EKATI DIAMOND MINE WASTE ROCK AND ORE STORAGE MANAGEMENT PLAN

CONCEPTUAL JAY PROJECT AMENDMENT

DRAFT

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PREAMBLE TO THE CONCEPTUAL AMENDMENT

This Conceptual Amendment to the Ekati Mine Waste Rock and Ore Storage Management Plan (WROMP) describes the additions and changes to the WROMP that are likely to be required to incorporate the Jay Waste Rock Storage Area (WRSA). The current WROMP for the Ekati Mine is Version 4.1, May 2014 (Dominion Diamond 2014a).

This Conceptual Amendment has been developed solely as information for the Environmental Assessment review of the Jay Project and, as such, reflects conceptual WRSA design information. Following completion of the Environmental Assessment, the final amendment to the WROMP would be developed to meet the requirements of the Ekati Mine Water Licence, which requires approval of the Wek'èezhìı Land and Water Board.

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Abbreviations

Abbreviation	Definition
ABA	acid base accounting
ARD	acid rock drainage
CCME	Canadian Council of Ministers of the Environment
DAR	Developer's Assessment Report
ML	metal leaching
NAG	non-acid generating
NP/AP	neutralization potential/acid potential
PAG	potentially acid generating
PK	processed kimberlite
SFE	shake flask extraction
SSWQO	Site-Specific Water Quality Objective
WLWB	Wek'èezhìı Land and Water Board
WROMP	Waste Rock and Ore Storage Management Plan
WRSA	waste rock storage area

Units of Measure

Unit	Definition
%	percent
ha	hectares
m	metre
m^3	cubic metres

1 INTRODUCTION

Section 1 will be updated to document inclusion of the Jay Project.

2 SITE DESCRIPTION

Section 2 will be updated to describe the most current status of the existing Ekati Mine waste rock storage areas (WRSAs).

3 GEOCHEMICAL CHARACTERIZATION

The following information will be updated where necessary and added into Section 3 of the WROMP as a new sub-Section to include the Jay Project. The insertion will be immediately before the final sub-section titled "General Summary of Geochemical Characterization", and the General Summary would be updated to reflect the most current information.

3.x Jay Pipe Geochemical Characterization

The following information is a summary of the geochemical characterization of Jay waste rock and kimberlite. The detailed analysis is provided in the Geochemistry Baseline Report for the Jay Project (Annex VIII of the Jay Project Developer's Assessment Report [DAR]; Dominion Diamond 2014b).

A geochemical dataset was compiled using existing data from the Ekati Diamond Mine (Ekati Mine), which were collected between 1995 and 2014. The geochemical dataset was used to develop an understanding of the acid rock drainage (ARD) and metal leaching (ML) potential of overburden, granite, diabase, metasedimentary rock, and kimberlite that will be mined at the Jay pipe. The analytical results from supplemental samples collected from the Jay pipe in 2014 were used to evaluate and confirm the ARD and ML characteristics of material that will be mined from the Jay pipe, relative to the regional dataset.

A statistical evaluation of solid-phase chemical compositions of waste rock and kimberlite samples was performed to determine if the solid-phase composition of each rock type was similar at each area of the Ekati Mine. The conclusion of the statistical evaluation was that there was a statistically identifiable variation in solid-phase composition of the rock types by area. However, a detailed review of the results of geochemical characterization of waste rock revealed that the ARD/ML characteristics of waste rock were similar between the various pits and areas at the Ekati Mine. Therefore, based on the Ekati Mine geochemical dataset, general conclusions regarding the ARD/ML potential of granite, metasediments, diabase, and kimberlite, respectively, were developed.

Overburden, granite, and diabase have a low acid generation potential. Most samples had neutralization potential/acid potential (NP/AP) ratios greater than 2, and were classified as non-potentially acid generating (non-PAG) according to the guidelines in MEND (2009). Kinetic testing of granite and diabase confirmed that these materials are generally non-PAG, and further identified that granite and diabase may have the potential for leaching several metals in neutral conditions. Concentrations of certain metals were elevated relative to the Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of aquatic life, including aluminum and copper. Occasional occurrences of elevated concentrations of arsenic, cobalt, and nickel concentrations were also measured in certain granite and diabase kinetic test leachates. Leachate concentrations of vanadium and sulphate were elevated with respect to the Ekati Mine Site-Specific Water Quality Objectives (SSWQOs). Concentrations of these parameters were generally within the range observed in seepage from the existing WRSAs at the Ekati Mine.

