



MEADOWBANK DIVISION

## **Monitoring Program Summary Report**

**June 2016**

Type A Water License 2AM-MEA1525

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## **SECTION 1 • BACKGROUND**

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As required under Part I, Item 20 of Type A Water License 2AM-MEA1525, this report documents the water management and monitoring activities at the mine site for the month. This includes water usage, Vault Attenuation Pond discharge water quality, East Dike Seepage discharge water quality, RSF Seepage, Central Dike Seepage, Assay Road Seepage, and sewage treatment plant discharge water quality (which are directed to the onsite storm water management pond).

In addition, a summary of spills/actions for the month is reported.

## SECTION 2 • WATER MANAGEMENT

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### 2.1 WATER USAGE

Fresh and reclaim water usage for June 2016 is summarized in Table 2-1 below.

**Table 2-1: Freshwater Usage (m<sup>3</sup>)**

Water Location	Source	January	February	March	April	May	June	Total 2016
Camp	Third Portage Lake	3,181	3,061	3,418	3,297	3,478	3,235	
Mill (freshwater tank)	Third Portage Lake	35,397	44,255	80,836	81,012	33,910	38,194	
Emulsion plant	No-name Lake	135	125	119	138	147	144	
<b>Total Freshwater Usage (m<sup>3</sup>)</b>		<b>38,713</b>	<b>47,441</b>	<b>84,373</b>	<b>84,447</b>	<b>37,535</b>	<b>41,573</b>	<b>334,082</b>
<b>Reclaim Water Usage (m<sup>3</sup>)</b>	South Cell TSF	261,513	207,769	204,407	200,883	268,825	231,995	1,375,392

### 2.2 WASTE ROCK STORAGE FACILITY SEEPAGE

In June 2016, 48,104 m<sup>3</sup> of water was pumped back to the North Cell TSF from the ST-16 sump. Of that amount, 1,132 and 1,428 m<sup>3</sup> were transferred from respectively the WEP1 and WEP2 sumps to the ST-16 sump.

As per the 2016 Freshet Action Plan, Agnico Eagle completed in June the daily freshet inspections at the Portage and Vault RSFs, and NP-2 Lake. No major issues were observed. Open water sampling at WEP1 (Station ST-30) and WEP2 (Station ST-31) required under the Freshet Action Plan was completed in June. Open water sampling will commence in July at ST-16, NP-2 and the downstream lakes.

### 2.3 CENTRAL DIKE SEEPAGE

In June 2016, 385,003 m<sup>3</sup> of water was pumped from the ST-S-5 sump back into the South Cell TSF. Total year to date is 1,975,562 m<sup>3</sup>.

Sampling was conducted monthly at ST-S-5 and the South Cell TSF (ST-21) as per the requirements of the NWB water license.

Daily visual inspections were also completed by the Engineering Department.

### 2.4 ASSAY ROAD SEEPAGE

In June 2016, 2,588 m<sup>3</sup> of water was pumped from the interception trench back to the mill. Weekly inspections of the area were conducted this month. Well monitoring for CN downstream of the trench has also ceased as water in the wells was frozen. Open water monitoring required under the Freshet Action Plan will resume in July.

## 2.5 SEEPAGE AND RUNOFF FROM THE LANDFILL

The landfill was inspected weekly and no seepage or runoff was observed.

## 2.6 SEEPAGE AT PIT WALL AND PIT WALL FREEZE/THAW AND PERMAFROST AGGRADATION

No ice buildup was observed in June during pit wall inspections in Vault and Portage pits as it had all melted. Moreover, it was not possible to distinguish between water seeping from pit walls and snow melting on catch benches. In June, 46,318 m<sup>3</sup> and 26,618 m<sup>3</sup> of water were pumped out of respectively Portage Pit North and South, to the South Cell TSF. 19,556 m<sup>3</sup> of water was pumped out of Vault Pit to the Vault Attenuation Pond.

## 2.7 SEWAGE TREATMENT PLANT

One (1) effluent wastewater sample was collected at the onsite sewage treatment plant (STP) in June 2016.

