10.0 BUILDING 4797: SWIFT RIVER UTILITY BUILDING

10.1 Description of Existing Water system

The water system for the Swift River Utility Building is supplied by a 23 m deep well located inside the pumphouse room of the utility building. The well location and other details about the surrounding area are provided in Figure 4797-A in Appendix A10. The coordinates of the wellhead were recorded as:

- UTM ZONE 9
- Northing: 6653544
- Easting: 377959

There is no treatment system present, and the water is stored in a 5800 L galvanized steel tank to serve the maintenance truck fill, and also serves the foreman's residence. A schematic detailing the water system is provided as Figure 4797-B in Appendix A10.

10.2 Description of Existing Wastewater Systems

A septic field that serves both the Swift River Living Complex and the foreman's residence is located approximately 60 m to the northeast of the utility building. A site plan showing the location of the septic system is given by Figure 4797-A in Appendix A10.

10.3 Water Quality Results

10.3.1 Water Quality Results from Previous Sampling

Bacteriological

Six samples were collected by YTG representatives from the Swift River Utility Building water system between September 2004 and March 2005 and were tested for total coliform and *E. coli* by Yukon Environmental Health Services using the presence/absence test method. Results are tabulated in Table 4797-1 in Appendix A10. *E. coli* bacteria were reported as absent in each of the six samples for which results were provided. One sample, however, taken November 9, 2004, tested positive for Total Coliform bacteria.

Potability

A water sample was collected by YTG representatives from the Swift River Utility Building water system on September 13, 2004 was submitted to Northwest Labs for detailed potability analyses. Additional analyses results were provided by YTG for a sample collected on June 22, 2005 from this system. The results of these analyses are summarized in Table 4797-2 in Appendix 10. EBA reviewed the analytical results to compare them with the Canadian Drinking Water Quality Guidelines (CDWQG) to observe general water quality, identify and recommend additional sampling, and to identify potential indicators of contamination.

- At 4.6 and 3.32 NTU, turbidity exceeded the CDWQG health based upper limit of 1.0 NTU;
- The water quality results indicated that all other health based and aesthetic objectives were met for the parameters analyzed. The total dissolved solids concentration was approximately 40 mg/L and is considered to be very fresh.
- The hardness (as $CaCO_3$) was approximately 34 mg/L, and is considered very soft.

10.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Swift River Utility Building that was identified to be included during the water system assessments is detailed below:

- UV absorbance, as well as tannins and lignin, to determine potential for UV treatment as a disinfection option for this water system;
- As turbidity had previously been in exceedence of CDWQG MAC, a subsequent sample was obtained;
- Total organic carbon (TOC), to assist in disinfection system selection; and,
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

Additional Analytical Results

A water sample obtained by EBA during the field program on June 20, 2005 was submitted to ALS Environmental in Vancouver, BC for analysis of the previously mentioned additional parameters. These results are summarized in Table 4797-2 in Appendix A10 and the laboratory reports are included in Appendix B.

- At 2.69 NTU, turbidity was similar to the previous sample results, and above the CDWQG MAC; and,
- Field chemistry indicated that the temperature of the water at the point of consumption in the foreman's residence was 40.6 ^{o}C.

10.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from surface water sources or septic waste. Chloride concentrations were low and are considered to be within the normal background ranges for groundwater in the region.

No elevated concentrations of indicator parameters were observed in the sample results reviewed.

10.4 Conceptual Hydrogeology

No log was available for this well, or any other wells in the Swift River area. This well is reported to be 23.0 m deep with a static water level of 4.41 m below ground. The direction of groundwater flow as inferred from topography and air photos is south towards the Swift River (40 m away).

10.5 Potential Contaminant Sources

Potential contaminant sources observed during the site investigation are provided in field notes in Appendix A10. Photos of potential contaminant sources are provided in Appendix A10.

A summary of potential contaminant sources within 30 m of the well is provided below:

- An oil heater at 3 m inside the same building;
- An above ground fuel storage tank at 4 m; and,
- An abandoned diesel tank at 10 m.

10.5.1 Spills Records and Contaminated Sites Search Results

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch identified three spill events for sites neighbouring the Swift River Utility Building, and they are outlined below.

On August 17, 2000, 1 L of gasoline was reportedly spilled at the Swift River Lodge. This, however, likely poses a minimal risk to this water system.

On March 1, 1993, it was identified that approximately 250 L of calcium chloride solution had been accidentally dumped at the Swift River Lodge during a de-icing, but there had been no effort made to collect the solution. The runoff had reportedly travelled towards Swift River, downgradient from this well and would not likely have posed a risk to this water system.

On February 1, 1999, it was identified that approximately 10 L of diesel fuel was spilled at the Yukon Electric Company facility when an EnviroTank was overfilled. The contaminated snow was reportedly removed and this spill likely poses a minimal risk to this water system. This spill location is likely greater than 60 m cross-gradient from this well.