Jay pipe overburden samples were not collected as part of the Geochemistry Baseline Report. However, it is anticipated that the geochemical characteristics of overburden at the Jay pipe are similar to those in the Ekati Mine database given the ubiquitous occurrence of glacial till in the area.

Granite and diabase samples collected from the Jay pipe generally reported similar acid base accounting (ABA) results as the samples collected from the other pits. These lithologies are classified as non-PAG based on ABA and NAG testing. Short-term leachates (shake flask extraction [SFE]) of the Jay pipe granite and diabase samples had near-neutral pH values, with several samples reporting aluminum and arsenic concentrations greater than the CCME guidelines. All metal concentrations in SFE leachates were below the SSWQOs in Jay pipe granite and diabase samples. The SFE leachate metal concentrations were within the range of those reported in kinetic testing of Ekati Mine granite and diabase. Metals that occurred at elevated concentrations relative to the CCME guidelines in non-acid generating (NAG) leachates included aluminum, arsenic, copper, lead, nickel, selenium, silver, and zinc. Vanadium and sulphate concentrations were elevated with respect to the SSWQOs in NAG leachates of one sample of granite and one sample of diabase. The results of NAG testing conservatively represent the metals that could be released to leachate after complete oxidation of a sample.

Metasedimentary rock has a higher potential for acid generation than overburden, granite, diabase, and kimberlite. Metasedimentary rock is capable of leaching several parameters in neutral and acidic conditions, including sulphate, aluminum, arsenic, cadmium, copper, iron, lead, mercury, nickel, selenium, and zinc. The Ekati Mine test data, including that for the Jay Project, consistently shows that only a portion of the metasediment samples are classified as potentially acid generating (PAG). Approximately 12% of the samples were classified as PAG, with an NP/AP ratio less than 1; 39% of the samples had an uncertain acid generation potential, with an NP/AP ratio between 1 and 2. However, for practical reasons, the WROMP for the Ekati Mine classifies and manages all metasedimentary rock as PAG. The acid generation potential of PAG materials is mitigated operationally by encapsulation of metasedimentary rock in the core of WRSAs.

Metasedimentary samples from the Jay pipe generally reported similar ABA results to the samples collected from the other pits. Approximately 42% of the Jay pipe metasediment samples were classified as PAG, and 38% of the samples had an uncertain acid generation potential. The SFE leachates of the Jay pipe metasediment samples had near-neutral pH values, with several samples reporting aluminum, arsenic, fluoride, and selenium concentrations greater than the CCME guidelines. The SFE leachate metal concentrations were within the range of those reported in kinetic testing of Ekati Mine metasediment, with the exception of arsenic, which was higher in short-term leachates than most kinetic test leachates. The NAG leachates contained elevated concentrations of aluminum, arsenic, cadmium, copper, nickel, selenium, silver, and zinc relative to the CCME guidelines. All metasediment leachate concentrations were below the SSWQOs for the Ekati Mine.

Kimberlite and processed kimberlite (PK) are non-PAG, owing to the abundance of carbonate minerals in these materials. Kimberlite samples from the Jay pipe generally reported similar ABA results to the samples collected from the other pit sampling areas, and both samples were classified as non-PAG.

Kimberlite and PK leached elevated concentrations of certain metals relative to the CCME guidelines, including aluminum, arsenic, copper, nickel, and iron. The SFE leachates of the Jay pipe kimberlite sample had a near-neutral pH value, with concentrations of cadmium, copper, molybdenum, nickel, selenium, and silver greater than the CCME guidelines, as well as sulphate concentrations greater than the SSWQO for the Ekati Mine. Several parameters were elevated in kimberlite and PK kinetic leachates relative to the SSWQOs for the Ekati Mine, including vanadium, molybdenum, potassium, and sulphate. The SFE leachate metal concentrations were within the range of those reported in kinetic testing of Ekati Mine kimberlite, though cobalt and nickel concentrations were generally higher in the Jay pipe samples. The NAG leachates contained elevated concentrations of aluminum, arsenic, cadmium, copper, nickel, selenium, and silver relative to the CCME guidelines, and sulphate and vanadium concentrations greater than the SSWQOs for the Ekati Mine.

4 GROUND TEMPERATURE

Section 4 will be updated to describe the most current findings of the ground temperature monitoring programs at the existing Ekati Mine WRSAs.

