# PROPOSED POTABLE WATER SYSTEM

As Part of the Remediation of the FOX-C
Intermediate DEW Line Site

Submitted To: Public Works and Government Services Canada
Real Property Services
Architectural & Engineering Services
Environmental Services
Western Region

Prepared By: Qikiqtaaluk Corporation

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## GENERAL INFORMATION

There is a former Intermediate DEW Line Site located at Ekalugad Fjord, Nunavut with the designation FOX-C. The site has been abandoned since 1963 and during that time the site has only been used by hunters. The remediation project at Ekalugad Fjord is planned to occur during the summer of 2006 and 2007. This document will outline the proposed potable water system used by the remediation project during these two seasons.

## WATER SOURCE

The camp is to be installed at the beach area near the POL Tanks. Between the Fjord and the lake at the top of the valley there are many sources of potable water. QC's preference is to use a water source that is as close to the camp as possible. However, the closest water sources are small creeks that may not have sufficient flow to be used as a source of potable water during the entire summer (ie. they may dry up). As a last resort the lake at the top of the valley will be used as a source of potable water. The lake is the last choice as the water appears to have a very high level of sediment (particles) in it which may plug up the filters very quickly. The potential sources of potable water are presented in Figure 1 at the end of the document.

## WATER QUALITY TESTING

A water sample will be taken every week using proper sampling containers (bottles). The sample will be collected from the farthest point from the water reservoir. The sample will be kept in a cooler, with ice packs to keep it cool, and sent with the next helicopter to Qikiqtarjuak. From there, QC's expediter will make sure it's sent by cargo to Iqaluit and then to Ottawa or Montreal (with instructions for the samples to be kept refrigerated) and forwarded to a Certified Laboratory for analysis. The following parameters will be analysed:

| Parameter | Units | CCME Water Quality Guidelines |
|---|---|---|
| Copper | mg/L | 1 |
| Iron | mg/L | 0.3 |
| Lead | mg/L | 0.01 |
| Manganese | mg/L | 0.05 |
| Mercury | mg/L | 0.001 |
| Cadmium | mg/L | 0.005 |
| Chromium | mg/L | 0.05 |
| Zinc | mg/L | 5 |
| pH | - | 6.5-8.5 |
| TSS | mg/L | < 500 |
| Nitrate | mg/L | < 10 [1] |
| Nitrite | mg/L | < 1.0 [1] |

| Parameter | Units | CCME Water Quality Guidelines |
|---|---|---|
| Faecal Coliforms | Cts/100 mL | 0 [1] |

All attempts will be made to reduce the time between the sampling and the time the sample arrives at a certified laboratory. In ideal conditions the sample would be returned to Iqaluit same day it was taken, and shipped to Montreal or Ottawa the next day. This means it could be analysed early the following morning which meets the requirements of the laboratory. Should it prove impossible to meet the 48 hour time limit for microbial and turbidity testing then the samples will be analysed on site using approved analysis methods. Tests for Faecal Coliforms can be done using Colilert testers developed and sold by IDEXX. Turbidity can be measured in the field using a hand held metre such as the WQ770 Turbidity Meter from Global Water.

If the source of potable water changes, each new source will be tested prior to use in the camp. If the testing shows that even after treatment the water is still not suitable for consumption then adjustments will be made to the treatment system, or a new source of potable water will be used.

## CONTINGENCY PLAN

A weeks supply of water will be kept on site. Should the test results show that the water in the camp is not suitable for consumption this water will be used for potable water by the camp personnel until the situation is remedied. Should any of the stored water be used it will be replaced as soon as possible.

### DESCRIPTION OF THE CAMP WATER SUPPLY SYSTEM

Potable water will be pumped, using a 2" pump with a screen on the intake, from the potable water source into a reservoir that is hauled using the roll off truck. Once filled the truck will haul the reservoir to the camp. The water from the reservoir will be pumped, using the same 2" pump, from the transport tank to the main camp tank. The water will pass through a 20 micron filter to remove any sediment. The water will then be stored in the main camp water reservoir. When needed the water will go from the main camp reservoir, through a 5 micron filter to remove any remaining sediment and some microbes, then through a UV filter to remove any remaining microbes. The water will then go into the camp distribution system. A schematic of the water system is presented in Figure 2 at the end of the document. Approximate flow rate will be a maximum 40 GPM.