10.6 Identified Water System Deficiencies and Associated Risk

10.6.1 High and Medium Risk Deficiencies

The following deficiencies were identified as high or medium risk for the Swift River Utility Building:

- Poor surface completion of the well (well casing is completed at grade and without a well cap);
- The well is not equipped with a surface sanitary seal as required by the Canadian Groundwater Association's Well Construction Guidelines;
- By definition of the Draft Yukon GUDI Assessment Guideline, the well is potentially under the direct influence of surface water because it is a vulnerable type (unconfined aquifer), and does not meet the requirements of the Guidelines for Water Well Construction;
- The turbidity has been in exceedence of CDWQG MAC;
- A positive total coliform count has been reported;
- There is no treatment or disinfection system present;
- The well is located within 30 m of potential sources of contamination, including an oil heater, an above ground fuel storage tank, and an abandoned diesel tank;
- The pressure tank is of galvanized steel construction, which, is not suitable for drinking water storage; and,
- There are several other open holes in the concrete slab floor of the utility building (potentially abandoned wells) that could act as conduits for contamination to enter the subsurface.

10.6.2 Low Risk Deficiencies

The following deficiencies were identified as low-risk for the Swift River Utility Building:

- The heat trace on the piping to the foreman's residence is left on at all times of the year. If the water is stagnant in the piping for any period of time then the water at the point of consumption is very hot. Aside from this being non-aesthetically pleasing and uneconomical, it likely also leads to accelerated encrustation and biofouling.

10.7 Mitigative Options for Deficiencies

Mitigative options were developed to address the deficiencies identified in the previous section. Deficiencies are categorized by recommended level of priority (with Priority 1 being most critical).

10.7.1 Priority 1

The existing water system at the Swift River Utility Building should not be used for potable water due to poor construction and proximity to potential contaminant sources. It is recommended that the foreman's residence be disconnected from this system. The well at the utility building should only be used as a source of non potable water such as road watering and vehicle cleaning. Wellhead upgrades for should be completed, however, in order to protect the aquifer. There are two options being presented to provide the foreman's residence with a water supply.

Option 1:

The existing well at the Swift River Living Complex has better water quality and is considered less vulnerable to contamination. This option proposes that the living complex well be used to supply the foreman's residence. During the water system assessment it appeared that the Complex well had the least deficiencies and had superior water quality to the other YTG maintained wells in Swift River. This option would involve the following:

- Further study would have to be done on the living complex well in order to determine that the Complex well is suitable to serve the other YTG maintained buildings at Swift River. This would involve obtaining the well log in order to determine the depth, and other wellhead construction details that were unavailable during this assessment. Sustainable well yield would also need to be verified by pumping tests;
- The wellhead at the living quarters requires improvement. Upgrades would involve installing a surface sanitary seal (grout or bentonite) to a depth of at least 3 m, and extending the well casing at least 500 mm above grade;
- A underground piped water distribution line should be installed, and should be properly freeze-protected through heat-trace and insulation; and,
- An NSF/ANSI 55 certified UV disinfection system complete with NSF-61 certified pre-filtration to 1 micron absolute should be installed near the point of entry in the Swift River Living complex.

Option 2:

The second option considered involves construction of a new well. A new well could potentially be used to supply all the YTG maintained buildings in Swift River, including the grader station, living complex, and foreman's residence. The new well should be constructed in consideration of the following recommendations:

- The well should be equipped with a surface seal to at least 6 m and the casing should be extended above grade (500 mm) within a lockable enclosure that is inaccessible to animals and unauthorized personnel;
- The well should be located upgradient from the current well and must be greater than 30 m from any potential source of contamination;
- The water from the new well must meet all CDWQG health based guidelines. If there are any exceedences in the CDWQG health-based guidelines then a treatment system must be designed and installed as necessary; and
- An NSF/ANSI certified UV disinfection system should be installed at a centralized location complete with adequate NSF approved pre-filtration.

10.7.2 Priority 2

There are no Priority 2 recommendations for this site, assuming that Priority 1 recommendations are carried implemented.

10.7.3 Priority 3 – Low Risk

Low-risk deficiencies would also be mitigated when Priority 1 mitigative options are carried out. There are no Priority 3 recommendations.

10.8 Cost Estimates for Mitigative Options

Engineering costs for mitigative options are estimated to be 20% of construction costs, and would include inspection and completion reporting. The costs for materials and labour (not including engineering) are provided in the sections below. An additional contingency allowance of 20% is suggested for budgetary purposes.

10.8.1 Priority 1

The estimated cost to upgrade the wellhead in the utility building to protect the aquifer, and to disconnect the Foreman's residence from this water system would

cost about **$1,000**. Class D cost estimates for all other upgrade options are outlined below.

