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November 29, 2017

Licensing
Nunavut Water Board
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Re: October 2017 – Monthly Monitoring Report for Water Licence 2AM-DOH1323

This report is comprised of monitoring requirements as set out in Part J and Schedule J of water licence 2AM-DOH1323 Amendment 1, and additional requirements from INAC.

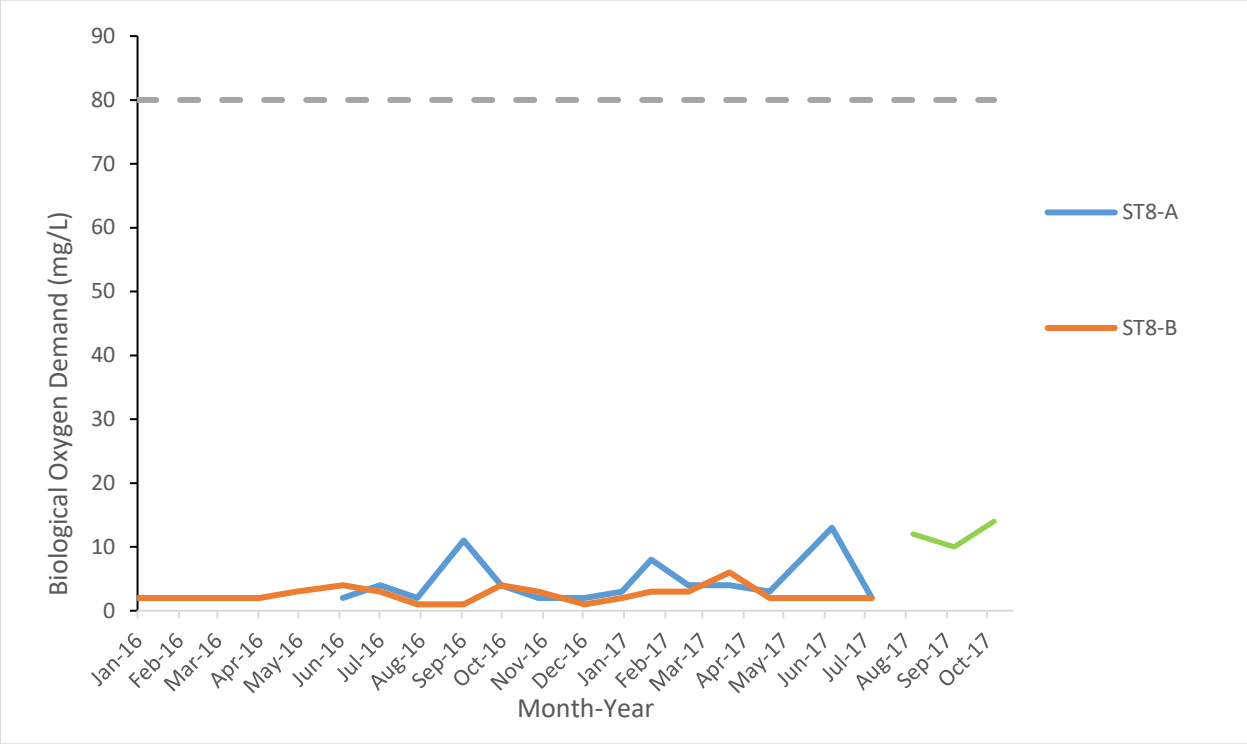
During the subject period of this report the focus of activities at Doris North was underground mining, construction, ore processing, water management and environmental compliance. Sampling locations monitored under this licence (seasonally or when facilities are operational) are provided in Figure 3 at the end of this report.

Site Wide Water Quality Monitoring Program (Part J Items 3, 8, and Schedule J)

Water quality sampling was conducted in October at monitoring stations identified in Schedule J of the licence (ST-1 through ST-13, TL-1 through TL-12). Water quality samples were not collected for monitoring stations that were inactive during the month being reported (e.g., facilities that had not yet been constructed, were frozen during the month, or were not operationally active). All parameters were compared to the applicable effluent quality limits outlined in Part G of the licence and no exceedances were observed. Results of this monitoring are attached to the report in Appendix A.

