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August 30, 2016

Licensing
Nunavut Water Board
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Re: July 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 709 m^3 of water was extracted from Windy Lake for domestic use this month as permitted by water licences 2BE-HOP1222 and 2AM-DOH1323. No water was used for surface exploration drilling in the month of July. A total of 414 m^3 of water was used from Doris and Windy Lakes (400 m^3 and 14 m^3, respectively) for underground drilling and other industrial purposes in support of the Doris North mine development. A total of 1,816 m^3 of water was used from Doris Lake for dust suppression on the airstrip and site roads this month. Water usage is presented in Table 1.

Table 1: Water usage, in cubic meters, July 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)	Dust Suppression (m^3)	Total (m^3)
Monthly Total	709	0	0	414	1,816	2,939
Annual Cumulative	4,633	0	334	2,498	3,076	10,541

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

No water was applied for ice road development during the month. In total, 1,068 m^3 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, July 2016

		Sample ID	ST7-19JUL16	ST7A-05JUL16
		ALS ID	L1800567-1	L1793713-1
		Date Sampled	7/19/2016 7:30:00 AM	7/5/2016 8:25:00 AM
Parameter	**Units**	**Detection Limit**	**Water**	**Water**
Hardness (as CaCO3)	mg/L	0.5	45.4	69.7
pH	pH	0.1	7.63	7.81
Total Suspended Solids	mg/L	3	4.2	5.4
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	0.0013	0.0026
Phosphorus (P)-Total	mg/L	0.002	0.0151	0.0089
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050
Cyanide, Free	mg/L	0.005	<0.0050	<0.0050
Fecal Coliforms [1]	MPN/100mL	1	<1	<1*
Aluminum (Al)-Total	mg/L	0.005	0.0582	0.33
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	8.11	12.1
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	0.0016	<0.0015 **
Iron (Fe)-Total	mg/L	0.03	0.218	0.296
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0041	0.0034
Magnesium (Mg)-Total	mg/L	0.1	6.1	9.59
Manganese (Mn)-Total	mg/L	0.0003	0.0192	0.00483
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	<0.0010	<0.0010
Potassium (K)-Total	mg/L	2	2.2	3.9
Selenium (Se)-Total	mg/L	0.0001	<0.000050	<0.000050
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020
Sodium (Na)-Total	mg/L	2	30.5	55.6
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	0.019
Uranium (U)-Total	mg/L	0.0002	<0.00020	<0.00020
Vanadium (V)-Total	mg/L	0.001	<0.00050	0.00074
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 L1793451-1 for Potable Water Station PDC10 (same location as ST-7a)*

*** Analyte detected at comparable level in Method Blank.*

^ results on Lab Work Order L1802241-1. BOD bottle was not included in Lab Work Order L1800567-1.

[1] *Analytical methodology used by laboratory to determine Fecal coliform concentrations has changed. Results now presented as Most Probable Number per 100mL (MPN/100mL).*

Part G: Conditions Applying to Waste Management and Waste Management Plans.

Item 1: Condition to Provide Notice of a Planned Discharge

Notification of planned discharges from facilities under this licence was provided to the Inspector on May 3, 2016.

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 stations associated with the Wastewater Treatment Plant effluent (ST-8a and ST8-b) in accordance with Schedule J requirements of the licence (Table 3). All parameters were in compliance with discharge criteria.

A total of 697 m^3 of treated effluent was discharged from ST8-a and ST8-b (377 m^3 and 320 m^3 respectively) this month.

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

			Sample ID	ST8A-12JUL16	ST8B-12JUL16	Part G Item 3(b)	
			ALS ID	L1797029-3	L1797029-1	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
			Date Sampled	7/12/2016 8:20:00 AM	7/12/2016 8:10:00 AM		
Parameter	**Units**	**Detection Limit**		**Water**	**Water**		
pH	pH	0.1		7.74	7.69	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3		<3.0	<3.0	100	100
Fecal Coliforms [1]	MPN/ 100mL	1		<1	<1	10,000	10,000
Biochemical Oxygen Demand (BOD_5)	mg/L	2		4	3	80	80
Oil and Grease	mg/L	5		<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a		NO	NO	No Visible Sheen	No Visible Sheen

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

[1] *Analytical methodology used by laboratory to determine Fecal coliform concentrations has changed. Results now presented as Most Probable Number per 100mL (MPN/100mL).*

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

Monthly water quality samples were taken from monitoring station ST-9 (Runoff from Wastewater Treatment Plant Effluent) in accordance with Schedule J requirements of the licence. Water quality results are presented in Table 4 below.