5 SEEPAGE QUALITY

Section 5 will be updated to describe the most current findings of the seepage monitoring programs at the existing Ekati Mine WRSAs.

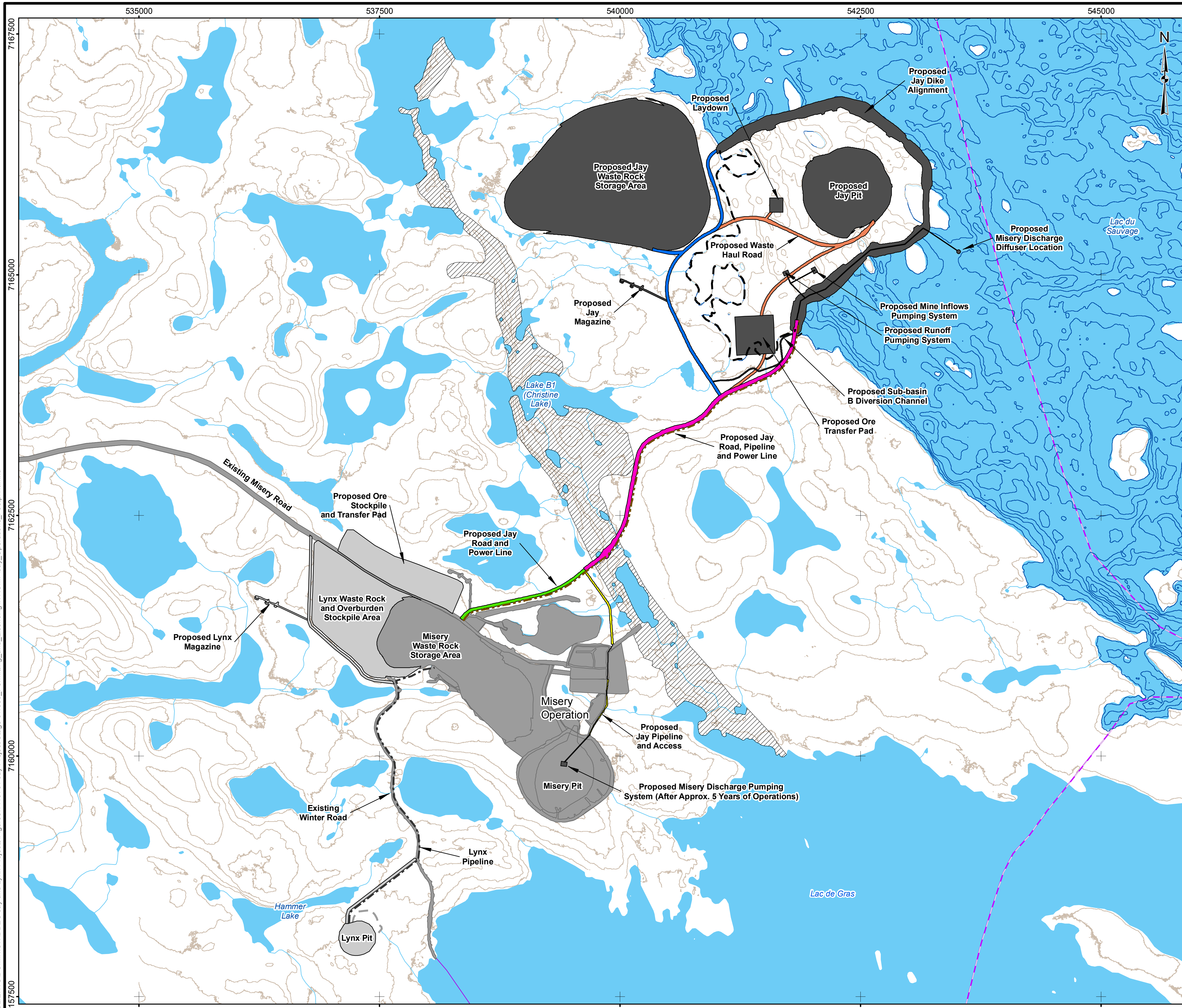
As a condition of the Water Licence with the Wek'èezhìı Land and Water Board (WLWB), annual monitoring and reporting of seepage quality for the Jay WRSA will be conducted and reported.

