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February 28, 2017

Licensing
Nunavut Water Board
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Re: January 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.

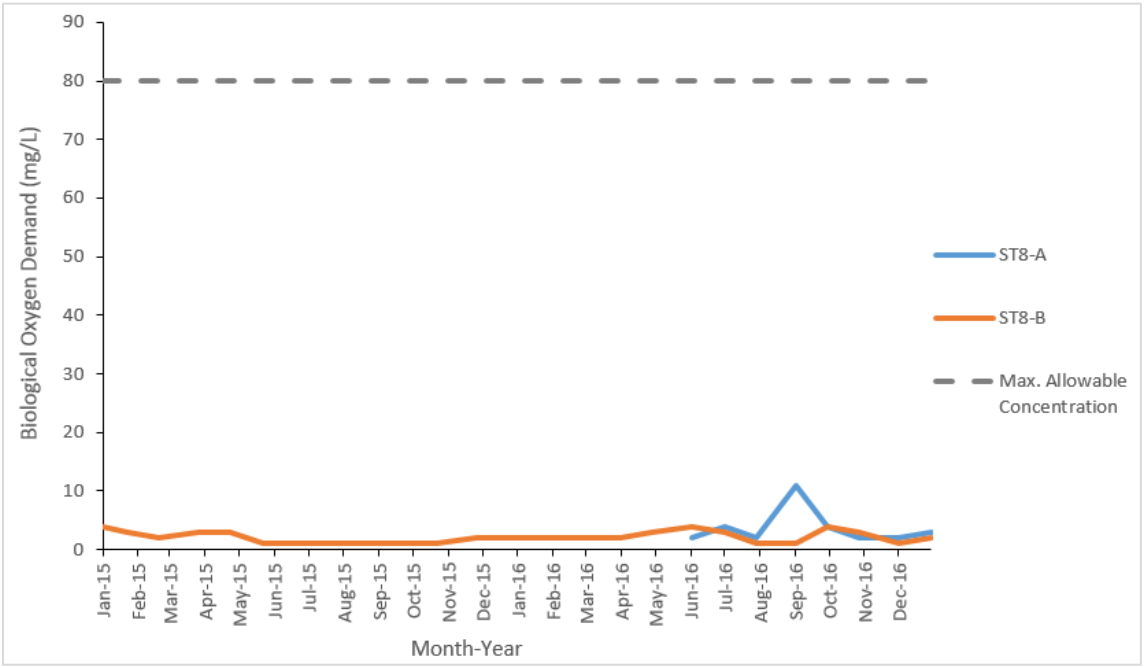
During the subject period of this report the focus of activities at Doris North was underground mining, construction, processing plant commissioning, water management and environmental compliance. Sampling locations monitored under this licence (seasonally or when facilities are operational) are provided 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 January at monitoring stations identified in Schedule J of the licence (ST-1 through ST-13, TL-1 through TL-12). Results of this monitoring are provided in Appendix A.

Figures 1 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 (ST-8A, 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, January 2017

Facility	Station Code	Discharge Volume (m^3)	Exceedances of Discharge Criteria	Discharge Location	Licence Reference
Sedimentation Pond	ST-1	0	N/A	Tailings Impoundment Area	Part G Item 22
Pollution Control Pond	ST-2	0	N/A	Tailings Impoundment Area	Part G Item 22
Landfill Sump	ST-3	0	0	Facility not constructed	Part G Item 23 (a-b, g)
Landfarm Sump	ST-4	0	0	Sedimentation Control Pond	Part G Item 23 (c-d, g)
Doris Tank Farm	ST-5	0	0	Sedimentation Control Pond	Part G Item 23 (e-f, g)
Rob Bay 5ML Tank Farm	ST-6a	0	0	Sedimentation Control Pond	Part G Item 23 (e-f, g)
Rob Bay Three 5ML Tank Farm	ST-6b	0	0	Sedimentation Control Pond	Part G Item 23 (e-f, g)
Wastewater Treatment Plant, Effluent	ST-8	834	0	Tundra Discharge 13W 432933 7559057	Part G Item 4 (a-d)
Wastewater Treatment Plant, Sewage	N/A	2.27	N/A	Incinerated	Part J Item 12 (g)
Reagent and Cyanide Storage Facility Sump	ST-11	0	N/A	Tailings Impoundment Area	Part G Item 22
Pollution Control Pond	ST-13	0	N/A	Facility not constructed	Part G Item 22
Mine Water Discharge	TL-12	0	N/A	Facility not constructed	

