPMENT ON SITE.

3. GROUT

3.1. ACCEPTANCE OF MIX DESIGN

3.1.1. THE GEOTECHNICAL INVESTIGATION INDICATES THAT THE AMBIENT GROUND TEMPERATURE VARIES FROM -4.5 DEGREE C TO -8 DEGREES C. THE GROUT MIX DESIGN MUST CONSIDER THE LOW-TEMPERATURE CONDITIONS IN ORDER TO PERMIT PROPER SETTING AND CURING OF THE CEMENTITIOUS MATERIALS AFTER INJECTION, PARTICULARLY IN SANDY SOILS.

3.1.2. THE CONTRACTOR SHALL PERFORM BENCH SCALE TESTING TO CONFIRM THAT THE PROPOSED MIX DESIGN CAN MEET THE REQUIRED VISCOSITY AND INITIAL SETTING TIME, AND THE MIX DESIGN SHALL BE ADJUSTED TO ACHIEVE THE REQUIRED VISCOSITY AND INITIAL SETTING TIME. THE CONTRACTOR WILL USE THIS INFORMATION TO MODIFY THE MIXING AND INJECTION PROCEDURES TO ACHIEVE THE DESIRED SET TIME MEASURED FROM THE POINT OF INJECTION.

3.1.3. THE GROUT MIX SHALL BE BASED ON THE MATERIALS AVAILABLE ON SITE.

3.1.4. THE GROUT MIX DESIGNS SHALL BE ADJUSTED BASED ON THE CONDITIONS ENCOUNTERED DURING GROUTING IN COLLABORATION WITH THE ENGINEER, AS NEEDED, TO PRODUCE THE GROUT MIXES REQUIRED FOR THE CONSTRUCTION OF THE GROUT CURTAIN.

3.1.5. THE SUBSURFACE CONDITIONS MAY CONSISTS OF ACTIVE SEEPAGE AREA. IF ACTIVE SEEPAGE AREA IS ENCOUNTERED DURING DRILLING AND GROUTING, THE MIX DESIGN SHALL INCORPORATE APPROPRIATE ANTI-WASHOUT AGENT.

3.2. TESTING OF GROUT MIXES

3.2.1. GROUT PRODUCTS WILL BE TESTED AS PER TABLE 5.3.1-1 DURING CONSTRUCTION TO CONFIRM ITS SUITABILITY FOR THE INTENDED.

4. SETTING OUT OF GROUT HOLES

4.1. ALL COORDINATES ARE IN UTM NAD83 ZONE 17.

4.2. SURVEY CONTROL

4.2.1. SURVEY CONTROL TO BE PROVIDED FOR ALL ASPECTS OF GROUT CURTAIN CONSTRUCTION.

4.2.2. ALL GROUT HOLES TO BE LOCATED IN THE FIELD BY THE SURVEYOR.

4.2.3. INCLINATION OF ALL GROUT HOLES TO BE CONFIRMED USING A DOWNHOLE ORIENTATION TOOL.

4.3. SURFACE GRADING

4.3.1. ALL CONSTRUCTION WORK AREAS ARE TO BE GRADED SUCH THAT NO PONDING OF WATER OCCURS. SUBSURFACE DRAINAGE SHALL BE SUPPLIED FOR LAYDOWNS WHERE SITE GRADING IS NOT SUITABLE TO PREVENT THE PONDING OF WATER.

4.4. CONTAINMENT FOR CONSTRUCTION MATERIALS STORAGE

4.4.1. LAYDOWNS THAT ARE DESIGNATED FOR THE STORAGE OF CONSTRUCTION MATERIALS SHALL BE EQUIPPED WITH SUITABLE CONTAINMENT WORKS TO CONTAIN SPILLS.

4.4.2. CONTAINMENT SYSTEMS SHALL MEET THE REQUIREMENTS OF THE ENVIRONMENTAL PERMITS FOR THE PROJECT.

4.5. SEQUENCE OF GROUTING

4.5.1. THE SECONDARY AND TERTIARY GROUT HOLES SHALL NOT BE DRILLED UNTIL THE COMPLETION OF DRILLING AND GROUTING OF PRIMARY HOLE.

TABLE 5.3.1-1 MINIMUM REQUIRED QUALITY TESTING FOR TESTING FOR GROUT

MATERIAL	TEST	FREQUENCY	STANDARD
LOCATION AND EXTENTS	GROUT HOLE AS-BUILT COLLAR SURVEY	EACH GROUT HOLE	N/A
HOLE ALIGNMENT	HOLE DEVIATION SURVEY	APPROXIMATELY EVERY 5 m INTERVAL ALONG THE LENGTH OF THE BOREHOLE; TO BE COMPLETED USING AN ACOUSTIC TELEVIEWER	N/A
EQUIPMENT CALIBRATION CHECKS	PRESSURE TRANSDUCER AND GAUGES		
	FLOW METERS		N/A
	MUD BALANCE		N/A
	DIGITAL THERMOMETERS		N/A
APPARENT VISCOSITY	MARSH FUNNEL	1 AT THE INITIATION OF INJECTION OF EACH GROUT STAGE AND AT EVERY CHANGE OF MIX TYPE	ASTM D6910
SPECIFIC GRAVITY	MUD BALANCE		ASTM D4380
GROUT MIX TEMPERATURE	DIGITAL THERMOMETERS		N/A
BLEED	MEASURED OVER 2 HOUR PERIOD AS CLEAR WATER AT THE TOP OF A 500 mL GRADUATED CYLINDER	1 EVERY SHIFT, PER GROUT PLANT, FOR EACH MIX TYPE INJECTED	ASTM C940
MIX WATER, AMBIENT, AND CEMENT TEMPERATURE	DIGITAL THERMOMETERS	2 EVERY SHIFT, PER GROUT PLANT	ASTM D2573
GELATION TIME	VANE SHEAR	1 PER PROPOSED GROUT MIX TYPE DURING INITIAL FULL SCALE MIX TESTING OR WHEN ADJUSTMENTS ARE MADE TO THE MIX DESIGNS.	N/A
SET TIME	VICAT NEEDLE	1 PER PROPOSED GROUT MIX TYPE DURING INITIAL FULL SCALE MIX TESTING OR WHEN ADJUSTMENTS ARE MADE TO THE MIX DESIGNS.	ASTM C191
WATER PRESSURE TESTING: FLOW RATE, PRESSURE, VOLUME, AND LUGEON VALUE MONITORING	REAL TIME MONITORING AND DATA ACQUISITION	CONTINUOUS VISUAL MONITORING DURING WATER PRESSURE TESTING; WATER PRESSURE BEFORE GROUTING EACH GROUT HOLE INTERVAL	N/A
GROUT INJECTION: FLOW RATE, PRESSURE, VOLUME, AND GROUT LUGEON VALUE MONITORING	REAL TIME MONITORING AND DATA ACQUISITION	CONTINUOUS VISUAL MONITORING DURING GROUT INJECTION	N/A

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KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

GENERAL NOTES

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

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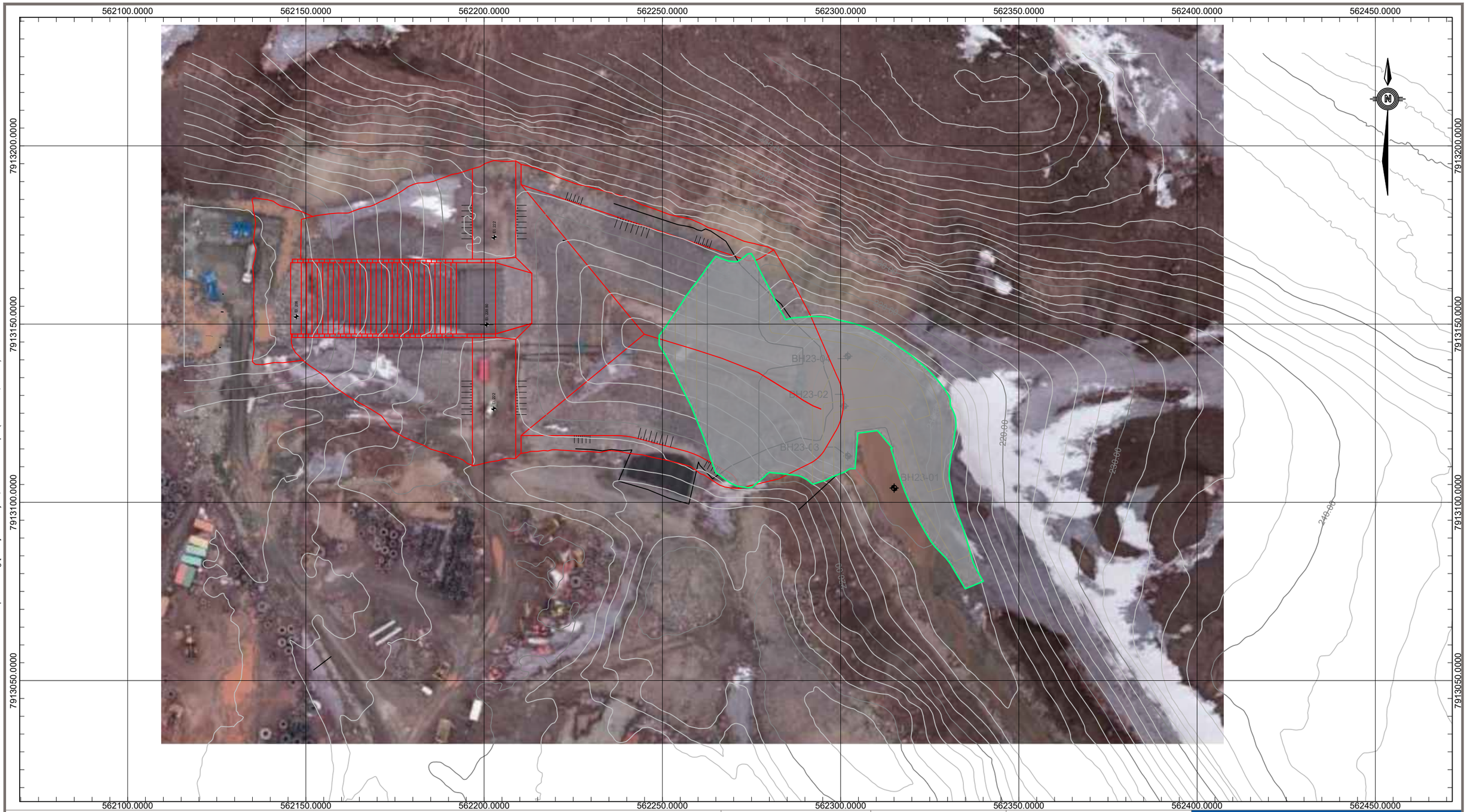
C002



LEGEND:

- PROJECT BONNDARY
- PROJECT AREA
- AS-BUILT GEOMEMBRANE LINER

0 50m

Scale: 1:1,000 @ 11"x17"

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KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

WORK AREA LAYOUT PLAN VIEW

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PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

OFFICE	DATE
EDM	FEBRUARY 06, 2024

C011

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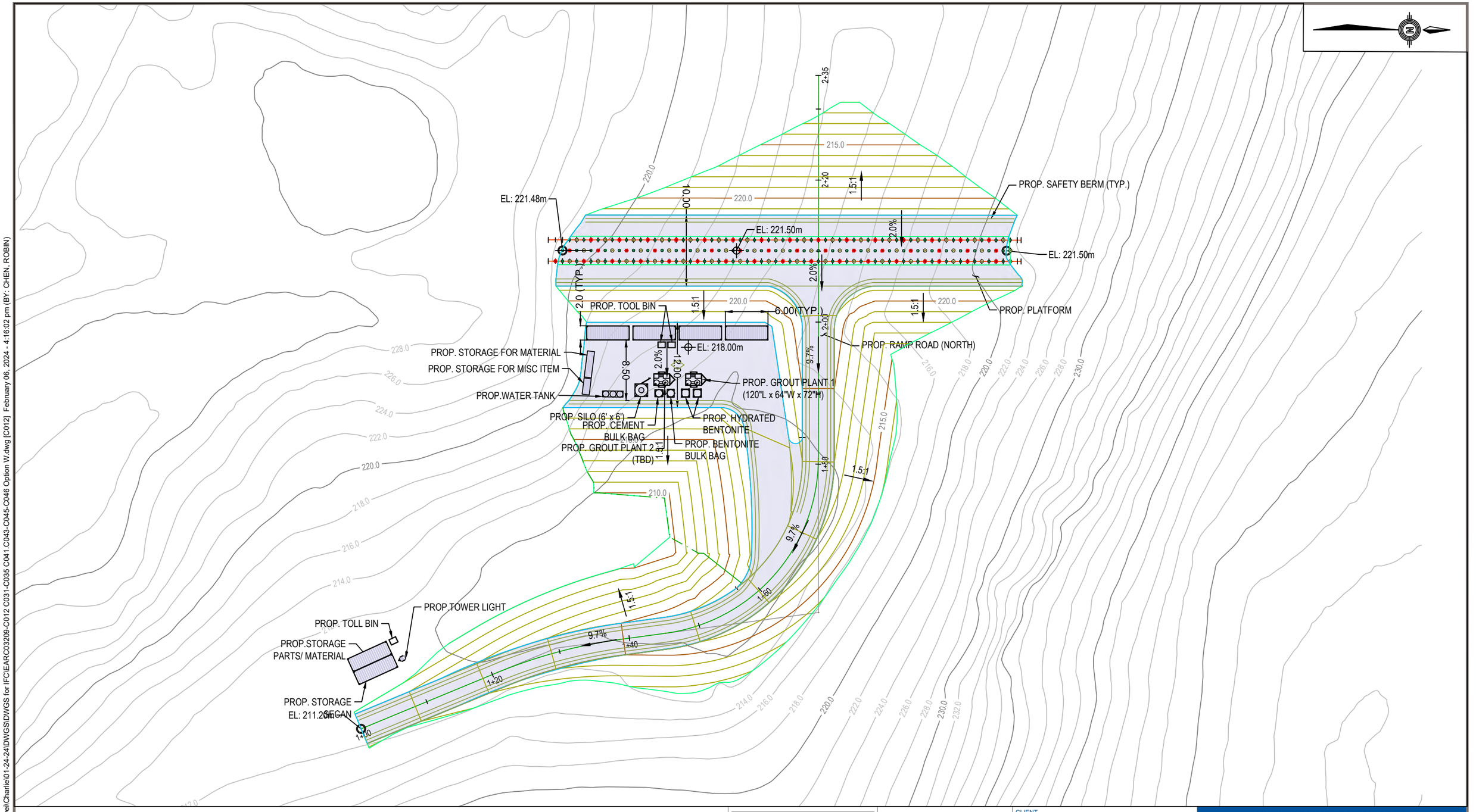

LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..

0 25m

Scale: 1:500 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

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KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

WORK AREA LAYOUT PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C012

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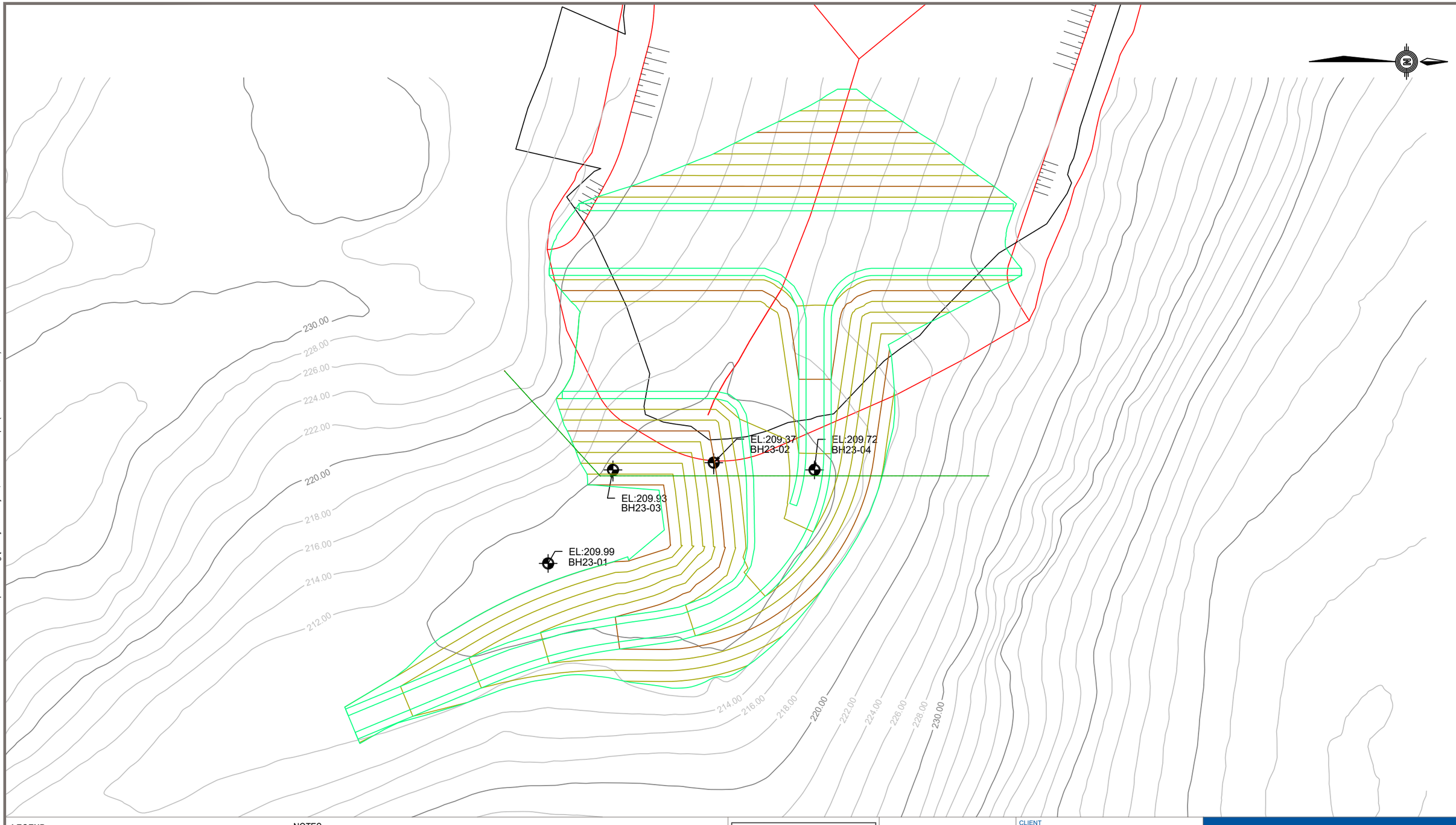

LEGEND:

- BOREHOLE
- AS-BUILT GEOMEMBRANE LINER
- GROUT S..
- GROUT P..
- GROUT T..

