AGNICO EAGLE
MEADOWBANK

Procedure

	PROCEDURE NUMBER: **AMQ-ENV-PRO- Quarry and borrow pit ARD-ML Sampling for Construction**		
People concerned	• **Environment, Mine, Road construction, Assay Lab**	**Prepared by**	**Erika Voyer**
		Authorized by	**Erika Voyer**
Issuing date :	**October 12, 2017**	**Revised**	
This procedure corresponds to the required minimum standard. Each and everyone also have to comply with the rules and regulations of the Nunavut Government in terms of health and safety at work.			

Objective:

- As per requirement of the License 2BB-MEA1318, this procedure is used to confirm that material used for the Amaruq construction has no potential to generate acid rock drainage (ARD) or to leach metals into the receiving environment upon exposure to ambient conditions. All samples need to be taken in the same manner to provide continuity of samples regardless of who is taking the samples. Sampling needs to be conducted in a safe and orderly manner.

Concerned departments:	**Required equipment:**
Environment, Mine, Assay Lab (Mill), Engineering, Geology, Construction	**Hydraulic shovel, Drill, GPS, Plastic bags, Sharpie, blast pattern copy**

Risks / Impacts legend

Health & Safety

Operations
Quality/Costs

Environment

Geochemical testing consists in collecting building material and analyzing them for Acid Rock Drainage and Metal Leaching - Material Sampling

Procedure	Risks/ Impacts
Sampling procedure	
1. Each quarry and borrow pit must be sampled in a representative manner to reflect the entire area of exploitation. Material needs to be sampled proportionally with the quantity extracted.	
2. For each quarry and borrow pit, less than 1,000,000 metric tons planned to be excavated. Based on the sampling frequency proposed in Table 8.2 (presented below) each quarry and borrow pit will require a minimum of 26 samples, distributed representatively. If more than 1,000,000 metric tons are excavated, more samples will be required. It will be the responsibility of Engineering and Geology to plan the sampling campaign before using the expected removed material from any quarry and borrow pit, make sure the sample are taken in compliance with this procedure and the number of samples required are reached.	
3. Sampling of bedrock (cuttings): Samples will be taken from the drill cuttings. Each sample must weigh at least 1 kg. Material must be placed in a plastic bag. Sample identification will follow the established protocol for sampling by Geology. Sampling of gravel: Samples will be distributed randomly in the borrow pit and proportionally according to the volume extracted. Each sample must weigh at least 1 kg. Material must be placed in a plastic bag. Sample identification will follow the established protocol for sampling by Geology.	
4. The list of samples will be sent to the Environment coordinator and to the Assay Lab by Geology. List template is attached to the procedure.	

5. All identified samples must be brought to the Assay lab for total sulphur and total inorganic carbon in rock (Allowing for Acid Rock Drainage characterization).	
6. A 5 to 7-day turnaround is expected for the analyses to be completed. Results will be sent by the laboratory to Geology to analyze and confirm PAG/NPAG results. Results will be forwarded to the Environment coordinators. Only NPAG material will be authorized for construction use at Amaruq.	
7. If some results indicate potential acid generator PAG material, management of this material will be discussed with the AEM construction supervisor, engineering and the environment coordinator. If required, the material could be stockpiled on location and a decision will be taken in time. Only NPAG material will be authorized for construction use at Amaruq.	
8. Material used for construction will be tested for ARD and metal leaching. The Assay lab will prepare a certain quantity of representative samples (minimally the number of samples shown in table 8.2 per site) to be sent for analysis to an external lab. External lab analysis will include ABA, Bulk Metal, WRA and SFE. Results from the accredited external lab will be sent to Geology and Environment coordinator for record. Comparison of the Assay lab versus External lab results will be compared to ensure compliance or any major differences between both laboratories.	

Table 8.2 Suggested initial sampling frequency based on tonnage when sampling without prior information (adapted from BCAMDTF, 1989)

Tonnage of Unit (metric tonnes)	Minimum number of samples
<10,000	3
<100,000	8
<1,000,000	26
<10,000,000	80

LIST TEMPLATE

Samples of Quarry for ARD Testing

Blast Pattern/GPS location	Sample ID	Date

Total weight (g): 0