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

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

Month	Number of days of discharge	Discharge Volume (m^3)	Exceedances of Discharge Criteria*
January	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, January 2017

	Usage by Water Source (m^3)		Total Usage (m^3)	
Water Usage	Windy Lake (ST-7A)	Doris Lake (ST-7)	Monthly	Annual Cumulative
Domestic Water*	849	0	849	849
Doris Surface Exploration Drilling	0	0	0	0
All Other Industrial Water Use**	15	0	15	15
Dust Suppression	0	0	0	0
Total	**864**	**0**	**864**	**864**
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, mill commissioning, concrete batching, etc.

No water was applied for ice road development during the month. No water has been applied for ice road development in 2017.

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

	Reclaim Water * (m^3)
Month	(m^3)

January	31,200
Annual Cumulative	**0**

* As per Part J Item 11(d)

Table 5. Waste Rock and Process Volumes, January 2017

Material	Waste Rock Stored Temporary Waste Rock Pile (tonnes)*	Waste Rock Returned Underground * (tonnes)	Dry Tailings Placed in TIA** (tonnes)	Dry Cyanide Leach Tailings Placed Underground** (tonnes)	Quantity of Ore Processed** (tonnes)
Monthly Total	24,811	0	600	0	0
Cumulative Total	**423,778**	**0**	**600**	**0**	**0**

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

** As per Part J Item 12.

Final mill commissioning activities occurred over the last 2 days of January, which included process testing. Tailings were discharged into the TIA irregularly during this time and were not sampled until operations commenced in February.

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

During Operations, monthly assessments will be conducted of the water balance and water quality model. Prior to entering Operations, this assessment is conducted annually and a summary provided in the Annual Report.

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))

Monitoring was not conducted on the Diversion Berm this month due to freezing conditions.

Incident Reporting

On January 15, 2017, commissioning began on the newly installed tailings discharge pipeline. Water from Doris Lake, which had been added to the processing plant in December, was used to confirm the pipeline integrity. Leaks in the pipeline were identified and resulted in a release of an estimated 1.5 m^3 of lake water to the roadway and tundra adjacent to the tailings pipeline. This water froze quickly on the surface and was contained within the snowpack (Figure 3).

As a precautionary measure, a water quality sample was collected and submitted for laboratory analysis. A slightly higher iron content was identified in the sample; however, these results were comparable to iron levels observed in Doris Lake water quality results (Table 6 below).

As is common in commissioning of pipelines, small releases do occur and lake water was chosen as an appropriate medium to be used in confirming the pipeline integrity. The cause of the leaks were identified and repairs were completed prior to the commencement of tailings discharge through the line.

Figure 3. Lake Water Released from Tailings Line During Commissioning

Table 6. Comparison of Water Quality Results of Lake Water Released During Tailings Line Commissioning (LR15JAN17) and 2016 Doris Lake Water Quality Results

