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Dear Ms. Beaulieu and Mr. Manzo:

Ferguson Lake Water Quality Summary 2008

Water sampling on Ferguson Lake was conducted at 12 lake stations in 2008 (Figure 1) . Nine of the Ferguson Lake water sampling lake locations were sampled in previous years. One new site (L11) was chosen to monitor any potential effect of the airstrip construction, one station (L12) was created to monitor the site where a piece of heavy equipment went through the ice and several were selected near the project development on the middle-west shore area of the lake. The other locations run in a northerly transect from the north end of the lake to the outflow. Reference Lake is located north of Ferguson Lake. The lake stations were sampled twice during the year; once in May –winter sample and once in late July/early August- summer sample.

Tonia Robb of Rescan Environmental Services was present during each sampling campaign and was responsible for the consistent training of assistants so that all personnel involved had the same information regarding the sampling techniques employed. Timing efforts were made to incorporate sampling with airplane flights in and out of Ferguson Lake to respect sample holding times. Samples were stored in refrigeration prior to shipping. Duplicates were taken at 10% of sites and field and travel blanks were collected for each sampling campaign. Equipment blanks were conducted during both winter and summer campaigns. Navigation to all locations was done using coordinates and a Global Positioning System (GPS).

Winter, under-ice, sampling was conducted by Rescan personnel with the assistance of Starfield and Nuna personnel. Samples were taken at two depths (mid column and at depth) when water depths allowed. Reference Lake was not of sufficient depth to get two winter samples. Samples were captured using Go-Flo deployments. Physical parameters for temperature and dissolved oxygen profiles were conducted at each site. Samples were collected into clean bottles, preserved if necessary and sent to ALS Laboratory Group for analysis. All Ferguson Lake samples were analyzed for physical parameters, anions and nutrients, cyanides, organic/inorganic carbon, total metals and dissolved metals (Table 2). In addition L2, L3 and L11 were sampled for subsequent analysis of Light Extractable Petroleum Hydrocarbon (LEPH), Heavy Extractable Petroleum Hydrocarbon (HEPH) and Polycyclic Aromatic Hydrocarbon (PAH).

Summer, open-water, sampling was also conducted by Rescan personnel with the assistance of Starfield and Nuna personnel. Samples were collected at one meter below surface and mid-depth using a Go-Flo for capture. Summer samples were analyzed for physical parameters, anions and nutrients, cyanides, organic/inorganic carbon, total metals and dissolved metals (Table 2). L2, L3, L11 and L12 were also sampled for LEPH, HEPH and PAH's.

Results

All samples that were collected for analysis of LEPH, HEPH, and PAH's were below detection limits (Table 3). Sample parameters that have existing CCME guidelines for the protection of aquatic life were met in almost all instances and the exceptions are detailed in Table 4. Many parameters were not above detection limits of the analytes.

Figure 1. Location of sampling sites in Ferguson Lake area.