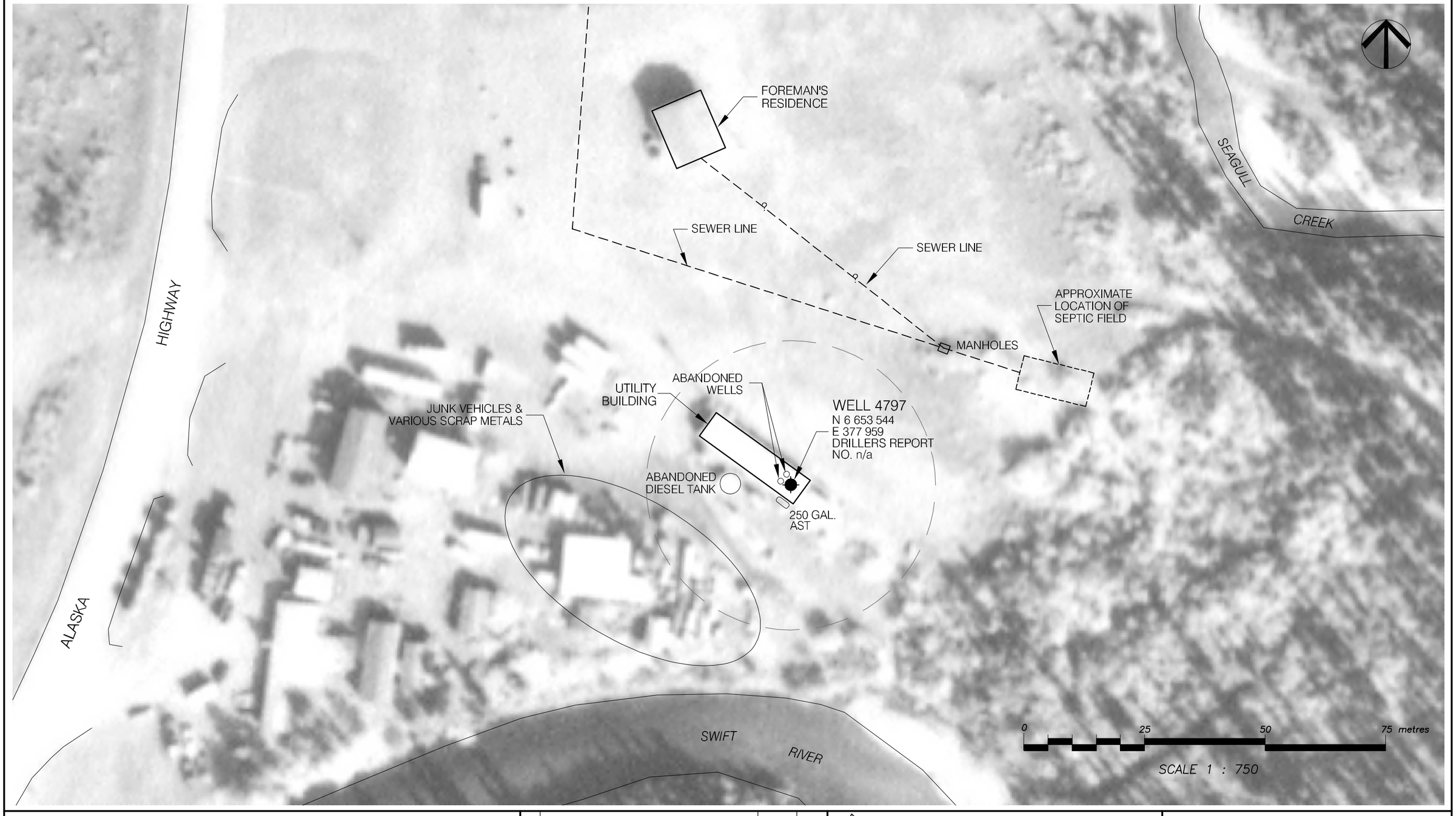
Option 1:

Some of the costs associated with this option depend on whether or not the Swift River Grader Station will also be supplied by the living complex well (costs to this system that can be distributed among multiple sites are reported as the average of the cost with two systems and the cost with three systems).

- Obtaining the well log, an additional site inspection, and additional water system assessment, would cost in the order of **$2,000**. This cost could be divided equally among the buildings proposed to be supplied by the living complex well, and would be approximately **$800**;
- The cost associated with improving the living quarters well would be in the order of **$5,000**. This cost could be divided equally among the buildings supplied by the living complex well, and would be approximately **$2,100**;
- Approximately 90 m of water distribution line, assuming $120 per metre (installed in shallow trench with required frost protection) would cost about **$10,800**;
- The proposed disinfection system to serve this water system would cost approximately **$1500**.

Option 2:

- It is recommended that **$30,000** be budgeted for materials and labour to drill, test, and complete the well. Since this well would serve three sites, the cost to this system would be approximately **$10,000**;
- Approximately 200 m of water distribution line would be required to serve all three buildings, and assuming $120 per metre, this would cost approximately **$24,000**. Since this well would serve three sites, the cost to this system would be approximately **$8,000**;
- The proposed disinfection system to serve this water system would cost approximately **$1500**.



NOTES:

1. UTM COORDINATES OBTAINED WITH A HAND HELD GPS USING NAD83 SYSTEM AND ARE CONSIDERED TO BE ACCURATE TO 10.0 m, APPROXIMATELY.

30 m RADIUS FROM WATER WELL FOR CONSIDERATION OF PROXIMITY TO POTENTIAL CONTAMINANT SOURCES.

No.	DESCRIPTION	DATE	APPROVED
0	ISSUED FOR CLIENT REVIEW	DD/MM/YY	XXX

REVISION

EBA Engineering Consultants Ltd.

