

May 21, 2016

Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU
X0B 1J0

Re: April 2016 – 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, and additional requirements from INAC. Licence items include:

- Part E (Conditions applying to Water Use) Item 1;
- Part G (Conditions Applying to Waste Management and Waste Management Plans) Items 1, 3(b) and 23 (a), 24 (c, e), 28, 29, 30, 32;
- Part J (Conditions Applying to General and Aquatic Effects Monitoring) Items 4(a), 8, 12 (a, d, g), 14, 15, 16, 20 and 21(e, f).

Other monitoring requirements stipulated in the licence refer to facilities that have not been constructed. During the subject period of this report the focus of activities at Doris North was surface exploration drilling, underground mining, construction, water management and environmental compliance. Sampling locations monitored under this licence (seasonally or when facilities are operational) are provided in Figure 1.

Part E: Conditions Applying to Water Use

Item 1: Water Usage and Part J, Item 12(a) Water Volume

A total of 655 m³ of water was extracted from Windy Lake for domestic use this month as permitted by water licences 2BE-HOP1222 and 2AM-DOH1323. 5 m³ of water from Doris Lake was used in the 2AM-DOH1323 licence area for surface exploration drilling; surface exploration drilling in this licence area concluded on April 2, 2016. A total of 97 m³ of water was used from Doris and Windy Lakes (94 m³ and 3 m³, respectively) for underground drilling and other industrial purposes in support of the Doris North mine development. No water was used for dust suppression on site roads this month. Water usage is presented in Table 1.

Table 1: Water usage, in cubic meters, April 2016

Water Usage	Domestic Water Use from Windy Lake ST-7a (m ³)	Domestic Water Use from Doris Lake ST-7 (m ³)	Doris Surface Exploration Drilling (m ³)*	All Other Industrial Water Use** (m ³)	Total (m ³)
Monthly Total	655	0	5	97	757
Annual Cumulative	2,478	0	284	619	3,381

* All water withdrawn from Doris Lake

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

A total of 8 m³ of water was applied from Doris Lake for ice road development during the month. In total, 1,068 m³ of water has been applied in 2016 for ice road development. These quantities are not included in the usage indicated in Table 1.

Schedule J: Water Quality Monitoring at Water Intake

Monthly water quality samples were taken from monitoring stations ST-7 (Doris Lake raw water) and ST-7a (Windy Lake raw water) in accordance with the Schedule J requirements of the licence. Water quality results are presented in Table 2 below.

Table 2: Monthly Compliance Sample Results for ST-7 and ST-7a, April 2016

Sample ID			ST7-19APR16	ST7A-12APR16
ALS ID			L1757584-1	L1754971-1
Date Sampled			4/19/2016 7:45:00 AM	4/12/2016 8:35:00 AM
Parameter	Units	Detection Limit	Water	Water
Hardness (as CaCO ₃)	mg/L	0.5	57.2	90.2
pH	pH	0.1	7.45	7.96
Total Suspended Solids	mg/L	3	4.8	<3.0
Ammonia, Total (as N)	mg/L	0.005	<0.0050	<0.0050
Nitrate (as N)	mg/L	0.005	<0.0050	<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	0.0259	0.0039
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050
Fecal Coliforms	CFU/100mL	1	<1	<1*
Aluminum (Al)-Total	mg/L	0.005	0.0225	0.0089
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	0.00001	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	0.1	10.1	15.5
Chromium (Cr)-Total	mg/L	0.001	0.0056	<0.0010
Cobalt (Co)-Total	mg/L	0.0003	<0.00030	<0.00030
Copper (Cu)-Total	mg/L	0.001	0.002	0.0013
Iron (Fe)-Total	mg/L	0.03	0.387	<0.030
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0039	0.0036
Magnesium (Mg)-Total	mg/L	0.1	7.79	12.5
Manganese (Mn)-Total	mg/L	0.0003	0.00889	0.00077
Mercury (Hg)-Total	mg/L	0.00001	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010	<0.0010
Nickel (Ni)-Total	mg/L	0.001	0.0031	<0.0010
Potassium (K)-Total	mg/L	2	3.3	5.1
Selenium (Se)-Total	mg/L	0.0001	0.000052	0.000052
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020
Sodium (Na)-Total	mg/L	2	41.1	69.8
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	0.00021
Vanadium (V)-Total	mg/L	0.001	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.005	<0.0050	<0.0050
Biochemical Oxygen Demand	mg/L	2	3	<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 L11754849-1 for Potable Water Station PDC10 (same location as ST-7a)

Part G: Conditions Applying to Waste Management and Waste Management Plans.**Item 1: Condition to Provide Notice of a Planned Discharge**

No planned discharges requiring notification occurred this month.