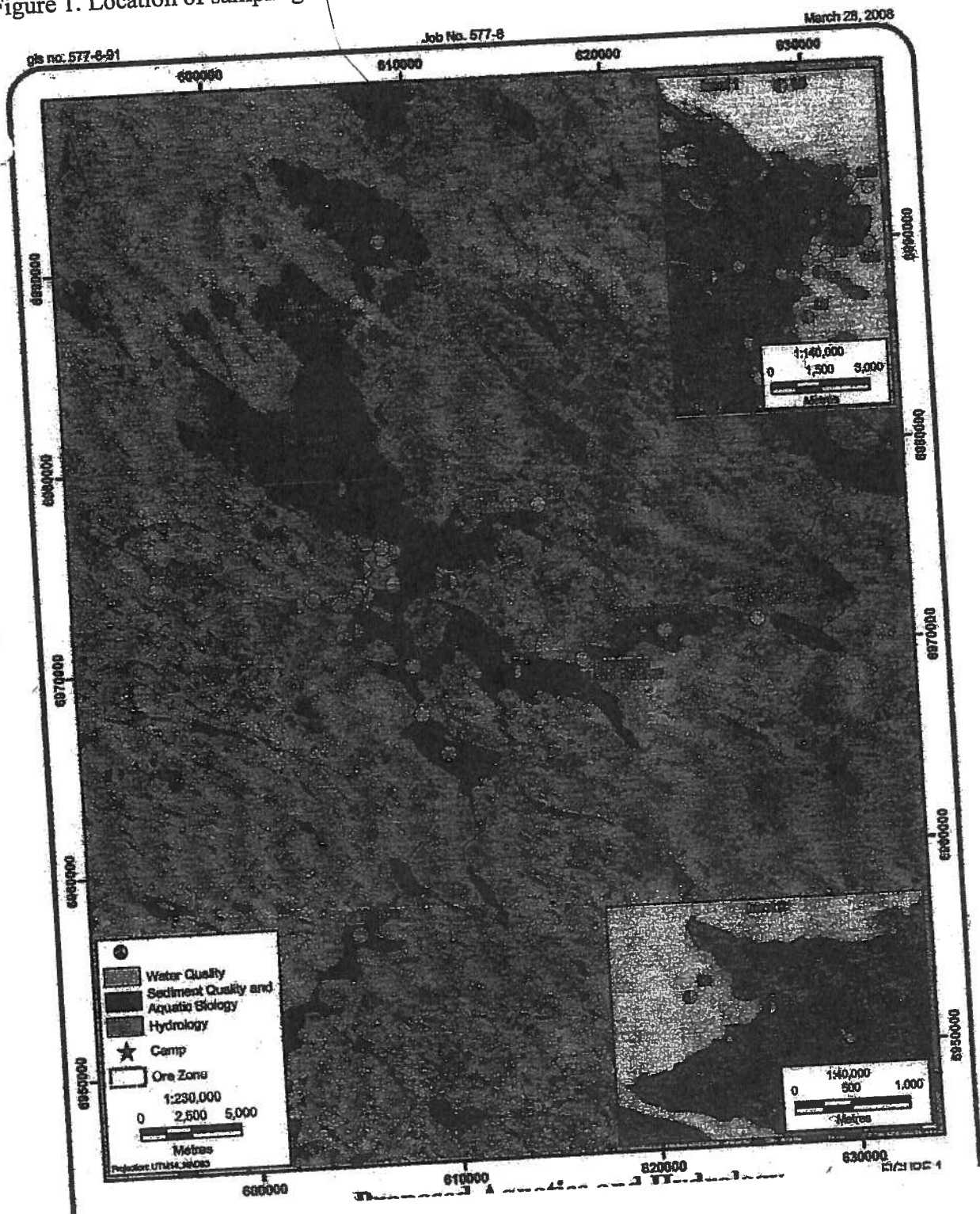


Table 2. List of analytes.

Physical Tests	
Analyte	Units
Anion Sum	meq/L
Cation Sum	meq/L
Cation-Anion Balance	%
Hardness	mg/L
Colour	CU
Conductivity	uS/cm
pH	pH
TDS	mg/L
TSS	mg/L
Turbidity	NTU

Anions and Nutrients	
Analyte	Units
Ammonia	mg/L
Acidity	mg/L
Alkalinity	mg/L
Bromide	mg/L
Chloride	mg/L
Fluoride	mg/L
Sulfate	mg/L
Nitrate	mg/L
Nitrite	mg/L
TKN	mg/L
T-Nitrogen	mg/L
T-Phosphate	mg/L