The Seprotech STP results are shown in Table 2.7.1 below; the LJ-Mix STP results are shown in Table 2.7.2. The discharge results indicate the system is working well. The effluent is discharged to the Stormwater Management pond which is pumped to the South Cell TSF. In June, 43,576 m<sup>3</sup> of water was pumped from the Stormwater Management pond to the South Cell TSF.

**Table 2.7.1: Seprotech Effluent Results**

Parameters	Units	June 6, 2016
Ammonia (NH <sub>3</sub> )	mg N/L	0.02
Ammonia-Nitrogen (NH <sub>3</sub> -NH <sub>4</sub> )	mg N/L	4.81
Total Kjeldahl Nitrogen	mg N/L	26.3
BOD-5	mg/L	6
COD	mg/L	59
Total Suspended Solids	mg/L	2
Nitrate	mg N/L	14.5
Nitrite	mg N/L	0.49
pH*	Units	6.1
Fecal Coliform	UFC/100 mL	40
Total Coliform	UFC/100 mL	130

\*Parameter measured by STP operators

**Table 2.7.2: LJ-Mix Effluent Results**

Parameters	Units	June 6, 2016
Ammonia	mg N/L	<0.01
Ammonia-Nitrogen	mg N/L	10.4

Total Kjeldahl Nitrogen	mg N/L	10.9
BOD-5	mg/L	2
COD	mg/L	45
Total Suspended Solids	mg/L	6
Nitrate	mg N/L	19.4
Nitrite	mg N/L	0.12
pH*	Units	5
Fecal Coliform	UFC/100 mL	2
Total Coliform	UFC/100 mL	40

\*Parameter measured by STP operators

## 2.8 VAULT ATTENUATION POND EFFLUENT

There was no discharge from the Vault Attenuation Pond into Wally Lake in June 2016. Prior-to-discharge samples were collected on June 20, 2016. The 10-day notice was sent to the INAC Inspector as per water licence Part F Item 12. Agnico Eagle will discharge in July if results meet water licence criteria.

## 2.9 EAST DIKE SEEPAGE EFFLUENT

Discharge from the East Dike Seepage occurred for the entire month of June. A total of 16,914 m<sup>3</sup> of water was discharged into Second Portage Lake in June 2016. Total year to date is 85,592 m<sup>3</sup>.

Four (4) weekly effluent samples were collected at ST-8 in June 2016. TSS results did not exceed the maximum allowable grab sample concentration (30 mg/L) permitted by Water License, Part F, Item 6. TSS monitoring results for June 2016 are shown in Table 2.9.1 below.

**Table 2.9.1: June 2016 East Dike Seepage Discharge Results**

Parameters	Units	6-June-16	13-June-16	20-June-16	28-June-16	Maximum Average Concentration
Total Suspended Solids	mg/L	<1	<1	2.9	<1	1.1

Regular sampling pursuant to MMER and the Water license was also conducted at this location. Results are shown in Table 2.9.2 below. There have been no exceedances of MMER or Water License criteria.

**Table 2.9.2: June 2016 Monthly Monitoring Results**

Parameters	Units	13-June-16
Aluminum	mg/L	0.060
Sulphate	mg/L	8.1

Arsenic	mg/L	<0.0005
Copper	mg/L	0.003
Nickel	mg/L	0.0017
Lead	mg/L	<0.0003
Zinc	mg/L	0.004
Radium 226	mg/L	<0.002
Total Cyanide	mg/L	<0.005

## 2.10 NON CONTACT WATER

As per the 2016 Freshet Action Plan, daily inspections were conducted at ST-5 and ST-6 in June. Portage Area East (ST-5) and West diversion ditches (ST-6) water quality results are shown in Tables 2.10.1 and 2.10.2, respectively. TSS results didn't exceed the maximum average concentration (15 mg/L) and maximum allowable grab sample concentration (30 mg/L) permitted by the Water License, Part F, Item 6.