### DESCRIPTION OF THE WATER SYSTEM EQUIPMENT

Table 1 presents the different components of the water treatment system and provides all specifications.

**Table 1: Specifications of the Components of the Water System**

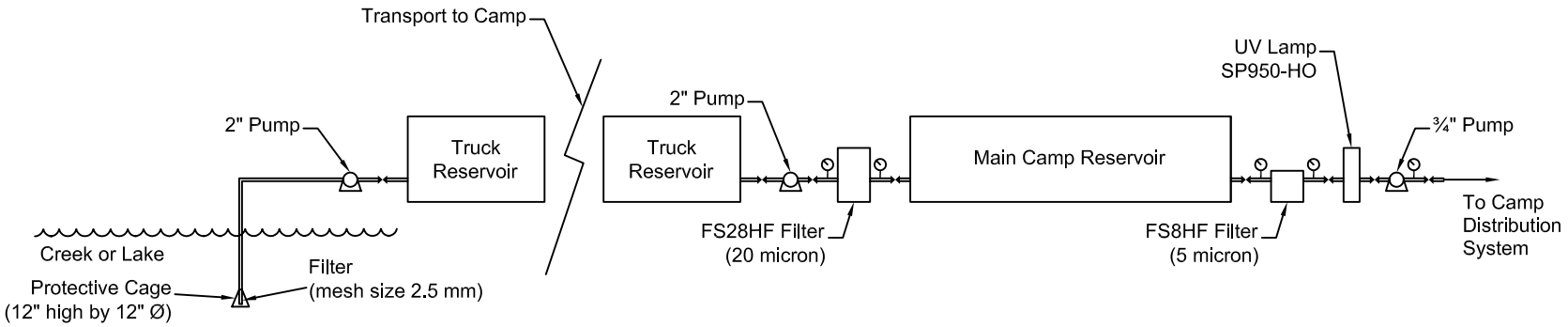
| Component | Manufacturer / Supplier | Model | Specifications |
|---|---|---|---|
| Intake Screen[1] | Durabac | N/A | Mesh Size: 2.54 mm |
| | | | Ball valve at top of mesh |
| | | | Conical Protection Cage 12" high, 12" ø |
| | | | Connects to 2" Hose |
| 2" water pump | Durabac | N/A | Gas Powered Pump (Honda Motor) |
| | | | Flow Rate 150 GPM |
| Roll Off Truck Reservoir | Durabac | N/A | 3,435 Gallons (13,000 Litres) |
| | | | Plastic Tank, FPI Approved |
| | | | Manhole access at top |
| Pre-Filter | R-Can Environmental | FS28-HF | 20 micron filter |
| | | | Maximum flow rate 225 GPM |
| | | | Operating Pressure 150 psi |
| | | | ½" Drain |
| | | | 2" Connectors |
| Camp Water Tank | N/A | N/A | 7,000 Gallons (26,500 Litres) |
| | | | Steel Tank with a Plastic Liner |
| Filter | R-Can Environmental | FS8-HF | 5 micron filter |
| | | | Maximum flow rate 64 GPM |
| | | | Operating Pressure 150 psi |
| | | | ½" Drain |
| | | | 2" Connectors |
| UV Treatment | R-Can Environmental | SP950-HO | Flow Rate 52 GPM |
| | | | Operating Pressure 125 psi |
| | | | 1" Connectors |
| | | | Indicators for light intensity and service time |

N/A = Not Available

[1] The potable water intake structure is in compliance with DFO requirements for subcarangiform fish species. The open screen area requirement at 150 GPM is 1.76 $ft^2$ of open screen area. The intake structure has an effective structure > 3 $ft^2$, therefore exceeding the minimum DFO requirement (see *Freshwater Intake End-of-Pipe Fish Screen Guideline, Department of Fisheries and Oceans, Catalogue No. Fs 23-270 / 1995E*).

