APPENDIX L PRELIMINARY GEOCHEMICAL MODELING

TETRA TECH EBA

TREASURY METALS GOLIATH GOLD PROJECT EIS SUBMISSION (GEOCHEMISTRY COMPONENTS)

PRESENTED TO

TT WEI

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ACRONYMS & ABBREVIATIONS

%	Percent
ABA	Acid Base Accounting
AP	Acid Potential
ARD	Acid Rock Drainage
BS	Biotite Schist
BMS	Biotite Muscovite Schist
%C	Percent Carbon
CCME	Canadian Council of Ministers of the Environment
CIL	Carbon-in-leach
COPCs	Constituents of Potential Concern
EIS	Environmental Impact Statement
HCT	Humidity Cell Test
Kg	kilogram
Kg $CaCO_3$/t	kilograms of calcium carbonate per tonne of material
km	Kilometer
L	Litre
LGO	Low-grade ore stockpile
MEND	Mine Environment Neutral Drainage
ML	Metal Leaching
MMER	Metal Mining Effluent Requirements
MSS	Muscovite Sericite Schist
MSED	Meta-Sediment
NP	Neutralization Potential
NPR	Neutralization Potential Ratio
OMOE	Ontario Ministry of Environment
PAG	Potentially Acid Generating
PWQO	Provincial Water Quality Objectives
%S	Percent Sulphur
SFE	Shake Flask Extraction
t	tonne
TSF	Tailings Storage Facility
WAD	Weak Acid Dissociable
WRSA	Waste Rock Storage Area

LIMITATIONS OF REPORT

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1.0 ACID ROCK DRAINAGE AND METAL LEACHING

Acid-rock drainage (ARD) and metal leaching (ML) geochemical characterization was undertaken for the Goliath Gold Project mine rock components with the potential to leach acid and metals during mining. These data and information have been used in the development of the overall mine plan and applicable environmental management plans, as well as in the predictive water quality assessments to assist in predicting possible effects and mitigation requirements for the Project.

The ARD/ML characterization and prediction studies were completed by EcoMetrix Inc. (EcoMetrix) in accordance with recommendations presented in the Mine Environment Neutral Drainage (MEND) “Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials, MEND Report 1.20.1 (MEND, 2009)”. This document represents an update to the “Draft Guidelines and Recommended Methods for the Prediction of Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia” prepared for the British Columbia Ministry of Energy and Mines (Price, 1997), and referenced in Regulation 240/00 of the Ontario Mining Act.

1.1 History of Geochemical Characterization Studies

The first record of geochemical characterization for the Goliath Project site is from 1997 when NAR Environmental collected five rock samples for acid base accounting (ABA) analyses as part of their closure plan (NAR, 1997). The preliminary results from these five samples triggered the collection of an additional 25 samples for ABA analyses. There was limited activity on the project between 1999 and 2008. Treasury Metals assumed ownership of the project in 2008, and initiated additional geochemical characterization analyses in 2012 as part of the Environmental Baseline studies. During the Environmental Baseline studies, 54 drill core samples were selected and submitted for ABA and whole rock metals analysis (KCB, 2012). These studies subsequently led into the ongoing geochemical characterization work being completed by EcoMetrix which is outlined in the proceeding sections. Samples collected and analyzed prior to 2012 have not been considered in the ongoing geochemical characterization program. The information presented in this EIS documents references the “Geochemical Evaluation of the Goliath Gold Project (Draft)” (EcoMetrix, 2014).

2.0 DEPOSIT GEOLOGY AND GEOCHEMICAL SETTING

The deposit mineralized zones are tabular composite units defined on the basis of anomalous to strongly elevated gold concentrations, increased sulphide content and distinctive altered rock units and are concordant to the local stratigraphic units. Stratigraphically, gold mineralization is contained in an approximately 100 to 150 m wide central zone composed of intensely altered felsic metavolcanic rocks (quartz-sericite and biotite-muscovite schist) with minor metasedimentary rocks. Overlying hanging-wall rocks consist of altered felsic metavolcanic rocks (sericite schist, biotite-muscovite schist and metasedimentary rocks) with the footwall comprising metasedimentary rocks with minor porphyries, felsic gneiss and schist. Gold within the central unit is concentrated in a pyritic (phyllic) alteration zone, consisting of quartz-sericite schist (MSS), quartz-eye gneiss, and quartz-feldspar gneiss.