DESIGNED BY:	R. MARTIN
DRAWN BY:	J. BUYCK
DATE:	JULY 2005
SCALE:	AS SHOWN
PROJECT No.:	1260002.002
ACAD FILENAME:	002-EASTERN REGION

CLIENT: Yukon
Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
EASTERN REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

SWIFT RIVER UTILITY
BUILDING # 4797
SITE LOCATION DIAGRAM
WELL ID: 4797

REVISION ISSUE: 0

FIGURE No.: 4797-A

Z:\020\Drawings\1260002 Water Assessment YTG\002 - Eastern Region\swift\1260002 Swift River Grader Station_4793 Site Plan.dwg, 7/20/2005 4:26:11 PM, Adobe PDF

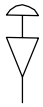
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

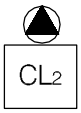

SOLENOID

#2 COMPONENT ID. No.
(SEE TABLE ON FOLLOWING PAGE)

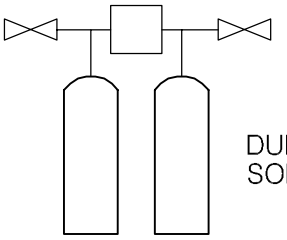
FLOW METER

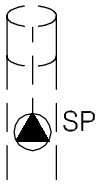
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

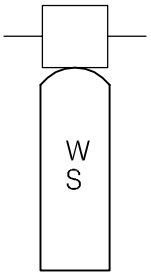


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

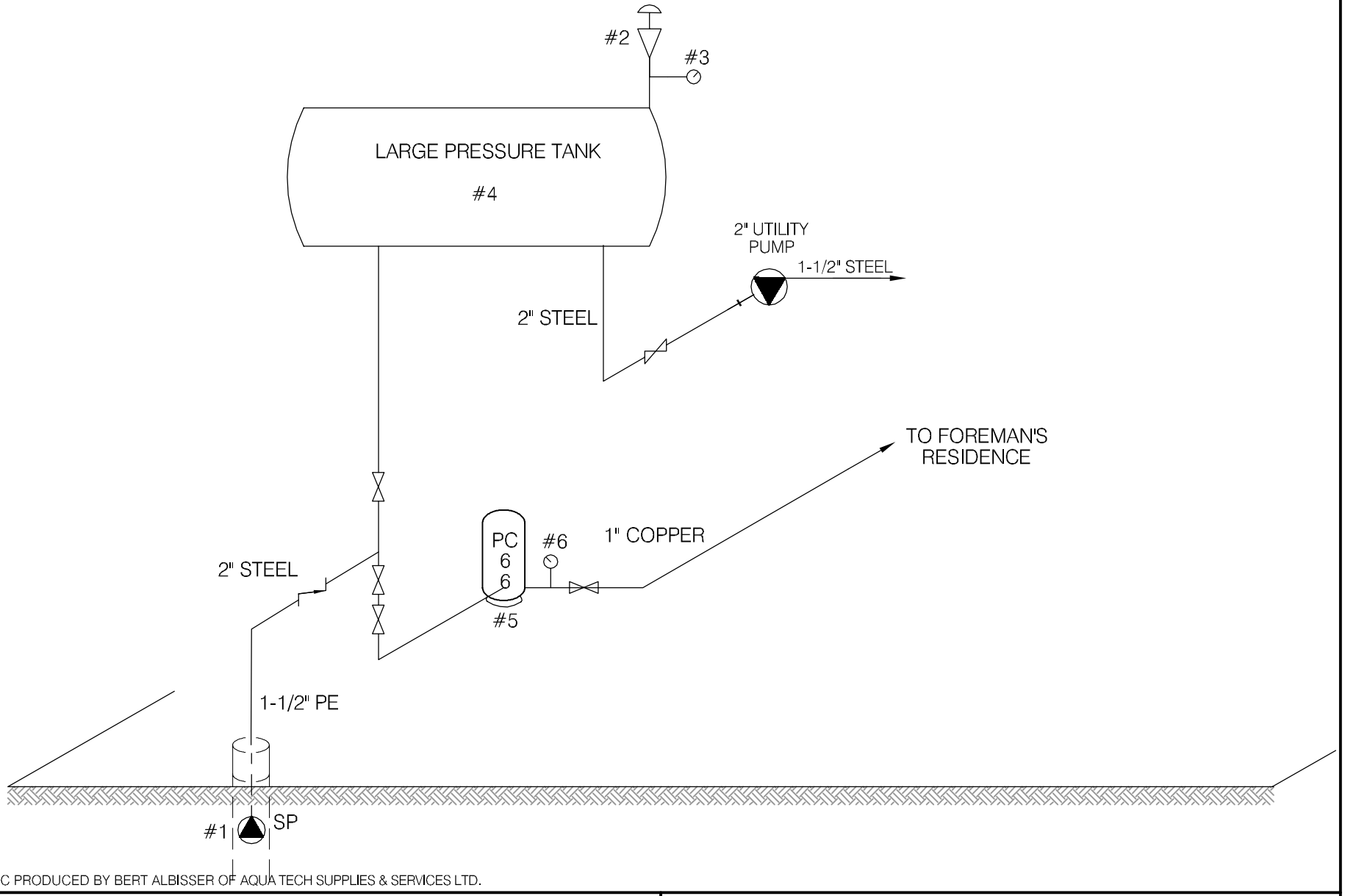


WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT EASTERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	SCHEMATIC SYSTEM LEGEND	
DATE APRIL 2006	DWN. JSB	CHKD. RMM	FILE NO. 1260002		DRWG. LEGEND



SCHEMATIC PRODUCED BY BERT ALBISSER OF AQUA TECH SUPPLIES & SERVICES LTD.