0 — 15m

Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

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BAFFINLAND IRON MINES CORPORATION

GEOLOGICAL BOREHOLE PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

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EDM	FEBRUARY 06, 2024

C021

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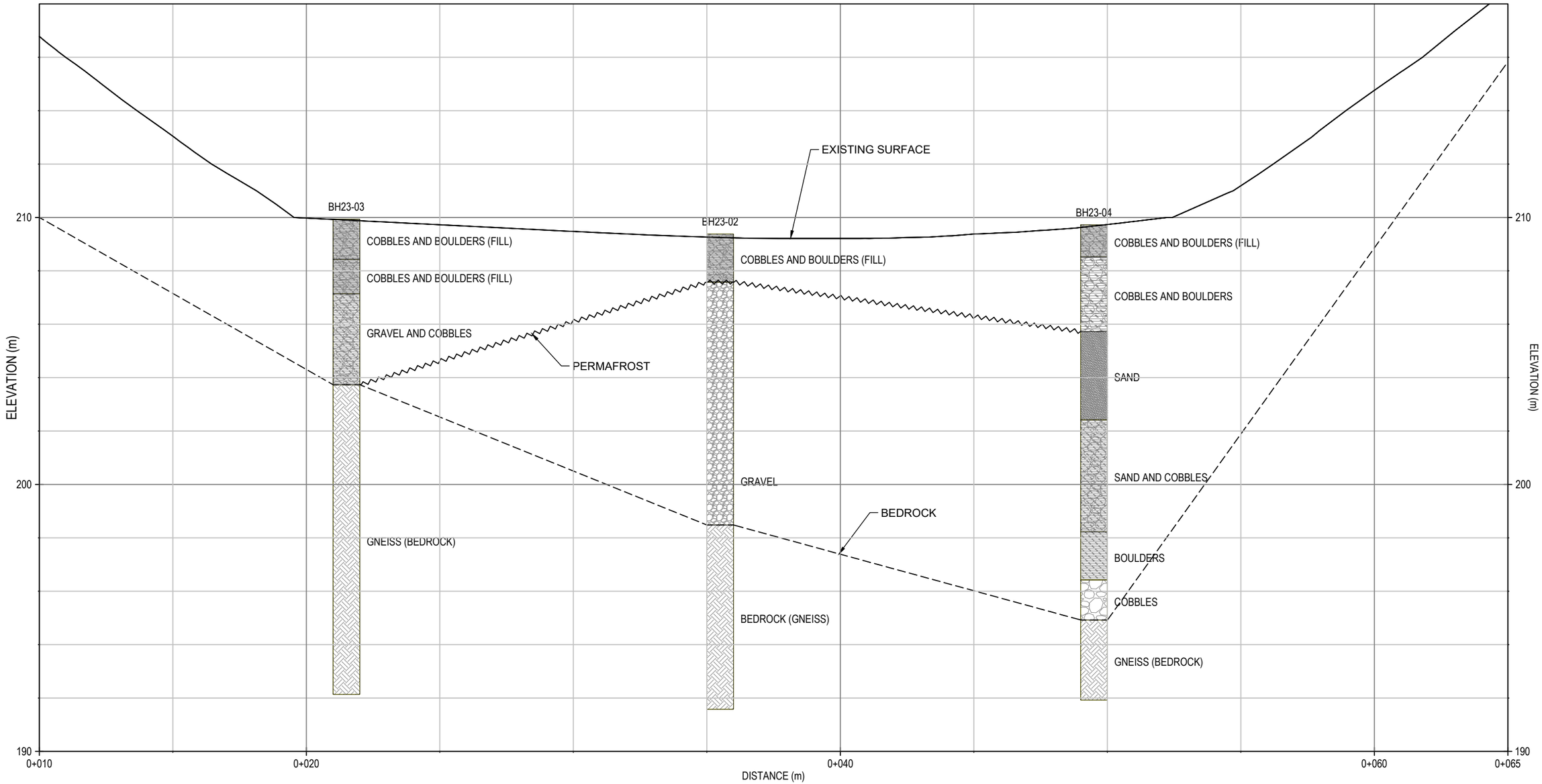

A C021 BOREHOLE PROFILE
SCALE: 1:150

LEGEND:

- Ⓢ - GROUT S..
- Ⓟ - GROUT P..
- Ⓣ - GROUT T..
- - COBBLES AND BOULDERS
- - ORGANIC GRAVEL
- - SAND
- - GNEISS
- - SAND AND GRAVEL
- - COBBLY SAND
- - BOULDERS
- - COBBLES
- - PERMAFROST
- - BEDROCK

ISSUED FOR CONSTRUCTION

0 5m
Scale: 1:150 @ 11"x17"

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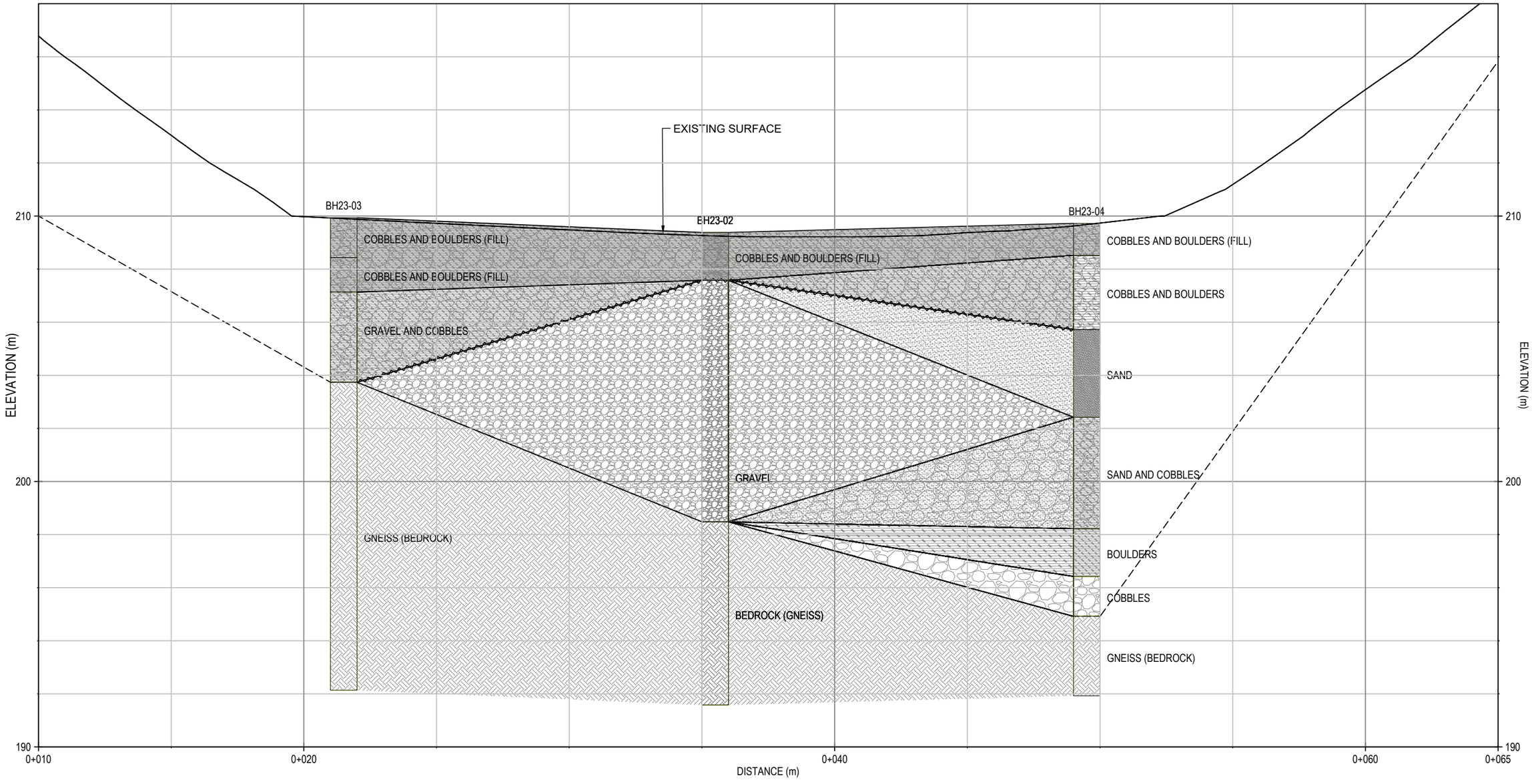
GEOLOGICAL PROFILE SECTION VIEW - STICK LOGS

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	0
OFFICE: EDM	DATE: DECEMBER 22, 2023		

C022



B / C021 BOREHOLE PROFILE
SCALE: 1:150

LEGEND:

- Ⓢ - GROUT S..
- Ⓟ - GROUT P..
- Ⓣ - GROUT T..
- - COBBLES AND BOULDERS
- - ORGANIC GRAVEL
- - SAND
- - GNEISS
- - SAND AND GRAVEL
- - COBBLY SAND
- - BOULDERS
- - COBBLES
- - PERMAFROST
- - BEDROCK

ISSUED FOR CONSTRUCTION

0 5m
Scale: 1:150 @ 11"x17"

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Date _____
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NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

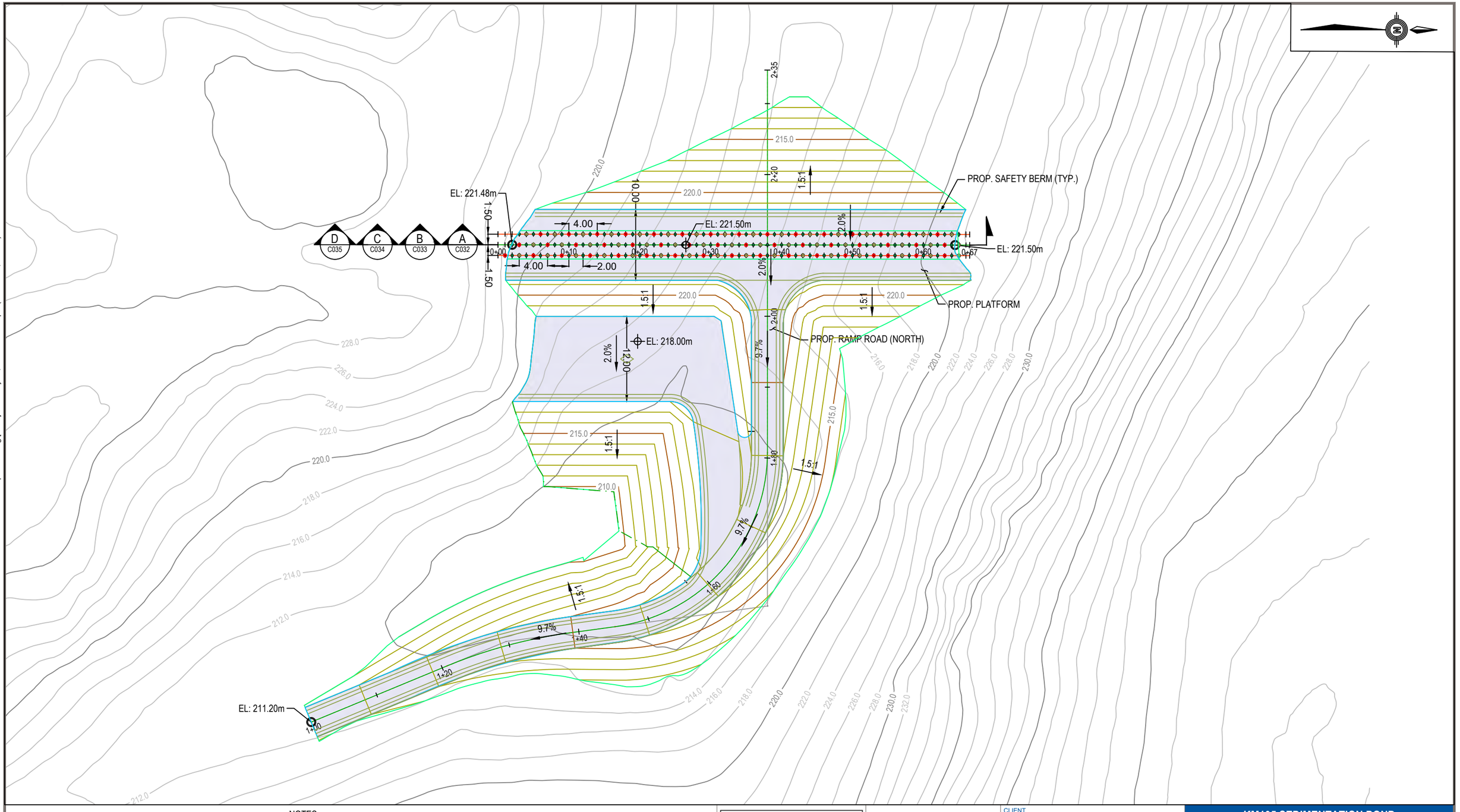
TETRA TECH

GEOLOGICAL PROFILE SECTION VIEW - STRATIGRAPHY

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	0
OFFICE	DATE		
EDM	DECEMBER 22, 2023		

C023

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C021-23 Option W.dwg [C023] February 06, 2024 - 4:16:16 pm (BY: CHEN, ROBIN)



LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..

0 25m

Scale: 1:500 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

TETRA TECH

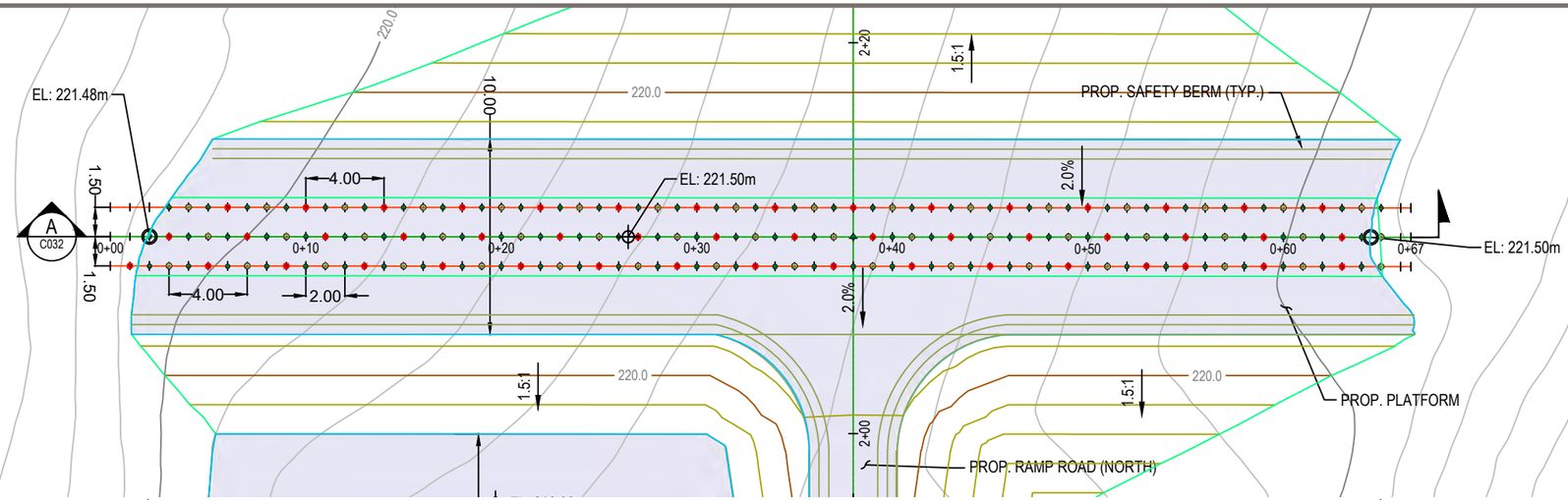
KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