3.0 PROJECT COMPONENTS

The proposed open pit will produce ore and four primary types of mine waste rock. The ore processing component of the Project will generate tailings. Additional quarry sources have been identified to supply construction material needed for the project. The geochemical characterization considers the range of rock materials generated over the life of the mine.

3.1 Mine Waste Rock

Mine waste rock is defined as rock that will be excavated from the active mining areas, and does not have sufficient ore grades to process for mineral extraction. It is estimated that approximately 46 million tonnes of mine waste rock will be generated from both underground and open pit operations over the over the life of the mine.

The mine waste rock has been subdivided into four primary rock types, which include Biotite Muscovite Schist (BMS), Biotite Schist (BS), Muscovite Sericite Schist (MSS), and Meta-Sediment (MSED). The estimated proportions of the four mine waste rock types in the proposed open pit and underground mine areas is presented in Table 3-1 (from Mark Wheeler, email communication).

Table 3-1: Estimated Volumes of Mine Waste Rock

Waste Rock Type	Relative Proportions of Each Waste Rock Type		
	Estimated Volume (m^3)	**Estimated Tonnage (Metric Tonnes)**	**Proportion of Total (%)**
Biotite Muscovite Schist (BMS)	~15.9 million	~32.2 million	70%
Biotite Schist (BS)			
Muscovite Sericite Schist (MSS)	~3.4 million	~6.9 million	15%
Metasediment (MSED)	~3.4 million	~6.9 million	15%
Total	**~22.7 million**	**~46 million**	**100%**

3.2 Tailings

Lycopodium Minerals Canada Ltd. (Lycopodium) produced a Process Optimization Study (Lycopodium, March 2014) for the project, identifying the Project as a free-milling gold deposit with ore material containing coarse gold and that is readily amenable to conventional processing options. The ore processing plant will process approximately 2,500 tonnes per day over the mine life using gravity concentration of free gold followed by Carbon in Leach (CIL) cyanidation. Process tailings will be placed and stored in an engineered Tailings Storage Facility (TSF).

3.3 Low-grade Ore

A low-grade ore stockpile (LGO) will be maintained over the mine life to allow blending of lower grade and higher grade ores to ensure a more consistent grade of ore to the processing plant. The LGO will be maintained throughout the initial years of mining and will be used to blend with the higher grade underground material until it is wholly consumed and fed to the process plant at the end of the mine life. It is expected that the ore stockpiles will be temporary, and that there will be ongoing replacement and turnover as the stockpiled ore is processed, and new ore from mining is placed in the stockpile.

Geochemical characterization of the low grade ore has not yet been completed. For the purposes of geochemical characterization, the MSS host rock has been used as a surrogate for the low grade ore as a preliminary approximation. Up to three separate stockpiles of varying grade will be used to feed the process plant.

3.4 Other Project Components

Geochemical characterization for quarry, excavation, and other potential construction materials has not yet been carried out, and will be done as the project design advances.

4.0 MATERIALS CHARACTERIZATION AND MANAGEMENT STUDIES

The geochemical characterization program has been an iterative process consisting of several sampling and analysis programs. The programs have served to obtain ARD/ML prediction information to be used for the water quality effects assessment and to determine mitigation requirements for the Project.

A preliminary geochemical assessment was completed in 2011 as part of the baseline studies for the site and involved the characterization of 54 drill core samples. An additional 112 drill core samples of potential mine rock material were selected and characterized in June 2012.

A summary of the characterization programs completed to date, including methodologies, analyses, and conclusions, are presented in EcoMetrix (2014). The geochemical characterization programs are ongoing with the intent and purpose of further refining the geochemical predictions and informing the mine rock management and handling strategies.

4.1 Methodology

The geochemical characterization program has included a suite of static and kinetic tests to evaluate short term static conditions and long term potential for acid generation and metal leaching. Characterization methods for the various project components included static and kinetic geochemical characterization tests. This includes acid-base accounting (ABA), whole rock metals (ICP-MS), shake flask extraction (SFE), humidity cell tests (HCT) and field cell tests. A complete summary of the geochemical characterization program and methodology for ARD/ML prediction is provided in EcoMetrix (2014).

ABA testing included paste pH, total sulphur, sulphate-sulphur, sulphide-sulphur, Modified Sobek NP, total carbon, total organic carbon, and total carbonate analyses. The results from these analyses were utilized to calculate the carbonate NP (Carb-NP), acid generating potential (AP), net neutralization potential (NNP), and Sobek NPR (ratio of Sobek NP to AP) and Carbonate NPR (Carb-NPR). Elemental analysis was completed to quantify the concentration of elements in the rock samples. An aqua regia digestion process was followed by an Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) scan. Shake flask extraction (SFE) metal leaching tests were used to assess the presence of potentially soluble elements and to understand their release during the initial stages of weathering. The shake flask extraction leachate was evaluated for pH, conductivity, hardness, sulphate and dissolved metals. SFE tests were run using both deionized water and a 0.1M HCl acid dissolution.