Table 4: Monthly Compliance Sample Results for ST-9, July 2016

		Sample ID	ST9-12JUL16
		ALS ID	L1797029-2
		Date Sampled	7/12/2016 8:06:00 AM
Parameter	**Units**	**Detection Limit**	**Water**
pH	pH	0.10	7.35
Total Suspended Solids	mg/L	3.00	<3.0
Fecal Coliforms [1]	MPN/ 100mL	1.00	1
Biochemical Oxygen Demand (BOD_5)	mg/L	1.00	3
Oil and Grease	mg/L	5.00	<5.0
Oil And Grease (Visible Sheen)		n/a	NO

[1] *Analytical methodology used by laboratory to determine Fecal coliform concentrations has changed. Results now presented as Most Probable Number per 100mL (MPN/100mL).*

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

Water quality samples were collected from monitoring station ST-1 in accordance with Schedule J of the licence. Results are provided in Table 5 below. Levels of ammonia, iron and zinc exceeded the criteria for discharge to tundra in Part G Item 23(a). No water was discharged to tundra. 7358 m^3 of water was discharged from the Sedimentation Pond (ST-1) to the Tailings Impoundment Area (TIA) this month in accordance with Part G Item 23(d) of the licence. Monitoring was undertaken at the Pollution Control Pond (ST-2) this month in accordance with the requirements of Schedule J, Table 2 of the licence. Results are presented in Table 6 below. In July, 5674 m^3 of water was pumped from the Pollution Control Pond (ST-2) to ST-1.

Table 5: Monthly Compliance Sample Results for ST-1, July 2016

		Sample ID	ST1-25JUL16A	ST1-25JUL16B^	Part G Item 23(a)	
		ALS ID	L1804048-1	L1804048-5	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
		Date Sampled	7/25/2016 10:20:00 AM	7/25/2016 10:20:00 AM		
Parameter	**Units**	**Detection Limit**	**Water**	**Water**		
Hardness (as CaCO3)	mg/L	0.5	760	768		
pH	pH	0.1	7.87	7.87	6.0 - 9.0	9.0
Total Suspended Solids	mg/L	3	3.6	<3.0	15.0	30.0
Alkalinity, Total (as CaCO3)	mg/L	1	85.7	86.9		
Ammonia, Total (as N)	mg/L	0.005	**7.56**	**7.63**	2.0	4.0
Bromide (Br)	mg/L	0.5	<1.0 ^	<1.0 *		
Chloride (Cl)	mg/L	5	665	677		
Fluoride (F)	mg/L	0.2	<0.40 ^	<0.40 *		
Nitrate (as N)	mg/L	0.05	33.3	33.8		
Nitrite (as N)	mg/L	0.01	0.332	0.371		
Sulfate (SO4)	mg/L	5	93.3	94.2		
Cyanide, Total	mg/L	0.005	<0.0050	<0.0050	1.0	2.0
Aluminum (Al)-Total	mg/L	0.005	0.173	0.189	1.0	2.0
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050		
Arsenic (As)-Total	mg/L	0.0005	0.00143	0.00141	0.05	0.10
Barium (Ba)-Total	mg/L	0.02	0.048	0.049		
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010		
Boron (B)-Total	mg/L	0.1	0.24	0.24		
Cadmium (Cd)-Total	mg/L	0.00001	0.000105	0.0000983		
Calcium (Ca)-Total	mg/L	0.1	249	252		
Chromium (Cr)-Total	mg/L	0.001	0.0121	0.0121		
Cobalt (Co)-Total	mg/L	0.0003	0.00137	0.00135		
Copper (Cu)-Total	mg/L	0.001	0.0063	0.0066	0.02	0.30
Iron (Fe)-Total	mg/L	0.03	0.292	**0.309**	0.30	0.60
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050	0.01	0.02
Lithium (Li)-Total	mg/L	0.005	0.0144	0.0169		
Magnesium (Mg)-Total	mg/L	0.1	33.4	33.8		
Manganese (Mn)-Total	mg/L	0.0003	0.287	0.292		
Molybdenum (Mo)-Total	mg/L	0.001	0.0094	0.0108		
Nickel (Ni)-Total	mg/L	0.001	0.0027	0.0029	0.05	0.10
Potassium (K)-Total	mg/L	2	20.6	20.8		
Selenium (Se)-Total	mg/L	0.0001	0.0014	0.00143		
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020		
Sodium (Na)-Total	mg/L	2	213	214		
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	0.023	0.021		
Uranium (U)-Total	mg/L	0.0002	0.00074	0.00083		
Vanadium (V)-Total	mg/L	0.001	0.00129	0.0013		
Zinc (Zn)-Total	mg/L	0.005	**0.0226**	**0.0231**	0.01	0.02
Oil and Grease	mg/L	5	<5.0	<5.0	5	10
Oil And Grease (Visible Sheen)		n/a	NO	NO	No Visible Sheen	No Visible Sheen