GROUT HOLES LAYOUT PLAN VIEW

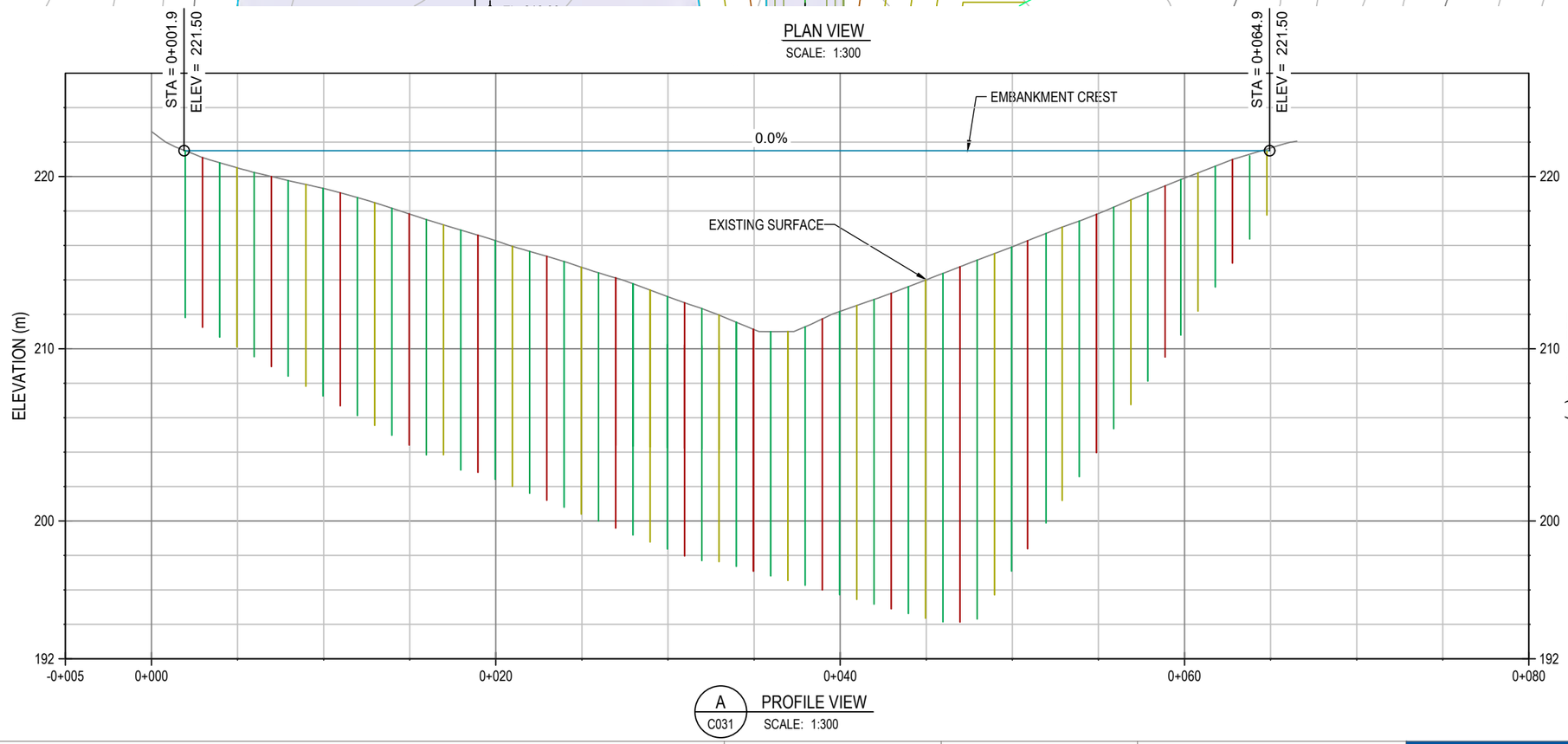
PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C031

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-241DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041 C043-C045-C046 Option W.dwg [C031] February 06, 2024 - 4:16:26 pm (BY: CHEN, ROBIN)



PLAN VIEW
SCALE: 1:300



A C031 PROFILE VIEW
SCALE: 1:300

LEGEND:

- Ⓢ - GROUT S.. ---------- - BEDROCK SURFACE
- Ⓟ - GROUT P.. ——— - EXISTING SURFACE
- Ⓣ - GROUT T.. ——— - EMBANKMENT CREST
- ——— - PRIMARY
- ——— - SECONDARY
- ——— - TERTIARY
- ——— - TEMPORARY PLATFORMS

0 15m
Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
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8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

TETRA TECH

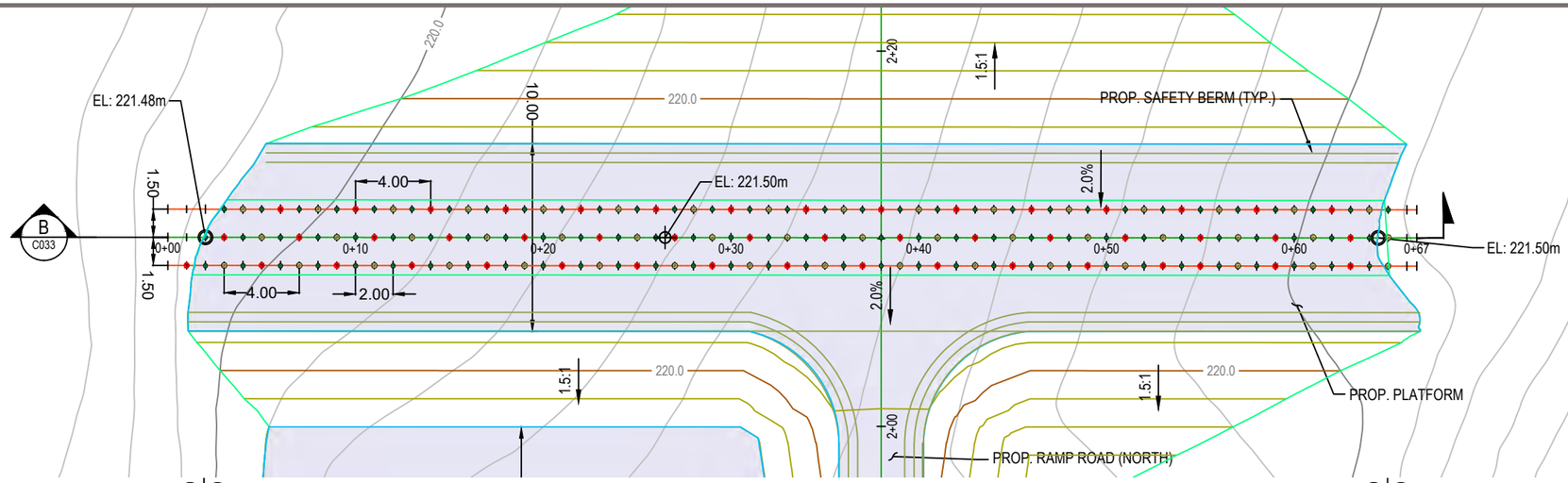
KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

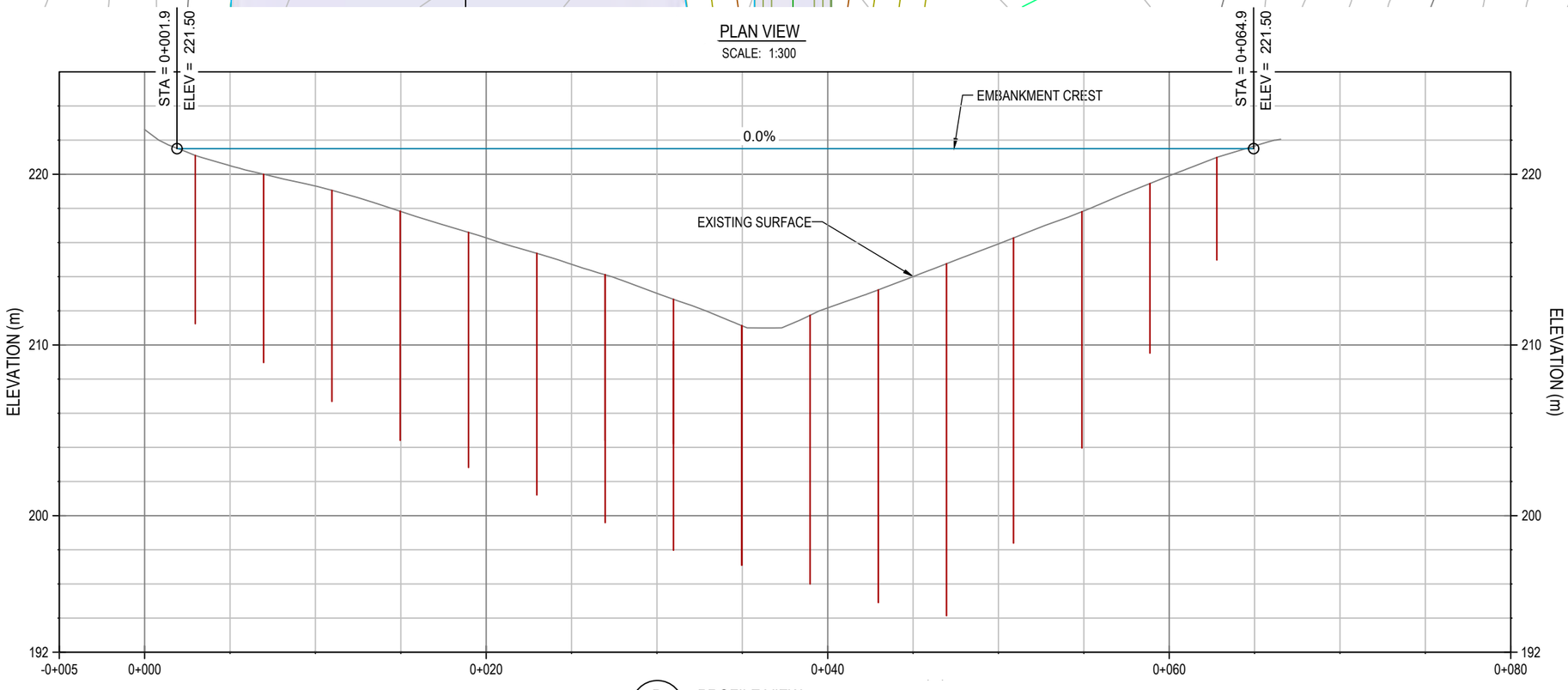
PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C032

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041 C043-C045-C046 Option W.dwg [C032] February 06, 2024 - 4:16:34 pm (BY: CHEN, ROBIN)



PLAN VIEW
SCALE: 1:300



B C031 PROFILE VIEW
SCALE: 1:300

LEGEND:

- (S) - GROUT S.. - BEDROCK SURFACE
- (P) - GROUT P.. - EXISTING SURFACE
- (T) - GROUT T.. - EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m
Scale: 1:300 @ 11"x17"

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists
PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

TETRA TECH

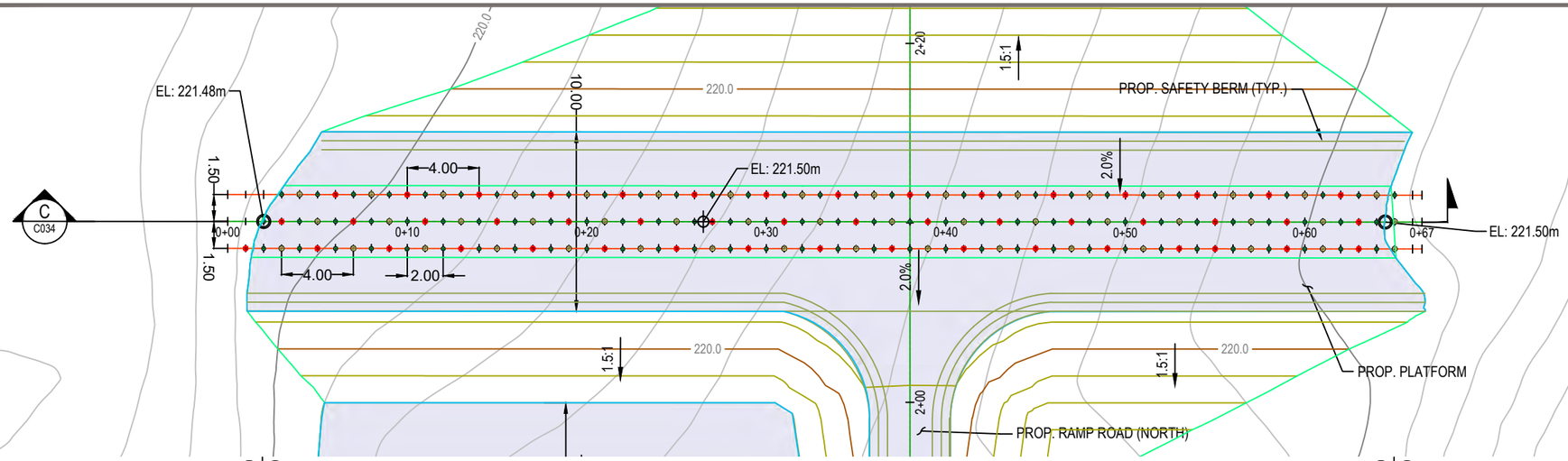
KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

PRIMARY GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

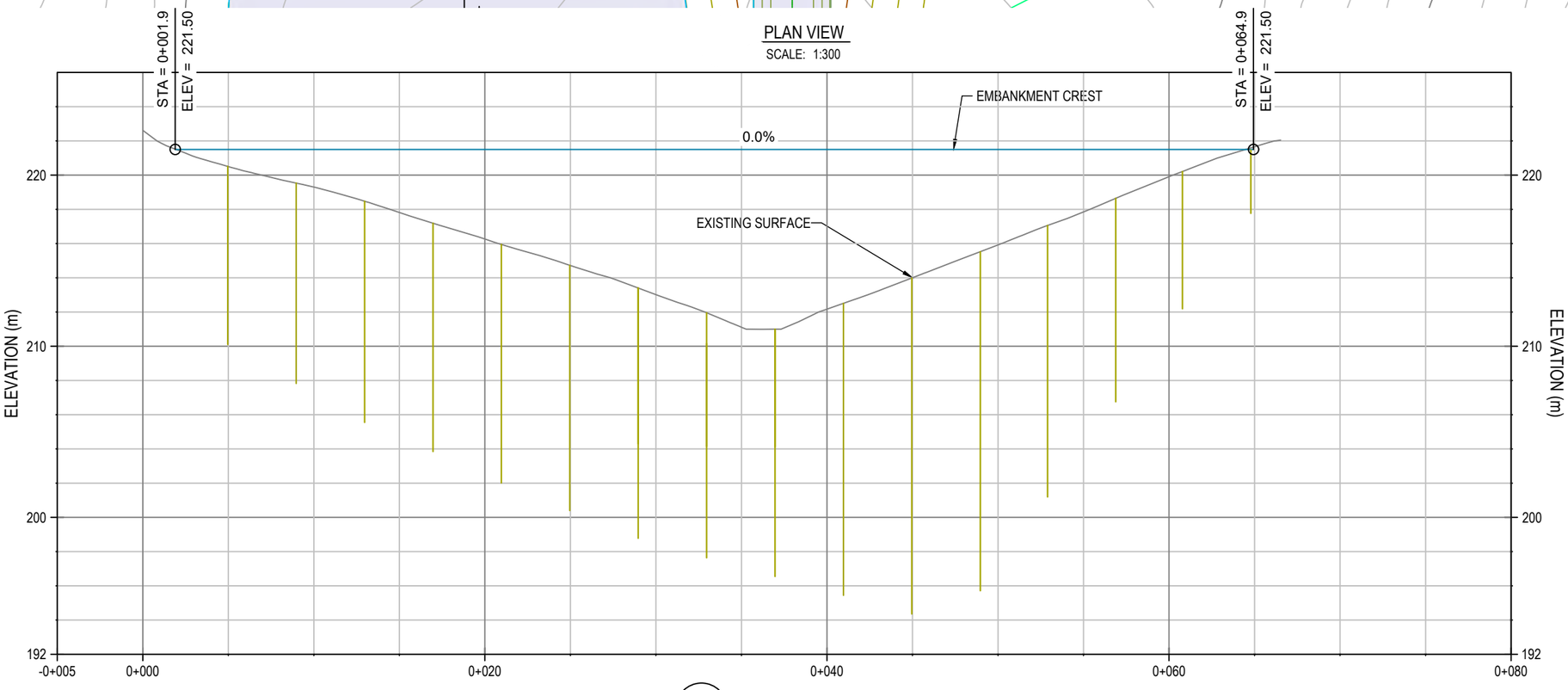
C033

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-241\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041-C043-C045-C046 Option W.dwg [C033] February 06, 2024 - 4:16:39 pm (BY: CHEN, ROBIN)



C
C034

PLAN VIEW
SCALE: 1:300



C
C031

PROFILE VIEW
SCALE: 1:300

LEGEND:

- S - GROUT S..
- P - GROUT P..
- T - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m

Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

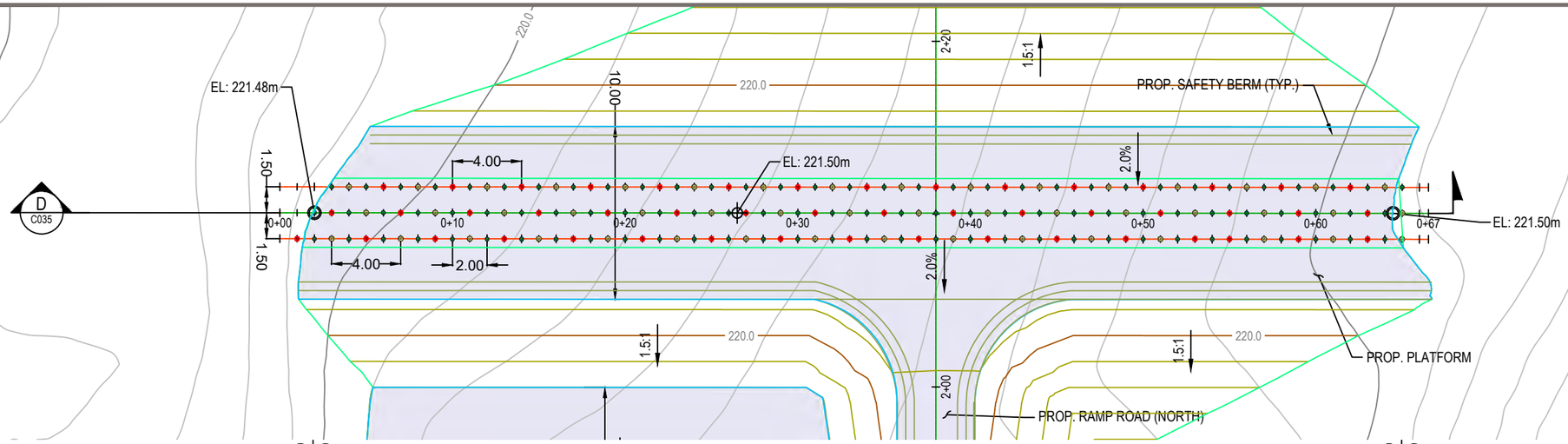
SECONDARY GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