Table 4-1: Sample Numbers for Static Tests on Waste Rock Material

Waste Rock Type	Number of Samples			
	Acid Base Accounting	Whole Rock Metals Analysis	Shake Flask Extraction	
			Deionized Water	0.1M HCl Acid
Biotite Muscovite Schist (BMS)	52	67	13	5
Biotite Schist (BS)	16	20	4	2
Muscovite Sericite Schist (MSS)	35	59	8	3
Metasediment (MSED)	9	15	3	1
Total	**112**	**161**	**28**	**11**

Three humidity cell tests (HCT) with different sulphur content ranges were initiated for each of the BMS, MSS, and BS materials, respectively. Drill core samples were selected to create composite samples representing humidity cell samples with sulphur ranges of less than 0.25 %S, 0.25 %S to 1.00 %S, and greater than 1.00 %S for each of the three rock types. For the MSED material, two columns were initiated, less than 0.60 %S and greater than 0.60 %S. These ranges allow for appropriate evaluation of potential metal leaching from mine rock material and were designed to be suitable for water quality modeling required as part of a feasibility study and Environmental Assessment.

Four barrel tests were initiated in September 2012 at the Goliath Gold site. The barrels were constructed using one-half of a clean 170 L plastic barrel. Selected drill core segments (50 cm to 100 cm long), including both half cores and full cores, were placed in each barrel to represent mine rock material from each of the four material types. Approximately 78, 87, 90, and 88 kg of core samples were placed in the BMS, BS, MSS, and MSED barrels, respectively. The top of each barrel remained open so that mine rock samples were exposed to air and to precipitation falling as rain or snow. Each barrel has a bottom drain spout connected with tubing to pails where water collects between sampling events. Leachates from the barrel tests were analyzed at an accredited lab for general chemistry (pH, hardness, conductivity, total dissolved solids, alkalinity, acidity, chloride, sulphate, phosphorus, nitrate/nitrate, and ammonium), cyanide (total, weak acid dissociable (WAD), and free), and total and dissolved trace metals.

Tailings samples were produced by metallurgical bench scale testing. Two duplicate HCTs were setup using the prepared composite tailings sample. A single composite tailings sample was submitted for ICP-MS (1 test), ABA (1 test) and SFE analysis (3 tests with deionized water, 2 tests with 0.1M HCl acid).

4.1.1 Classification Method and Screening Criteria

ARD classification criteria are as documented in the MEND Guidelines (Price, 2009) stipulating that material with an NPR value of less than 1 (ie. NPR<1) is classified as potentially acid generating (PAG). Material with an NPR value of greater than 2 (ie. NPR>2) is classified as non-acid generating (NAG). And material with an NPR value of between 1 and 2 (ie. 1<NPR<2) is classified as Uncertain.

Shake flask and humidity cell results were compared against the Ontario Provincial Water Quality Objectives (PWQO; MOEE, 1994) to evaluate constituents of potential concern (COPCs).

4.2 Material Characterization for ARD/ML Potential

4.2.1 Waste Rock

All rock types were characterized by carbonate NPR (Carb-NPR) geomean values below 1.0. Similarly, with the exception of the BS samples, all mine rock samples had geomean values for Sobek-NPR below 1.0. Therefore, all four mine rock types were classified as potentially acid generating (PAG), as per the MEND Guidelines (Price, 2009).

The average sulphide-sulphur contents amongst all the samples ranged between 0.01 and 8.58 %S, whereas the average sulphate-sulphur contents ranged between 0.01 and 1.00 %S. The geomean sulphide-sulfur contents of BMS, BS, MSS, and MSED were 0.0.44, 0.40, 0.78, and 0.52 %S, respectively, while sulphate-sulphur values were 0.24, 0.22, 0.23, and 0.16 %S, respectively. For all four mine rock types, the high sulphide-sulphur content standard deviation (0.43, 0.38, 1.24 and 0.53 %S) relative to the geomean values demonstrates the broad range of sulphide contents.

