



MEADOWBANK DIVISION

Monitoring Program Summary Report

July 2015

Type A Water License 2AM-MEA0815

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SECTION 1 • BACKGROUND

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, 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

2.1 WATER USAGE

Freshwater usage for July 2015 is summarized in Table 2.1 below. The total freshwater consumption for the month was 48,722 m³. It should be noted that restarting on July 8 the water to supply the Emulsion Plant was taken from the unnamed lake as the pump in the lake was repaired. The total amount of reclaim water used in the mill for July was 253,692 m³. Reclaim water is supplied by the TSF South Cell.

Table 2-1: Freshwater Usage (m³)

	July
Freshwater Storage Tank	48,575
Emulsion Plant	147
Water Truck	0
Total	48,722
Year to date total	598,995

2.2 WASTE ROCK STORAGE FACILITY SEEPAGE

In July a total of 3,414 m³ was pumped back to the North Cell TSF from the ST-16 sump. Total year to date is 15,871m³.

As per the Freshet Action Plan, AEM continued the daily visual inspections at the RSF and NP-2 Lake. To date, the water level in ST-16 area was very low preventing any possible seepage through the till plug.

2.3 ASSAY ROAD SEEPAGE

In July, water in the interception trench and the original containment berm and sumps was pumped back to the mill. The total volume pumped was 6,633m³. Total year to date pumped from MW-203, the interception trench and containment is 20,141m³. AEM is conducting daily visual inspections of these areas and to date no concern has been observed.

2.4 SEWAGE TREATMENT PLANTS

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

The Seprotech STP results are shown in Table 2.4.1 below; the LJ-Mix STP results are shown in Table 2.4.2. The results of the discharge indicate the system is working well. The effluent is discharged to the stormwater management pond and is pumped to the TSF

(2x/year). This water becomes part of the reclaim pond. There is no discharge to the receiving environment.

Table 2.4.1: Seprotech Effluent Results

Parameters	Units	July 6, 2015
Ammonia	mg N/L	0.27
Ammonia-Nitrogen	mg N/L	32.2
Total Kjeldahl Nitrogen	mg N/L	28.3
BOD-5	mg/L	10
COD	mg/L	54
Total Suspended Solids	mg/L	11
Nitrate	mg N/L	9.48
Nitrite	mg N/L	0.82
pH*	Units	7.10
Fecal Coliform	UFC/100 mL	840
Total Coliform	UFC/100 mL	8,000

Table 2.4.2: LJ-Mix Effluent Results

Parameters	Units	July 6, 2015
Ammonia	mg N/L	<0.01
Ammonia-Nitrogen	mg N/L	2.72
Total Kjeldahl Nitrogen	mg N/L	3.70
BOD-5	mg/L	8
COD	mg/L	56
Total Suspended Solids	mg/L	9
Nitrate	mg N/L	21
Nitrite	mg N/L	0.25
pH*	Units	6.00
Fecal Coliform	UFC/100 mL	43
Total Coliform	UFC/100 mL	400

*Parameter measured by STP operators

2.5 VAULT ATTENUATION POND EFFLUENT

Discharge from the Vault Attenuation Pond restarted on July 7 and continued for the whole month. During the month, a total of 398,490 m³ was discharged thru the diffuser into Wally Lake.

Four weekly effluent samples were taken at ST-10 in July. No Actiflo Water Treatment Plant was necessary during the month as the TSS levels were below the effluent criteria stated in Part F, Item 3 of the Water License.

The sample results are shown in Table 2.5.1 below.

Table 2.5.1: ST-10 Effluent Results

Date Parameters	Units	Max. grab conc.	8-July-15	13-July-15	21-July-15	29-July-15	Monthly Average	Max. avg. conc.
pH*		6.0-9.0	7.10	6.58	6.98	7.66	7.08	6.0-9.0
TSS	mg/L	30	6	2	6	1	3.75	15
Turbidity*	NTU	15	13.70	2.72	1.01	1.20	4.66	15
Aluminium	mg/L	3.0	0.089	0.062	0.034	0.011	0.049	1.5
Dissolved Aluminium	mg/L	2.0	<0.006	<0.006	<0.006	<0.006	<0.006	1.0
Arsenic	mg/L	0.2	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.1
Cadmium	mg/L	0.004	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.002
Copper	mg/L	0.2	0.003	0.0013	0.0023	0.0016	0.0021	0.1
Mercury	mg/L	0.008	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.004
Ammonia nitrogen	mg N/L	40	1.10	0.99	0.99	0.84	0.98	20
Nickel	mg/L	0.4	0.0044	0.0033	0.0033	0.0032	0.0036	0.2
Nitrate	mg N/L	100	1.92	1.64	1.73	1.91	1.80	50
Lead	mg/L	0.2	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.1
Phosphorus	mg/L	3.0	0.02	0.02	0.03	0.01	0.02	1.5
Zinc	mg/L	0.4	<0.001	<0.001	0.001	<0.001	0.0006	0.2
Chloride	mg/L	1000	4.3	4.7	9.9	3.9	5.7	500

*Parameter measured by technician on the field

2.6 EAST DIKE SEEPAGE EFFLUENT

No East Dike Seepage has been discharged into Second Portage Lake since June 16 following a visual turbidity increase. Total year to date discharged is 80,106 m³.

