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Your file / Votre référence

Our file / Notre référence
NWB2MEL0103

November 13, 2001.

Alan Sexton, District Geologist
WMC International Ltd.
22 Gurdwara Road
Nepean, ON K2E 8A2

August 28, 2001 Water Licence Inspection - Report

Firstly, I wish to thank Al Burton and yourself for the much appreciated time and assistance provided during the tour of the campsite's water use and waste disposal facilities. Attached for your records is the Industrial Water Use Inspection Report pertaining to the August 28, 2001 inspection; concerns previously raised have been addressed. Nonetheless, the following considerations were outlined during the inspection:

- **Water supply:** At the time of the inspection, the Licensee was seeing to the installation of a replacement water supply conveyance line (figure 1), which unlike the previous one will withstand wintertime and will include a flow gauging device. This being said, the attached analytical results relating to a sample taken in vicinity of the intake station indicate that the raw water meets the *Guidelines for Canadian Drinking Water Quality* for all tested parameters.

- **Waste disposal:** Since the last inspection, the Licensee has undertaken to upgrade the campsite's greywater disposal system (figure 2). Although it was mentioned that the sediment trap might have to be expanded in order to increase the retention capacity of the sump when the camp reverts to its former level of activity, the facility in the meantime appears quite adequate. As such, no evidence of solid wastes was noticeable beyond the facility, nor was flow noted along the shoreline downslope of the area. Thus, the attached analytical results relating to a sample collected from Meliadine Lake below the likely path of greywater discharge reveal that all tested parameters meet the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*. Further, the Microtox sample, which constitutes a reliable toxicity indicator (IC_{50}), did not denote toxicity.

In parallel, the Inspector commends the Licensee for the considerable on-site segregation of waste initiated at the campsite's waste management area (figure 3). Accordingly, through on-site incineration and off-site disposal, the Licensee minimizes the likelihood of camp operations bringing about the deposit of waste into waters.

In related matters, attached are also the analytical results relating to background water quality data sampled from the outlet of Peg, Control, and Meliadine lakes; all tested parameters were found to readily meet the *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life*, save for iron (858 μg/L vs 300 μg/L) at Peg Lake.

Please feel free to contact me at (867) 975-4298 or lavalleep@inac.gc.ca if any questions/comments arise.

Sincerely,

Philippe Lavallée
Water Resources Officer
INAC, Nunavut District

c.c. - Nunavut Water Board, Gjoa Haven
- KIA Lands, Rankin Inlet (Luis Manzo)
- EC Environmental Protection, Yellowknife (Anne Wilson)
- DFO Habitat Management, Iqaluit (Jordan DeGroot)

Indian and Northern Affairs Canada | Affaires Indiennes et du Nord Canada

INDUSTRIAL WATER USE INSPECTION REPORT

Date: 2001/08/28 **Company Rep.** (Name/Title): Al Burton / Camp Manager

Licensee: **WMC International Ltd.**, Meliadine Project **Licence No.:** **NWB2MEL0103**

WATER SUPPLY

Source(s): Meliadine Lake **Quantity used:** approx. max. of 56 m^3 per month **Meter Reading:** none

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Intake Facilities: A	**Storage Structure:** A	**Treatment Systems:** A	**Recycling:** NA
Flow Meas. Device: A	**Conveyance Lines:** U	**Pumping Stations:** NA	**Modifications:** A

Comments: Deficient conveyance line failed during wintertime; currently seeing to the installation of the replacement line. Flow meter will be included in new intake setup. Chlorination and filtration in use.