The total carbonate values for all four rock types, measured as percent carbon (%C), ranged between 0.01 and 0.71 %C. Total carbonate values were higher in BS and MSED samples with geomean values of 0.09 and 0.08 %C. Conversely, BMS and MSS samples both had geomean values of 0.03 %C.

The measured Sobek-NP values were relatively low, ranging from 2.10 to 20.8 kg CaCO3/t with geomeans of 7.19, 8.57, 5.69, and 8.90 kg CaCO3/t for BMS, BS, MSS, and MSED, respectively. Typically, Carb-NP values were lower than and only represent less than one-half of the Sobek-NP values, ranging from 0.08 to 16.7 kg CaCO3/t with geomean values for BMS, BS, MSS, and MSED of 0.74, 1.37, 0.72, and 1.87 kg CaCO3/t, respectively.

As expected, higher soluble concentrations were generally observed in samples for all four mine rock types in the acid extractions compared to those in the deionized water extractions. Deionized water extraction values exceeded acid-wash values for antimony and sulphate for the BMS samples; cadmium, zinc, and sulphate for the MSS sample; and sulphate for the MSED samples. The screening values were exceeded for aluminum (BS, MSED), copper (MSED), and lead (BMS, BS, MSED) in the acid-wash SFEs. Conversely, no screening values were exceeded for any of the deionized-water SFE for all four mine rock types.

4.2.2 Tailings

Tailings material is classified as PAG, as per the MEND Guidelines (Price, 2009), with an NPR ratio of well below one in the composite tailings sample (EcoMetrix, 2013). The tailings sample was analyzed with a total-sulphur content of 1.53 %S, occurring dominantly as sulphide sulphur (1.23 %S). All carbon in the sample is in the form of carbonate at a concentration of 0.02 %C.

Mineralogy information for material reported in Lycopodium report (March 2014) indicate that total sulphide accounts for ~2.1% of the sample mass, with 10% of the sulphide minerals occurring as pyrrhotite The dominant non-sulphide gangue minerals present were quartz (56%), micas (22%), and feldspars (22%).

5.0 MINE MATERIAL MANAGEMENT AND STORAGE STRATEGY

The following sections document the proposed management, material handling and disposal plans for mine rock and related materials. Mitigation strategies and contingency plans are identified in the context of mine material management and strategies.

5.1 Waste Rock Material Management

Approximately 26 million tonnes of waste rock will be permanently stored in the dedicated WRSA, while the remaining 20 million tonnes will be placed into the adjacent mined-out pit bottom during operation. The majority of the waste rock is classified as PAG, with a small portion of material (7%) classified as non-PAG. All waste rock material will be handled appropriately to minimize the potential impacts of ARD/ML. As all waste rock is found to be unsuitable for road aggregate, the necessary aggregate for construction purposes will be obtained from an approved outside source.

5.1.1 Waste Rock Storage Area

A waste rock storage area (WRSA) will be constructed for permanent storage of waste rock material generated throughout the life of the mine. The location of the WRSA has not been finalized at this time. It is anticipated that the WRSA will be constructed on the north side of the proposed open pit.

The WRSA will have a capacity of approximately 12.8 million m^3 or 26 million tonnes. It will have a footprint area of approximately 675,000 m^2 and a maximum vertical stack height of 20 m. Current design criteria suggest that the slopes will be set at a 3:1 ratio, and that vertical stack height will be limited to reduce the potential visual impact for neighbouring residents.

5.2 Tailings Storage Area

A tailings storage facility (TSF) will be constructed for the permanent storage of all tailings material generated during the life of the mine. The facility is proposed for construction within the water shed of the Blackwater Creek Tributary #2.

The TSF will have a capacity of approximately 10 million m^3 and a total final footprint area of approximately 600,000 m^2. Due to the flat terrain, a compound style dam will be constructed. In the current design, the primary dam structure is on the downstream side and a secondary dam is constructed to contain the upstream flooding, effectively creating a deeper TSF with a smaller lateral footprint. In accordance with the water management strategy (Lycopodium, June 2014), all tailings material shall be deposited sub-aqueously.

A fence will be installed around the TSF to limit possible interactions with wildlife, particularly large mammals such as moose, deer and wolves. The fence will be constructed in consultation with the Ministry of Natural Resources.

5.3 Low Grade Ore Stockpiles

The low grade ore will be stockpiled in a location adjacent to the processing plant site to facilitate transport to the processing plant. The low grade stockpile will have a maximum volume of 900,000 m^3 or 1.8 million tonnes, and occupy a footprint of approximately 62,500 m^2.