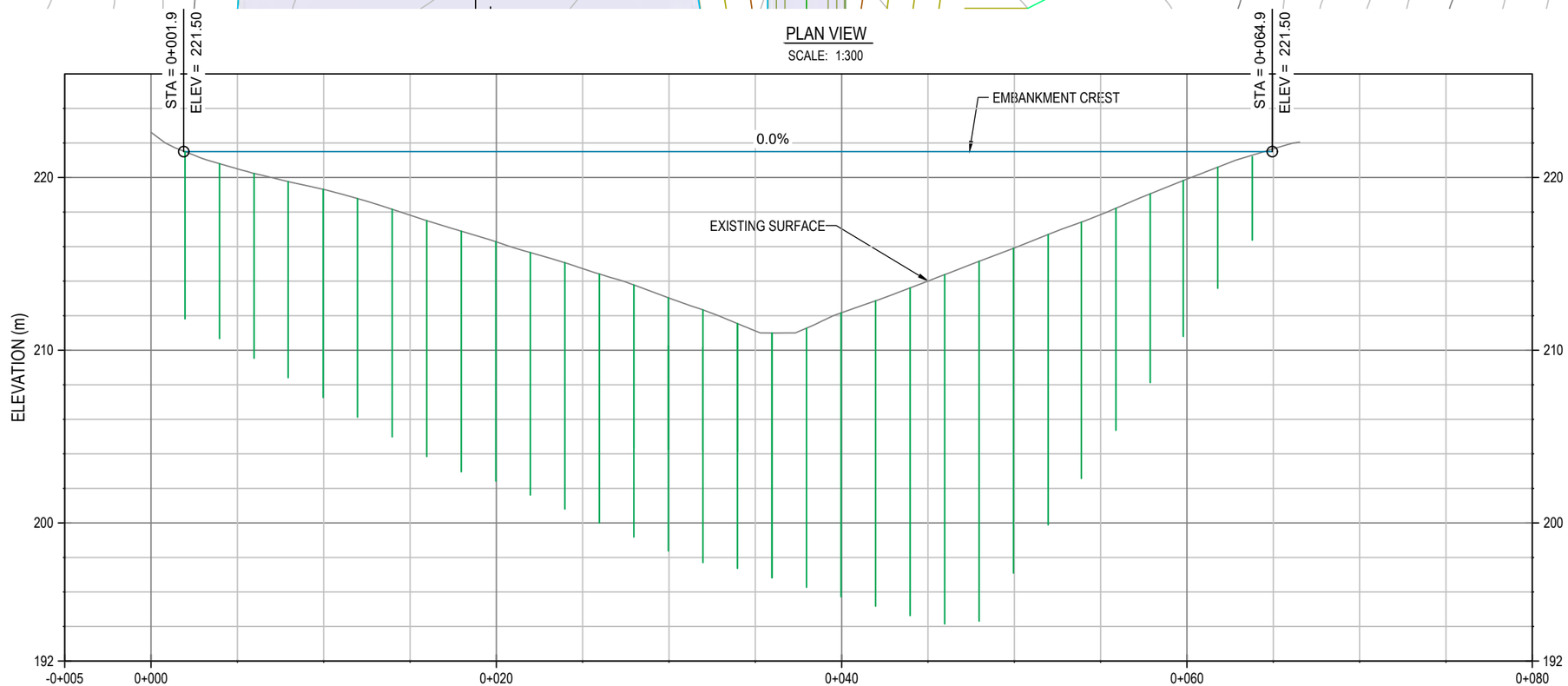
OFFICE	DATE
EDM	FEBRUARY 06, 2024

C034



D
C035

PLAN VIEW
SCALE: 1:300



D
C031

PROFILE VIEW
SCALE: 1:300

LEGEND:

- Ⓢ - GROUT S..
- Ⓟ - GROUT P..
- Ⓣ - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m

Scale: 1:300 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
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8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

TETRA TECH

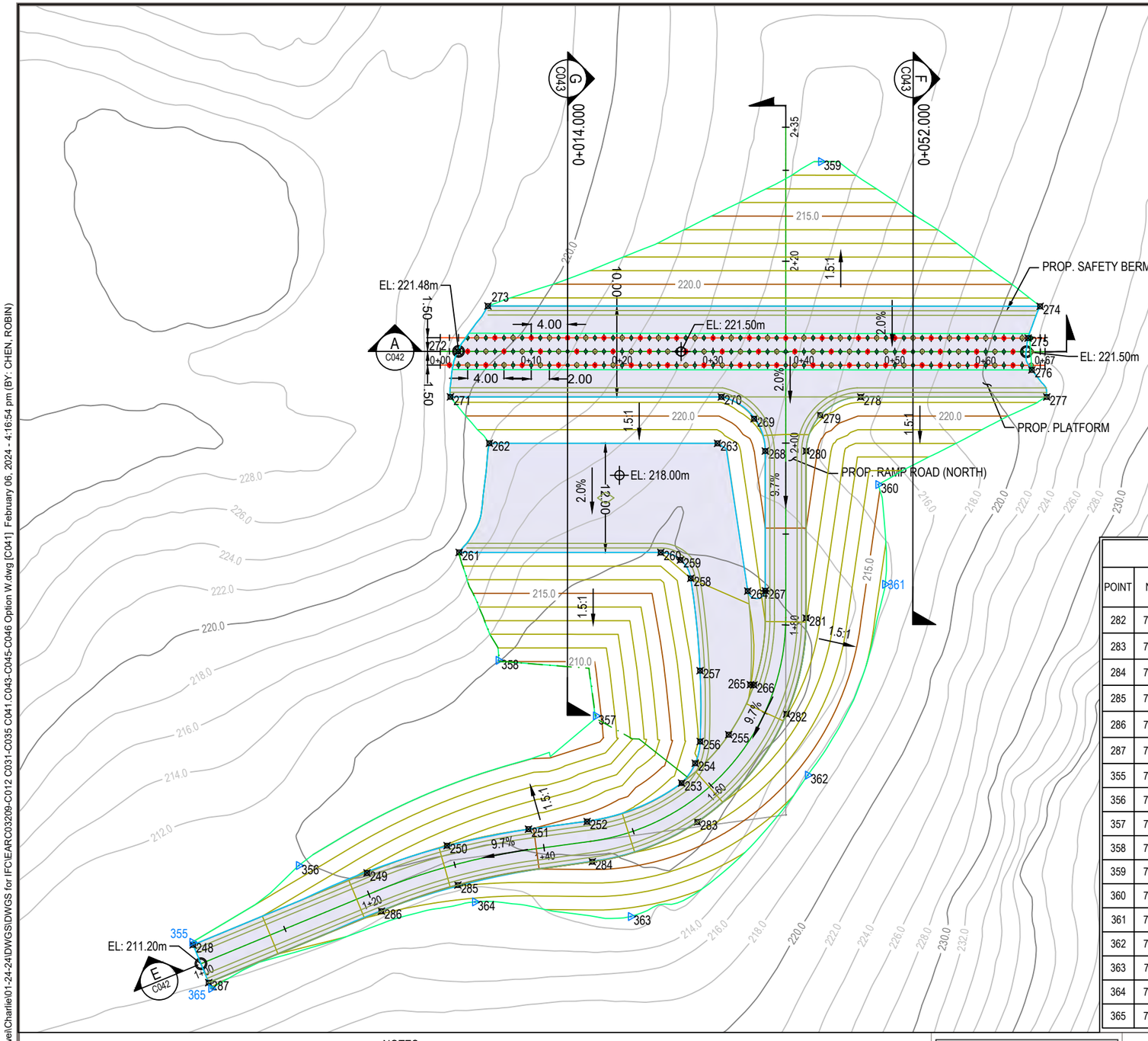
KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TERTIARY GROUT HOLES LAYOUT PLAN AND PROFILE VIEW

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

OFFICE	DATE
EDM	FEBRUARY 06, 2024

C035



COORDINATION OF WORK POINTS LIST					
POINT	NORTHING	EASTING	ELEVATION (EXISTING)	ELEVATION (PROPOSED)	DESCRIPTION
248	7 913 075.86	562 335.23	211.00	211.199m	Ramp
249	7 913 095.00	562 327.32	210.00	213.209m	Ramp
250	7 913 103.80	562 324.32	210.00	214.085m	Ramp
251	7 913 112.76	562 322.51	210.00	214.945m	Ramp
252	7 913 119.21	562 321.68	209.85	215.578m	Ramp
253	7 913 129.61	562 317.45	209.38	216.695m	Ramp
254	7 913 131.11	562 315.27	209.20	216.951m	Ramp
255	7 913 134.79	562 312.12	209.07	217.508m	Ramp
256	7 913 131.65	562 312.87	209.01	217.120m	Platform2
257	7 913 131.64	562 305.08	209.04	217.601m	Platform2
258	7 913 130.61	562 294.94	209.80	218.000m	Platform2
259	7 913 129.49	562 292.91	209.95	218.000m	Platform2
260	7 913 127.32	562 292.09	210.00	218.000m	Platform2
261	7 913 105.14	562 292.08	217.99	218.000m	Platform2 & Work Area
262	7 913 108.46	562 280.08	218.00	218.000m	Platform2 & Work Area
263	7 913 133.56	562 280.08	210.97	218.000m	Platform2
264	7 913 136.89	562 296.33	209.83	218.041m	Platform2
265	7 913 137.18	562 306.63	209.11	217.973m	Platform2
266	7 913 137.57	562 306.66	209.14	218.238m	Ramp
267	7 913 138.82	562 296.30	209.95	219.330m	Ramp
268	7 913 138.82	562 280.94	211.89	220.818m	Ramp
269	7 913 137.59	562 277.38	211.13	221.238m	Ramp
270	7 913 133.98	562 274.98	211.40	221.400m	Platform1
271	7 913 104.18	562 274.98	221.37	221.400m	Platform1 & Work Area
272	7 913 105.02	562 269.98	221.50	221.500m	Platform1 & Work Area
273	7 913 108.30	562 264.99	221.60	221.600m	Platform1 & Work Area
274	7 913 169.05	562 265.01	221.60	221.600m	Platform1 & Work Area
275	7 913 167.73	562 268.51	221.53	221.530m	Platform1 & Work Area
276	7 913 168.14	562 272.01	221.46	221.460m	Platform1 & Work Area
277	7 913 169.78	562 274.99	221.40	221.400m	Platform1
278	7 913 149.32	562 274.99	215.09	221.395m	Platform1
279	7 913 144.87	562 276.99	213.61	221.263m	Ramp
280	7 913 143.32	562 280.93	213.41	220.823m	Ramp
281	7 913 143.32	562 299.30	210.27	219.042m	Ramp

COORDINATION OF WORK POINTS LIST					
POINT	NORTHING	EASTING	ELEVATION (EXISTING)	ELEVATION (PROPOSED)	DESCRIPTION
282	7 913 141.16	562 309.84	209.78	218.075m	Ramp
283	7 913 131.34	562 321.73	209.85	216.684m	Ramp
284	7 913 119.79	562 326.10	210.16	215.572m	Ramp
285	7 913 105.00	562 328.66	211.68	214.087m	Ramp
286	7 913 096.59	562 331.53	211.67	213.196m	Ramp
287	7 913 077.59	562 339.39	211.95	211.199m	Ramp
355	7 913 075.76	562 334.95	211.00	---	Work Area
356	7 913 087.49	562 326.51	210.15	---	Work Area
357	7 913 120.17	562 310.06	209.55	---	Work Area
358	7 913 109.46	562 303.95	210.09	---	Work Area
359	7 913 144.93	562 249.10	211.00	---	Work Area
360	7 913 151.24	562 284.62	214.98	---	Work Area
361	7 913 151.98	562 295.58	213.57	---	Work Area
362	7 913 143.49	562 316.57	214.21	---	Work Area
363	7 913 124.01	562 332.12	211.35	---	Work Area
364	7 913 106.87	562 330.51	212.72	---	Work Area
365	7 913 077.85	562 340.03	212.23	---	Work Area

LEGEND:

- (S) - GROUT S...
- (P) - GROUT P...
- (T) - GROUT T...
- ▲ - FOOTPOINT OF WORK AREA
- ⊠ - FOOTPOINT OF WORK POINT

0 25m

Scale: 1:500 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

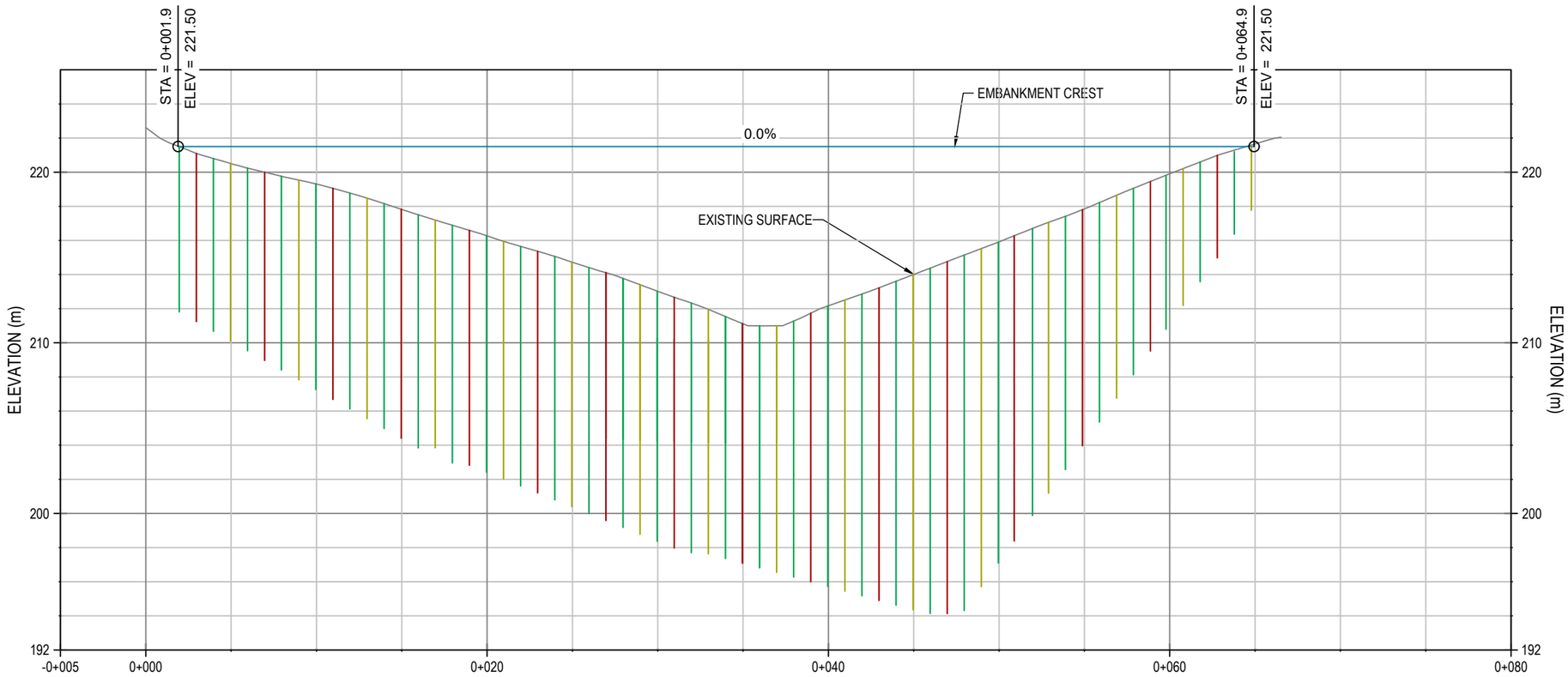
TEMPORARY WORK PLATFORM LAYOUT PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

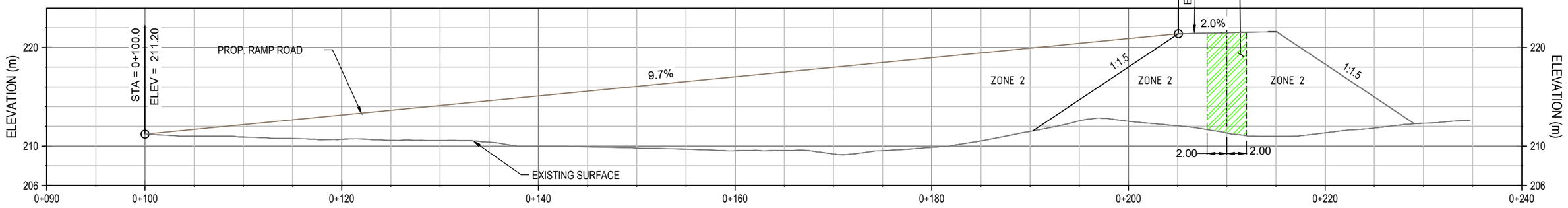
C041

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041 C043-C045-C046 Option W.dwg [C041] February 06, 2024 - 4:16:54 pm (BY: CHEN, ROBIN)



A C041 PROFILE VIEW
SCALE: 1:300

0 15m
Scale: 1:300 @ 11"x17"



E C041 PROFILE VIEW
SCALE: 1:400

0 20m
Scale: 1:400 @ 11"x17"

LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
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Signature _____
Date _____
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NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