Cyanides	
Analyte	Units
T-Cn	mg/L

Total Metals	
Analyte	Units
T-Al	mg/L
T-Sb	mg/L
T-As	mg/L
T-Ba	mg/L
T-Be	mg/L
T-Bi	mg/L
T-B	mg/L
T-Cd	mg/L
T-Ca	mg/L
T-Cr	mg/L
T-Co	mg/L
T-Cu	mg/L
T-Fe	mg/L
T-Pb	mg/L
T-Li	mg/L
T-Mg	mg/L
T-Mn	mg/L
T-Hg	mg/L
T-Mo	mg/L
T-Ni	mg/L
T-P	mg/L
T-K	mg/L
T-Se	mg/L
T-Si	mg/L
T-Ag	mg/L
T-Na	mg/L
T-Sr	mg/L
T-Ti	mg/L
T-Sn	mg/L
T-Tl	mg/L
T-U	mg/L
T-V	mg/L
T-Zn	mg/L

Dissolved Metals	
Analyte	Units
D-Al	mg/L
D-Sb	mg/L
D-As	mg/L
D-Ba	mg/L
D-Be	mg/L
D-Bi	mg/L
D-B	mg/L
D-Cd	mg/L
D-Ca	mg/L
D-Cr	mg/L
D-Co	mg/L
D-Cu	mg/L
D-Fe	mg/L
D-Pb	mg/L
D-Li	mg/L
D-Mg	mg/L
D-Mn	mg/L
D-Hg	mg/L
D-Mo	mg/L
D-Ni	mg/L
D-P	mg/L
D-K	mg/L
D-Se	mg/L
D-Si	mg/L
D-Ag	mg/L
D-Na	mg/L
D-Sr	mg/L
D-Tl	mg/L
D-Sn	mg/L
D-Ti	mg/L
D-U	mg/L
D-V	mg/L
D-Zn	mg/L

Polycyclic Aromatic Hydrocarbons	
Analyte	Units
Acenaphthene	mg/L
Acenaphthylene	mg/L
Acridine	mg/L
Anthracene	mg/L
Benz(a)anthracene	mg/L
Benzo(a)pyrene	mg/L
Benzo(b)fluoranthene	mg/L
Benzo(k)fluoranthene	mg/L
Benzo(g,h,i)perylene	mg/L
Chrysene	mg/L
Dibenz(a,h)anthracene	mg/L
Fluoranthene	mg/L
Fluorene	mg/L
Indeno(1,2,3-c,d)pyrene	mg/L
Napthalene	mg/L
Phenanthrene	mg/L
Pyrene	mg/L
Quinolene	mg/L

Extractable Hydrocarbons	
Analyte	Units
EPH10-19	mg/L
EPH19-32	mg/L
LEPH	mg/L
HEPH	mg/L

Organic Parameters	
Analyte	Units
TOC	mg/L

Table 3. Summer and winter sampling for hydrocarbons results.

[illegible]

nte < indicates below detection limits

ashes indicate no data available

units in mg/L

Canadian Council of Ministers of the Environment, 2006. Canadian water quality guidelines for the protection of aquatic life

nterim guideline

Table 4. Analytes above CCME guidelines.

	Cadmium	Zinc (Zn)	Lead (Pb)
CCME Guideline	0.000017 mg/L	0.03 mg/L	0.001 mg/L ¹
Reference Lake 1 metre	0.00003	0.0312	
L2 at depth			0.00177
L11 at 1 metre		0.0305	0.0105
L3 at 1 metre			0.00117
L6 at 1 metre			0.00235
L8 at 1 metre			0.00101
L8 at depth			0.00111
L7 at 1 metre			0.00126
L7 at depth			0.00111
L5 at 1 metre			0.00254
L5 at depth			0.0021

¹ Lead guideline = 1 µg/L at a water hardness of 0-60 mg/L (soft) as CaCO₃

References

Canadian Council of Ministers of the Environment. 2007. Canadian water quality guidelines for the protection of aquatic life: Summary table. Updated December, 2007. In: Canadian environmental quality guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

Rescan™ Environmental Services Ltd. 2008. Ferguson Lake 2008 Baseline Studies Work Plan. Report Version A.1

CC: Andrew Keim,
Water Resource Officer,
INAC