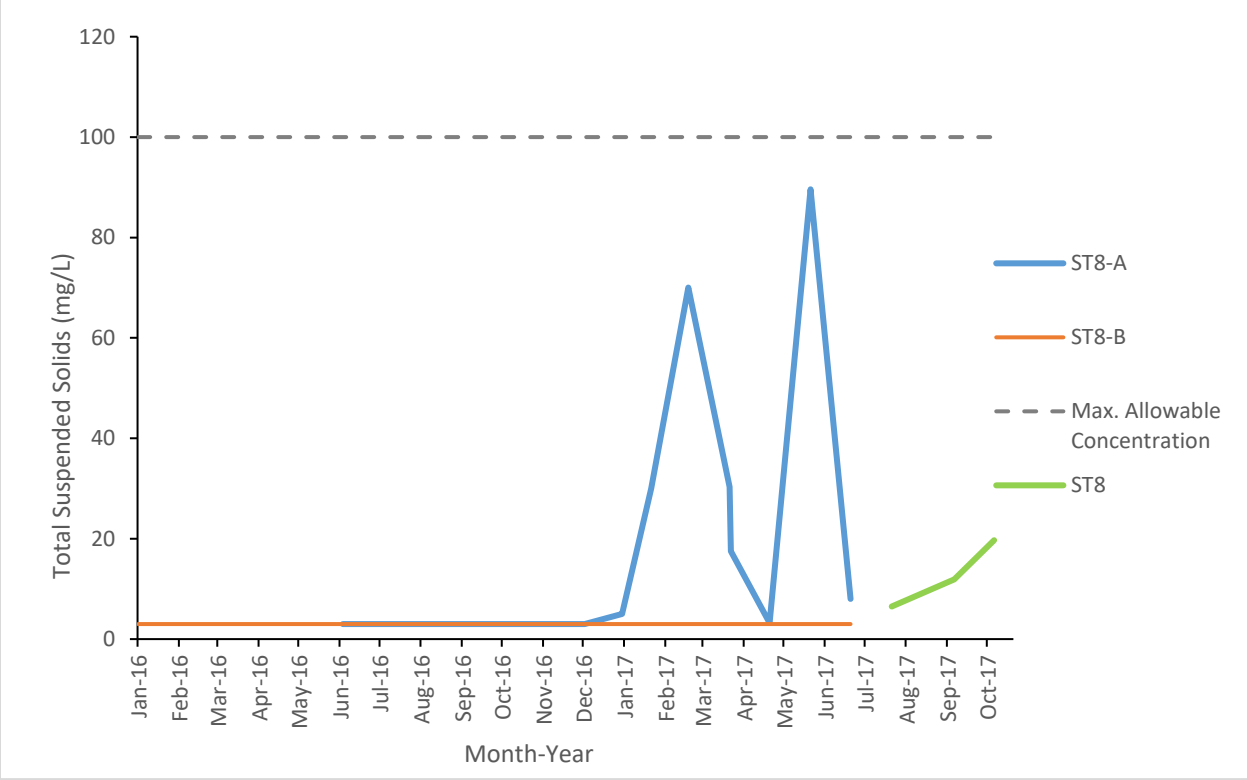
Figure 1 and 2 illustrates effluent quality characteristics for parameters of interest at select monitoring stations.

Figure 1. Biological Oxygen Demand Results Consistently Below Discharge Criteria for Wastewater Treatment Plant (ST8, ST8A, ST8B)



Note: Maximum Average Concentration as per Part G Item 4(b).

Figure 2. Total Suspended Solids Results Consistently Below Discharge Criteria for Wastewater Treatment Plant (ST8, ST8A, ST8B)



Note: Maximum Average Concentration as per Part G Item 4(b).

Flow and Volume Measurements (Part J Items 11, 12, and Schedule J)

Table 1. Effluent discharge, October 2017

Facility	Station Code	Discharge Volume (m^3)	Exceedances of Discharge Criteria	Discharge Location	Licence Reference
Sedimentation Pond	ST-1	0	0	Tailings Impoundment Area	Part G Item 22
Pollution Control Pond #1	ST-2	0	N/A	Tailings Impoundment Area	Part G Item 22
Landfill Sump	ST-3	0	0	Facility not constructed	Part G Item 24 (a, b, g)
Landfarm Sump	ST-4	0	0	Tundra Discharge 13W 432450 7559600	Part G Item 24 (c, d, g)
Doris Tank Farm	ST-5	0	0	Tundra Discharge 13W 432960 7559270	Part G Item 24 (e, f, g)
Rob Bay 5ML Tank Farm	ST-6a	0	0	Tundra Discharge 13W 432973 7563440	Part G Item 24 (e, f, g)
Rob Bay Three 5ML Tank Farm	ST-6b	0	0	Tundra Discharge 13W 432730 7563200	Part G Item 24 (e, f, g)
Wastewater Treatment Plant, Effluent	ST-8	871	0	Tundra Discharge 13W 432933 7559057	Part G Item 23(b-d)
Wastewater Treatment Plant, Sewage Cake	N/A	20.1	N/A	Tailings Impoundment Area	Part J Item 12 (g)
Reagent and Cyanide Storage Facility Sump	ST-11	0	0	Tailings Impoundment Area	Part G Item 23 (a)
Pollution Control Pond #2	ST-13	0	0	Facility not constructed	Part G Item 22
Mine Water Discharge	TL-12	0	N/A	Tailings Impoundment Area	Schedule J Table 2

Records of visual monitoring of discharge to tundra are maintained on file as per Part J Item 18.