Item 3(b): Conditions Applying to Sewage Effluent Quality and Schedule J, Table 2 Monitoring Requirements: Discharge from Wastewater Treatment Plant in cubic meters.

Monthly compliance samples were taken from monitoring station ST-8 (Wastewater Treatment Plant Effluent) in accordance with the Schedule J requirements of the licence (Table 3). All parameters were in compliance with discharge criteria.

Table 3: Monthly Compliance Sample Results for ST-8B, April 2016

Sample ID			ST8B-12APR16	Part G Item 3(b)	
ALS ID			L1754966-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
Date Sampled			4/12/2016 9:25:00 AM		
Parameter	Units	Detection Limit	Water		
pH	pH	0.1	7.65	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3	<3.0	100	100
Fecal Coliforms	CFU/ 100mL	1	<1	10,000	10,000
Biochemical Oxygen Demand (BOD ₅)	mg/L	2	2.0	80	80
Oil and Grease	mg/L	5	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	No	No Visible Sheen	No Visible Sheen

Bold/shading indicates exceedance of Part G Item 3(b) Maximum Concentration in a Grab Sample.

Sample ID			ST8B-08MAR16	Part G Item 3(b)	
ALS ID			L1742519-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
Date Sampled			3/8/2016 8:55:00 AM		
Parameter	Units	Detection Limit	Water		
pH	pH	0.1	7.79	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3	<3.0	100	100
Fecal Coliforms	CFU/ 100mL	1	3	10,000	10,000
Biochemical Oxygen Demand (BOD ₅)	mg/L	2	2	80	80
Oil and Grease	mg/L	5	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	n/a	No Visible Sheen	No Visible Sheen

This month, 646 m³ of treated effluent was discharged from the sewage treatment plant.

Schedule J, Table 2 Monitoring Requirements: Runoff from Waste Water Treatment Plant Discharge (ST-9)

No water was available for sampling at location ST-9 (prior to entry into Glenn Lake) due to freezing conditions.

Item 23(a): Water Discharged from the Sedimentation Pond (ST-1) and Reagent and Cyanide Storage Facility Sumps (ST-11) and Schedule J, Table 2 Monitoring Requirements

No water was discharged from ST-1 this month, and no water was pumped from the Pollution Control Pond (ST-2) to ST-1. No water quality sampling was undertaken at ST-1 or ST-2 due to freezing conditions.

The Reagent and Cyanide Storage Facility Sumps (ST-11) are not constructed.

Items 24(c): Landfarm Sump (ST-4) and Schedule J, Table 2 Monitoring Requirements

No water was discharged from the Landfarm (ST-4) this month and no sampling was conducted.

Items 24(e): Fuel Storage and Containment Facility Sumps (ST-5, ST-6a and ST-6b) and Schedule J, Table 2 Monitoring Requirements

Compliance monitoring samples were not collected at the Doris Tank Farm (ST-5) and Roberts Bay tank farms (ST-6a and ST-6b) this month. These facilities are frozen and no discharge occurred.

Item 28, 29, 30 and Part J Item 8: Water Quality Discharged from Tailings Impoundment Area (TL-1, TL-2, TL-3 or TL-4.)

Dewatering of the Tailings Impoundment Area ended September 23, 2015 and has not yet re-commenced for 2016. No monitoring was conducted.

Item 32: Tailings Impoundment Area Discharge Volume – Comparison of Flows at TL-4 and TL-2

No water was discharged from the TIA to Doris Creek this month; a comparison of flows was not conducted.

Schedule J: Tailings Impoundment Area Water Quality (TL-10)

Monitoring at TL-10 is conducted annually prior to the deposition of tailings into the Tailings Impoundment Area. This monitoring will be conducted during the open water season in 2016.

Part J: Conditions Applying to General and Aquatics Effects Monitoring

Item 4(a): TIA Discharge Quality – Water Quality Comparison/Deviations

No water was discharged from the TIA this month and no water quality comparisons were made.

Item 8 and Schedule J, Monitoring Requirements: Acute Lethality Testing (TL-1 and TL-4)

No water was discharged from the TIA this month and no water was sampled.