WASTE DISPOSAL

Tailings: **Tailings Pond:** **Natural Lake:** **Underground:**
Sewage: **Sewage Treatment System:** **Tailings Pond:** **Natural Water Body:**
Continuous Discharge: **Intermittent Discharge:**
Solid Waste: **Open Dump:** **Landfill:** **Burn & Bury:** **Underground:**

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Discharge Quality: NA	**Decant Structure:** NA	**Dyke Inspections:** NA
Conveyance Lines: NA	**Pond Treatment:** NA	**Runoff Diversion:** NA
Discharge Meas. Device: NA	**Dams, Dykes:** NA	**Erosion:** A
Freeboard: NA	**Seepages:** A	**Spills:** none reported
Effluent Discharge Rate: NA	**Samples Collected:** raw water @ intake, lake @ greywater discharge	

Comments: Sewage and combustible wastes incinerated on-site; ashes, and non-combustible/hazardous wastes dispatched to the Rankin Inlet solid waste disposal facility. Waste oil delivered to a third party equipped with a furnace, in Rankin Inlet. Waste well segregated at the on-site waste management area. Greywater disposal system upgraded since the previous inspection; no evidence of solids beyond the new sump and sediment trap. No flow noted along the shoreline downslope of the discharge point, although soil somewhat saturated.

GENERAL CONDITIONS

Indicate: **A** - Acceptable **U** - Unacceptable **NA** - Not Applicable **NI** - Not Inspected

Ore & Waste Rock Stockpiles: NA	**Records & Reporting:** A	**SNP:** NA
Geotechnical Inspection: NA	**Posting/Signage:** NA	**Contingency Plan:** A
Restoration Activities: A	**New Construction:** NA	**Fuel Storage:** A
Mine Water Discharge: NA	**Chemical Storage:** A	**Annual Report:** A

Comments: Conscientious bulk fuel storage and supply systems. Old burn pit reclaimed and fertilized.

Violations of Act or Licence: None noted.

General Comments: Generally tidy and well managed campsite. Concerns raised during the last inspection have been responsibly been addressed.

Philippe Lavallée
Inspector's Name

Inspector's Signature

figure 1. Replacement of the water supply conveyance line; 2001/08/28.

figure 2. Upgraded greywater disposal system; 2001/08/28.

figure 3. Waste management facility; 2001/08/28.

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: raw water **Taiga Sample ID:** 212228

Client Project: **Sample Type:** freshwater **Received Date:** 29-Aug-01

Location: Meliadine **Sampling Date:** 28-Aug-01

Report Status: **Final** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	< 5		5	31-Aug-01
pH	7.26	pH units	0.05	30-Aug-01
Solids, Total Dissolved	27	mg/L	10	13-Sep-01
Nutrients				
Ammonia as N	< 0.005	mg/L	0.005	07-Sep-01
Biological Oxygen Demand	3	mg/L	2	29-Aug-01
Nitrate+Nitrite as N	< 0.008	mg/L	0.008	10-Sep-01
Major Ions				
Sodium	3.82	mg/L	0.02	29-Aug-01
Microbiology				
Coliforms, Fecal	< 1	CFU/100mL	1	29-Aug-01
Metals, Total				
Arsenic	< 1.0	µg/L	1.0	13-Sep-01
Cadmium	< 0.3	µg/L	0.3	09-Sep-01
Chromium	< 3	µg/L	3	09-Sep-01

Report Date: Friday, October 05, 2001

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Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: raw water **Taiga Sample ID:** 212228

Cobalt	<1	µg/L	1	09-Sep-01
Copper	<2	µg/L	2	09-Sep-01
Iron	120	µg/L	30	08-Sep-01
Lead	1	µg/L	1	09-Sep-01
Manganese	7	µg/L	1	09-Sep-01
Mercury	<0.01	µg/L	0.01	13-Sep-01
Nickel	<1	µg/L	1	09-Sep-01
Zinc	<10	µg/L	10	09-Sep-01
Subcontracted Tests				
Chloride	8.3	mg/L	0.1	17-Sep-01
Sulphate	5.1	mg/L	0.3	17-Sep-01

Field Data (01/08/28) **raw water**
Temperature: 14.5 °C
Conductivity: 75 µS/cm
pH: 8.5 **Time:** 13:22