	Sample ID	LR15JAN17	ST7-19JAN16	ST7-16FEB16a	ST7-16FEB16b	ST7-15MAR16	ST7-19APR16	ST7-17MAY16	ST7-28JUN16	ST7-19JUL16	ST7-16AUG16	ST7-20SEP16	ST7-18OCT16	ST7-15NOV16	ST7-20DEC16
	ALS ID	L1880227-1	L1725139-1	L1734857-1	L1734857-2	L1745031-1	L1757584-1	L1770135-1	L1790650-1	L1800567-1	L1814224-1	L1831824-1	L1844993-1	L1857948-1	L1872232-1
	Date Sampled	16/01/2017 8:00	19/01/2016 11:20	16/02/2016 8:40	16/02/2016 8:40	15/03/2016 8:15	19/04/2016 7:45	17/05/2016 9:20	28/06/2016 8:20	19/07/2016 7:30	16/08/2016 7:45	20/09/2016 8:25	18/10/2016 8:45	15/11/2016 7:55	20/12/2016 7:30
Parameter	**Units**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**	**Water**
pH	pH	8.33	6.68	7.54	7.54	7.67	7.45	7.79	7.61	7.63	7.84	7.77	7.80	7.84	7.45
Total Suspended Solids	mg/L	8.1	4.4	3.8	3.7	4.5	4.8	4.8	3.3	4.2	3.1	5.9	6.1	6.6	3.2
Aluminum (Al)-Total	mg/L	0.0860	0.0211	0.0985	0.0269	0.0125	0.0225	0.0095	0.0496	0.0582	0.0293	0.0861	0.0874	0.0569	0.0314
Arsenic (As)-Total	mg/L	0.00031	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cadmium (Cd)-Total	mg/L	0.0000150	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	11.1	9.48	9.86	9.90	10.0	10.1	9.87	8.11	8.11	8.16	8.65	8.56	8.83	8.65
Chromium (Cr)-Total	mg/L	0.00090	<0.0010	<0.0010	<0.0010	<0.0010	0.0056	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Copper (Cu)-Total	mg/L	0.00205	0.0033	0.0077	0.0023	0.0018	0.0020	0.0018	0.0017	0.0016	0.0021	0.0021	0.0017	0.0021	0.0018
Iron (Fe)-Total	mg/L	0.644	2.83	0.170	0.122	0.119	0.387	0.061	0.432	0.218	0.156	0.231	0.129	1.59	0.066
Lead (Pb)-Total	mg/L	0.000172	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00258
Molybdenum (Mo)-Total	mg/L	0.000658	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Total	mg/L	0.00131	0.0012	<0.0010	<0.0010	<0.0010	0.0031	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	mg/L	<0.050	0.0198	0.0254	0.0247	0.0271	0.0259	0.0263	0.0148	0.0151	0.0082	0.0167	0.0263	0.0210	-
Selenium (Se)-Total	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	0.000052	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000057	0.000066	0.000052
Silver (Ag)-Total	mg/L	<0.000010	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Thallium (Tl)-Total	mg/L	<0.000010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Zinc (Zn)-Total	mg/L	0.0063	<0.0050	0.0093	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0070	0.0128
Oil and Grease	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Oil And Grease (Visible Sheen)	NA	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Should there be any questions regarding this monthly report, please contact John Roberts. John.Roberts@tmacresources.com.

Yours sincerely,

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cc. Eva Paul, Water Resources Officer, INAC

Appendix A: Water Quality Monitoring Program Results

Water quality samples were not collected for facilities that have not yet been constructed (ST-3 and ST-13) or for facilities that were frozen during the month (ST-1, ST-2, ST-4, ST-5, ST-6a, ST-6b, ST-9, and ST-11). As operations had not yet commenced, sampling was not conducted at compliance stations associated with the process plant, or reclaim water and tailings discharge lines (TL-1 through TL-12). No runoff from facilities occurred; therefore, no samples were collected under monitoring station ST-10 (Part D Item 18).

Table 7. Water Intake Facilities, Doris Lake (ST7) and Windy Lake (ST7a), January 2017

