

LEGEND



PUMP



PRESSURE GAUGE



GATE VALVE



CHECK VALVE



SOLENOID

#2

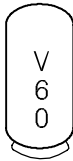
COMPONENT ID. No.
(SEE TABLE ON FOLLOWING PAGE)



FLOW METER



WATER FILTER
(CARTRIDGE TYPE)

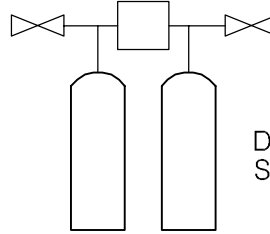


PRESSURE TANK



CL₂

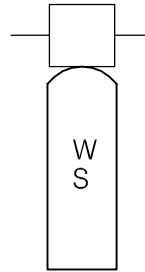
CHLORINE RESERVOIR AND
INJECTION PUMP



DUPLEX WATER
SOFTENER



WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

Z:\0201\Drawings\1260002 Water Assessment YTG\001 - Whitehorse Region\1260002003 Whitehorse Schematic_LEGEND.dwg, 4/11/2006 10:28:07 AM, Adobe PDF, jbuyck



EBA Engineering Consultants Ltd.

PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WHITEHORSE REGION

CLIENT



TITLE

**SCHEMATIC SYSTEM
LEGEND**

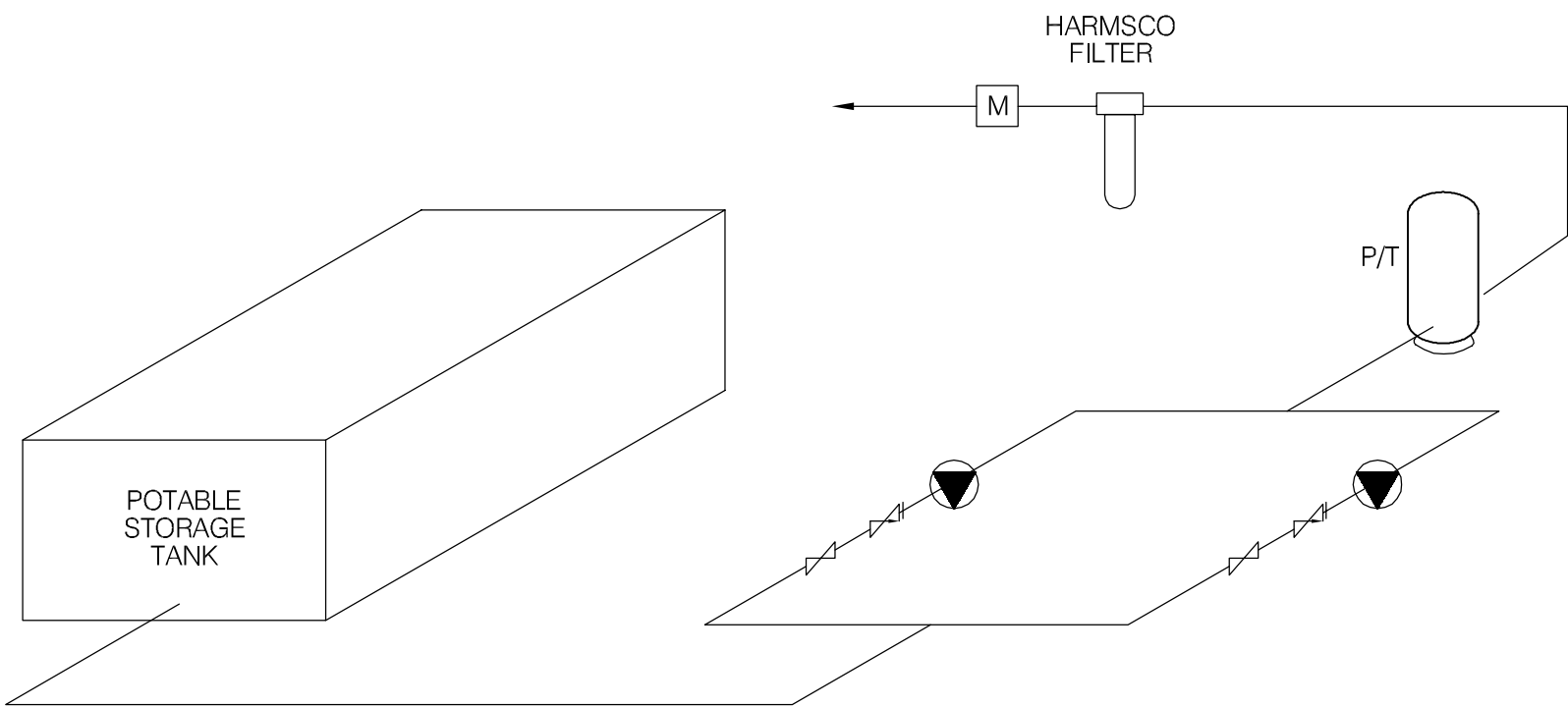
DATE APRIL 2006

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 WHITEHORSE REGION	
CLIENT 		TITLE WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 1134 CARCROSS SCHOOL	
DATE	APRIL 2006	DWN.	JSB
CHKD.	FMM	FILE NO.	1260002.001
		DWG.:	FIGURE 1134B

Whitehorse Region – Carcross School
Building # 1134

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	Pump #1 Well	GRUNDFOS				1 HP.
2	Pump #2 Well	JACUZZI				2 HP.
3	Pump #1 (Potable)	MONARCH	JKC-53		1191	3/4 HP
4	Pump #2 (Potable)	MONARCH	MJS-75		5102	3/4 HP
5	Pressure Tank	MONARCH	FG42			42 Gallon
6	Storage Tank	CUSTOM				6 ^W FT x 3 ^H x 12 ^L
7	Pressure Tank	MONARCH	M-302			
8						
9						
10						

TABLE 1134 - 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?
1134	Carcross School	12	Sept-04 to Mar-05	no	0/12	no	2-Mar-05	no