Report Date: Friday, October 05, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: ~~control lake outlet~~ Greywater **Taiga Sample ID:** 212229

Client Project: **Sample Type:** freshwater **Received Date:** 29-Aug-01

Location: Meliadine **Sampling Date:** 28-Aug-01

Report Status: Final ***Approved by:***

Lab Section	Test Parameter	Result	Units	Detection Limit	Analysis Date
Nutrients	Ammonia as N	<0.005	mg/L	0.005	07-Sep-01
	Biological Oxygen Demand	<2	mg/L	2	29-Aug-01
	Nitrate+Nitrite as N	<0.008	mg/L	0.008	10-Sep-01
	Phosphorous, Total	0.011	mg/L	0.004	13-Sep-01
Physicals	pH	7.30	pH units	0.05	30-Aug-01
	Solids, Total Suspended	3	mg/L	3	11-Sep-01

Field Data (01/08/28) greywater
Temperature: 14.5 °C
Conductivity: 70 µS/cm
pH: 8.1 **Time:** 13:42

Report Date: Monday, September 24, 2001

REPORT OF TOXICITY USING MICROTOX

COMPAN LOCATION: **Meliadine Lake Camp**

Sample Collected By: Philippe Lavallee

Date/Time Sampled: August 28, 2001

Date/Time Received: August 28, 2001

Date/Time Test Start: August 29, 2001

Sample Type: Elutriate
Sampling Method: Grab

Method: ***Environment Canada Laboratories SOP#830.0 Revision 1, for Microtox Testing in Compliance with November 1992: Biological Test Method: Toxicity Test Using Luminescent Bacteria Photobacterium phosphoreum), November 1992, EPS 1/RM/24.***

Environment Canada has conducted testing on the material sampled according to its own Microtox standards and procedures. The data proceeding from that testing is intended as a preliminary screening tool only, and cannot be used for any other purpose. This data is provided on the condition that it not be used in any report that is intended for public or official use.

RESULTS: **NON TOXIC at 45% Concentration**

TEST ORGANISMS:
Species: Vibrio fisheri (Photobacterium phosphoreum)
Test Apparatus: Model 500 Analyzer

TEST SUBSTANCE/CONDITIONS

pH of Sample: N/A (No pH adjustment)

Sample Appearance: Clear, no colour adjustment

Lot # of Osmotic Adjusting Solution: OAS007

Lot # of Reconstitution Solution: RSN099Y

Lot # of Diluent: DIL034L

TEST METHODS AND CONDITIONS

Test Start Date/Time: August 29, 2001 / 03:16 PM

Test Method: Basic 45% Test, 15 minute incubation.

QUALITY CONTROL

Reference Toxicant: Zinc Sulfate Standard

Reagent Lot #: ACV026-6

IC_{50} - 15 minutes mg/L: 2.8 mg/L

IC_{50} Confidence Range: 2.7 to 2.9 mg/L

TEST ANALYST: Wade Romanko

INITIAL: WR

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: control lake outlet **Taiga Sample ID:** 212225

Client Project: **Sample Type:** freshwater **Received Date:** 29-Aug-01

Location: Meliadine **Sampling Date:** 28-Aug-01

Report Status: **Final** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	5		5	31-Aug-01
pH	7.56	pH units	0.05	30-Aug-01
Solids, Total Suspended	<3	mg/L	3	11-Sep-01
Nutrients				
Ammonia as N	<0.005	mg/L	0.005	07-Sep-01
Biological Oxygen Demand	<2	mg/L	2	29-Aug-01
Nitrate+Nitrite as N	<0.008	mg/L	0.008	10-Sep-01
Phosphorous, Total	0.007	mg/L	0.004	13-Sep-01
Major Ions				
Calcium	9.81	mg/L	0.05	30-Aug-01
Sodium	1.92	mg/L	0.02	29-Aug-01
Metals, Total				
Arsenic	<1.0	µg/L	1.0	13-Sep-01
Cadmium	<0.3	µg/L	0.3	09-Sep-01
Chromium	<3	µg/L	3	09-Sep-01