6 WASTE ROCK AND ORE STORAGE MANAGEMENT

The following information will be updated where necessary and added into Section 6 of the WROMP as new sub-Section for the Jay Project. An Engineering Design Report for the Jay WRSA that meets the requirements of Part G Item 2 of the Ekati Mine Water Licence will accompany the WROMP Amendment.

6.x Jay Waste Rock Storage Area

Waste rock and overburden excavated from the Jay Pit and during dike construction will be stored at the Jay WRSA. The Jay WRSA will be located west of Lac du Sauvage (Map 6.x-1 and Figure 6.x-1). The Project is located within a region of continuous permafrost. The permanently frozen subsoil and rock is generally deep, and it is overlain by a relatively thin active layer that thaws during the summer. The ground ice content is relatively low in the region at 0 to 10%.



LEGEND

- EKATI MINE FOOTPRINT (MISERY OPERATION)
- WINTER ROAD
- NORTHERN PORTION OF TIBBITT TO CONTWOYTO WINTER ROAD
- BATHYMETRY CONTOUR (5 m INTERVAL)
- ELEVATION CONTOUR (10 m INTERVAL)
- WATERCOURSE
- WATERBODY
- ESKER

JAY PROJECT FOOTPRINT

- EXISTING SHORELINE OF DEWATERED AREA
- POWER LINE
- PROPOSED JAY PROJECT INFRASTRUCTURE
- PROPOSED JAY ROAD NORTH (HAUL ROAD)
- PROPOSED JAY ROAD (HAUL ROAD AND POWER LINE)
- PROPOSED JAY ROAD (HAUL ROAD, PIPELINE AND POWER LINE)
- PROPOSED JAY PIPELINE ROAD (ACCESS ROAD AND PIPELINE)
- PROPOSED OPERATION ROADS

LYNX PROJECT FOOTPRINT

- EXISTING SHORELINE OF DEWATERED LYNX LAKE
- LYNX PIPELINE
- LYNX PROJECT INFRASTRUCTURE

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NOTES

ROAD, PIPELINES, AND POWER LINE ARRANGEMENT TO BE DETAILED AS PART OF FURTHER PRE-FEASIBILITY DESIGN. APPROXIMATE CORRIDOR WIDTHS ARE SHOWN.

REFERENCE

JAY PROJECT CONCEPTUAL ENGINEERING REPORT, EKATI MINE, DOC#: 1313280041-E14037-R-REV0-4060, DATED: MAY 13, 2014
JAY PROJECT DESIGN BASIS MEMORANDUM FOR PRE-FEASIBILITY DESIGN OF PROJECT ROADS AND PIPELINE BENCHES, DOC#: 1313280041-E14031-TM-REVD-2020, DATED: AUGUST 1, 2014
LIDAR AND BATHYMETRIC DATA OBTAINED FROM AURORA, 2013
WATER OBTAINED FROM CANVEC © NATURAL RESOURCES CANADA, 2012
DATUM: NAD83 PROJECTION: UTM ZONE 12N