**Table 2.10.1: Portage Area East Diversion Ditch (ST-5) Results**

Parameters	Units	13-June-16
Total Suspended Solids	mg/l	4

**Table 2.10.2: Portage Area West Diversion Ditch (ST-6) Results**

Parameters	Units	13-June-16
Total Suspended Solids	mg/l	3

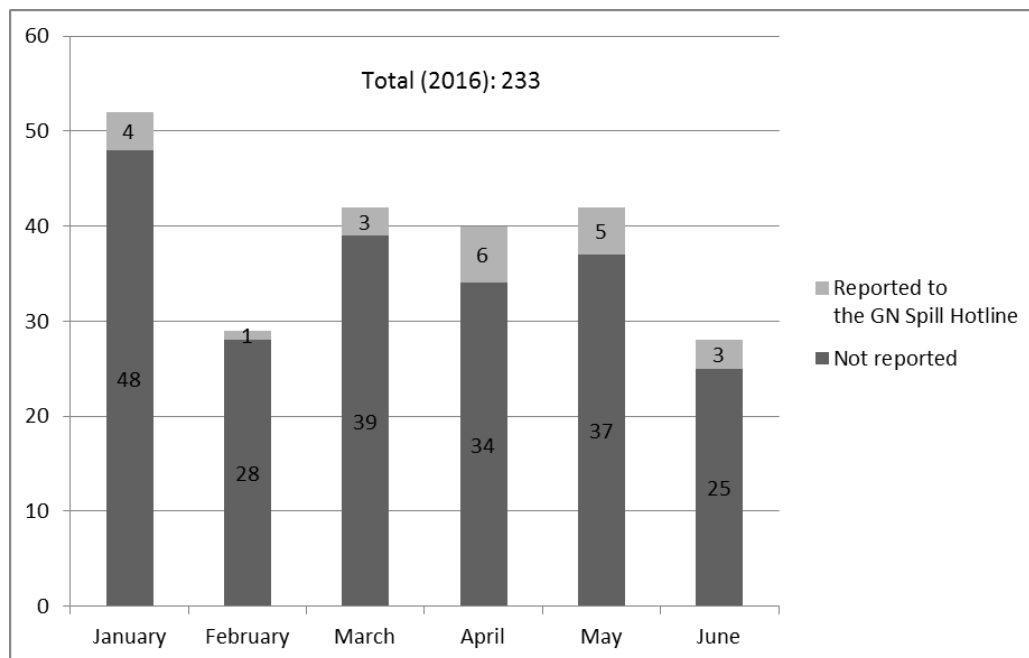
### SECTION 3 • SPILL MANAGEMENT

Figure 3.1 shows reported and non-reported spills for 2016 broken down per month and Table 3.1 summarizes AEM spill reports for June 2016. All spills reported internally and to regulators were managed appropriately on site according to AEM's spill contingency plan. Spills were contained and cleaned, contaminated material was disposed to the appropriate area (landfarm, TSF if required), and the clean-up actions were monitored closely by the Environment Department. There was no off site impact to any watercourses.

A team of personnel from the Maintenance, Mine operations, Environment, and Strategic Optimization Departments has initiated a series of actions to better understand the cause of this trend and to reduce the number of spills occurring on site. These actions include:

- Defective equipment is being tracked to ensure equipment presenting recurrent deficiencies is adequately taken care of;
- Defective equipment is being fixed more efficiently;
- Number of spills is being tracked and communicated monthly to relevant departments;
- Spill types and associated reporting/clean-up actions were better defined and communicated to departments involved with spill occurrences as well as to new employees through induction training;
- Containment was placed under all mobile equipment when not in operation to collect any potential leaks;
- Communication from equipment operators to maintenance dispatch, when equipment is defective, is currently being assessed to increase efficiency;
- Number and cause of spills are being benchmarked with similar northern projects.