Report Date: Friday, October 05, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: control lake outlet **Taiga Sample ID: 212225**

Cobalt	<1	µg/L	1	09-Sep-01
Copper	<2	µg/L	2	09-Sep-01
Iron	138	µg/L	30	08-Sep-01
Lead	<1	µg/L	1	09-Sep-01
Manganese	9	µg/L	1	09-Sep-01
Mercury	<0.01	µg/L	0.01	13-Sep-01
Nickel	<1	µg/L	1	09-Sep-01
Zinc	<10	µg/L	10	09-Sep-01
Subcontracted Tests				
Chloride	3.4	mg/L	0.1	17-Sep-01
Sulphate	1.6	mg/L	0.3	17-Sep-01

Field Data (01/08/28)Control lake
Temperature: 17.0 °C
Conductivity: 73 µS/cm
pH: 8.0 **Time:** 14:55

Report Date: Friday, October 05, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: outlet @ Peg Lake **Taiga Sample ID:** 212224

Client Project: **Sample Type:** freshwater **Received Date:** 29-Aug-01

Location: Meliadine **Sampling Date:** 28-Aug-01

Report Status: **Final** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	< 5		5	31-Aug-01
pH	7.78	pH units	0.05	30-Aug-01
Solids, Total Suspended	< 3	mg/L	3	11-Sep-01
Nutrients				
Ammonia as N	< 0.005	mg/L	0.005	07-Sep-01
Biological Oxygen Demand	< 2	mg/L	2	29-Aug-01
Nitrate+Nitrite as N	< 0.008	mg/L	0.008	10-Sep-01
Phosphorous, Total	0.014	mg/L	0.004	13-Sep-01
Major Ions				
Calcium	13.6	mg/L	0.05	30-Aug-01
Sodium	2.32	mg/L	0.02	29-Aug-01
Metals, Total				
Arsenic	1.0	µg/L	1.0	13-Sep-01
Cadmium	< 0.3	µg/L	0.3	09-Sep-01
Chromium	< 3	µg/L	3	09-Sep-01

Report Date: Friday, October 05, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations ***Attn:*** Philippe Lavalllee

Sample ID: outlet @ Peg Lake **Taiga Sample ID:** 212224

Cobalt	<1	µg/L	1	09-Sep-01
Copper	<2	µg/L	2	09-Sep-01
Iron	858	µg/L	30	08-Sep-01
Lead	<1	µg/L	1	09-Sep-01
Manganese	11	µg/L	1	09-Sep-01
Mercury	<0.01	µg/L	0.01	13-Sep-01
Nickel	<1	µg/L	1	09-Sep-01
Zinc	<10	µg/L	10	09-Sep-01
Subcontracted Tests				
Chloride	7.1	mg/L	0.1	17-Sep-01
Sulphate	3.5	mg/L	0.3	17-Sep-01

Field Data (01/08/28) Peg lake
Temperature: 16.0 °C
Conductivity: 64 µS/cm
pH: 8.3 **Time:** 14:39

Report Date: Friday, October 05, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: Meliadine lake outlet @ river **Taiga Sample ID:** 212226

Client Project: **Sample Type:** freshwater **Received Date:** 29-Aug-01

Location: Meliadine **Sampling Date:** 28-Aug-01

Report Status: **Final** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	< 5		5	31-Aug-01
pH	7.40	pH units	0.05	30-Aug-01
Solids, Total Suspended	< 3	mg/L	3	11-Sep-01
Nutrients				
Ammonia as N	< 0.005	mg/L	0.005	07-Sep-01
Biological Oxygen Demand	< 2	mg/L	2	29-Aug-01
Nitrate+Nitrite as N	< 0.008	mg/L	0.008	10-Sep-01
Phosphorous, Total	0.005	mg/L	0.004	13-Sep-01
Major Ions				
Calcium	5.59	mg/L	0.05	30-Aug-01
Sodium	2.83	mg/L	0.02	29-Aug-01
Organic				
Cyanide, Total	< 0.003	mg/L	0.003	02-Oct-01
Oil and Grease	0.4	mg/L	0.2	12-Sep-01
Metals, Total				