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT EASTERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 4797 SWIFT RIVER UTILITY BUILDING	
DATE JULY 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.002		DWG.: FIGURE 4797-B

Z:\0201Drawings\1260002 Water Assessment YTG\002 - Eastern Region\swift\1260002 Swift River Utility Bldg_4797 Schematic.dwg, 7/20/2005 4:15:27 PM, Adobe PDF

Eastern Region – Swift River Utility Building
Building # 4797

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SUB PUMP	MONARCH	SB11D15E		2892	4"
2	PRESSURE SWITCH	SQ. D	GSG-2	224330		
3	PRESSURE GAUGE	MARSH	0-100			2"
4	PRESSURE TANK	N/A.	LARGE			16' x 4'
5	PRESSURE TANK	CHALLENGER	PC 66			DOMESTIC
6	PRESSURE GAUGE	0-100	4" DIAL			"
7						
8						
9						
10						

TABLE 4797- 1: SUMMARY OF BACTERIOLOGICAL RESULTS

Building #	Building Name	Number of Sampling Events	Time Period over which Sampling was Done	Any Positive Total Coliform Results? (yes or no)	Fraction of Positive Total Coliform Results vs. Total Sampling Events	Any positive E.Coli results? (yes or no)	Most Recent Sampling Event Available for EBA Review	Is Most Recent Result Positive?
4797	Swift River Utility Building	6	Sept-04 to Mar-05	yes	1/6	no	9-Mar-05	no

Table 4797-2: Water Quality Results

Location/ Resident	Swift River			GCDWQ Criteria		
Address	km 1181 Alaska Highway					
Treatment	No					
Disinfection	No					
Source of Water	On-Site Well					
Purpose of Sampling	Baseline	Additional Sampling	Baseline			
Sample Location		Foreman's Residence Kitchen Tap				
Date Sampled	13-Sep-04	20-Jun-05	22-Jun-05	**Lower Limit**	**Upper Limit**	
Physical Tests *(ALS)*				**AO**	**MAC**	**AO**
Colour (CU)	7		<5			15
Conductivity (uS/cm)			72.3			
Total Dissolved Solids	40		43			500
Hardness CaCO3	32.6		34	AO >200 = poor, > 500 unacceptable[A]		
pH	7.3		7.03	6.5		8.5
Turbidity (NTU)	**4.6**	**2.69**	**3.32**		1	5
UV Absorbance		0.027				
% Transmittance						
Dissolved Anions *(ALS)*						
Alkalinity-Total CaCO3	37		42.6			
Chloride Cl	<0.5		0.76			250
Fluoride F	0.72		0.692		1.5	
Silicate SiO4						500
Sulphate SO4	3.56		3.32			
Nitrate Nitrogen N	<0.1		<0.10		10	
Nitrite Nitrogen N	<0.05		<0.10		1	
Ammonia Nitrogen N						
Total Phosphate PO4						
Total Metals *(ALS)*						
Aluminum T-Al	0.007		<0.010			
Antimony T-Sb	<0.0002		<0.0005		0.006	
Arsenic T-As	<0.0002		0.00014		0.025	
Barium T-Ba	0.012		0.020		1	
Boron T-B	0.011		<0.010		5	
Cadmium T-Cd	<0.00001		<0.00020		0.005	
Calcium T-Ca			11.0			
Chromium T-Cr	<0.0005		<0.0020		0.05	
Copper T-Cu	0.023		0.0392		1	
Iron T-Fe	0.25		0.253			0.3
Lead T-Pb	0.0011		0.0044		0.01	
Magnesium T-Mg			1.56			
Manganese T-Mn	0.021		0.0148			0.05
Mercury T-Hg			<0.00020		0.001	
Potassium T-K			0.32			
Selenium T-Se			<0.0010		0.01	
Sodium T-Na	1.8		<2.0			200
Uranium T-U	<0.0005		0.00038		0.02	
Vanadium T-V						
Zinc T-Zn	0.073		0.096			5
Dissolved Metals						
Aluminum D-Al						
Antimony D-Sb						
Arsenic D-As						
Barium D-Ba						
Boron D-B						
Cadmium D-Cd						
Calcium D-Ca						
Chromium D-Cr						
Copper D-Cu						
Iron D-Fe						
Lead D-Pb						
Magnesium D-Mg						
Manganese D-Mn						
Mercury D-Hg						
Potasium D-K						
Selenium D-Se						
Sodium D-Na						
Uranium D-U						
Vanadium D-V						
Zinc D-Zn						
Trihalomethanes						
Bromodichloromethane						
Bromoform						
Chloroform						
Dibromochloromethane						
Total Trihalomethanes						
Organic Parameters						
Tannin and Lignin		<0.10				
Total Organic Carbon C		0.70				
Haloacetic Acids						
Bromoacetic Acid						
Bromochloroacetic Acid						
Chloroacetic Acid						
Dibromoacetic Acid						
Dichloroacetic Acid						
Trichloroacetic Acid (TCA)						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene						
Acenaphthylene						
Acridine						
Anthracene						
Benz(a)anthracene						
Benzo(a)pyrene						
Benzo(b)fluoranthene						
Benzo(g,h,i)perylene						
Benzo(k)fluoranthene						
Chrysene						
Dibenz(a,h)anthracene						
Fluoranthene						
Fluorene						
Indeno(1,2,3-c,d)pyrene						
Naphthalene						
Phenanthrene					0.1	
Pyrene						
Quinoline						
Extractable Hydrocarbons						
EPH10-19						
EPH19-32						
LEPH						
HEPH						
Field Chemistry (EBA)						
pH		7.43		6.5		8.5
TDS (ppm)		41				500
EC (uS/cm)		82				
Temperature (°C)		40.6				
Free Available Chlorine						