TETRA TECH

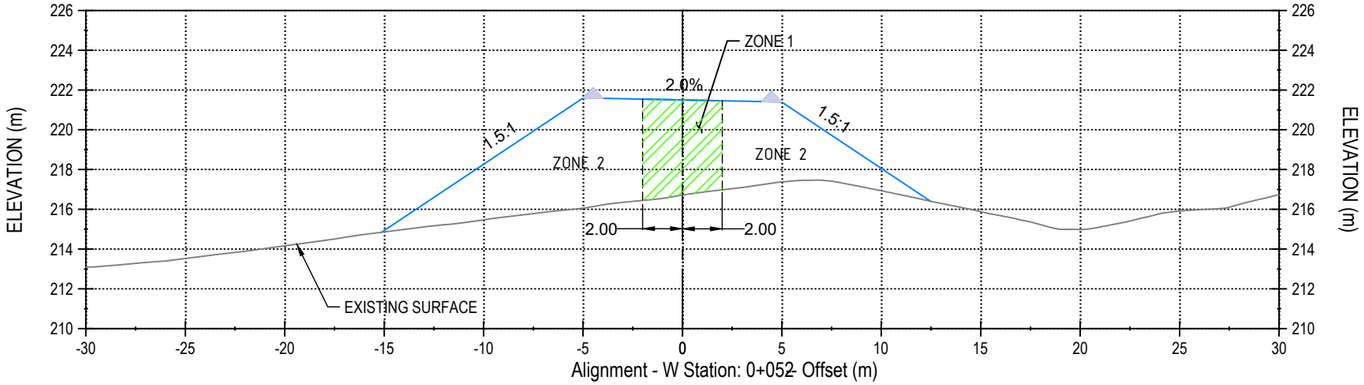
TEMPORARY WORK PLATFORM PROFILES VIEW

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

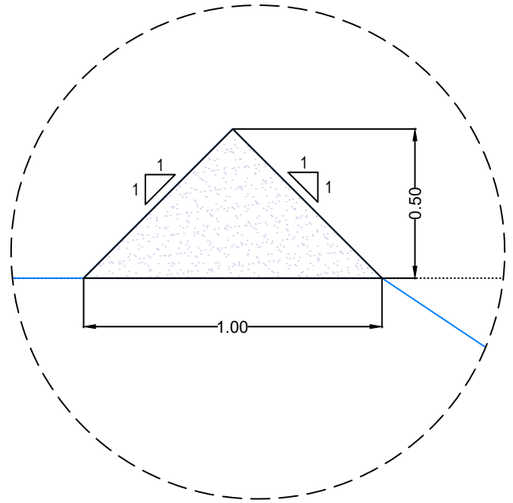
OFFICE	DATE
EDM	FEBRUARY 06, 2024

C042

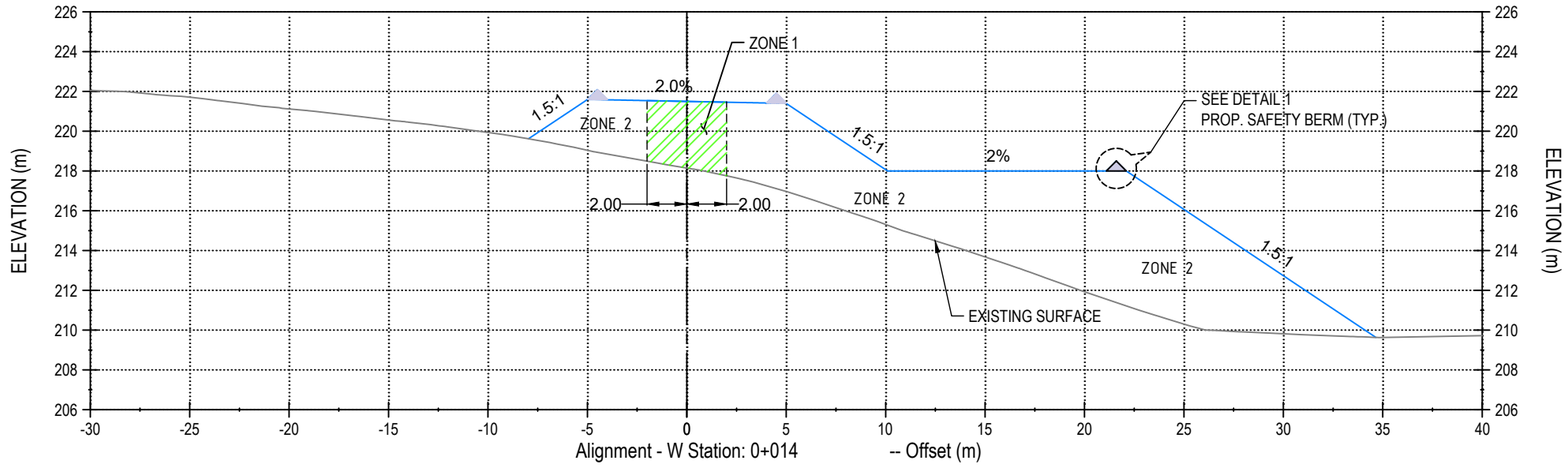
C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-24\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041 C043-C045-C046 Option W.dwg [C042] February 06, 2024 - 4:16:58 pm (BY: CHEN, ROBIN)



F C041 SECTION VIEW
SCALE: 1:300



1 -- SAFETY BERM DETAIL
SCALE: 1:20



G C041 SECTION VIEW
SCALE: 1:300

LEGEND:

- S - GROUT S..
- P - GROUT P..
- T - GROUT T..
- BEDROCK SURFACE
- EXISTING SURFACE
- EMBANKMENT CREST
- PRIMARY
- SECONDARY
- TERTIARY
- TEMPORARY PLATFORMS

0 15m
Scale: 1:300 @ 11"x17"

NOTES:
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2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
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ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists
PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

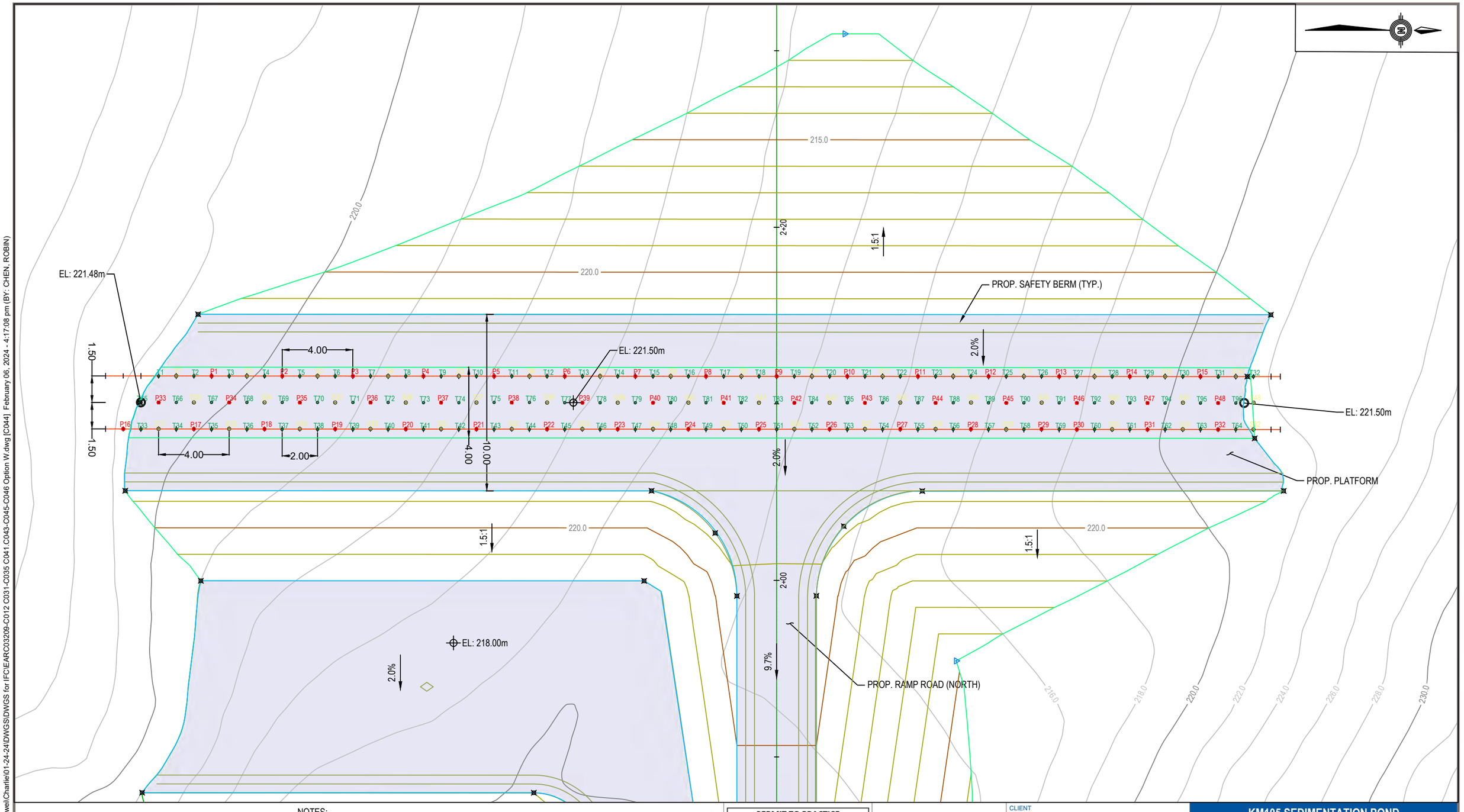
TETRA TECH

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TEMPORARY ABUTMENT PLATFORM SECTIONS AND DETAIL VIEW

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C043



LEGEND:

- (S) - GROUT S..
- (P) - GROUT P..
- (T) - GROUT T..

0 10m

Scale: 1:200 @ 11"x17"

NOTES:

1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
5. ZONE 2 TO CONSIST OF RUN OF QUARRY MATERIAL. VOLUME: 15183m^3.
6. SAFETY BERM VOLUME: 89m^3.
7. THE RAMP MUST BE MAINTAINED CLEAR OF SNOW, AND REGULARLY SANDED FOR TRACTION CONTROL.
8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

PROFESSIONAL SEAL

CLIENT

BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

GROUT HOLES NUMBER LAYOUT PLAN VIEW

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C044

C:\Users\robin.chen\Documents\Hongwei\Charlie\01-24-241\DWGS\DWGS for IFC\EARC03209-C012 C031-C035 C041.C043-C045-C046 Option W.dwg [C044] February 06, 2024 - 4:17:08 pm (BY: CHEN, ROBIN)

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
P1	562 268.48	7 913 109.07
P2	562 268.48	7 913 113.07
P3	562 268.49	7 913 117.07
P4	562 268.49	7 913 121.07
P5	562 268.49	7 913 125.07
P6	562 268.49	7 913 129.07
P7	562 268.49	7 913 133.07
P8	562 268.50	7 913 137.07
P9	562 268.50	7 913 141.07
P10	562 268.50	7 913 145.07
P11	562 268.50	7 913 149.07
P12	562 268.50	7 913 153.07
P13	562 268.51	7 913 157.07
P14	562 268.51	7 913 161.07
P15	562 268.51	7 913 165.07
P16	562 271.48	7 913 104.07
P17	562 271.48	7 913 108.07
P18	562 271.48	7 913 112.07
P19	562 271.48	7 913 116.07
P20	562 271.49	7 913 120.07
P21	562 271.49	7 913 124.07
P22	562 271.49	7 913 128.07
P23	562 271.49	7 913 132.07
P24	562 271.49	7 913 136.07
P25	562 271.49	7 913 140.07
P26	562 271.49	7 913 144.07
P27	562 271.49	7 913 148.07
P28	562 271.49	7 913 152.07
P29	562 271.49	7 913 156.07
P30	562 271.51	7 913 158.07
P31	562 271.51	7 913 162.07
P32	562 271.51	7 913 166.07
P33	562 269.98	7 913 106.07
P34	562 269.98	7 913 110.07
P35	562 269.98	7 913 114.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
P36	562 269.98	7 913 118.07
P37	562 269.99	7 913 122.07
P38	562 269.98	7 913 126.07
P39	562 269.99	7 913 130.07
P40	562 269.99	7 913 134.07
P41	562 270.00	7 913 138.07
P42	562 270.00	7 913 142.07
P43	562 270.00	7 913 146.07
P44	562 270.00	7 913 150.07
P45	562 270.01	7 913 154.07
P46	562 270.01	7 913 158.07
P47	562 270.01	7 913 162.07
P48	562 270.01	7 913 166.07
S1	562 268.48	7 913 107.07
S2	562 268.48	7 913 111.07
S3	562 268.48	7 913 115.07
S4	562 268.49	7 913 119.07
S5	562 268.49	7 913 123.07
S6	562 268.49	7 913 127.07
S7	562 268.49	7 913 131.07
S8	562 268.50	7 913 135.07
S9	562 268.50	7 913 139.07
S10	562 268.50	7 913 143.07
S11	562 268.50	7 913 147.07
S12	562 268.50	7 913 151.07
S13	562 268.50	7 913 155.07
S14	562 268.51	7 913 159.07
S15	562 268.51	7 913 163.07
S16	562 268.51	7 913 167.07
S17	562 271.48	7 913 106.07
S18	562 271.48	7 913 110.07
S19	562 271.48	7 913 114.07
S20	562 271.49	7 913 118.07
S21	562 271.49	7 913 122.07
S22	562 271.49	7 913 126.07

COORDINATION OF GROUT HOLES LIST		
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S23	562 271.49	7 913 130.07
S24	562 271.49	7 913 134.07
S25	562 271.49	7 913 138.07
S26	562 271.49	7 913 142.07
S27	562 271.49	7 913 146.07
S28	562 271.49	7 913 150.07
S29	562 271.51	7 913 154.07
S30	562 271.51	7 913 160.07
S31	562 271.51	7 913 164.07
S32	562 271.51	7 913 168.07
S33	562 269.98	7 913 108.07
S34	562 269.98	7 913 112.07
S35	562 269.98	7 913 116.07
S36	562 269.99	7 913 120.07
S37	562 269.99	7 913 124.07
S38	562 269.99	7 913 128.07
S39	562 269.99	7 913 132.07
S40	562 270.00	7 913 136.07
S41	562 270.00	7 913 140.07
S42	562 270.00	7 913 144.07
S43	562 269.99	7 913 148.07
S44	562 269.99	7 913 152.07
S45	562 269.99	7 913 156.07
S46	562 269.99	7 913 160.08
S47	562 269.99	7 913 164.08
S48	562 270.00	7 913 168.07
T1	562 268.48	7 913 106.07
T2	562 268.48	7 913 108.07
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T4	562 268.48	7 913 112.07
T5	562 268.48	7 913 114.07
T6	562 268.48	7 913 116.07
T7	562 268.49	7 913 118.07
T8	562 268.49	7 913 120.07
T9	562 268.49	7 913 122.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
T10	562 268.49	7 913 124.07
T11	562 268.49	7 913 126.07
T12	562 268.49	7 913 128.07
T13	562 268.49	7 913 130.07
T14	562 268.49	7 913 132.07
T15	562 268.49	7 913 134.07
T16	562 268.50	7 913 136.07
T17	562 268.50	7 913 138.07
T18	562 268.50	7 913 140.07
T19	562 268.50	7 913 142.07
T20	562 268.50	7 913 144.07
T21	562 268.50	7 913 146.07
T22	562 268.50	7 913 148.07
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T24	562 268.50	7 913 152.07
T25	562 268.50	7 913 154.07
T26	562 268.50	7 913 156.07
T27	562 268.51	7 913 158.07
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T41	562 271.50	7 913 121.07
T42	562 271.50	7 913 123.07
T43	562 271.50	7 913 125.07
T44	562 271.50	7 913 127.07

COORDINATION OF GROUT HOLES LIST		
NAME	EASTING	NORTHING
T45	562 271.50	7 913 129.07
T46	562 271.50	7 913 131.07
T47	562 271.50	7 913 133.07
T48	562 271.50	7 913 135.07
T49	562 271.50	7 913 137.07
T50	562 271.50	7 913 139.07
T51	562 271.50	7 913 141.07
T52	562 271.50	7 913 143.07
T53	562 271.50	7 913 145.07
T54	562 271.50	7 913 147.07
T55	562 271.50	7 913 149.07
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T61	562 271.51	7 913 161.07
T62	562 271.51	7 913 163.07
T63	562 271.51	7 913 165.07
T64	562 271.51	7 913 167.07
T65	562 269.98	7 913 105.07
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T70	562 269.98	7 913 115.07
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T73	562 269.99	7 913 121.07
T74	562 269.99	7 913 123.07
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T76	562 269.98	7 913 127.07
T77	562 269.99	7 913 129.07
T78	562 269.99	7 913 131.07
T79	562 269.99	7 913 133.07

COORDINATION OF GROUT HOLES LIST		
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T88	562 270.00	7 913 151.07
T89	562 270.00	7 913 153.07
T90	562 270.01	7 913 155.07
T91	562 270.01	7 913 157.07
T92	562 270.01	7 913 159.07
T93	562 270.01	7 913 161.07
T94	562 270.01	7 913 163.07
T95	562 270.01	7 913 165.07
T96	562 270.01	7 913 167.07

**NOTES:
P# -- PRIMARY GROUT HOLE
S# -- SECONDARY GROUT HOLE
T# -- TERTIARY GROUT HOLE

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.
4. ZONE 1 TO CONSIST OF 19mm MINUS SAND AND GRAVEL OR EQUIVALENT. VOLUME: 1307.6m^3.
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8. RAMP AND PLATFORM MATERIALS WILL BE REMOVED AT THE END OF THE GROUT CURTAIN INSTALLATION.