Table 1134-2: Water Quality Results

SOURCE:		Building 1134 - Carcross School		GCDWQ Criteria		
Location/ Resident		Carcross				
Address		Block 53				
Treatment		Public Water System				
Source of Water		Benette Lake Pumphouse				
Purpose of Sampling		Baseline	Additional Sampling			
Sample Location						
Date Sampled			11-May-05	Lower Limit	Upper Limit	
Physical Tests (ALS)				AO	MAC	AO
Colour (CU)		<5.0				15
Conductivity (uS/cm)		68.8				
Total Dissolved Solids		40				500
Hardness CaCO3		28.9		AO >200 = poor, > 500 unacceptable ^A		
pH		7.58		6.5		8.5
Turbidity (NTU)		0.16				5
Dissolved Anions (ALS)						
Alkalinity-Total CaCO3		25.5				
Chloride Cl		0.72				250
Fluoride F		0.224			1.5	
Sulphate SO4		6.38				500
Nitrate Nitrogen N		<0.10			10	
Nitrite Nitrogen N		<0.10			1	
Ammonia Nitrogen N		<0.020				
Total Metals (ALS)						
Aluminum T-Al		<0.010				
Antimony T-Sb		<0.00050			0.006	
Arsenic T-As		0.00026			0.025	
Barium T-Ba		<0.020			1	
Boron T-B		<0.10			5	
Cadmium T-Cd		<0.00020			0.005	
Calcium T-Ca		9.71				
Chromium T-Cr		<0.0020			0.05	
Copper T-Cu		0.0461			1	
Iron T-Fe		0.055				0.3
Lead T-Pb		<0.0010			0.01	
Magnesium T-Mg		1.12				
Manganese T-Mn		<0.0020				0.05
Mercury T-Hg		<0.00020			0.001	
Potassium T-K		0.45				
Selenium T-Se		<0.0010			0.01	
Sodium T-Na		2.1				200
Uranium T-U		0.00081			0.02	
Zinc T-Zn		0.05				5
Field Chemistry (EBA)						
pH		7.94		6.5		8.5
TDS		30				500
EC (uS/cm)		60				
Temperature		17.2				
Free Available Chlorine		0.00				250

Notes:

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

Shading indicates exceedence of Proposed MAC guideline (arsenic).