## FIGURE 2:

## POTABLE WATER SYSTEM SCHEMATIC



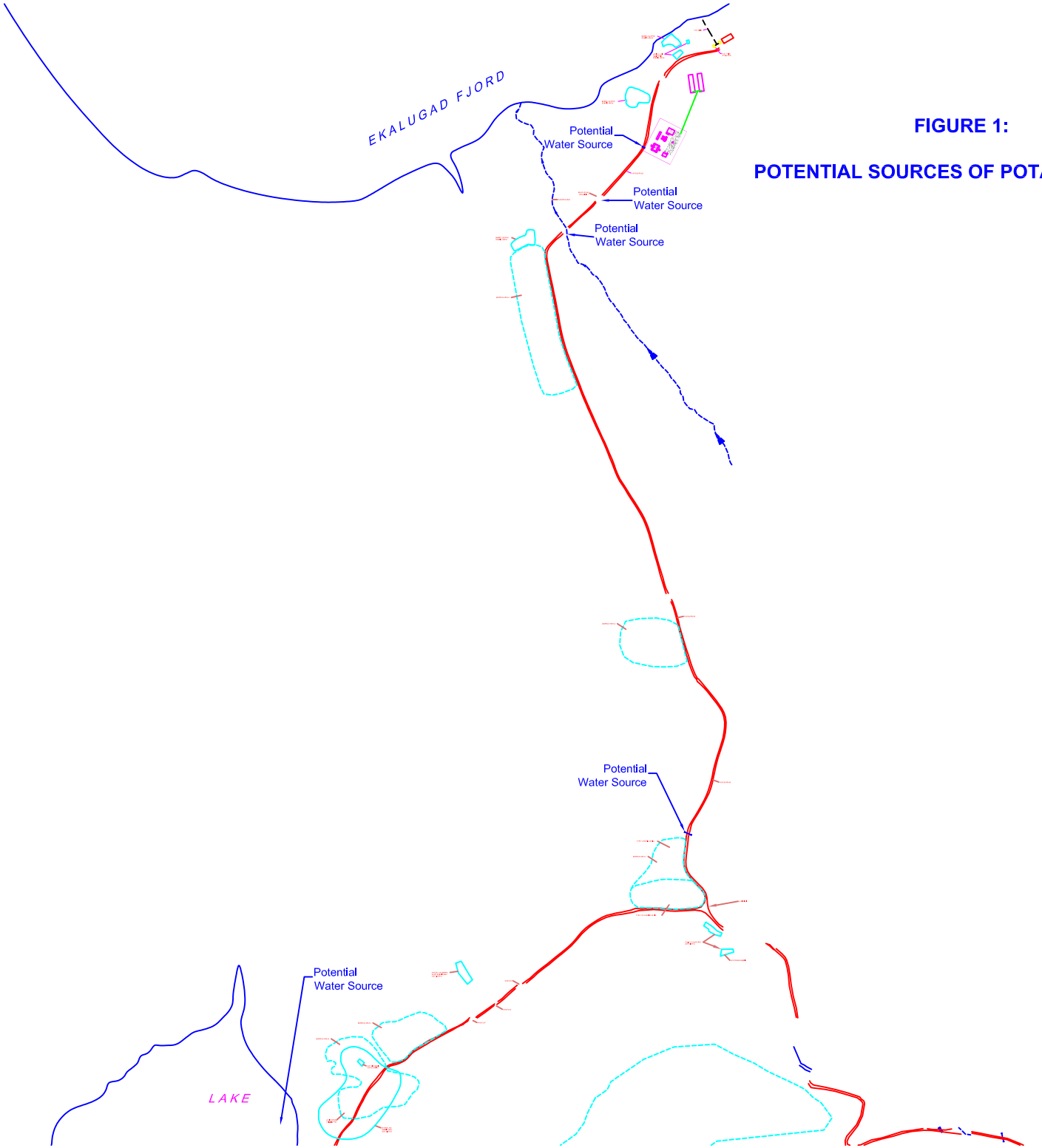



**FIGURE 1:**

**POTENTIAL SOURCES OF POTABLE WATER**