



MEADOWBANK DIVISION

**Monitoring Program Summary Report**  
**September 2014**

Type A Water License 2AM-MEA0815

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## **SECTION 1 • BACKGROUND**

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As required under Part I, Item 25 of Type A Water License 2AM-MEA0815, this report documents the water management and monitoring activities at the mine site for the month. This includes water usage, Portage Attenuation Pond discharge water quality, Vault Attenuation Pond discharge water quality, East Dike Seepage discharge water quality, RSF Seepage, Assay Road Seepage and sewage treatment plant discharge water quality (which is directed to the onsite storm water management pond).

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

## SECTION 2 • WATER MANAGEMENT

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### 2.1 WATER USAGE

Freshwater usage for September 2014 is summarized in Table 2.1 below. Total freshwater used for the month was 43,395 m<sup>3</sup> for a total year to date of 815,881 m<sup>3</sup>. The total amount of reclaim water used in the mill for September was 249,265 m<sup>3</sup>.

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

	September
Freshwater Storage Tank	43,237
Emulsion Plant	158
Water Truck	0
<b>Total</b>	<b>43,395</b>
<b>Year to date total</b>	<b>815,881</b>

### 2.2 WASTE ROCK STORAGE FACILITY SEEPAGE

In September, a total of 1,088 m<sup>3</sup> was pumped from ST-16 to the North Cell TSF. To date an annual total of 32,169 m<sup>3</sup> was pump directly to the TSF storage area from ST-16.

At the end of August, a flowmeter was installed to monitor volumes of water pumped at ST-16. After installation, AEM realized that the previous methods to calculate the volume (based on the pump capacity and time of pumping) overestimated the actual quantity of water pumped. AEM has since corrected the previous cumulative annual volume based on the flowmeters, which overestimated the annual volume by approximately 6,000m<sup>3</sup> (previous YTD including September is 38,522m<sup>3</sup>).

AEM continues to complete weekly and after rain event inspections at RSF and NP-2 Lake and weekly monitoring for CN. To date, the water level in ST-16 area has low and is contained in the sump; as a result the water has not been in contact with the cut off plug and till road and therefore ensures no possible seepage into NP2.

### 2.3 ASSAY ROAD SEEPAGE

As in the previous months, in September the water in the interception trench and the original containment berm and sump was pumped back to the mill for a total of 2,420 m<sup>3</sup> during the month. Year to date volume that has been pumped is 11,942 m<sup>3</sup>. At the end of August, a flowmeter was installed to monitor the volume of water pumped at this location. After the installation, AEM noted an overestimation of water quantity pumped by approximately 3,500m<sup>3</sup> (i.e. previous YTD including September is 15,427m<sup>3</sup>).

Weekly and after rain event inspections of the area were conducted in September. Based on well monitoring downstream of the trench, all the water was contained up gradient or collected by the interception trench and therefore has not reached TPL. This was confirmed

with near shore sampling in TPL; to date no contaminants (copper, total CN or free CN) have been detected in the lake. AEM received the *Meadowbank Mine, Assay Road Seepage Phase 2: Environmental Site Assessment and Engineering QA/QC, TetraTech EBA (2014)* in August and has put in place or will complete all recommendations made in this report. Repairs to the containment areas inside the mill, and in particular near the CIP and other problem areas, have been completed. Other areas inside the mill and outside the leach tanks are nearly complete.

## 2.4 SEWAGE TREATMENT PLANTS

One (1) effluent wastewater sample was taken from the onsite sewage treatment plant (STP's) in September.

The Seprotech STP results are shown in Table 2.3.1 below; the LJ-Mix STP results are shown in Table 2.3.2. The results of the discharge indicate the system was working well. The effluent is discharged to the stormwater management pond and is sent to the TSF and back to the mill as reclaim water. This water is not discharged to land.

**Table 2.3.1: Seprotech Effluent Results**

Parameters	Units	September 2, 2014
Ammonia	mg N/L	<0.01
Ammonia-Nitrogen	mg N/L	2.1
Total Kjeldahl Nitrogen	mg N/L	6.5
BOD-5	mg/L	14
COD	mg/L	67
Total Suspended Solids	mg/L	23
Nitrate	mg N/L	23.2
Nitrite	mg N/L	0.31
pH*	Units	5.80
Fecal Coliform	UFC/100 mL	15
Total Coliform	UFC/100 mL	<1,000

\*Parameter measured by STP operators

**Table 2.3.2: LJ-Mix Effluent Results**

Parameters	Units	September 2, 2014
Ammonia	mg N/L	<0.01
Ammonia-Nitrogen	mg N/L	6.4
Total Kjeldahl Nitrogen	mg N/L	10.7
BOD-5	mg/L	6
COD	mg/L	51
Total Suspended Solids	mg/L	7
Nitrate	mg N/L	27.5
Nitrite	mg N/L	0.22
pH*	Units	4.30
Fecal Coliform	UFC/100 mL	14
Total Coliform	UFC/100 mL	2,000

\*Parameter measured by STP operators

## 2.5 PORTAGE ATTENUATION POND EFFLUENT

July 5<sup>th</sup>, 2014 was the last day of discharge from the Portage Attenuation Pond. AEM does not plan to discharge anymore water from the south cell in 2014. Total year to date is 207,813 m<sup>3</sup> of water discharged into Third Portage Lake.

## 2.6 VAULT ATTENUATION POND EFFLUENT

Vault Attenuation Pond discharge was completed on August 14, 2014. Total year to date (including dewatering water) discharge volume is 329,101 m<sup>3</sup>.

## 2.7 EAST DIKE SEEPAGE EFFLUENT

East Dike Discharge was continuous for the month of September. During the month, a total of 19,914 m<sup>3</sup> was discharged thru the diffusor into Second Portage Lake for a total year to date of 92,424 m<sup>3</sup>. Monitoring results are shown in Table 2.7.1 below.

TSS results did not 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 4.

**Table 2.7.1: East Dike Seepage Discharge Results**

Parameters	Units	2-Sept-14	9-Sept-14	17-Sept-14	24-Sept-14	28-Sept-14	Average Concentration
Total Suspended Solids	mg/L	2	4	7	14	<1	5.6

## 2.8 NON CONTACT WATER

The north cell non-contact east diversion ditch (ST-5) results are shown in Table 2.4.1 below and west diversion ditch (ST-6) results are shown in Table 2.4.2.

TSS results did not 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 4. Furthermore, to comply with Water License Part D Item 22, sediment barriers were installed throughout the month of September; weekly and after rain event visual inspections were conducted to prevent entry of sediments into the receiving environment.

**Table 2.4.1: Portage Area East Diversion Ditch (ST-5) Results**

Parameters	Units	Sept-02-14
Total Suspended Solids	mg/l	1

**Table 2.4.2: Portage Area West Diversion Ditch (ST-6) Results**

Parameters	Units	Sept-02-14
Total Suspended Solids	mg/l	<1

### SECTION 3 • SPILL MANAGEMENT

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AEM has developed a thorough internal system of tracking spills on-site. Table 3.1 summarizes the AEM spill reports for the month. One (1) spill occurred on site and 0 was reported to the GN spill hotline. AEM contained and cleaned up the spill.

**Table 3-1: Summary of AEM Internal Spill Reports**

Date of Spill	Hazardous Material	Quantity (L/Kg)	Location	Cause of spill	Clean-up action taken	Reported to Spill Line
2014-09-27	Hydraulic Oil	15	Goose Pit Ramp Access	Mechanical failure on compressor	Site Services was notified and asked to scrape area with shovel	No