ISSUED FOR CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists
PERMIT

PROFESSIONAL SEAL

CLIENT
BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

COORDINATION OF GROUT HOLES NUMBER LIST

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1

OFFICE	DATE
EDM	FEBRUARY 06, 2024

C045

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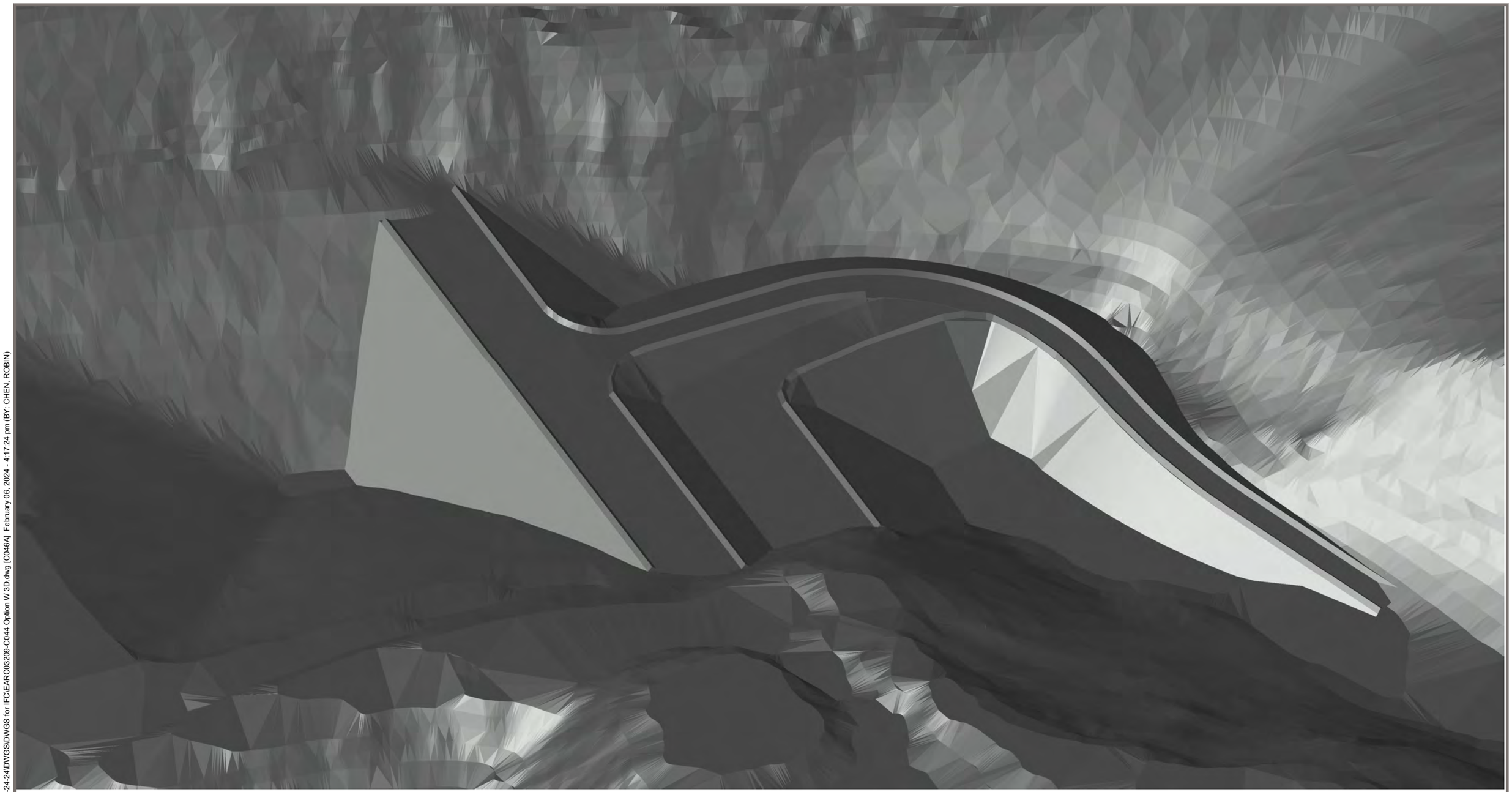

3D VIEW
SCALE: NTS

ISSUED FOR CONSTRUCTION

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

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BAFFINLAND IRON MINES CORPORATION

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TEMPORARY WORK PLATFORM LAYOUT 3D VIEW A

TETRA TECH

PROJECT NO.	DWN	CKD	REV	
ENG. EARC03209-10	RC	CH	1	**C046A**
OFFICE	DATE			
EDM	FEBRUARY 06, 2024			

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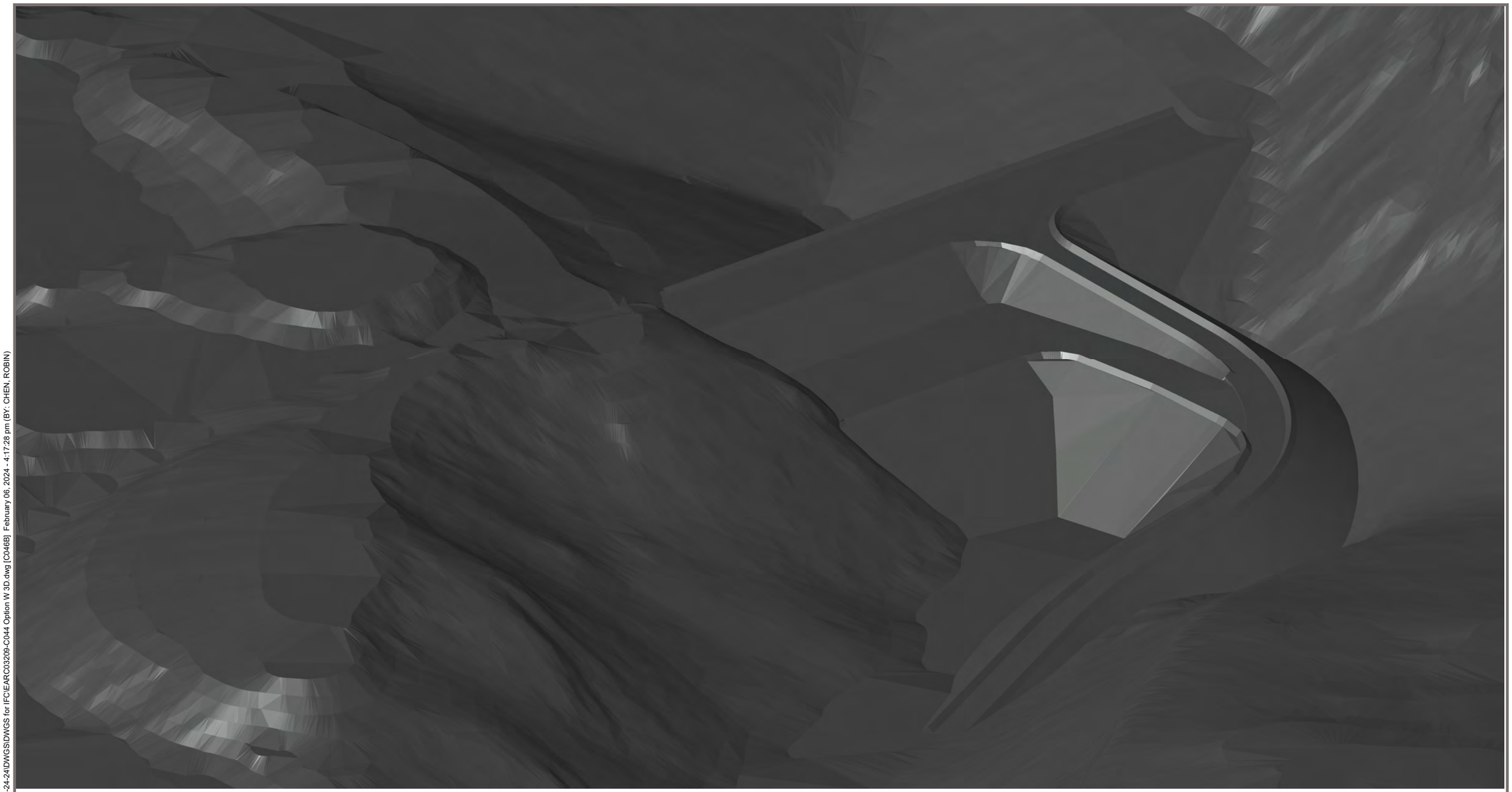

3D VIEW
SCALE: NTS

ISSUED FOR CONSTRUCTION

NOTES:
1. PRIMARY HOLE SPACING OF 4.0m.
2. SECONDARY HOLE SPACING OF 4.0m.
3. TERTIARY HOLE SPACING OF 2.0m.

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature _____
Date _____
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

PERMIT

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BAFFINLAND IRON MINES CORPORATION

TETRA TECH

KM105 SEDIMENTATION POND GROUT CURTAIN PROJECT

TEMPORARY WORK PLATFORM LAYOUT 3D VIEW B

PROJECT NO.	DWN	CKD	REV
ENG. EARC03209-10	RC	CH	1
OFFICE	DATE		
EDM	FEBRUARY 06, 2024		

C046B

ᖃᑭᖅᑕᒥ ᐃᓄᐃᑦ ᑲᑎᒪᔨᖏᑦᑐᖅ
Qikiqtani Inuit Association

ᐱᓕᕆᕋᖅᑐᑦ ᓄᓇᕗᑦ ᐅᑯᓂᖅ
Serving the communities of
ᐃᑲᐱᐊᕋᓱᒃ Arctic Bay
ᑲᖏᕐᕋᑐᒍᑎᒃ Clyde River
ᐊᐅᓚᐃᑦᑕᑐᒃ Grise Fiord
ᐃᓚᒋᑦ Igloolik
ᐃᕐᓱᓗᐃᑦ Iqaluit
ᑭᒥᓯᕐᒥ Kimmirut
ᑭᙵᓗᐃᑦ Kinngait
ᐱᖓᓱᓕᔅᓴᖅ Pangnirtung
ᑎᑎᕕᒃᓴᖅ Pond Inlet
ᖁᓕᖅᑕᕐᔪᐊᖅ Qikiqtarjuaq
ᕆᐊᑦᑕᕐᓂᐊᖅ Resolute Bay
ᓴᓂᑰᓕᖅ Sanikiluaq
ᓴᓂᕆᔨᒃ Sanirajak

December 14, 2023

Connor Devereaux, Environmental Manager
Baffinland Iron Mines, Inc.
360 Oakville Place Drive, Oakville ON L6H 6K8
647.456.9067
Connnor.Devereaux@baffinland.com

RE: Baffinland Iron Mines Corporation's Mary River Project – Qikiqtani Inuit Association September 2023 General Site Inspection Findings and Recommendations

Mr. Devereaux,

Consistent with requirements under Schedule E, Item 12 of the Commercial Lease No.: Q13C301 (CPL), issued to Baffinland Iron Mines Corporation (Baffinland) by the Qikiqtani Inuit Association (QIA), the QIA conducted a Site Inspection (Inspection) of the Mary River Mine (Project) in late September 2023. Conor Goddard and Andrew Jaworenko of QIA conducted the Inspection with technical support provided by Joe Cavallo of LGL Ltd. AND Lois Boxill of MIS Ltd. An overview of the inspectors' findings and recommendations is provided below.

Nakurmiik,

Conor Goddard
Manager, Project Compliance and Monitoring
Qikiqtani Inuit Association
(P) 867.975.8385 or toll-free 1.800.667.2742
cgoddard@qia.ca

December 11, 2023

ᑯᓇᕐ ᓯᐱᖅᓱ / ᒪᓕᒐᓕᕆᓂᕐᔪᑎᓄᑦ ᐊᐅᓚᑦᑎᔨ
Conor Goddard / Manager of Project Compliance and Monitoring
CGoddard@qia.ca / Office: 867.975.8385

ᕿᑭᖅᑖᓂ ᐃᓄᐃᑦ ᑲᑐᔾᔨᖃᑎᒌᖕᒋᑦ
Qikiqtani Inuit Association
1.800.667.2742
ᓱᑲᑦᑐᒃᑯᑦ / Fax: 867.979.3238
www.qia.ca

Dear Conor:

Re: Water License 2AM-MRY1325 - Mary River Project
Follow up Report to September 20 and 20 Environmental Inspection
LGL Limited and Mining Impact Specialists Ltd.
Commercial Lease Q13C301

Introduction

Consistent with requirements under Schedule E, Item 12 of the Commercial Lease, issued to Baffinland Iron Mines Corporation (Baffinland) by the Qikiqtani Inuit Association (QIA), LGL Limited (LGL) and Mining Impact Specialists Ltd. (MISL) along with QIA representatives Conor Goddard and Andrew Jaworenko, conducted a Site Inspection (Inspection) of the Mary River Mine (Project) on September 20 and 21, 2023.

Joseph Cavallo conducted the Inspection on LGL's behalf, and Lois Boxill, Ph.D., P.Eng. conducted the Inspection on behalf of MISL. An overview of the Inspectors' findings and requested actions are provided below. Photographs associated with the findings and requested actions made by LGL are provided in Appendix A. Photographs associated with the inspection and assessment completed by MISL are provided in Appendix B. Additionally, Figures accompanying MISL's review findings, observations, and requested actions are provided in Appendix C.

Review of Spill Reports

The following spill reports were received and reviewed following completion of the first annual environmental inspection report in early August 2023:

- **Tote Road** (17 Sep 2023): erosion was noted at eight (8) watercourse crossings due to a significant rainfall event on August 14 and 15. High sediment concentrations via runoff entered the Ravn and Mary River watersheds. Remedial actions were implemented immediately. Sampling conducted on August 15 showed Total Suspended Solids (TSS) concentrations were within applicable criteria at five (5) of the eight (8) locations.
- **Waste Rock Facility Water Treatment Plant** (3 Sep 2023): TSS levels of water discharged at MS-08 exceeded water licence and MDMER criteria. Exceedance was only identified during

review of laboratory data on 26 October 2023. The level of TSS exceedance was not indicated in the Spill Report.

- **MRM Crusher Pad and Surface Water Management Pond**
  - 27 August 2023: contact water from the Crusher Pad with elevated TSS failed to be conveyed into the Surface Water Management Pond. Neither the TSS concentration nor the portion of the collection ditch that was repaired were indicated in the spill report.
  - 4 November 2023: 167L of transmission oil from a stationary K992 loader leaked onto the ore pad (aka Crusher Pad) near crusher A. Impacted soils were excavated and disposed of in accordance with Baffinland's Hazardous Materials and Hazardous Waste Management Plan.
- **MSC Lift Station** (28 Nov 2023): Approximately 1000L of frozen raw sewage was found on the ground near the MSC lift station (location needs to be identified on a map). The source of the sewage was unknown/unclear at the time of the initial report filing
- **Tote Road** (17 Aug 2023): At KM 71, 260 L of diesel fuel was released to the ground surface affecting an area of approximately 10 m^2. The spill resulted from damage to the fuel tank of an Ore Haul Truck (OHT). An additional 182L of diesel was captured from the breached OHT fuel using various spill containment measures avoiding further ground contamination. It was noted that the spill occurred 150 m from the nearest water body.
- **Milne Port**
  - 17 Aug 2023: Approximately 500 L of waste oil observed on the B1 pad at base of a shipping container packaged for offsite backhaul. The spill was believed to result from failure of a pressure regulation valve on a waste oil containment tote that was in the shipping container where the spill was observed. An area of approximately 15 m^2 was observed to be impacted by the spill and occurred 74 m away from the nearest water body. The damaged tote was removed to the hazardous waste berm and the spill covered with sand to aid spill containment and subsequent removal which was completed in accordance with Baffinland's Hazardous Waste Management Plan.
  - Milne Port WWTP (8 Sep 2023): A vacuum truck operator malfunction at the Milne Port Wastewater Treatment Plant (WWTP), resulted in the release of approximately 500 L of untreated sewage to the ground. The spill was contained to the immediate area adjacent to the WWTP, resulting in an affected area of approximately 20 m^2. The spill location was approximately 370 m to the Milne Inlet; the nearest fish bearing water body.

Consistent with the observations made during the September 2023 Inspection, the occurrences of TSS exceedance were significantly reduced - compared to findings from the June Inspection which were primarily impacted by freshet. Reported TSS exceedances were limited to the last discharge from the WRF WTP (at the end of the water treatment season in late August), and to contact water from the ore pad failing to report to the Crushed Pad Surface Water Management Pond (SWMP). The speed with which the failed collection ditch reporting to the Crusher SWMP was repaired is noted.

It was observed that TSS levels were generally not included in the spill reports reviewed. This differs from the information that was presented in reports reviewed as part of the First Annual Inspection report. It is recommended that TSS detail be consistently provided in Spill Reports. While it is noted that contaminated soils were excavated and disposed of “in accordance with Baffinland’s Hazardous Materials and Hazardous Waste Management Plan,” the reports do not provide any indication as to how Baffinland personnel confirmed the depth and extent of contaminated materials to be removed, or state exactly where contaminated materials were placed. Inclusion of that information would enable more effective review of these reports and confirmation of the specific measures taken by Baffinland personnel at each spill occurrence to protect Inuit Owned Land and to mitigate any occurrence with possible deleterious or undesirable effects. This is especially relevant in instances where hydrocarbon contamination has

occurred. It is also recommended that all future spill reports consistently include: a spill report number, the coordinates of the spill location, a map indicating the location of the spill and the area(s) where repairs or remediation activities were completed. Where possible, reference locations on the map should be indicated in any pre and post spill photographs to enable easy review of remediation activities.

Site Inspection Observations

The September Inspection included stops at the following locations: Waste Rock Facility Surface Water Management Pond and Water Treatment Plant (Figure 8), several benches in the Active Mining Area (Figure 8), KM 106 Ore Storage Facility (Figure 9), area west and south of the collection pond downstream of the KM 106 stockpile (Figure 10), KM 105 Sedimentation Pond (both embankments and along the downstream toe of the northwest embankment, Figure 10, Figure 11), Crusher Pad (Figure 12), the Landfill and areas along the Tote Road in the vicinity of Sailiivik Camp (Figure 13), building infrastructure east of Camp Lake and west of the Helicopter Hangar (Figure 15, Figure 16), various stops along the Tote Road (Figure 3, Figure 4); the ship loader at Milne Port, and the areas adjacent to the surface water management ponds downstream of the ore stockpiles at Milne Port.

The Inspectors were accompanied on both days of the Inspection by Mr. Todd Swenson (Environmental Superintendent). Additionally, Mr. Rob Turner (Mine Operations Superintendent) provided insight for inspection stops east of the Crusher Pad; Mr. Lee Miller (Crusher Superintendent) provided a tour of crusher operations; Mr. Jason Lubbe (Site Services) provided insight to all repairs and civil works completed along the Tote Road west and north of Sailiivik Camp; and Mr. Hugh Gibbs (Environment Department) accompanied Inspectors during inspections of locations at Milne Port.

While detailed observations and recommendations are provided in the tracking tables provided with this report, the following points are considered deserving of special mention and attention:

Waste Rock Facility Surface Water Management Pond (WRF SWMP)

- Confirmation about whether the secondary collection pond downstream of the WRF SWMP is lined is critical. While it is understood that the liner of the WRF SWMP will be repaired, the secondary collection pond would not provide effective containment for any seepage reporting to it from the WRF SWMP if the facility is unlined. While QIA will review the design drawings filed with the original project application and follow up with Baffinland as may be warranted following that review, the absence of effective contact water containment is material to Baffinland's ability to fulfil its obligations to protect Inuit Owned Land from infiltration of potentially deleterious materials, especially those collected at the WRF SWMP. Consequently, knowledge about the various containment mechanisms for site infrastructure is considered essential to upholding the expectations set forth under the Water Licence.