1 0 1
SCALE 1:40,000 KILOMETRES

PROJECT
DOMINION DIAMOND™
JAY PROJECT
NORTHWEST TERRITORIES, CANADA

TITLE

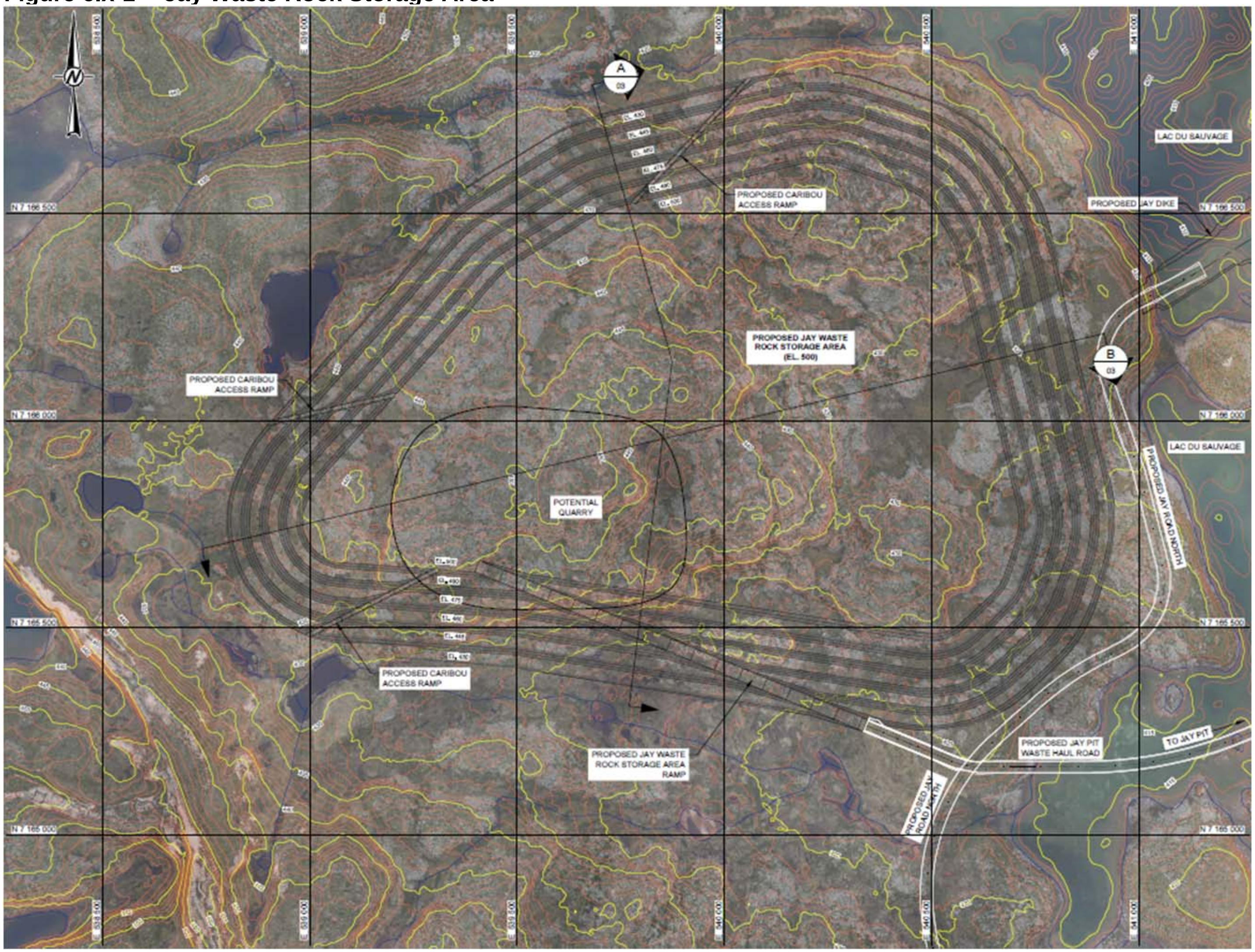
DEVELOPMENT FOOTPRINT OPERATIONS

Golder Associates

PROJECT		13-1328-0041	FILE No.	
DESIGN	MJ	01/06/15	SCALE AS SHOWN	REV 0
GIS	LMS	01/06/15	MAP 6.x-1	
CHECK				
REVIEW				

G:\CLIENTS\DOMINION\DDEC Jay and Lynx Projects\Figures\1419751 Jay Project Stage 3\4030_Permitting_and_Licencing\WROMP\Jay_Operations_Footprint.mxd

