

On December 4, 2020, Agnico Eagle Mines Limited (Agnico Eagle) met with Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) to discuss Agnico Eagle's response to the CIRNAC's technical comments on the Waterline application. Agnico Eagle agreed to provide CIRNAC with additional information to resolve technical comment CIRNAC-TRC-04. CIRNAC asked additional clarifying questions about the turnaround time of the treated effluent analytical results and the testing frequency. Also, CIRNAC needed to know what would be the volume of non-compliant treated effluent that could potentially be discharged to the Melvin Bay from the time a sample is taken and sent to an accredited laboratory for analysis, a result is reported back by the laboratory and a response is initiated/actioned.

Agnico Eagle has structured the response as follows:

- Management steps
- Monitoring Overview
- Potential volume release of non-compliant water

Management Steps

Regardless of the parameter, management steps that will be taken if a non-compliance is identified is as follows:

- Discharge will be stopped immediately when a non-compliance or exceedance of treatment objective is identified either via on-site monitoring or receiving accredited lab results.
- An investigation into the cause will then be conducted.
- Discharge will not be resumed until the gathered evidence suggests it is safe to do so (either internal or accredited lab results or data).

Monitoring Overview

Water to be discharged to Melvin Bay through the Waterline will be analyzed for a variety of parameters and a variable frequency (Table 1). The general purpose of monitoring is to meet two objectives as follows:

- To evaluate treatment performance
 - pH, turbidity, total chlorine, ammonia, and TSS
- To meet the Metal and Diamond Mining Effluent Regulations (MDMER; GC 2020)
 - pH, deleterious substances (e.g., total suspended solids [TSS]), acute toxicity, chronic toxicity, and effluent characterization

The main parameter of concern in the discharge water is ammonia; the SETP was designed to treat for ammonia removal through various steps including chlorination. The final water treated water is adjusted for chlorine and pH as elevated values of these parameters, in addition to ammonia, can cause toxicity. The remaining MDMER parameters (e.g., metals, cyanide, and radium-226) are subject to more gradual rates of change in concentration due to the relatively low turnover rates of the storage ponds feeding treatment. The trends in concentrations of all parameters of concern are monitored in storage ponds regularly to identify developing shifts in feed concentrations.

Water quality parameters linked to treatment performance are subject to more rapid rates of change in concentrations, relative to water quality parameters not impacted by treatment performance, and as such these parameters are analyzed daily (Table 1). In addition, these parameters are analyzed within the SETP and upstream of the final discharge point (FDP; end-of-pipe) for the MDMER parameters. Regardless of



the monitoring location, controls have been developed to return potentially non-compliant water for storage or re-treatment.

Table 1: Monitoring Frequency before Discharge to Sea

Purpose	Monitoring Component	Sampling Frequency	Monitoring Location
To evaluate treatment performance	pH, turbidity, and total chlorine monitoring (non-accredited)	Ongoing	Post-treatment at SETP
	On-site laboratory (non-accredited) ammonia monitoring	4 times per day	
	On site laboratory (non-accredited) TSS monitoring	Once per day	
To meet regulations	pH and Deleterious Substances (MDMER Schedule 4)	Once per week	FDP (end-of-pipe)
	Effluent Characterization	Four times a year, at least one month apart, during discharge	
	Acute toxicity	Every month (sampled concurrently with effluent characterization)	
	Sublethal toxicity	Twice a year, at the start and finish of the discharge	

Potential Volume Release of Non-compliant Water

Water will be determined to be compliant if it meets the MDMER criteria:

- pH is between 6.0 and 9.5 (monitored weekly);
- concentrations of deleterious substances (monitored weekly) are less than the values in Schedule 4 of the MDMER; and
- the effluent is not acutely lethal (monitored monthly).

The potential volume release of non-compliant discharge water resulting from process upset (as discussed above) is driven mainly by the time equal to the sum of the duration between sampling events (i.e., sampling frequency) and the time required to receive results of a sample (i.e., turnaround time or TAT). These values are provided in Table 2 for the parameters linked to SETP treatment.

The timeline to identify a potential non-conformity, and the management action steps differ for the treatment performance parameters.

Table 2: Timing to Identify Non-compliant Water

Parameter Group	Monitoring method	Sampling Frequency	Result turnaround time (plus 3 days shipping where applicable)	Sampling frequency plus turnaround time ^(a)	Volume pertaining to frequency plus turnaround time ^(b)
Total Suspended Solids (TSS)	On-Site Lab (non-accredited)	Daily	4 hours	28 hours	4,000 – 19,000 m ³
	On-site turbidity (non-accredited)	Ongoing	Instantaneous	0 day (instantaneous)	0 m ³



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Parameter Group	Monitoring method	Sampling Frequency	Result turnaround time (plus 3 days shipping where applicable)	Sampling frequency plus turnaround time ^(a)	Volume pertaining to frequency plus turnaround time ^(b)
Parameters of risk to toxicity (ammonia, chlorine, pH)	On-site chlorine and pH	Ongoing	Instantaneous	0 day (instantaneous)	0 m ³
	On-Site Lab (non-accredited) for pH, ammonia, chlorine	4 times per day (every 6 hours)	1 hour	7 hours	0 – 2,800 m ³

(a) Duration between receiving of results of a given sample relative to sample date of prior sample

(b) Assuming waterline discharge range of 6,000 m³/day to 20,000 m³/day

Summary

Rigorous monitoring procedures at the SETP will be in place with respect to parameters which require close monitoring due to the link to treatment performance and potential for toxicity. Assuming discharge rates of 6,000 to 12,000 m³/day, and up to 20,000 m³/day for the contingency option, and based on the existing monitoring program, the release of potentially non-compliant pH, ammonia, and/or chlorine related water could range from 0 m³ up to 2,800 m³, and the release of potentially non-compliant TSS water could range from 4,000 m³ up to 19,000 m³

References

GC (Government of Canada). 2020. Metal and Diamond Mining Effluent Regulations. SOR/2002-222. Last Amended June 18, 2020.