Table 2. Discharge from TIA to Doris Creek, October 2017

Month	Number of days of discharge	Discharge Volume (m^3)	Exceedances of Discharge Criteria*
January	0	0	0
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
Annual Cumulative	**0**	**0**	**0**

* Discharge criteria outlined in Part G Items 29, 30, 31 and Part J Item 8.

A comparison of flows between TL-4 and TL-2 as per Part G Item 32 of the licence was not conducted as no water was discharged for the Tailings Impoundment Area to Doris Creek this month.

Table 3. Water usage, October 2017

Month	Windy Lake (ST-7A)				Doris Lake (ST-7)				Total Usage
	Domestic Water* (m^3)	Surface Exploration (m^3)	Industrial Usage** (m^3)	Dust Suppression (m^3)	Domestic Water* (m^3)	Surface Exploration (m^3)	Industrial Usage** (m^3)	Dust Suppression (m^3)	
January	849	0	15	0	0	0	0	0	864
February	801	0	0	0	0	0	0	0	801
March	925	1	0	0	0	0	32	0	958
April	873	0	2	0	0	0	608	0	1,483
May	892	0	3	0	0	0	512	32	1,439
June	946	0	1	0	0	0	26	838	1,811
July	844	0	7	0	0	0	0	1,356	2,207
August	849	0	0	0	0	0	34	1,784	2,667
September	814	0	0	0	0	0	1	335	1,150
October	889	0	0	0	0	0	16	0	889
Annual Total	8,682	1	28	0	0	0	1,229	4,345	14,285
Annual Allowance	**22,995**								**480,000**

* As permitted by water licences 2BE-HOP1222 and 2AM-DOH1323

** Includes industrial uses such as underground drilling, core processing, concrete batching, etc.

October Ice Road Development: 0m^3. Cumulative total for Ice Road Development in 2017: 16m^3.

Table 4. Volume of Reclaim Water from the TIA, October 2017

Month	Reclaim Water (m^3) *
January	31,200
February	94,080
March	107,880
April	100,800
May	107,880
June	104,400
July	81,721
August	96,586
September	92,016
October	92,181
Annual Cumulative	**901,304**

* As per Part J Item 11(d)

Table 5. Waste Rock and Process Volumes, October 2017

Month	Waste Rock Stored on Temporary Waste Rock Pile (tonnes)*	Waste Rock Returned Underground* (tonnes)	Quantity of Ore Processed** (tonnes)	Dry Tailings Placed in TIA** (tonnes)	Dry Cyanide Leach Tailings Placed Underground** (tonnes)	Volume of Void Space Created Underground (tonnes)	Volume of Void Space Created Underground (m^3)
January	24,811	0	2,020	600	0	-	-
February	22,584	1,392	6,174	5,927	247	-	-
March	23,917	5,060	11,177	10,970	207	618,048	220,731
April	23,437	11,226	19,058	17,761	1,297	-162	-58
May	24,341	7,660	20,867	20,418	449	4,269	1,525
June	22,189	4,320	20,662	19,867	796	25,491	9,104
July	19,121	11,960	18,464	17,652	812	-5,711	-2,040
August	8,164	1,380	23,995	23,075	913	27,180	9,707
September	17,326	12,920	17,337	16,681	655	23,451	8,375
October	20,613	16,792	23,557	22,707	851	-4,664	-1.666
Cumulative Total	605,470	72,710	163,311	155,658	6,227	687,902	245,679

* As per Part J Item 11(e, f)

** As per Part J Item 12.

Note: The cumulative total of void space underground is determined as the sum of the initial void space as calculated in March 2017 and void space created each month from mining activities. A negative volume of void space created indicates that a higher volume of waste rock and dry cyanide leach tailings was returned underground compared to the volume of void space created from new mining activities.