2.7 NON CONTACT WATER

Portage Area East diversion ditch (ST-5) results are shown in Table 2.7.1 below and Portage Area West diversion ditch (ST-6) results are shown in Table 2.7.2. 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 4.

Table 2.7.1: Portage Area East Diversion Ditch (ST-5) Results

Parameters	Units	6-July-15
Total Suspended Solids	mg/l	3

Table 2.7.2: Portage Area West Diversion Ditch (ST-6) Results

Parameters	Units	6-July-15
Total Suspended Solids	mg/l	3

SECTION 3 • SPILL MANAGEMENT

AEM has developed a thorough internal system of tracking spills on-site. Table 3.1 summarizes the AEM spill reports for the month. Fourteen (14) spills occurred on site and four (4) were reportable to the GN spill hotline. AEM contained, cleaned up and disposed of the spill material adequately. The majority of the clean-up material was taken to the AEM Landfarm. Absorbent pads are eventually disposed of at the on-site incinerator. Spill clean-up material containing a majority of snow is disposed in the TSF.

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 Hot Line
2015/07/01	Hydraulic Oil	3L	Pit E	Rock punctured Oil pan.	Vehicle was stopped and an oil pan was placed under the vehicle to drain.	No
2015/07/03	Hydraulic Oil	75L	Vault Pit	While replacing a hydraulic cylinder the residual oil from the failed cylinder leaked onto the ground.	Spill pads were placed on the ground prior to the cylinder being removed. Once the cylinder was replaced the spill pads were picked up and adequately disposed in the hazmat area.	No
2015/07/04	Mill Slurry	1500L	Mill	On the tailings line a "Y" is used at the mill to send the pig in the tailing line for clean-up. This "Y" was worn-out and a hole appeared in the side of the tailings line outside the mill. The majority of the slurry that exited the tailings pipe from this worn hole was collected in the tailings line trench. Other slurry was sprayed directly into the secondary containment for the leach pad.	All slurry was immediately pumped into leach pad secondary containment. From here the slurry will be re-introduced into the mill circuit. Tailings disposal has ceased and will not recommence until the "Y" is fixed. Other potential worn components will be inspected for integrity.	Yes
2015/07/07	Hydraulic Oil	10L	Maintenance Oil Pad - Dome Side	Hydraulic fitting was not tight enough and oil started to leak onto the ground when pressure was applied.	Equipment was stopped and fitting was tightened. Contaminated material was then collected with a shovel and placed in a yellow roll off bin.	No

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2015/07/07	Sulfur prill	150Kg	Overpad	While in the process of putting a container on a tractor/trailer with a forklift, the container floor collapsed which caused it to tip over (away from container handler) fall to the ground. While putting it back upright, the product inside (sulfur prills) leaked out from the openings created by the impact.	The spilled product was quickly collected with a loader and brought to the landfill for disposal. It will be covered immediately. The material is not soluble in water. The remainder of product left in and/or around container will taken to the mill for use in the S02 unit. Any unsalvageable material will be disposed at the Landfill.	Yes
2015/07/07	Sulfur prill	2Kg	Overpad	The container had a fork pole hole from a long time ago, while moving the seacan the sulfur prill started to leak.	Contaminated soil was removed and taken to the roll-off for adequate disposal.	No
2015/07/07	Hydraulic Oil	85L	Pit E	While replacing hydraulic cylinders, residual oil from failed cylinders leaked on the ground.	Spill pads were placed on the ground prior to the cylinder being removed. Once the cylinder was replaced the spill pads were picked up and adequately disposed in the hazmat area.	No
2015/07/07	Hydraulic Oil	30L	Pit E	While replacing a hydraulic cylinder on the bucket dump, residual oil from the failed cylinder leaked onto the ground.	Spill pads were placed on the ground prior to the cylinder being removed. Once the cylinder was replaced the spill pads were picked up and adequately disposed in the hazmat area.	No
2015/07/16	Hydraulic Oil	40L	Pushback at BAC11	Opened plug under main pump and was not able to reinstall the plug back on place.	Collected spill with absorbent pads and shoveled contaminated soil into a secondary container. Contaminated material sent to landfarm.	No
2015/07/24	Tailings slurry	5000L	RF1 Dike	While switching the tailings deposition point in the North Tailings Cell, a leak was identified on the tailings pipe causing a spill on RF1.	Stop the deposition with the broken pipe and repair it. Scrap the tailings and put it back in the tailings pond.	Yes
2015/07/24	Oil	60L	Row 10	While transporting 4 drums of oil, one fall to the ground and the zoom boom crushed it.	Contaminated material cleaned up and adequately disposed of in the yellow roll-off bin.	No
2015/07/28	Hydraulic Oil	10L	Old Toromont office	Busted hose on loader 09.	Contaminated material cleaned up and adequately disposed of in the yellow roll-off bin.	No
2015/07/28	Used oil	25L	Lube station	Shut valve of lube cube left open while pumping so it went out of the lube station on the ground.	Contaminated material cleaned up and adequately disposed of in the yellow roll-off bin.	No

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2015/07/30	Diesel	300L	Vault Pit 5116818	A piece of loose rock fell from the pit wall and struck the large excavator on the track and then hit the fuel tank, puncturing it.	All fuel spilled was contained inside the pit with no effect to any waterways. The contaminated area was excavated to remove all contaminated material. This contaminated material will be taken to the Meadowbank landfarm for remediation.	Yes
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