Figure 6.x-1 Jay Waste Rock Storage Area

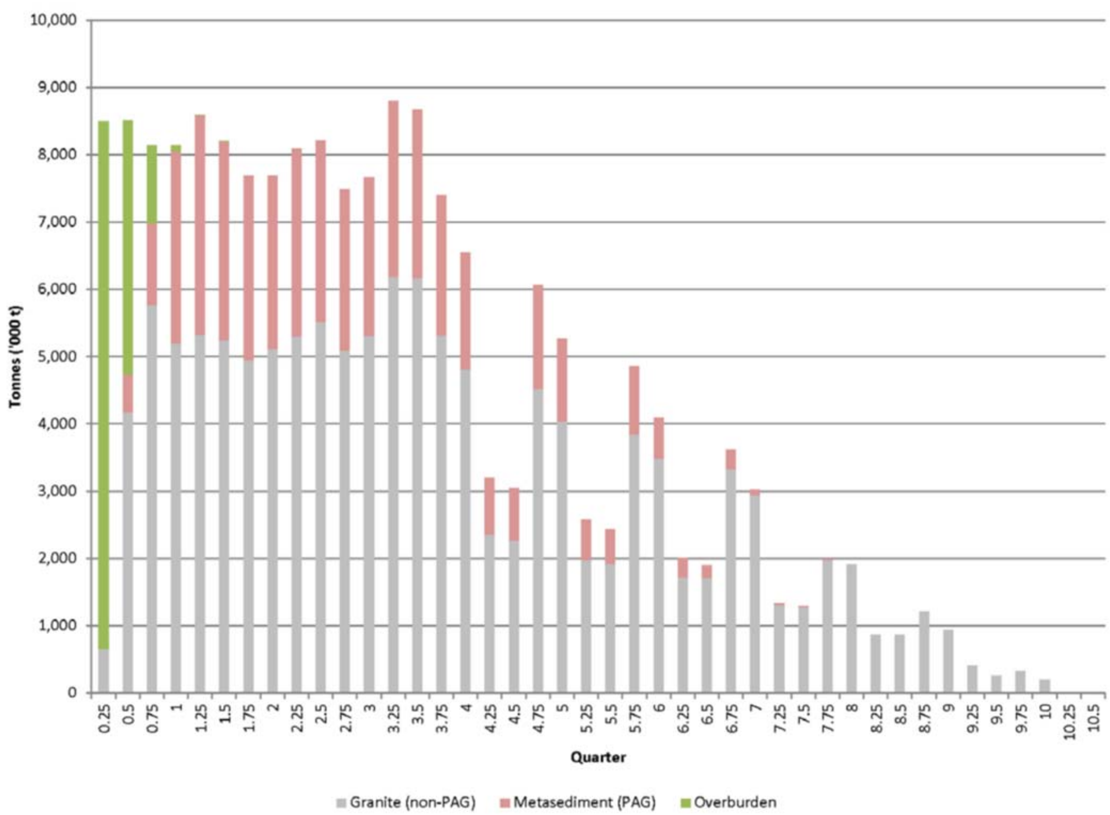


The annual volumes of waste rock and overburden to be stored in the Jay WRSA are summarized in Table 6.x-1. This information is displayed graphically for each quarter in Figure 6.x-2.

Table 6.x-1 Jay Annual Schedule of Waste Rock Production

By end of Year	Mass Overburden (tonnes)	Mass Granite (tonnes)	Mass Metasediment (tonnes)
Year 1 of operations	12,831,000	21,158,532	7,888,476
Year 2 of operations	-	20,609,209	11,057,541
Year 3 of operations	-	22,113,574	10,063,454
Year 4 of operations	-	16,8640,257	7,170,387
Year 5 of operations	-	12,808,764	4,150,368
Year 6 of operations	-	10,959,372	2,441,854
Year 7 of operations	-	9,300,616	572,299
Year 8 of operations	-	6,037,945	27,018
Year 9 of operations	-	3,425,750	-
Year 10 of operations	-	804,986	-
Total	**12,831,000**	**125,859,005**	**43,371,397**

Figure 6.x-2 Quarterly Jay Open Pit Waste Rock and Overburden Tonnage by Rock Type



The Jay WRSA has been designed to accommodate a volume of 120 million cubic metres (m^3), which includes approximately 11 million m^3 for contingency. The Jay WRSA will cover an area of 251.1 hectares (ha). The planned elevation for the WRSA to accommodate the 108,699,000 m^3 of waste rock is approximately 492 metres (m), which is a maximum height of approximately 57 m over the average tundra elevation. Providing for the contingency storage, the elevation of the last lift of the Jay WRSA would be 500 m, and the maximum height 65 m over the average elevation of the tundra. The Jay WRSA overall height is higher than the target of 50 m set out in the WRSA general design approach (Section 2.4); this is due to several desired setback distances. The development of the pile will be a minimum of 100 m from Lac du Sauvage, a minimum of 30 m from other smaller waterbodies and streams, and a minimum of 200 m from the adjacent esker. Waste rock from the Jay Pit will be mainly non-PAG granite (estimated 70%), with the remainder metasediments and overburden.

All of the metasediment mined from the Jay Pit will be managed as PAG material because, as with other open pits at the Ekati Mine, such as Misery, there is no practical means of separating the portion of metasediment that is PAG (on average approximately 50%) from that portion which is not.

Potentially acid generating (PAG) (metasediment) and non-PAG (overburden, granite, and diabase) waste rock will be produced at the same time during the first seven years of mining. PAG rock accounts for 25% to 38% of the total waste rock tonnage between the third quarter of 2020 and the second quarter of 2024. Over the remainder of the mine life, non-PAG rock accounts for more than 75% of the total waste rock tonnage.