Bold/shading indicates exceedance of Part G Item 23(a) Maximum Average Concentration and/or Maximum Concentration in a Grab Sample.

* Detection Limit Raised.

^ Duplicate Sample.

Table 6: Monthly Compliance Sample Results for ST-2, July 2016

		Sample ID	ST2-25JUL16A	ST2-25JUL16B^
		ALS ID	L1804048-2	L1804048-6
		Date Sampled	7/25/2016 10:40:00 AM	7/25/2016 10:40:00 AM
Parameter	**Units**	**Detection Limit**	**Water**	**Water**
Hardness (as CaCO3)	mg/L	0.5	561	574
pH	pH	0.1	7.88	7.87
Total Suspended Solids	mg/L	3	<3.0	3.5
Alkalinity, Total (as CaCO3)	mg/L	1	92.7	89.9
Ammonia, Total (as N)	mg/L	0.25	4.55	4.63
Bromide (Br)	mg/L	0.05	<1.0 **	<1.0 **
Chloride (Cl)	mg/L	0.5	505	518
Fluoride (F)	mg/L	0.02	<0.40 **	<0.40 **
Nitrate (as N)	mg/L	0.025	27.1	28.1
Nitrite (as N)	mg/L	0.001	0.292	0.306
Sulfate (SO4)	mg/L	0.5	107	108
Cyanide, Total	mg/L	0.005	0.0053 *	0.0053 *
Aluminum (Al)-Total	mg/L	0.006	0.232	0.296
Antimony (Sb)-Total	mg/L	0.0005	<0.00050	<0.00050
Arsenic (As)-Total	mg/L	0.0005	0.00209	0.00217
Barium (Ba)-Total	mg/L	0.02	0.032	0.033
Beryllium (Be)-Total	mg/L	0.001	<0.0010	<0.0010
Boron (B)-Total	mg/L	0.1	0.29	0.28
Cadmium (Cd)-Total	mg/L	0.00002	0.0000695	0.0000776
Calcium (Ca)-Total	mg/L	0.1	182	186
Chromium (Cr)-Total	mg/L	0.001	0.0181	0.0186
Cobalt (Co)-Total	mg/L	0.0003	0.00139	0.00145
Copper (Cu)-Total	mg/L	0.001	0.0076	0.0079
Iron (Fe)-Total	mg/L	0.03	0.388	0.506
Lead (Pb)-Total	mg/L	0.0005	<0.00050	<0.00050
Lithium (Li)-Total	mg/L	0.005	0.0167	0.0147
Magnesium (Mg)-Total	mg/L	0.1	26	26.4
Manganese (Mn)-Total	mg/L	0.0003	0.235	0.241
Molybdenum (Mo)-Total	mg/L	0.001	0.0138	0.0121
Nickel (Ni)-Total	mg/L	0.001	0.0026	0.0028
Potassium (K)-Total	mg/L	2	20.1	20.5
Selenium (Se)-Total	mg/L	0.0002	0.00153	0.00159
Silver (Ag)-Total	mg/L	0.00002	<0.000020	<0.000020
Sodium (Na)-Total	mg/L	2	192	195
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	0.024	0.026
Uranium (U)-Total	mg/L	0.0002	0.00071	0.00063
Vanadium (V)-Total	mg/L	0.002	0.00189	0.00213
Zinc (Zn)-Total	mg/L	0.005	<0.0050	<0.0050
Oil and Grease	mg/L	5	<5.0	<5.0
Oil And Grease (Visible Sheen)		n/a	NO	no