Notes:

A. Guidelines indicated for hardness are not CDWQG, rather they are general aesthetic guidelines - exceedences are indicated in yellow highlighting.

Italics and underline indicates exceedence of proposed MAC (ie. arsenic)

Bold with Yellow highlighting indicates exceedence of CDWQG Aesthetic Objective (AO)

Bold Underline with Yellow highlighting indicates exceedence of CDWQG MAC

Results are expressed as milligrams per litre except for pH and Colour (CU)

Conductivity (umhos/cm),Temperature (°C) and Turbidity (NTU)

< = Less than the detection limit indicated.

AO = Aesthetic Objective

MAC = Maximum Acceptable Concentration (Health Based)

Table 4797-3: Summary of Well Assessment Results
SMALL PUBLIC DRINKING WATER SYSTEMS

Well Identification			GPS Coordinates		
Building #	**Building Name**	**Location**	**Northing (+/- 10 m)**	**Easting (+/- 10 m)**	**Grade Elevation (+/- 10 m)**
4797	**Utility Building**	**Swift River**	6643544	377959	884

Well Details							
Well Casing Diameter (mm)	**Year Well Installed**	**Well Log?**	**Well Depth (m bg)**	**Reported Low Permeabilty Protective Layer?**	**Pump Setting (m bg)**	**Well Capacity - Tested, or Reported by User**	**Static Water Level Below Ground (m-btwc)**
150		No	23	Unknown	10.11		4.41

Potential Contaminant Sources					
Distance from well to nearest point of septic field (m)	**Distance from well to nearest building (m)**	**Distance to surface water body (m)**	**AST present on property?**	**Distance from well to AST (m)**	**Other potential sources of contamination observed on property, and distance to well**
60	Inside utility building	40 m to Swift River	AST	4	Oil Heater at 10 m
			Abandoned Diesel Tank	10	

Well Construction Details					
Wellhead Above ground (m)	**Well Cap**	**Well Screen**	**Surface Seal**	**Apron Grading**	**Comments**
Wellhead is at grade	No			Concrete floor around well is not sloped	Well services a highway maintenace truck fill and the forman's residence. The heat trace to the residence had been left on at the time of inspection so all water was hot.

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin
Luke Lebel -

Date June 20, 2005

WELL ID #	Owner	Location Description
4797	YTG	Swift River Utility Building

1. Well Location and Potential Contaminant Sources

a. General location of well: (Community, Subdivision, etc.)
Swift River

b. Specific location: (Road or street, Building number, name of owner and/, legal description,
Swift River, Alaska Hwy

c. GPS location: N 6653544 E 377959 elv 884m ±6

d Is there electric power? ☒ Yes ☐ No

e Is there outside water access? ☐ Yes ☒ No

f. Does the well system have:

☐ 15 or more service connections to a piped distribution system ? If so how many_____
Foreman's Residence + fill line

☐ 5 or more delivery sites on a trucked distribution system? If so how many_____

g. Nearest building, specify inside utility buildings

h. Distance from well to building _____

i. If there is an effluent disposal field, is its location known? ☒ Yes ☐ No

j. Distance from well to nearest point of known field: 60m

k. Well location relative to field: ☐ upslope ☒ downslope ☒ lateral
slightly downslope

N 6653545
E 377976

l. Is there any part of a sewage disposal system(s)or other potential sources of pollution that may pose a health and safety risk within 30 m? ☐ Yes ☐ No
lodge septic >50m, sewer pipe @ 35m

m. Is the well located within 300 m from a sewage lagoon or pit? ☐ Yes ☒ No

n. Is the well located within 120 m from a solid waste site or dump, cemetery? ☐ Yes ☒ No

o. Is the infrastructure protecting the wellhead, pumphouse, storage tank and/or water treatment plant designed and secured to prevent:

Unauthorized access by humans? ☒ Yes ☐ No Inside locked building
Entrance by animals? ☐ Yes ☒ No Access possible

p. Is well site subject to flooding? ☐ Yes ☒ No no signs of ponding

q. Is the well site well drained? ☒ Yes ☐ No

r. Is there a buried fuel tank on the property? ☐ Yes ☒ No unlikely <150m

If yes, is it ☐ in use ☐ abandoned

Is the location known? ☐ Yes ☐ No

Distance from the well to known buried tank _____

s. Are there any other known contaminant sources on the property?