		Sample ID	ST7-16JAN17	ST7A-03JAN17
		ALS ID	L1880215-1	L1875238-1-1
		Date Sampled	01/16/2017 16:15	03/01/2016 8:00
Parameter	**Units**	**Detection Limit**	**Water**	**Water**
Hardness (as CaCO3)	mg/L	0.5	53.5	77.2
pH	pH	0.1	7.56	7.76
Total Suspended Solids	mg/L	3	3.8	<3.0
Ammonia, Total (as N)	mg/L	0.005	0.0549	0.0082
Chloride (Cl)	mg/L	0.5	63.6	n/a
Nitrate (as N)	mg/L	0.005	0.0098	<0.0050
Nitrite (as N)	mg/L	0.001	<0.0010	<0.0010
Orthophosphate-Dissolved (as P)	mg/L	0.001	<0.0010	<0.0010
Phosphorus (P)-Total	mg/L	0.002	0.0289	0.0038
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050
MPN-Fecal Coliform	MPN/100mL	1	n/a	<1*
Aluminum (Al)-Total	mg/L	0.005	0.0263	0.0106
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0005	<0.00050	<0.00050
Barium (Ba)-Total	mg/L	0.02	<0.020	<0.020
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.1	<0.10	<0.10
Cadmium (Cd)-Total	mg/L	0.000005	<0.0000050	0.0000126
Calcium (Ca)-Total	mg/L	0.1	9.51	13.8
Chromium (Cr)-Total	mg/L	0.001	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	0.0003	<0.00030	<0.00030
Copper (Cu)-Total	mg/L	0.001	0.0017	0.0011
Iron (Fe)-Total	mg/L	0.03	0.11	<0.030
Lead (Pb)-Total	mg/L	0.0005	0.00121	<0.00050
Lithium (Li)-Total	mg/L	0.001	0.0041	0.0028
Magnesium (Mg)-Total	mg/L	0.1	7.22	10.4
Manganese (Mn)-Total	mg/L	0.0003	0.00671	0.00114
Mercury (Hg)-Total	mg/L	0.000005	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010	<0.0010
Nickel (Ni)-Total	mg/L	0.001	<0.0010	<0.0010
Potassium (K)-Total	mg/L	2	2.4	4.5
Selenium (Se)-Total	mg/L	0.00005	<0.000050	<0.000050
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020
Sodium (Na)-Total	mg/L	2	34.9	60.3
Thallium (Tl)-Total	mg/L	0.0002	<0.00020	<0.00020
Tin (Sn)-Total	mg/L	0.0005	<0.00050	<0.00050
Titanium (Ti)-Total	mg/L	0.01	<0.010	<0.010
Uranium (U)-Total	mg/L	0.0002	<0.00020	<0.00020
Vanadium (V)-Total	mg/L	0.0005	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.005	<0.0050	<0.0050
Biochemical Oxygen Demand	mg/L	2	<5.0	<2.0
Oil and Grease	mg/L	5	<5.0	<5.0
Oil And Grease (Visible Sheen)		n/a	No	No

* Results on Lab Work Order L1875240-1 for Potable Water Station PDC10 (same location as ST-7a)

Table 8. Wastewater Treatment Plant (ST-8a, ST-8b), January 2017

		Sample ID	ST8A-10JAN17	ST8B-10JAN17	Part G Item 3(b)
		ALS ID	L1877934-1	L1877934-2	Maximum Average Concentration (mg/L)
		Date Sampled	10/01/2017 7:45	10/01/2017 8:00	
Parameter	**Units**	**Detection Limit**	**Water**	**Water**	
Biochemical Oxygen Demand (BOD5)	mg/L	2	3.0	2	80
Fecal Coliforms	MPN/100mL	1	43	3	10,000
Oil and Grease	mg/L	5	<5.0	<5.0	5
Oil And Grease (Visible Sheen)			No	No	No Visible Sheen
pH	pH units	0.1	7.86	8.28	6-9
Total Suspended Solids	mg/L	3	3.9	<3.0	100

Bold/shading indicates exceedance of Part G Item 3(b) Maximum Allowable Concentration. No exceedances observed.

Table 9. Doris Lake Water Level (ST-12), January 2017

Minimum Water Level (masl)	Maximum Water Level (masl)	Mean Water Level (masl)	Water Level Change (masl)	Low Action Level Trigger (masl)
21.778	21.823	21.797	0.045	21.425

* Low action level trigger is relative to the average water level value (September 10-30, 2016) 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.

Figure 4. 2AM-DOH-1323 SNP Monitoring Locations