* Lab reports may be biased high due to interference from high nitrite in this sample.
** Detection Limit Raised
^ Duplicate sample.

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

Pre-discharge effluent quality samples were collected from the Landfarm (ST-4) this month. Results of this sampling are presented in Table 7 below. All parameters were in compliance with discharge criteria, however no water was discharged from the Landfarm (ST-4) this month.

Table 7: Monthly Compliance Sample Results for ST-4, July 2016

		Sample ID	ST4-19JUL16A	ST4-19JUL16B*	Part G Item 24(c)	
		ALS ID	L1800752-1	L1800752-2	Maximum Average Concentration (mg/L)	Maximum Concentration in any Grab Sample (mg/L)
		Date Sampled	7/19/2016 8:15:00 AM	7/19/2016 8:15:00 AM		
Parameter	**Units**	**Detection Limit**	**Water**	**Water**		
pH	pH	0.1	8.35	8.36	6.0-9.0	9
Total Suspended Solids	mg/L	3	3.4	3.3	15.0	30.0
Total Oil and Grease	mg/L	5	<5.0	<5.0	5.0	10.0
Oil And Grease (Visible Sheen)		n/a	NO	NO	No Visible Sheen	No Visible Sheen
Total Ammonia - N	mg/L	0.005	0.0128	0.0151	2.0	4.0
Total Lead	mg/L	0.00005	0.000152	0.000169	0.01	0.02
Benzene	mg/L	0.0005	<0.00050	<0.00050	0.37	
Toluene	mg/L	0.0005	<0.00050	<0.00050	0.002	
Ethylbenzene	mg/L	0.0005	<0.00050	<0.00050	0.090	

Bold/shading indicates exceedance of Part G Item 24(c) Maximum Concentration in a Grab Sample.
* Duplicate sample.

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

Beginning on June 15, 2016, all water accumulating at the Doris tank farm (ST-5) and Roberts Bay tank farms (ST-6a and ST-6b) was redirected to the Sedimentation Control Pond for transfer to the TIA. No compliance monitoring samples were collected this month for stations ST-5, ST-6a or ST-6b.

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.)

No discharge from the TIA to Doris Creek occurred in July and no water quality sampling was conducted this month at stations associated with the TIA discharge (TL-1 through TL-3).

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)

No discharge from the TIA to Doris Creek occurred in July and no water quality sampling was conducted this month at station TL-10.

Part J: Conditions Applying to General and Aquatics Effects Monitoring

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

No discharge from the TIA to Doris Creek occurred in July and no water quality sampling was conducted.

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

Acute lethality testing was not conducted this month at sample station TL-1 (TIA intake) as no water was discharged from the Tailings Impoundment Area.

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

Waste rock produced from the underground mining program is hauled to surface. The volume of waste rock brought to surface in July was 12,772 tonnes. The current total volume of waste rock on Pad T and the temporary waste rock pad is 310,414 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 this month.

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

No suspended sediment was noted during the month.

Item 21 (f) Doris North Camp Diversion Berm Effectiveness

During spring melt and after heavy rainfall events, visual observations were made of runoff associated with the diversion berm. No sedimentation was noted and water is effectively routed away from camp facilities.

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,

M. John Roberts
Vice President, Environmental Affairs
Hope Bay Project
(416) 628-0216

cc. Eva Paul, Water Resources Officer, INAC

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