Report Date: Wednesday, October 17, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: Meliadine lake outlet @ river **Taiga Sample ID:** 212226

Arsenic	<1.0	µg/L	1.0	13-Sep-01
Cadmium	<0.3	µg/L	0.3	09-Sep-01
Chromium	<3	µg/L	3	09-Sep-01
Cobalt	<1	µg/L	1	09-Sep-01
Copper	<2	µg/L	2	09-Sep-01
Iron	85	µg/L	30	08-Sep-01
Lead	<1	µg/L	1	09-Sep-01
Manganese	2	µg/L	1	09-Sep-01
Mercury	<0.01	µg/L	0.01	13-Sep-01
Nickel	<1	µg/L	1	09-Sep-01
Zinc	<10	µg/L	10	09-Sep-01
Subcontracted Tests				
Chloride	5.2	mg/L	0.1	17-Sep-01
Sulphate	2.2	mg/L	0.3	17-Sep-01

Field Data (01/08/28) **Mel. Lake**
Temperature: 14.0 °C
Conductivity: 55 µS/cm
pH: 7.7 **Time:** 15:11

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: Meliadine lake west outlet **Taiga Sample ID:** 212227

Client Project: **Sample Type:** freshwater **Received Date:** 29-Aug-01

Location: Meliadine **Sampling Date:** 28-Aug-01

Report Status: **Final** ***Approved by:***

Test Parameter	Result	Units	Detection Limit	Analysis Date
Physicals				
Colour	<5		5	31-Aug-01
pH	7.37	pH units	0.05	30-Aug-01
Solids, Total Suspended	<3	mg/L	3	11-Sep-01
Nutrients				
Ammonia as N	<0.005	mg/L	0.005	07-Sep-01
Biological Oxygen Demand	3	mg/L	2	29-Aug-01
Nitrate+Nitrite as N	<0.008	mg/L	0.008	10-Sep-01
Phosphorous, Total	0.008	mg/L	0.004	13-Sep-01
Major Ions				
Calcium	4.89	mg/L	0.05	30-Aug-01
Sodium	2.80	mg/L	0.02	29-Aug-01
Organic				
Cyanide, Total	0.003	mg/L	0.003	02-Oct-01
Oil and Grease	0.2	mg/L	0.2	26-Sep-01
Metals, Total				

Report Date: Wednesday, October 17, 2001

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- CERTIFICATE OF ANALYSIS -

Prepared For: Nunavut District Office DIAND, Operations *Attn:* Philippe Lavalllee

Sample ID: Meliadine lake west outlet **Taiga Sample ID:** 212227

Arsenic	<1.0	µg/L	1.0	13-Sep-01
Cadmium	<0.3	µg/L	0.3	09-Sep-01
Chromium	<3	µg/L	3	09-Sep-01
Cobalt	<1	µg/L	1	09-Sep-01
Copper	<2	µg/L	2	09-Sep-01
Iron	211	µg/L	30	08-Sep-01
Lead	<1	µg/L	1	09-Sep-01
Manganese	2	µg/L	1	09-Sep-01
Mercury	<0.01	µg/L	0.01	13-Sep-01
Nickel	<1	µg/L	1	09-Sep-01
Zinc	<10	µg/L	10	09-Sep-01
Subcontracted Tests				
Chloride	5.1	mg/L	0.1	17-Sep-01
Sulphate	2.3	mg/L	0.3	17-Sep-01

Field Data (01/08/28)W Mel. Lake
Temperature: 14.5 °C
Conductivity: 50 µS/cm
pH: 8.1 **Time:** 15:34

Report Date: Wednesday, October 17, 2001