Active Mining Area

- The ability to inspect sites within the Active Mining Area – specifically the 480, 570 and 620 benches – was appreciated. The visit improved Inspector understanding of how contact water from the active mining area is managed: either pumped from the collection sump on the 480 bench up to the WRF SWMP or conveyed via surface ditching along the mine haul road into the KM 105 sedimentation pond.
- Distinct weathering facies were observed in the pit highwall and on the floor of the 480 bench. The ability to review mineralogical data for these facies and the various ore components producing the minus 10mm and minus 39mm ore products would support characterization of ultrafines sources at the site.

KM 106 Ore Storage Facility (OSF)

- The relocation of failed ultrafines from the June 22, 2023, spill event, and management's decision to direct new ore fines to an area adjacent to the southeast toe of the KM 106 OSF is commendable (Figure 9). This action demonstrates operation's understanding of the potential hazards associated with including ultrafines within the OSF, especially when stored at angles of repose suitable to store waste rock. Additionally, the actions taken by Baffinland demonstrate a commitment to personnel and operational safety.
- The area located west and south of the KM 106 OSF SWMP (Figure 10) should be monitored to explore whether some portion of contact water from the active mining area may be running subsurface through an area of natural ground with an open structure located between the mine haul road and the southwest perimeter of the KM 106 OSF. The channel upstream of monitoring point MQ-C-E showed evidence of sediment transport during a runoff event that had occurred prior to the Inspection. This investigation is necessary to ensure that contact water from the mining area continues to be captured using the appropriate stie infrastructure and is not inadvertently finding a path into fish bearing waters nearby.

KM 105 Sedimentation Pond

- The trough that existed along the crest and upper reaches of the upstream face of the South Embankment (Figure 11) observed during the June 2023 Inspection remained in a state of disrepair at the time of the September 2023 Inspection. The trough enables both accumulation of snow and ice and further development of erosion features that were observed in the upper reaches of the upstream slope and in some cases, to the exposure of the liner. Repair of this area of the South Embankment is deemed necessary to restore the design section of this facility but also to avoid further erosional damage to this component of the sedimentation pond.
- The Inspectors look forward to reviewing the remediation plan proposed by Baffinland's third-party Engineer-of-Record (EOR). Additionally, the Inspectors recommend enabling a secondary capture and treatment system using the geobags that were observed adjacent to the downstream toe of the NW Embankment at the time of the Inspection. While it is understood that this secondary system would need to be more carefully designed to ensure its effectiveness, it is recommended that this system be on standby prior to and during the 2024 freshet. This would demonstrate Baffinland's commitment to averting a repeat of an undesirable and unacceptable extended period of TSS exceedance in the waters downstream of the KM 105 Sedimentation Pond (namely Sheardown Lake), by not solely relying on installation of a grout curtain – proposed by the EOR - to arrest future infiltration through KM 105 NW Embankment materials.

Crusher Pad

- The use of bespoke screens and blinds installed at strategic locations on crushing and conveying equipment at the Mary River site demonstrated Baffinland's efforts to manage fugitive dust generated during crushing activities. Awareness of dust problems, the conditions and times throughout the year where dusting challenges are elevated, and knowledge of planned trials to assess technologies that could further reduce dust issues by the Crusher Superintendent demonstrates a level of ownership and commitment by Baffinland to addressing challenges associated with fugitive fines and "dust" in this area of the site that is commendable and is commended.

Tote Road Ditches and Runoff Management Infrastructure

- Installation of rip rap lined drainage approaches, swales, and check dams at various locations along the Tote Road (Figure 3, Figure 4, and Figure 13) demonstrates Baffinland's efforts up to the time of the Inspection to address the significant concerns raised by the Inspectors during the June 2023 Inspection regarding an overall need for much improved TSS management across the

entire site. The efforts made by Baffinland in this regard, are noted as a positive start to address an issue of persisting concern to the Inspectors, even if additional works are efforts are required. It was also noted that at several of these locations, the surface of riprap should be cleaned as part of annual maintenance using a vac truck. Removal of accumulated dust and sediment on riprap surfaces reduces sources of sediment loading to receiving waters as well as allows the installed armored surface to function effectively.

- Use of coconut coir logs at several locations along the Tote Road was noted and commended by the Inspectors to site personnel present. Because of their enhanced filtering and sediment capturing capability, the Inspectors recommend that use of coir logs supersede use of silt fences as part of sediment control infrastructure at the project site.

Milne Port

- The southwest, west, and south sides of port infrastructure down-wind of the ore stockpiles indicate that fine-grained ore is consistently transported and deposited when the wind is blowing from these directions. It is recommended that air quality monitoring devices – like the Purple Air devices being trialled at the time of the second Inspection - be installed on infrastructure surfaces showing signs of fines deposition and accumulation. The installed orientation of each monitor should also be logged to enhance analysis and interpretation of all collected data.
- Thick layers ore deposited fine grained ore were found on natural ground west of the ore stockpile (Figure 5).

Overall TSS Management at the Site

- Indication by the Environmental Superintendent that two Baffinland staff will complete training to become Certified Inspectors of Sediment and Erosion Control (CISEC) is noted and affirmed by the Inspectors.
- The use and testing of PurpleAir™ monitors to remotely measure fine particulate matter (PM 2.5 microns), temperature, pressure, and humidity data is noted and encouraged by the Inspectors. The ability to combine collected directionally noted air quality data with targeted windspeed and direction data will dramatically improve data needed to better understand fugitive dust emissions at the site. It is also important that the elevation and orientation of all air quality monitoring devices be included in the data set for each installation.

Responses to Information Requests

To enable a broader scope of consideration for the persisting challenge with fugitive dust at the mine site, as well as to understand the assessment and plans made by third-party geotechnical consultants to Baffinland related to both management of ultrafines in the ore stockpile as well as mitigation of foundation seepage beneath the northwest embankment dam at KM 105, the Inspectors requested additional information following completion of the September 2023 Inspection. Baffinland provided responses to these requests in a letter dated October 31, 2023.

The information provided by Baffinland will enable QIA's deeper assessment of the topics of interest and is appreciated. The response also documented Baffinland' s dust suppression product trials and identified critical documents to be accessed to develop the depth of understanding desired, especially as it relates to the overall Tote Road sediment control plan. This information will enable QIA to provide any additional feedback related to these topics later.

The following responses warrant additional comment:

- While qualitative descriptions of aggregate taken from the Q1 quarry (just south of Milne Port) used to create the Tote Road's running surface provide some insight, receipt of the actual mineralogical assessment of these materials is requested to support an investigation into possible

sources of microfine generation at the site, and especially related to dust generation along the Tote Road.

- The responses provided state that "the Tote Road is managed in accordance with the approved Roads Management Plan, which is reviewed and updated regularly to address operational changes." While this may technically be the case, the September 2023 Inspection is the third one attended by the Inspectors where only one water truck was reported to be in service while dust generated by OHTs using the Tote Road was observed to be consistently significant and persistent. This observation suggests that more action is still needed by Baffinland to effectively implement the Roads Management Plan or to significantly overhaul the procedures that would enable more frequent and consistent use of more than one water truck to suppress dust generated along the Tote Road.
- The Inspectors look forward to receiving and reviewing the plan prepared by Baffinland's third-party EOR (EBA TetraTech) to install a grout curtain to mitigate the flow of water beneath the northwest embankment of the KM105 sedimentation pond.

Closing

It is our professional opinion that Baffinland must continue to reduce the overall number of spills and particularly those related to elevated TSS. While extended periods of elevated TSS appear to primarily occur during freshet, onboarding of two CISEC trained personnel is encouraging to the Inspectors and is hoped to become a driver for significant improvement to overall sediment management across the entire site across the year. Additionally, because of the importance of protecting Inuit Owned Land so that Inuit life ways and practices can be preserved, it is hoped that Baffinland with seize and capitalize on opportunities presented by robust maintenance, monitoring, and evaluations to proactively manage sediment and dust pollution across the site prior to occurrences where TSS threshold levels are exceeded.

We also look forward to receiving the mitigation plan for KM 105 sedimentation pond as well as changes to the Tote Road and dust management plans for the site that demonstrate and document the effectiveness of implemented measures. We also look forward to what is learned from trialling the PurpleAir monitors across the site, and especially in areas where elevated levels of dust and dusting have been observed.

For further description of concerns and requested actions, please see tables below. We have included an additional column which describes whether the concern and requested actions from prior site inspections were addressed, partially addressed or not. New or updated recommended actions are in bold.

Should you wish to discuss any aspects of this letter, please feel free to contact either of the undersigned.

Sincerely,

Lois Boxill, Ph.D., P.Eng.
Mine Closure, Land Reclamation
and Development Impact Specialist
Mining Impact Specialists Ltd.

Joseph Cavallo
Senior Biologist
LGL Limited,
Environmental Research Associates

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
1	KM105 Pond Sedimentation Pond (North Embankment)	**June and September 2023 Inspection:** Seepage under the constructed dam structure related to the incident on July 14/15, 2022, and May 20, 2023.	See table with MISL Recommended Actions based on their technical review of embankment seepage issues.	Yes, but attempts to repair have been unsuccessful
2	KM 105 Sedimentation Pond (South Embankment)	**June and September 2023 Inspection:** Significant failure of the upstream slope	See table with MISL Recommended Actions based on their technical review of slope failure issues.	No action observed
3	Throughout the project area but particularly along the Tote Road	**June and September 2023 Inspection:** Excessive amounts of dust from heavy equipment and haul trucks observed throughout the project areas, but particularly along the Tote Road. The dust appears to be originating from the road surface and is mobilized by tires. During our travels on the Tote Road, few water trucks were observed spraying the road surface. Tundra vegetation including shrubs, grasses, mosses, sedges, and lichens were observed with considerable amounts of road dust coating their surfaces which could inhibit their ability to	We understand that dust suppressants have been used, however their effectiveness during our visit was questioned. We suggest the following: • Regular schedule of water trucks to continually spray the road surface to discourage any mobilization of dust (depending on time of year). • Increase the number of water trucks available at any given time. • An effective early notification system is required to alert managers when dust levels are increasing;	No effective dust suppression action observed

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
		photosynthesize, grow and propagate.	• Regularly wash heavy equipment to remove sediments and dust; • Monitor airborne dust levels and the accumulation of dust on the tundra; • Develop a monitoring methodology for dust dispersion to determine 'hot spots' and to determine various levels of impacts; • Monitor the long-term health of tundra vegetation within an area of impact determined on the above. The commercial dust suppressant used by BIM road maintenance staff will continue to be used however, we ask that the concentration of the mixture should be evaluated to see if the presence of ultrafines on the Tote Road is altering the effectiveness at the concentration previously used. The number of water trucks and the amount of water being sprayed on the roads is still far below recommended.	

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
			We ask that a summary of the impacts to tundra vegetation be provided. **We understand that road dust suppression alternatives used in other cold climate conditions will be explored. Some were discussed during our inspection.**	
4	Immediately downstream of pond KM105	**June 2023 Inspection:** Fine sediments (silt/clay) were observed in the areas downstream of the KM105 dam. These sediments are believed to be a result of the dam bypass incident of July 14/15, 2022 and May 20, 2023 (Appendix A Photo 1). The sediments appear to be fine silts/clays, likely from imported construction material. These introduced fine sediments have the potential to change the shallow soil characteristics (nutrient balance, pH, and other edaphic characteristics) and have an altering effect on the native vegetation.	• Remediation of the KM105 pond dam and upstream channel (in progress) will minimize the amounts of fine sediments able to travel downstream; • Continue to monitor turbidity, water levels and chemical parameters in pond KM105. • Increased ESC controls should be employed to minimize entrained sediments and encourage settling (turbidity curtains, silt fencing, filter logs, etc.)	Yes, but attempts to repair Km105 pond have been unsuccessful. **Remedial efforts observed (Geobag) during September 2023 inspection will provide some level of treatment due to the failure of the dam.**

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
		September 2023 Inspection: A large 'Geobag" was observed to aid in the removal of fine sediment materials from turbid effluent. This is a commendable effort. (Appendix A Photo 2)		
5	Immediately south of the mine road adjacent to the Sheardown Lake Tributary	**June 2023 Inspection:** The mine road is immediately adjacent to the Sheardown Lake tributary for approximately 200 m on the south side of the mine road. There is a potential for sediments from the road to directly enter the tributary following rain and snowmelt events (Appendix A Photo 3). **September 2023 Inspection:** Rock has been placed along the slope to prevent fine sediments from entering the tributary.	• Sediment control fencing or other method of erosion and sediment control (ESC) should be installed at the base of the road to minimize/prevent future sedimentation impacts.	**This concern has been addressed since the June 2023 inspection.**
6	Phillips Creek crossing at KM17	**June 2023 Inspection:** The face of the sheet piles on the old bridge abutments are damaged. These are on the south side of the Tote Road on the east and west side of the stream. Find sediments are exposed to erosion and have the potential to enter Phillips Creek.	• Place ESCs at the base of the abutments to prevent any fine sediments from entering Phillips Creek; • Remove the old abutments and the fine materials from these two areas • Place coarse rock in disturbed areas to stabilize slopes and prevent fine	**This concern has been addressed since the June 2023 inspection.**

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
		September 2023 Inspection: The old abutments have been removed on the west side of the river and rock has been placed to stabilize the slopes (Appendix A Photos 4 and 5).	sediments from entering Phillips Creek.	
7	Waste Rock Facility Water Treatment Plant at top of Mine Site	**June and September 2023 Inspection:** We observed the Treatment Plant at the top of the Mine Site where ferric-flocculant- lime treatment train was in use to mitigate low pH runoff from the mining areas. Effluent was discharged several hundred metres to the east onto the tundra. No issues were noted on the date of observation. **September 2023 Inspection:** We understand that some seepage through the treatment pond side slope to the tundra had occurred but we did not observe any seepage or negative effects (Appendix A Photo 6).	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances; • Ensure contingency plan in the event of large quantities of runoff exceeding capability of the treatment infrastructure.	Work on this facility has been completed to improve the function of the treatment plant. Monitor the seepage issue through the treatment pond side slope and address the possible cause.
8	Pond KM107	**June 2023 Inspection:** Pond MS107 used to treat runoff from ore stockpile. Our understanding is that treatment is mainly for TSS.	• Continue to monitor turbidity and other chemical parameters of effluent and ensure no exceedances; • Ensure contingency plan in the event of large quantities	The ultrafine materials previously placed on the stockpile have been moved to a safe location.

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
		Observed in June was the failure of the slope containing ultrafine ore material along the stockpile. **September 2023 Inspection:** The gully west of the treatment pond contained relatively high amounts of fine sediments of unknown origin. These fines have the potential to enter the Mary River downstream (Appendix A Photos 7 and 8).	of runoff exceeding capability of the treatment infrastructure.	Monitor the fine materials in the gully and address the possible cause.
9	SDCT-1 Tributary at Km63	In 2022, Ninespine Stickleback (*Pungitius pungitius*) were stranded in a pool downstream of two perched CSP's on the west side of the mine road. **June and September 2023 Inspection:** Streambank erosion has occurred downstream of the two CSP culverts due to scour (Appendix A Photos 9 and 10)	• Mitigate the perched condition of the CSP's to ensure free passage of fish through the structure.	No action observed. We understand these CSP's will be placed at proper elevation to remove the barrier to fish.
10	Milne Port Loading Area	Loading of ship was occurring at time of observation (Appendix A Photo 11).	• Although not observed at time of inspection, the dust levels should be minimized on the loading infrastructure (conveyors, chutes, etc.), stockpiles and in other areas	No action required

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
			to prevent dust from dispersing.	
11	Ditches along the Mine Haul Road	**June and September 2023 Inspection:** The informal ditches are collecting road and hillslope runoff and is flowing downstream unchecked and with no controls for high flow periods.	• As discussed, the ditches should be reconstructed and sized to convey high flows, and rock check dams should be installed per typical specifications to reduce velocities, allow for settling and to reduce erosion in the ditches. • Reduction of TSS entering Km105 pond in upstream catchment will significantly aid in reducing treatment issues in the control pond.	No action observed. We understand that the ditches are to be reconstructed in the future
12	Km85 Stream Crossing	**June 2023 Inspection:** Fine sediments are entering the stream and causing turbidity **September 2023 Inspection:** Rock has been placed throughout areas previously noted as eroding (Appendix A Photo 12)	• More robust ESC controls should be implemented and maintained. • A maintenance staff and program are recommended to respond to issues in a timely and effective manner. Issues should be proactively addressed (i.e., prior to spring freshet).	**This concern has been addressed since the June 2023 inspection.**
13	Km80 Stream Crossing	**June 2023 Inspection:** Fine sediments are entering the stream due to deteriorated sediment control fencing	• More robust ESC controls should be implemented and maintained.	**This concern has been addressed since the June 2023 inspection.**

LGL Limited – Ecological Review of the Mary River Project				
Item No.	**Project Location**	**Description of Concern**	**QIA Requested Action**	**Has the Concern Been Addressed from Previous Recommendations**
		(Appendix A – Photo 13, 14 and 15) **September 2023 Inspection:** Sediment control fencing and coir logs were installed to control sediment from entering the watercourse	• A maintenance staff and program are recommended to respond to issues in a timely and effective manner. Issues should be proactively addressed (i.e., prior to spring freshet).	