☐ Yes ☐ No Describe _____

If yes, specify the source: ☐ dump ☐ sewage lagoon ☐ cemetery ☐ other

Potential Source 1: Oil heater ; Distance from well to Potential Source 1: 3m
Potential Source 2: AST ; Distance from well to Potential Source 2: 4m
Potential Source 3: Diesel tank (abandonned) ; Distance from well to Potential Source 3: 10m
Potential Source 4: Swift River ; Distance from well to Potential Source 4: 40m

t. Are there other wells on this property? ☒ Yes ☐ No possible - There is piping coming from floor that may be abandonned wells

How many? _____ ☒ in use ☒ abandoned ☐ require proper sealing
living complex + grader stn wells >50m

2. Well and Wellhead information:

a. When was well installed? Year unknown Month _____

b. Type: ☒ drilled ☐ dug ☐ sand point ☐ other _____
likely

c. Is there a drillers log for the well: ☐ Yes ☒ No

d. Is there a surface seal to 6 m ☐ Yes ☒ No ☐ unknown ☒ unlikely

e. Surface casing: ☐ Yes Diameter _____ ☒ No

f. Well casing: Diameter 15 cm Material: ☒ steel ☐ plastic ☐ concrete

g. Depth of well: 10.11 m could be pump 75ft likely ☒ measured (if possible) ☒ reported ☐ from log

h. Static water level below ground: 4.41m bg

☒ measured (if possible) ☐ reported ☐ from log ☐ flowing

i. (If granular) Is the well completed: ☐ open end casing ☐ with a well screen

☐ with slotted pipe ☐ unknown other unknown

j. (If bedrock) Does the well have a liner? ☐ yes ☐ No ☐ steel ☐ plastic

k. If there is a well screen: length unknown slot size(s) _____
Location of screen: from _____ to _____ from log reported

l. Is there a sump below the screen? ☐ Yes ☐ No unknown

m. Is the well head: ☐ in pumphouse ☐ in pit ☐ pitless adaptor ☒ in a building

☐ in a wooden enclosure other, describe _____

n. If the well head is located in a wooden enclosure,

i. Is the well head below grade? describe in detail at grade approx.

ii. Are there signs of ponding on the enclosure(e.g. water stains, etc.)? ☐ Yes ☒ No

iii. Is the wellhead enclosed by fiberglass insulations? ☐ Yes ☒ No

iv. Any evidence of rodents? Specify Access possible, but no evidence

v. Does the well casing have a proper seal cap? ☐ Yes ☒ No

If no, describe condition steel lid above casing

3. Water Supplying This Well:

a. By definition is the water from a surface water source or under the direct influence of surface water?

☒ Yes ☐ No ☐ farther investigation required.

If yes is there treatment ☐ Yes ☒ No

Explain (filtration, disinfection etc…)_____

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4. Aquifer Supplying This Well:

a. The aquifer is: ☐ bedrock ☑ granular sediment ☐ unknown likely

b. Does water level and/or well capacity show seasonal fluctuation? ☐ Yes ☒ No unknown

5. Pump Installation:

a. Is the well equipped with a pump? ☒ yes ☐ No

b. Type of pump: ☐ hand ☒ electric submersible ☐ jet

☐ shallow well centrifugal ☐ other, _____

c. Description: Manufacturer _____ Model _____

horsepower _____ capacity _____ voltage _____

d. Date installed: _____ By: _____

e. For submersible pump, depth of setting below surface _____

f. Drop pipe for submersible pump: ☐ steel ☒ plastic

g. Pump delivers water to: ☒ pressure tank (domestic) ☒ elevated tank (truck fill) ☐ other

h. Are there automatic pump controls: ☒ Yes ☐ No

i. Is there provision for taking water samples before water reaches storage? ☐ Yes ☒ No

j. Is there a water meter on the system? ☐ Yes ☒ No

k. Is the pump and piping protected from freezing? ☒ Yes ☐ No

If yes, describe: Heater - no insulation or heat trace

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

b.Recommendations:

PART B: EBA Site Inspection

Inspector: BERT ALBISSER Date JUNE 20/05

WELL ID #	Owner	Location Description
4797	YTG	SWIFT RIVER UTILITY BLD.

6. **Water Treatment**

a. Is well water treated? ☐ Yes ☑ No; Type of treatment:

☐ chlorination ☐ iron and or manganese removal ☐ other _____

b. Is water entering plumbing or piped distribution system treated with chlorine or another treatment that is as effective as chlorine used to achieve disinfection throughout the system?

☐ Yes ☐ No If so how _____

c. If treated with chlorine, is the free residual chlorine concentration less than 0.2 mg/L

☐ Yes ☐ No _____ reading.