At the end of mining operations, the LGO will be depleted and no material is to be left behind. Treasury understands that conditions may change over the life of the mine. For this reason, a contingency plan is presented in Section 11 of the EIS to address potential for a low grade stockpile at closure.

5.4 Mitigation and Contingency Plans

Mitigation strategies will be required to manage mine rock and tailings at the site to prevent potential negative effects on water quality at the site in post closure and during operation. Best practises and handling of materials guidelines will be incorporated into site management plans.

6.0 WATER MANAGEMENT STRATEGY AND WATER QUALITY ANALYSIS

A pre-feasibility level water management strategy is currently being prepared for the Project by Lycopodium (Lycopodium, June 2014). The information provided in the water management study includes an overall site water balance and characterization of the predicted final effluent discharged at various points of the mine. The study provided a conceptual design for the final effluent discharge point routing options.

Preliminary water quality modelling was undertaken by Tetra Tech. The model was developed for the assessment of surface water quality during mine operations, as well as water quality for the proposed pit lake water quality at closure.

Water bodies and water courses that are situated within the project footprint are documented in Section 5 of the EIS. The primary water courses are Blackwater Creek, Thunder Lake Tributary #3, and Hoffstrom’s Bay Tributary, Hartman Lake, Wabigoon Lake in the area of Keplyn’s Bay, and the tree nursery ponds.

6.1 Drainage

Water from the site run-off will be collected and managed as per a surface water management plan. The plan will be designed and implemented for all phases of the project, from initial construction trough operation and into closure. The management plan contains specific guiding principles for drainage collection throughout the life of the project. The plan specifies particular attention to collection of run-off from the TSF, mine roads, process plant site, ore stockpiles, and the WRSA. Any runoff from the low-grade ore stockpiles will be directed to the open pit for eventual treatment or use within the dewatering process. A series of catchments, ditches, and culvert drainages will be constructed to separate site-affected waters from any natural water sources proximate to the project site.

All existing surface drainage ways coinciding with site infrastructure will be diverted around the infrastructure to prevent potential contamination of fresh water and to minimize the quantity of leachate being processed through the site. Site infrastructure (ore pad, waste rock storage, and processing plant) will be located on sites contoured such that surface run-off can be captured independently of surrounding surface water and processed through the mill or be sent directly to the TSF. Any contaminated surface water will be collected in a minimum number of collection ponds and be pumped to mill via a lift station.

6.2 Water Quality and Expected Leachate

6.2.1 Humidity Cell Leachate

The HTCs have not yet attained long-term steady state conditions, as of this reporting date; meaning that the pH of the leachate can be expected to decrease further. Under the mildly acidic conditions observed in all of the HTCs, concentrations of alkaline-soluble metals continue to decrease while the concentrations of acid-soluble metals increase. Currently available results of the humidity cell leachate analysis are described above in Section 4.2.

6.2.2 Waste Rock Storage Area

Preliminary geochemical modelling indicates that prior to the onset of ARD-generating conditions, concentrations of all analytes are below the respective MMER guidelines. pH during the majority of mine operations will remain circumneutral (>6.5).

Model scenarios based on the dissolved metal concentrations in the field cell leachate were notably different from the HTC leachate-derived scenarios. Initial flushing of the WRSF indicates that pH during the majority of mine operations will remain circumneutral (>6.5). Prior to the inset of ARD-generating conditions, there are no predicted exceedances of MMER guidelines for metal concentrations; however the pH may decrease to below 6.5 shortly after the initial flushing of the WRSF.

Although the field cells have operated for approximately the same length of time as the HTCs, differences in particle size, flushing volumes, and temperature-dependent reaction rates results in a delay in the onset of acid-generating conditions. As such, the field tests were not yet acid generating at the time of this modelling effort.

Because MMER guidelines are reflective of total metal concentrations, an additional set of scenarios were constructed which use the field cell total metal concentrations as source data. Initial flushing of the WRSF indicates that pH during the majority of mine operations will remain circumneutral (>6.5). Prior to the inset of ARD-generating conditions, there are no predicted exceedances of MMER guidelines for metal concentrations; however the pH may decrease to below 6.5 shortly after the initial flushing of the WRSF.

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6.2.3 Low-Grade Ore Stock Pile

Prior to the onset of ARD-generating conditions, concentrations of all analytes are below the respective MMER guidelines. pH during the majority of mine operations will remain circumneutral (>6.5). After the onset of sulfide oxidation, the pH of the leachate/run-off of the LGO decreases to approximately 5.8.