Operational mixing of PAG and non-PAG mine rock (on top of the basal layer of granite) will mitigate the acid generation potential of PAG rock. Mixing of PAG and non-PAG rock during waste rock deposition minimizes the potential for formation of zones of PAG rock with a greater susceptibility for acid generation. Mixing of waste rock from the Jay Pit on an “as-mined” basis during operations is possible because of the simultaneous production of both metasediment and granite, with a predominance of granite, throughout the mine life.

The mine plan was used to calculate the NP/AP ratio of the material mined from the Jay Pit on a quarterly basis. The purpose of this evaluation was to confirm that an NP/AP ratio greater than 2 can be achieved based on the amount of each rock type (metasediment, granite, and overburden) mined each quarter. The overall NP and AP of waste rock produced during each quarter were calculated assuming the median characteristics of metasedimentary (PAG) and overburden, granite/diabase (non-PAG) rock. An NP/AP ratio of at least 2 was achieved over the life of mine.

The geochemical evaluation included consideration of the volumetric mixing ratio of PAG and non-PAG rock required to achieve an NP/AP ratio greater than 2. Neutralization potential / acid potential (NP/AP) values greater than 2 are achieved when PAG rock accounts for less than approximately 40% of the total mine rock volume. Therefore, given that the maximum proportion of metasediment mined in a three-month period of mine operations is 38%, the desired NP/AP ratio (greater than 2) is achieved throughout operations. Completion of a 5 m thick encapsulating cover of granite to promote freezing and maintain the seasonally active zone within low reactive granite, provides additional, long-term risk mitigation. The proportions of granite versus metasediment to be mined from the Jay Pit provide ample granite for this cover layer.

A waste rock material balance is provided in Table 6.x-2.

Table 6.x-2 Waste Rock Material Balance

Construction Component / Material Type	Estimated Quantity (m^3)	Total (m^3)
2 m non-PAG basal blanket layer	5,022,000	75,819,000
Volume of non-PAG waste rock for mixed deposition	58,497,000	
5 m non-PAG cover	12,300,000	
Volume of PAG waste rock	26,127,000	26,127,000

m = metre; m^3 = cubic metres; non-PAG = non-potentially acid generating; PAG = potentially acid generating.

The overburden soils from stripping of the Jay Pit will be stored within the Jay WRSA. The current mine plan indicates that the overburden soils will be removed during the first year of pit development. Most of this material is anticipated to be stored in the southern area of the WRSA footprint. To limit complications of physical long-term stability, the overburden soils would be placed in the interior area of the footprint followed by waste rock placement out to the design toe.

A quarry may be required to supply rockfill for construction of the Jay Dike. This potential quarry would be developed in granite bedrock within the footprint of the WRSA. The quantity of rockfill required from the quarry could be in excess of 1 million m^3 but has not been confirmed. The quarry area could also be used for placement of wet lakebed sediments that require containment for placement.

The final WRSA design must consider interactions with wildlife. Caribou emergency egress ramps have been considered in the preliminary design based on existing caribou trail mapping and discussions during community engagement.

7 VERIFICATION, MONITORING, AND REPORTING

The verification monitoring and reporting programs that are described in Section 7 of the WROMP apply to all Ekati Mine WRSAs and will encompass the Jay WRSA. The monitoring components include Physical Monitoring (S.7.1), Temperature Monitoring (S.7.2), Waste Rock Geochemistry Monitoring (S.7.3), Coarse Kimberlite Reject Geochemistry Monitoring (S.7.4), Seepage Monitoring (S.7.5), Environmental Effects Monitoring Program (S.7.6), and Adaptive Management (S.7.7).

Specifically, the following Jay-specific bullet will be added to the current Section 7.3, Waste Rock Geochemistry Monitoring, which mimics the initial sampling requirement at the Misery and Pigeon open pits:

- Waste rock mined in the Jay open pit development will be sampled at a rate of three samples per rock type, per bench, every year with geological mapping of the benches sampled.

8 REFERENCES

Dominion Diamond (Dominion Diamond Ekati Corporation). 2014a. Waste Rock and Ore Storage Management Plan. Prepared by Tetratech EBA and SRK consulting. Yellowknife, NWT, Canada.

Dominion Diamond. 2014b. Developer's Assessment Report for the Jay Project. Yellowknife, NWT. Canada.

MEND (Mine Environment Neutral Drainage). 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. MEND Report 1.20.1. December 2009.