**Figure 3-1. 2016 Reported and Non-Reported Spills**





**Table 3.1: Summary of Agnico Eagle Internal Spill Reports, June 2016**

Date	Hazardous Material	Quantity (L/kg)	Location	Cause of spill	Clean-up action taken	Reported to Spill GN Hotline?
June 1, 2016	Engine oil	35	Maintenance shop	Hole in engine block	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
June 3, 2016	Hydraulic Oil	20	Vault Pit	Broken hydraulic hose	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
June 4, 2016	Hydraulic Oil	30	Vault Parking	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately.	No
June 4, 2016	Engine oil	5	Portage Pit	Engine oil filter was knocked off when it hit a rock on the ramp	Contaminated soil was picked up and disposed of adequately.	No
June 7, 2016	Hydraulic oil	10	Pushback parking	While performing maintenance repairs oil was spilled on the ground.	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
June 8, 2016	Hydraulic oil	30	Portage Pit	Blown O-ring on the hydraulic pump	Contaminated soil was picked up and disposed of adequately.	No
June 8, 2016	Diesel fuel	10	MBK Tank Farm	Tank over-filling during refueling operations	Contaminated soil was picked up and disposed of adequately.	No
June 10, 2016	Hydraulic oil	45	Portage Pit	Broken pump hose	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
June 10, 2016	Hydraulic oil	6	Maintenance Shop	Leaking cylinder	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No

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June 10, 2016	Hydraulic oil	95	Vault pit	O' ring failure	Contaminated soil was picked up and disposed of adequately.	No
June 11, 2016	Hydraulic Oil	30	Vault Pit	While performing maintenance repairs oil was spilled on the ground.	Contaminated soil was picked up and disposed of adequately.	No
June 11,2016	Hydraulic oil	60	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately. Mechanical issue was fixed.	No
June 12, 2016	Hydraulic oil	150	Vault pit	O' ring failure	Contaminated soil was picked up and disposed of adequately.	Yes
June 12, 2016	Diesel fuel	50	Portage Pit	Fuel spilled out during refueling operations.	Contaminated soil was picked up and disposed of adequately.	No
June 12, 2016	Fuel	5	Vault camp parking	Fuel spilled out from breather during refuelling	Contaminated soil was picked up and disposed of adequately.	No
June 12, 2016	Hydraulic oil	60	Vault Pit	Broken hydraulic hose	Contaminated soil was picked up and disposed of adequately. Mechanical issue was fixed.	No
June 14 2016	Hydraulic oil	20	Portage Pit	O' ring failure	Contaminated soil was picked up and disposed of adequately.	No
June 14, 2016	Hydraulic Oil	20	Vault camp parking	Hydraulic hose failure	Contaminated soil was picked up and disposed of adequately.	No
June 15, 2016	Engine oil	2	Portage Pit	Rock was hidden under mud; hit the pan of truck causing leak.	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No
June 16, 2016	Engine oil	4	Maintenance Shop	Engine oil pan was cracked from hitting a rock	Contaminated soil was picked up and disposed of adequately.	No
June 19, 2016	Hydraulic Oil	50	Vault pit	Broken hydraulic stick cylinder	Contaminated soil was picked up and disposed of adequately.	No
June 20, 2016	Hydraulic Oil	90	Vault pit	Hydraulic line feeding the pump failure	Contaminated soil was picked up and disposed of adequately.	No
June 23, 2016	Hydraulic oil	150	Vault pit	Broken hydraulic hose	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	Yes

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June 23, 2016	Coolant	20	Vault pit	Coolant leak	Contaminated soil was picked up and disposed of adequately.	No
June 23, 2016	Hydraulic oil	150	Portage Pit	O' ring failure	Contaminated soil was picked up and disposed of adequately.	Yes
June 24, 2016	Coolant	40	Vault pit	Coolant leak	Contaminated soil was picked up and disposed of adequately.	No
June 25, 2016	Coolant	40	Vault pit	Coolant leak	Contaminated soil was picked up and disposed of adequately.	No
June 25, 2016	Engine oil	25	Vault pit	Broken engine oil pan	Spill was contained with absorbent pads. Contaminated material soil was picked up and disposed of in yellow contaminated soil roll off container.	No