Table 6. Doris Lake Water Level (ST-12), October 2017

Month	Minimum Water Level (masl)	Maximum Water Level (masl)	Mean Water Level (masl)	Monthly Water Level Variation (masl)**	Comparison of Mean Water Level from Month to Month (masl)^	Low Action Level Trigger (masl)*
January	21.783	21.833	21.810	0.049	-	21.425
February	21.804	21.862	21.831	0.058	0.022	21.425
March	21.814	21.869	21.837	0.055	0.006	21.425
April	21.827	21.864	21.850	0.037	0.013	21.425
May	21.845	22.375	21.929	0.530	0.079	21.425
June	22.114	22.407	22.235	0.293	0.306	21.425
July	21.761	22.067	21.886	0.306	-0.349	21.425
August	21.708	21.757	21.732	0.049	-0.154	21.425
September	21.706	21.773	21.751	0.067	0.019	21.425
October	21.708	21.767	21.734	0.059	-0.017	21.346

* Low action level trigger is relative to the average water level value (September 10-30, 2016/2017) measured in Doris Lake. Low action level trigger (-0.42 m) outlined in Section 5.4 of the Doris Aquatic Effects Monitoring Plan, August 2016.

** Monthly Water Level Variation is calculated as the difference between the Maximum Water Level and the Minimum Water Level measured during the month.

^ Comparison of the change in water level from month to month. This value is calculated by subtracting the Mean Water Level of the current month from the Mean Water Level of the previous month (e.g February Mean Water level - January Mean Water level). A positive value from this calculation indicates a rise in water level since the previous month; a negative value from this calculation indicates a drop in water level since the previous month.

Summary of Assessments of Water Balance and Water Quality Model (Part G Item 34)

Average monthly water quality, hydrologic, and climatic monitoring data were collected while in operations during October. Data will contribute to the assessment of the water and load balance model, and will be compared to the predicted water quality and elevation within the TIA and will be reported in the annual report for 2017.

Thermal Monitoring (Part J Items 13 and 14)

Thermal monitoring undertaken as per Part J Items 13, 14 and Schedule J is reported in the annual Geotechnical Report.

Doris North Camp Diversion Berm Effectiveness (Part J Item 19(d))

Visual monitoring was conducted during October to evaluate the diversion berm's efficacy of diverting runoff away from the camp pad. The diversion berm was observed to be functioning as per its design purpose.

Incident Reporting

Spill #17-398 – On October 26, 2017 a spill of tailings material occurred to the camp pad outside the process plant building at Doris Camp. A leak from the tailings discharge pipeline was discovered on an elbow-section of pipe located inside the process plant building. Spray from the leak contacted the wall of the building, migrated down the wall and onto the concrete footing below. An estimated 50-60L of tailings material was able to seep between the metal cladding of the wall and the concrete footing, and was released onto the camp pad outside the building. Upon discovering the leak, discharge from the tailings line was shut down and repairs were completed on the discharge pipeline. Tailings material was excavated from the camp pad surface outside the building and disposed of in the Tailings Impoundment Area.

The leak occurred due to wear in the steel elbow at this location. To reduce the risk of a similar event occurring outside of the process plant building, each elbow along the tailings discharge pipeline will be fitted with a secondary, enclosed exterior elbow (coffin elbow) which will provide containment in the event of a leak at these locations. A port will be installed on each exterior elbow to allow personnel to check for leaks in the interior pipeline during routine inspections. A barrier will also be installed along the inside wall of the process plant building to contain splash from a pipe leak within the building itself.

In addition to these measures, TMAC will install flow meters at the beginning of the tailings discharge pipeline and at a location before the first discharge spigot to measure flow differential within the line between the process plant and the Tailings Impoundment Area. This will allow for continuous monitoring of the flow differential from within the process plant control room. A change in flow within the pipeline will cause an alarm within the control room which will trigger an additional inspection of the line to assess for leaks.

Spill #17-401 – On October 30, 2017 a spill of 18L of ethylene glycol antifreeze occurred from a pickup truck parked idling on the west side of the Heavy Equipment shop at Doris Camp. The driver shut down the vehicle upon discovery of the spilled material in order to prevent further spillage. It was determined that the lower radiator hose clip of the pickup had failed which caused the radiator hose to disconnect. A new radiator hose clip was installed and the radiator was topped up with fluid, which is the basis for the spill estimate. All contaminated snow and gravel was removed from the camp pad surface and taken to waste management for disposal.

TMAC internally reviewed the incident to identify any corrective actions. All site equipment undergoes scheduled preventative maintenance checks to ensure equipment is in satisfactory operating condition and to reduce the likelihood of spill occurrences. Pre-operational checks of all vehicles are conducted by operators to identify potential issues which could result in a spill.

Yours sincerely,

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cc. Eva Paul, Water Resources Officer, INAC

Figure 3. 2AM-DOH-1323 SNP Monitoring Locations