Model scenarios based on the dissolved metal concentrations in the field cell leachate were notably different from the HTC leachate-derived scenarios. Initial flushing of the LGO indicates that pH during the majority of mine operations will remain circumneutral (>6.5). Prior to the inset of ARD-generating conditions, there are no predicted exceedances of MMER guidelines for metal concentrations; however the pH may decrease to below 6.5 shortly after the initial flushing of the LGO.

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6.3 Water Treatment

As the majority of the mine rock is classified as PAG, contacted mine water must be treated prior to discharge. Direct discharge is not a viable method during the construction and operational phases of the project. Effluent discharged from the Goliath project will comply with the Metal Mining Effluent Regulations (MMER) SOR/2002-22, and, where applicable, with the Ontario Ministry of Environment (OMOE) site specific discharge criteria established in the site water licence.

Contaminated water will be treated in the cyanide destruction circuit with subsequent attenuation in the tailings storage facility (Lycopodium, June 2014). Details of the water treatment and discharge facilities, including details of the cyanide destruction and management plan are presented in (Lycopodium, June 2014).

By utilizing contacted mine water to meet process water requirements in the plant, treatment can be affected through no additional measures. The CIL processing circuit will be capable of neutralizing any contact water and ARD and precipitate metals form solution in addition to destroying cyanide. During wet periods, it will not be possible to process all of the contact water through the plant. During these periods, excess mine water will report directly to the tailings facility via the tailings pipeline. During operation of the plant, the tailings storage facility is expected to operate with an alkaline pH of ~9 and natural attenuation will reduce the metals concentrations. In addition, during periods of low precipitation, the tailings supernatant will be reclaimed to the process plant, thus providing additional treatment for any contact water diverted directly to the TSF.

6.4 Discharge to Receiving Environment

Blackwater Creek has been identified as the preferred downstream receiving environment based on evaluation of economics, technical feasibility, and satisfactory achievement of the project objectives. Blackwater Creek ultimately reports to Wabigoon Lake. The environmental effects assessment of discharge into the various receiving water bodies is addressed in Section 6 of the EIS. Effluent water will be pumped to the selected location in Blackwater Creek via a pipeline. The quantity of effluent expected to be discharged to the receiving environment is 1,467 m^3/d for years 1 to 3. Thereafter the effluent will be directed into the pit to facilitate filling.

In accordance with the federal Metal Mining Effluent Regulations (MMER) the discharge of effluent from the Project into Blackwater Creek will require environmental effects monitoring (EEM). The results of the EEM program will assist in confirming current EIS aquatic environmental effects predictions and the success of proposed mitigation measures or the need for additional or different mitigation measures for the ongoing protection of the downstream receiving environment.

6.5 Anticipated Effects and Mitigation Measures

Anticipated effects of the project on downstream water quality are expected to be limited to run-off from waste rock piles during operation. All leachate generated from the waste rock piles in the WRSA and LGO will report to the process facility and ultimately undergo treatment prior to eventual discharge to the TSF.

Materials management and handling procedures will be established to reduce the risk of leachate entering the receiving environment prior to treatment. Additionally, water quality monitoring will be carried out according to the Water Licence and the requirements of the MMER. Short and long-term monitoring will consist of visual analysis inspection and collection and analysis of seepage. If levels of certain metals are found to exceed the established criteria or ARD impacts are noted, treatment measures will be implemented prior to discharge to ensure compliance. Additional mitigation measures such as increased capping requirements and drainage diversions can also be implemented as soon as possible.

Drainage channels and diversions will ensure that impacted water is contained, controlled, and subsequently diverted to the appropriate area. Capacities for drainage ditches and pipes will be developed with consideration for storm events. Contingencies plans will be developed to ensure that mitigation measures are implemented quickly and efficiently in the event of issues, including undesirable discharge to the receiving environment. Appropriate closure mitigation measures will be implemented to minimize the potential for impacts in post-closure.

All necessary construction aggregate materials will be sourced from approved outside sources. No PAG material will be used in construction activities.

7.0 POST-CLOSURE PLANS

Preliminary closure plans indicate that the East pit will be filled with waste rock and flooded so that all waste rock and pit walls are sub-aqueous. The West and Central Pits will backfilled with waste rock and subsequently capped and revegetated. The LGO stockpile will be processed through the mill prior to the cessation of mill operations and will no longer exist on the site post-closure. Any underground workings will be back filled and cemented.

8.0 CLOSURE

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

Respectfully submitted,
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