Mining Impact Specialists Ltd. – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**Requested Action**
14	KM105 Sedimentation Pond - Northwest Embankment	**June 2023 Inspection:** Steady water flow emerging from downstream toe of the Northwest Embankment adjacent to its North Abutment - believed to have resulted from the piping phenomena that led to the spill incident on July 14/15, 2022.	**June 2023:** • Develop a remediation plan that ensures cut-off of sedimentation pond water from the embankment's foundation, especially along the North Embankment's basal contact with the North Abutment (aka its right abutment) and along the toe of the embankment's upstream slope. This plan should include actions to preserve and protect permafrost, especially in areas adjacent to the upstream toe of the Northwest Embankment. **September 2023:** • Review remediation plan prepared by the EOR to see if actions above flagged in June 2023 have been addressed. • Have secondary containment and filtering system on standby prior to start of 2024 freshet
15	KM105 Sedimentation Pond - Northwest Embankment	**June 2023 Inspection:** Flushing of finer grained embankment construction materials from the lowest 1m of embankment's base along its contact with the North Abutment.	**June 2023:** • Develop a plan to seal the existing flow through zone/pipe that actively conveys water reporting to the upstream toe of the Northwest Embankment along its basal contact with the North Abutment. • Effectively seal the flow-through zone. **September 2023:** • Review remediation plan prepared by the EOR to see if actions above flagged in June 2023 have been addressed.

Mining Impact Specialists Ltd. – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**Requested Action**
			• Have secondary containment and filtering system on standby prior to start of 2024 freshet
16	KM105 Sedimentation Pond - Northwest Embankment	**June 2023 Inspection:** Possible melting of upper reaches of permafrost, and creation of a progressive thawing front along the entirety of the contact between the North Abutment's base and the Northwest Embankment.	**June 2023:** • Provide map showing the location and installation depth of thermistors at locations DT2040-02660, DT2040-02871, DT2040-02873 and DT2040-02876 whose data for Thermistors 6 and 7 indicate thawed zone). All thermistor locations except DT2040_02873 indicate warming trends up to marginally freezing temperatures. • Install additional thermistors at depths where the top of the permafrost horizon is thought to exist beneath the base of the Northwest Embankment if thermistors have not already been installed at the proposed locations. • Based on temperature measurements, determine if mitigative actions are necessary to avoid further or accelerated thawing of permafrost (if possible), and whether melting permafrost may impact the structural integrity of the Northwest Embankment's foundation and superstructure.
17	KM105 Sedimentation Pond - Northwest Embankment	Potential for possible water ingress along the upstream toe of the Northwest Embankment caused by the existence of conditions like those that resulted in the July 14/15 seepage event.	**June 2023** • Ensure that the remediation plan for the Northwest Embankment extends upstream of the toe of this embankment

Mining Impact Specialists Ltd. – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**Requested Action**
			to avoid water ingress into the dam foundation. **September 2023:** • Review remediation plan prepared by the EOR to see if actions above flagged in June 2023 have been addressed. • Have secondary containment and filtering system on standby prior to start of 2024 freshet
18	KM105 Sedimentation Pond - South Embankment	**June 2023 Inspection:** Extensive slumping of the upper third of the upstream slope and no evidence of geotextile on top of the HDPE liner **September 2023 Inspection:** Slumped materials from the upstream crest edge and uppermost reaches of the upstream slope of the south embankment remain in the same condition in which they were observed in June 2023. Erosion features in slumped materials were observed with the geomembrane exposed in several locations. The slumped materials have created a trough in which snow and ice can accumulate during the winter months.	**June 2023:** • Ensure remediation plan includes installation of geotextile on top of the geomembrane to prevent embankment materials placed on the upstream slope of the South Embankment from slumping. The geotextile should be anchored into a trench beneath the crest. • Crest and upstream slope embankment materials must all placed and adequately compacted to stabilize the crest so that it can be used as a trafficable surface by light vehicles. It is noted that the current crest does not provide a safety berm along the edge adjacent to the upstream slope and as such does not comply with requirements for a mine haul road used by any vehicle larger than a 1-ton pickup truck. **September 2023:** • Remediate previous damage to avoid further degradation or erosion of embankment materials.

Mining Impact Specialists Ltd. – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**Requested Action**
19	Tote Road (KM 105 through KM 17)	**September 2023:** • Dust and fine-grained sediment were observed on the surfaces of rip rap used to line runoff management infrastructure like armored swales, drainage channels and ditches.	**September 2023:** • Include removal of sediment on armored surfaces as part of an annual sediment control structure maintenance plan. • Remove debris and sediment that has accumulated against the upstream side of installed coconut coir logs.
20	Tote Road (KM 105 through KM 17)	**September 2023:** • Silt fences in various states of disrepair used independently or with sediment control structures along the Tote Road.	**September 2023:** • Strategically replace all existing silt fences with coconut coir logs. • Use coconut coir logs in combination with maintained sediment control structures to drastically reduce the amount of sediment reporting to fish-bearing waters along the Tote Road.
21	Tote Road (KM 7)	**September 2023:** • Extensive erosion of surface materials (sands and gravels) leading to undermining ground stability at staging area where light trucks and other vehicles are stored. Ground beneath at least one light truck has almost completed been washed away creating an unsafe condition and potential for at least damage or total loss of a vehicle into a downstream ravine that also appears to be deepening through erosion.	**September 2023:** • Relocate vehicles from within the limits of the developing erosion gulley. • Design and install properly armored storm management channel to mitigation further development of the existing gully.
22	Tote Road (entire alignment)	**September 2023:** • Quarried rock (from Q1 quarry) could be a source of ultrafines contributing to the extensive and	**September 2023:** • Provide mineralogical data to QIA for ore and aggregates used to build the Tote Road. The data will be reviewed to

Mining Impact Specialists Ltd. – Geotechnical and Geo-Environmental Review of the Mary River Project			
Item No.	**Project Location**	**Description of Concern**	**Requested Action**
		persisting dust generated during OHT use of the Tote Road. • Only one water truck reported to be operational at time of Inspection.	assess and identify sources of ultrafines and support identification of possible ways to improve dust management at the site. • Develop a program to demonstrate how measures included in Baffinland's Tote Road management plan is effectively managing dust along the Tote Road alignment.
23	Milne Port Ship loading Infrastructure	**September 2023:** • Significant fine-grained ore observed caking the west, southwest and south faces of ship loading equipment and covered structures downwind of ore stockpiles.	**September 2023:** • Install air quality monitoring devices with capabilities similar to those of the Purple Air units being trialled at the time of the Inspection to collect better data about wind direction, frequency and amount of fines transported from the ore stockpiles at Milne Port. • Ensure that directional information is recorded for all air quality monitoring devices.

Appendix A
LGL Photographs

Photo 1 – Fine sediments accumulating downstream oi dam at km105 (Sep 2023).

Photo 2 – Geobag downstream of dam/pond at km105 (Sep 2023).

Photo 3 – Immediately south of the mine road adjacent to the Sheardown Lake Tributary (Sep 2023).

Photo 4 – Phillips Creek crossing at km17 (Sep 2023).

Photo 5 – Phillips Creek crossing at km17 (Sep 2023).

Photo 6 – Waste Rock Facility treatment pond berm where seepage had been reported (Sep 2023).

Photo 7 – Gully west of the km107 treatment pond where fines were observed (Sep 2023).

Photo 8 – Gully west of the km107 treatment pond where fines were observed (Sep 2023).

Photo 9 –SDCT-1 Tributary at km63 perched culverts (Sep 2023).

Photo 10 –SDCT-1 Tributary at km63 streambank erosion (Sep 2023).

Photo 11 – Milne Port active loading of ship (Sep 2023).

Photo 12 – Km85 watercourse crossing where erosion control with rock has taken place (Sep 2023).

Photo 13 – km80 watercourse crossing where ESC measures have been implemented (Sep 2023).

Photo 14 – km80 watercourse crossing where ESC measures have been implemented (Sep 2023).

Photo 15 – km80 watercourse crossing where ESC measures have been implemented (Sep 2023).

Appendix B
MISL Photographs

Photo 1: Secondary collection area downstream of Waste Rock Facility Surface Water Management Pond. It was unclear at the time of the Inspection whether this area is lined.

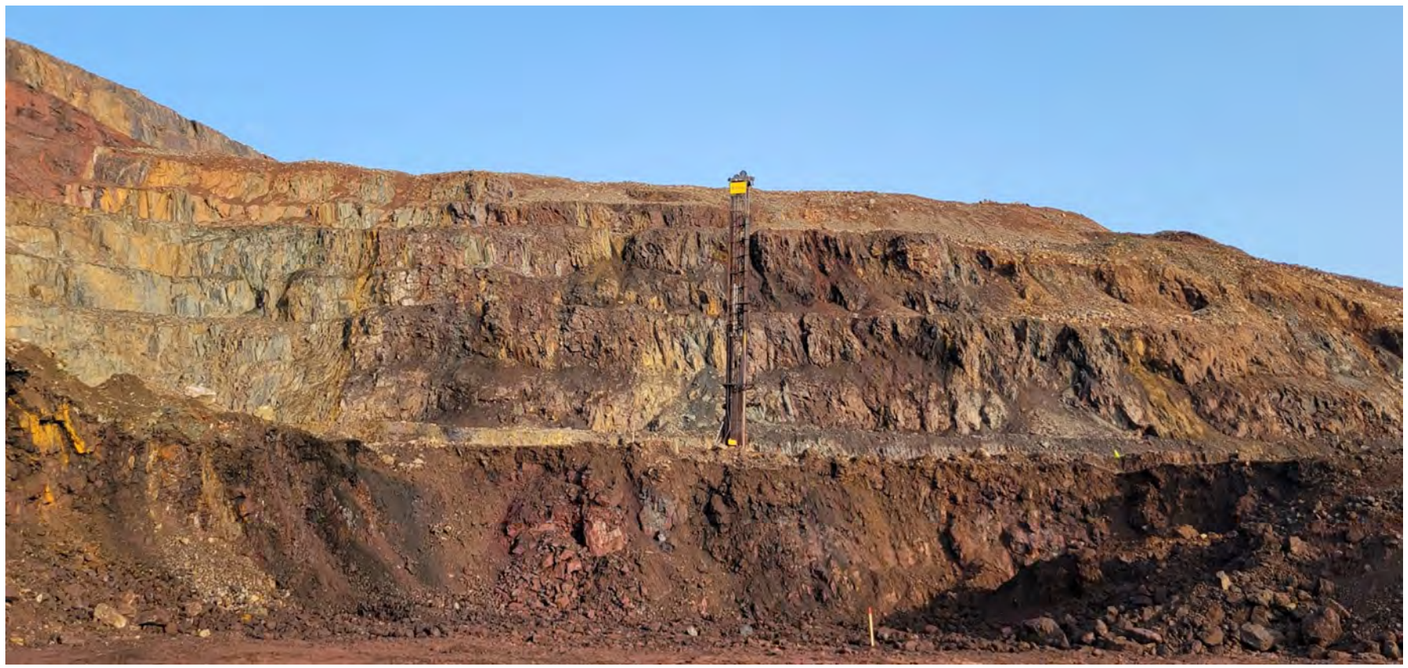

Photo 2: Close up of altered and weathered facies in pit wall.

MINING IMPACT SPECIALISTS LTD. ENABLING CHANGE TO SERVE FUTURE GENERATIONS.	LGL LIMITED Est. 1971 environmental research associates	2023 Mary River Project Site Visit #2		
Mining Impact Specialists Ltd.	LGL Limited	**Key Photos from September 2023 Inspection**		
		Date: 05 Dec 2023	Approved: LEB	Page: **1**

Photo 3: Area south and west of the southwest corner of the KM 106 Ore Stockpile with open geological structure that appears to allow water to flow through. Direction of water flow is shown.

MINING IMPACT SPECIALISTS LTD. ENABLING CHANGE TO SERVE FUTURE GENERATIONS	LGL LIMITED Est. 1971 environmental research associates	2023 Mary River Project Site Visit #2
Mining Impact Specialists Ltd.	LGL Limited	**Key Photos from September 2023 Inspection**
		Date: 05 Dec 2023 / Approved: LEB / Page: **2**

Photo 4: Downstream of area shown in Photo 3 showing evidence of previous water flow – area west and south of the KM 106 Surface Water Management Pond.

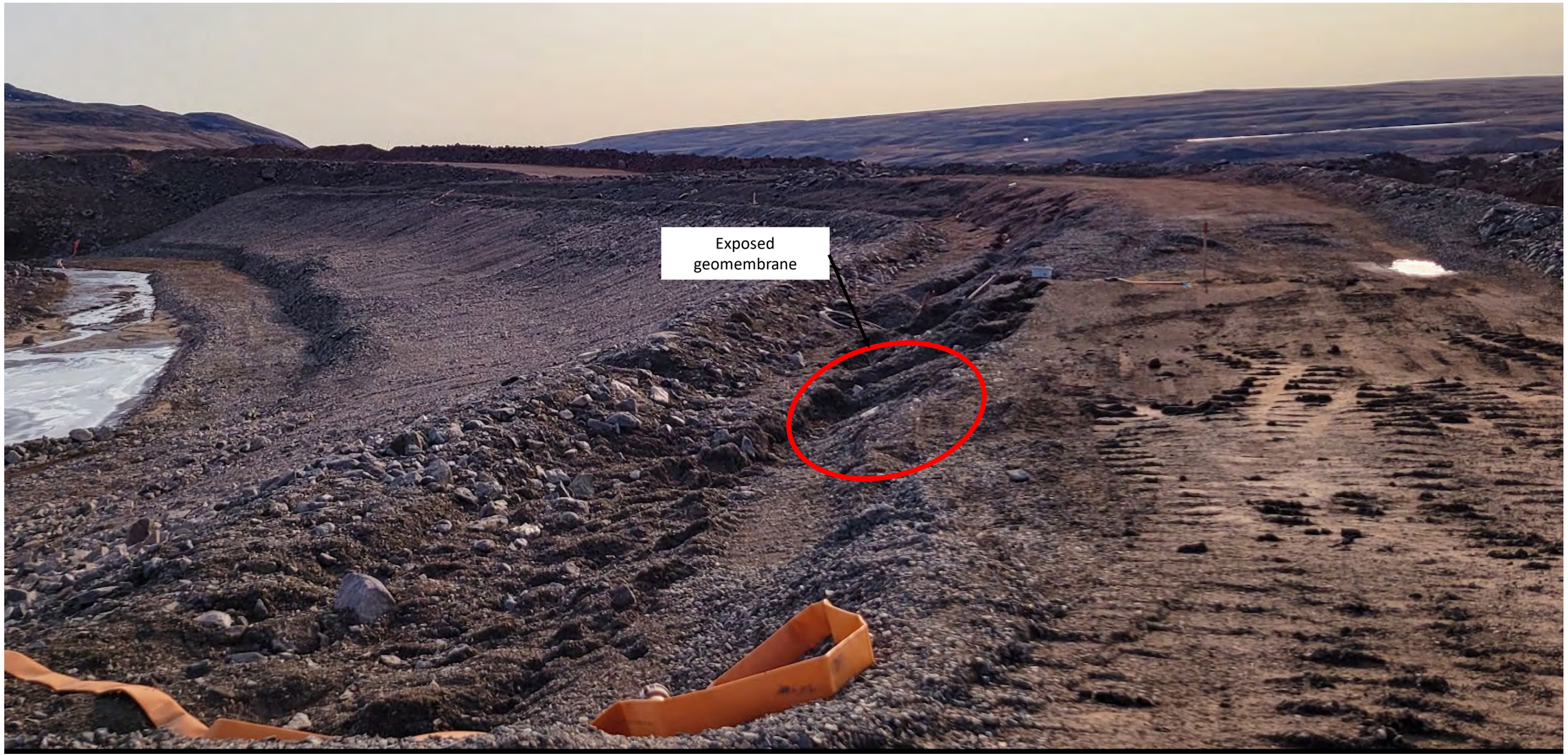

Photo 5: View of damaged crest and upper portion of the upstream slope of the KM 105 South Embankment. The damage to the uppermost surface the downstream slope continues to progress.

Photo 6: View of thick layers of deposited sediment in the base of the KM 105 pond.

Photo 7: View of pad extended northwards and adjacent to the downstream toe of the KM 105 Northwest Embankment. The black geobag (pictured) lies on top of a white geomembrane. At the time of the September 2023 Inspection, the geobag was not in use. Site personnel indicated that the system was installed at some point after the June 2023 Inspection to capture sediment laden water seeping from the toe of the embankment. It is recommended that this system be configured to provide an auxiliary line of defense to mitigate undesirable sediment loading to waters that ultimate report to Shear Down Lake. It was also noted that the pad created was extended beyond the original limits expected by QIA. A technical memo should summarize and provide details about the installation.

Photo 8A: Loose debris present outside of fence encircling the onsite landfill south of Sailiivik Camp (Figure 10). The amount of metal present within the landfill was notable and raised a question about the longterm fate of metal stored in that facility.

Photo 8B: Loose debris in water course that empties into Sheardown Lake that is downstream of the Landfill. The channel is also the continuation of the channel seen in Photo 8.

Photo 9: Significant volume of scrap steel and metal staged in area slightly north of the landfill.

Photo 10A: View of south side of Tote Road just east of Sailiivik Camp where armoring and sediment control civil works were completed in the period between the two independent environmental Inspections completed in 2023.

Photo 10B: View of north side of Tote Road just east of Sailiivik Camp where armoring and sediment control civil works were completed in the period between the two independent environmental Inspections completed in 2023.

Photo 11A: View of riprap covered in sediment upstream of the channel that convey water to Sheardown Lake. Annual maintenance should include removal of accumulated sediment to allow sediment control structures to work effectively during the annual freshet. The broken blue arrow shows the direction and flow path of the water course that heads towards Sheardown Lake. This area is located north of Sailiivik Camp but on the south side of the Tote Road. View looking northwest towards the laydown area.

Photo 11B: Closer view of side slope armoring upstream of channel conveying water to Sheardown Lake pictured in Photo 11A. Areas of accumulated sediment on the surface of rock armoring are evident and in need of cleaning prior to the onset of the 2023 freshet. A commonly observed condition of silt fences at the site where they have been installed in also seen left of the center of the photo. It is recommended that silt fences be replaced by coir logs which have improved filter and sediment capture capability with the added benefit of greater durability, especially in this application context.

Photo 12: View of areas on south bank of river at KM 80 crossing showing use of both a silt fence and a coconut coir log. This area should be monitored to ensure that sediment control measures work as desired and adequately mitigate sediment runoff into the adjacent water body.