Item 12d: Tonnages of Waste Rock Stored on the Temporary Waste Rock Pad

Underground mine development restarted in April 2015. The waste rock produced from the mining program is hauled to surface and stored on Pad T. The volume of waste rock brought to surface in April was 16,117 tonnes. The current total volume of waste rock on Pad T and the temporary waste rock pad is 280,950 tonnes.

Item 12g: Tail Lake Ice Thickness

Ice thickness measurement on the TIA is only required following deposition of tailings.

Item 14, 15, 16 and Schedule J, Monitoring Requirements: Thermal Monitoring

Thermal monitoring undertaken under this part is reported in the annual Geotechnical Inspection Report.

Item 20: Daily Visual Monitoring of Discharges to Tundra

No discharges to tundra occurred during this period. During periods of discharge monitoring observations will be documented.

Item 21 (e) Daily Visual Assessment of Suspended Sediment at TIA

The TIA was frozen during this month. No visual assessments were conducted.

Item 21 (f) Doris North Camp Diversion Berm Effectiveness

An assessment of effectiveness was not conducted on the Diversion Berm this month due to freezing conditions

Under-Ice Drilling Samples

The winter on-ice drilling program concluded on April 2, 2016. Post-drilling water quality samples were collected from Doris Lake on April 4, 2016. Water quality results of this sampling are presented in Table 4 below.

Table 4: Doris Lake Post-drilling Water Quality Samples, April 2016

Sample ID			DL-04APR16A	DL-04APR16B	DL-04APR16C	DL-04APR16D	DL-04APR16E	DL-04APR16F
ALS ID			L1752377-1	L1752377-2	L1752377-3	L1752377-4	L1752377-5	L1752377-6
Date Sampled			4/4/2016 1:55:00 PM	4/4/2016 2:35:00 PM	4/4/2016 3:05:00 PM	4/4/2016 3:35:00 PM	4/4/2016 4:10:00 PM	4/4/2016 4:55:00 PM
Parameter	Units	Detection Limit	Water	Water	Water	Water	Water	Water
Conductivity	uS/cm	2	356	337	333	343	349	331
Hardness (as CaCO ₃)	mg/L	0.5	59.8	57.6	59.4	61.2	56.6	55.8
pH	pH	0.1	7.88	7.74	7.79	7.83	7.85	7.88
Total Suspended Solids	mg/L	3	8.4	7.5	4.6	9.1	6.3	12.4
Aluminum (Al)-Total	mg/L	0.005	0.0229	0.0213	0.0543	0.0911	0.0231	0.0258
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Barium (Ba)-Total	mg/L	0.02	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Cadmium (Cd)-Total	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)-Total	mg/L	0.1	10.6	10.3	10.7	11	10.1	9.93
Chromium (Cr)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt (Co)-Total	mg/L	0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Copper (Cu)-Total	mg/L	0.001	0.0019	0.0018	0.002	0.0023	0.002	0.0019
Iron (Fe)-Total	mg/L	0.03	0.062	0.042	0.101	0.171	0.056	0.049
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.001	0.0045	0.0044	0.0046	0.0046	0.0044	0.0043
Magnesium (Mg)-Total	mg/L	0.1	8.07	7.76	7.96	8.17	7.62	7.52
Manganese (Mn)-Total	mg/L	0.0003	0.0105	0.00352	0.0053	0.00704	0.00356	0.00445
Mercury (Hg)-Total	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Nickel (Ni)-Total	mg/L	0.001	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	0.001
Potassium (K)-Total	mg/L	2	2.9	2.8	2.8	3	2.7	2.7
Selenium (Se)-Total	mg/L	0.00005	<0.000050	0.000051	<0.000050	<0.000050	<0.000050	<0.000050
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Sodium (Na)-Total	mg/L	2	40.7	38.9	39.6	41.2	38.4	37.7
Thallium (Tl)-Total	mg/L	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin (Sn)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Titanium (Ti)-Total	mg/L	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vanadium (V)-Total	mg/L	0.0005	<0.00050	<0.00050	<0.00050	0.00052	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Oil and Grease	mg/L	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Oil And Grease (Visible Sheen)		n/a	No	No	No	No	No	No

Incident Reporting

No incidents pertaining to this licence occurred during this month.

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

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'John Roberts', with a stylized flourish at the end.

M. John Roberts
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cc. Eva Paul, Water Resources Officer, INAC

Figure 1. 2AM-DOH-1323 SNP Monitoring Locations