Tested at _____ (location)

d. Is testing for chlorine residual concentration done at the tap (eg. Kitchen faucet) or from representative points in a piped distribution system, including a point from tap at the end line

☐ Yes ☐ No If yes how often? _____

e. If the drinking water is being transported by water delivery truck does it have a minimum chlorine free residual of 0.4 mg/L at the time of fill. ☐ Yes ☐ No

7. **Water Quality (observations):**

a. Does the water stain plumbing? ☐ yes ☐ No ☐ slight ☐ severe

Type of stain: ☐ brown ☐ red ☐ black

b. Does the water contain sediment? ☐ Yes ☐ No ☐ occasional ☐ constant

c. Is there an unpleasant odour? ☐ Yes ☐ No ☐ H_2S ☐ Other _____

d. Is there an unpleasant taste? ☐Yes ☐No ☐brackish ☐ Other _____

e. Is there a history of bad bacterial analyses? ☐ Yes ☐ No

f. Is there a chemical analysis? ☐ Yes ☐ No ☐adequate ☐ incomplete

g. Is there analysis of trihalomethanes (THMs) where the water source is a surface water supply or a well under the direct influence of surface water? ☐ Yes ☐ No

h. Is the drinking water tested daily with an accurate reading chlorine test kit capable of reading in the range 0 to 3.5 mg/L of free chlorine residual in increments of 0.1mg/L? ☐ Yes ☐ No ☐ unknown

i. If yes is the test performed in accordance with manufactures directions? ☐ Yes ☐ No ☐ unknown

j. Is a record of the date, time,name of person performing the test and results of the drinking water sample kept? ☐ Yes ☐ No

TANK AND PIPING DETAILS

Tank Room

Is there a water tank? (Yes) No Details: PRESSURE TANK

Where is it located?
Comments: UTILITY BLDG.

Is the room in which the water tank is located heated to maintain an optimum temperature of 4°C for stored water?
(YES) NO
Comments: _____

Are there windows in the add-on that may allow direct sunlight onto the water holding tank? YES (NO)
Comments: _____

Are there other heat sources near the tank? YES (NO)
Comments: _____

Is there waterproof flooring with a sealed base to contain spills? YES (NO)
Comments: _____

Overall Tank

What are the tank size and dimensions?

16' L x 4' Ø

What material is the tank constructed of? GALV. STEEL

Is tank and associated piping constructed of safe materials (i.e. CSA approved and material that does not affect the taste of the water)? YES (NO)

Comments: _____

Tank Inlet, Outlet and Lid

Is there adequate access on the tank for cleaning (i.e. min 15" access lid)? YES NO

Does the lid have a tight seal and is it watertight when closed? YES NO

Does the tank have an overflow or high level whistle? YES NO

Is the water tank drain accessible? YES NO

WATER TANK AND WATER QUALITY CONDITION

Are there signs of staining or biofouling? YES NO
Comments: _____

Is there any sediment or scum in bottom of tank? YES NO
Comments: _____

Is there any odour associated with the water or tank? YES NO

Have there been any bacteriological analyses conducted previously? YES NO

Does the tank appear that it has been cleaned recently? YES NO

Are the tanks easily assessed for the purpose of cleaning and disinfection? YES NO

8. Conclusions

a. Comments on overall installation:

WELL IS AT FLOOR LEVEL. PRESSURE TANK NOT SUITABLE FOR DRINKING WATER. THERE IS NO TREATMENT IN PLACE NO SANITARY SEAL ON WELL HEAD

b. Recommendations:

EXTEND CASING TO PROPER HEIGHT. INSTALL SANITARY SEAL. SPLIT SYSTEM TO SEPARATE UTILITY WATER AND DOMESTIC SUPPLY. INSTALL APPROPRIATE TREATMENT.

Environment Canada Environnement Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
PH: 867.667.3400 FAX: 867.667.7962

Spill Report Information

Spill #	9321
Jurisdiction	Yukon
Community	
Address	
Highway	Alaska Highway
Milepost	M 733
Feature	Swift River
Location and Cause	Swift River Lodge - de-icing operation being conducted without collection of solution
Latitude	60.0080555555556
Longitude	-131.184166666667
Incident Date	3/1/1993
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	
Company(s)	Swift River Lodge
Amount	250
Units	Litres
Quantity	Estimate
Release Description	Dumped
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Calcium Chloride
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	de-icing solution not being contained - no runoff to river yet but potential - advised operation to be moved and solution contained - toxic to fish

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Spill Report Information

Spill #	9902
Jurisdiction	Yukon
Community	Swift River
Address	
Highway	Alaska Highway
Milepost	M 733
Feature	Swift River
Location and Cause	YECL Envirotank overfilled - tanker truck driver unsure of storage tanks capacity
Latitude	60.004
Longitude	-131.1864
Incident Date	2/1/1999 11:50:00 AM
Lead Agency	Yukon Government - Environmental Programs
Other Agency	
Company(s)	Healey Enterprises (Fort Nelson, BC)
Amount	10
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	fuel ran down sides of tank into snow - contaminated snow to be recovered and free product soaked up - pump shut off as soon as fuel came out vent - no further information

Photo 0249: 4797 Utility building (back right), and foreman's residence (left)

Photo 0243: 4797 Wellhead

Photo 0247: 4797 Septic field

Photo 0246: 4797 Swift River (back), and utility building (right)

Photo 0248: 4797 Utility building (right), above ground storage tank (centre), and abandoned diesel tank (back left)

Photo 0244: 4797 Water storage tank