Bold Underline with Yellow shading 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 1134-3: Summary of Well Assessment Results
SMALL PUBLIC DRINKING WATER SYSTEMS**

Well Identification and Location					
Building #	Building Name	Location	Northing (+/- 10 m)	Easting (+/- 10 m)	Grade Elevation (+/- 10 m)
1134	Carcross School	Carcross	6670157	516083	664

Well Details							
Well Casing Diameter (mm)	Year Well Installed	Well Log?	Well Depth (m bg)	Reported Low Permeability Protective Layer?	Pump Setting (m bg)	Well Capacity - Tested, or Reported by User	Static Water Level Below Ground (m-btwc)
W1 - 150	?	No	?	Likely: Silt and Clay: ~10m to ~60m Till: ~80m to ~100m	?	1hp submersible pump	7.04
W2 - 150	?	No	W2 - Greater than 60		59.4	2hp submersible pump	

Well Construction Details				
Wellhead Above ground (m)	Well Cap	Well Screen	Surface Seal	Apron Grading
W1- 1.8 below grade	Split Cap Gasket	?	Unlikely	No, but ground slopes away from pit
W2 - 1.1 below grade	Split Cap Gasket, 2 missing bolts	?	Unlikely	No, but ground slopes away from pit

**Table 1134-4: Potential Contaminant Sources:
Building 1134 – Carcross School**

Potential Contaminant Source	Potential Contaminants	Distance from Water Source	Northing	Easting
Industrial Refuse	<i>Organic</i> and inorganic chemicals.	40 m		
Cemetery	<i>Biological</i> ¹ , inorganic ² and organic parameters.	>120 m		
Sewage lagoon	<i>Biological</i> , inorganic and organic parameters.	>300 m		
Sewage lines, tanks and lift stations	<i>Biological</i> , inorganic and organic parameters.	unknown		
Septic fields	<i>Biological and Inorganic</i> parameters.	>60 m		
Gas stations	<i>Organic and Inorganic</i> parameters.	>30 m		
Undergrounds Fuel Storage Tanks (USTs)	<i>Organic</i> parameters.	2 m		
Above ground storage tanks (ASTs)	<i>Organic</i> parameters.	50 m, 50 m		
Naturally occurring sources of contamination	<i>Radionuclides, Bacteria and Viruses from surfacewater sources.</i>	Approx. 200 m to surfacewater		

Notes:

Bold highlighting of distances indicates non-compliance with proposed guidelines

1- Biological parameters include: bacteria, viruses, protozoa (parasitic organisms), helminthes (intestinal worms), and bio aerosols (inhalable moulds and fungi).

2 – Inorganic contaminants could include arsenic in embalming chemicals (prior to early 1900's), and heavy metals in caskets.

Required Setback Distances Draft Guidelines for Part III – Small Public Drinking Water Systems:

300 m (1,000 ft) from a sewage lagoon or pit and manure heaps

120 m (400 ft) from a solid waste dump or a cemetery

30 m (100 ft) from any other potential source of contamination

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SMALL PUBLIC WATER SYSTEM ASSESSMENT

↳ non-potable water wells

PART A: EBA Site Inspection

Inspector: Ryan Martin
Luke Lebel

Date May 11, 2005

WELL ID #	Owner	Location Description
1134	YTG	Carcross School

1. Well Location and Potential Contaminant Sources

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

Carcross

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

Carcross School

c. GPS location: 516083 Easting; 6670157 Northing; 664m elev. ±9m

d. Is there electric power? Yes No

e. Does the well system have:

15 or more service connections to a piped distribution system? If so how many _____

Carcross School non-potable water

5 or more delivery sites on a trucked distribution system? If so how many 0

f. Nearest building, specify Carcross School

g. Distance from well to building 2m

h. If there is an effluent disposal field, is its location known? Yes No

i. Distance from well to nearest point of known field: holding tank only Yes No (There are, however many residential septic tanks in the area, likely >60m lateran)

j. Well location relative to field: upslope downslope lateral

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k. 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

There are residential septic holding tanks nearby

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

m. Is the well located within 120 m from a solid waste site or dump, cemetery? Yes No
However, there is a junkyard ~60m away from the wells and many residential homes with mechanical gear and fuel/oil storage tanks on their property

n. 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 Entrance by animals? Yes No
Neither well was locked. Well has unfurnished 4x6 beams on top. Well has a put plywood casing screwed on only. Well had no evidence of animals, well did contain some mouse droppings

o. Is well site subject to flooding? Yes No
Well has evidence of water staining. Well has no evidence of water staining or flooding

p. Is the well site well drained? Yes No

q. Is there a buried fuel tank on the property? Yes No

If yes, is it in use abandoned

Is the location known? Yes No

Distance from the well to known buried tank 1.5m

r. 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: Lot w/ Mech Equip; Distance from well to Potential Source 1: 40m

Potential Source 2: AST 1; Distance from well to Potential Source 2: 50m

Potential Source 3: AST 2; Distance from well to Potential Source 3: 50m

Potential Source 4: _____; Distance from well to Potential Source 4: _____

s. Are there other wells on this property? Yes No

How many? There are 2 on the property in use abandoned require proper sealing
The well from the Carcross Fire Hall is nearby (<120m)

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2. Well and Wellhead information:

*a. When was well installed? Year _____ Month _____

b. Type: drilled dug sand point other _____

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

measured values
58.315 m (pump)
bottom > 60 m
7.040 m (static)

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

e. Surface casing: Yes Diameter _____ No

f. Well casing: Diameter w1 - 15 cm w2 - 15 cm Material: steel plastic concrete

g. Depth of well: w2 > 60 m measured (if possible) reported from log

h. Static water level below ground: 7.040 m

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 _____

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

*k. If there is a well screen: length _____ slot size(s) _____

Location of screen: from _____ to _____ from log reported

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

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

w1 is in a pit with cement walls and w/ 4"x6" wooden beam ceiling
w2 is in a pit within insulated pref enclosure

in a wooden enclosure other, describe _____

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

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- i. Is the well head below grade? describe in detail Yes W1 180cm, W2 84cm
- ii. Are there signs of ponding on the enclosure (e.g. water stains, etc.)? Yes No
W1 has serious signs of flooding and water stains
W2 has no evidence of ponding
- iii. Is the wellhead enclosed by fiberglass insulations? Yes No
In both cases
- iv. Any evidence of rodents? Specify W2 is clean, no evidence of rodents
W1 has some mouse droppings
- v. Does the well casing have a proper seal cap? Yes No

If no, describe condition both have split seal gasket caps, though
rusty, W2 has 2 missing bottom plates
and may not be properly sealed.

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 N/A - not used for potable water

Explain (filtration, disinfection etc...) _____

4. Aquifer Supplying This Well:

- * a. The aquifer is: bedrock granular sediment unknown
- b. Does water level and/or well capacity show seasonal fluctuation? Yes No

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 W1 - Grundfos W2 - Jacuzzi Model _____
horsepower W1 - 1 hp W2 - 2 hp capacity _____ voltage _____

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d. Date installed: unknown By: _____

e. For submersible pump, depth of setting below surface 58.315m bc → 22

f. Drop pipe for submersible pump: steel plastic

g. Pump delivers water to: pressure tank elevated tank other

h. Are there automatic pump controls: Yes No

i. Is there provision for taking water samples before water reaches storage? Yes No
in well pits

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: There is insulation and heat trace on both wells

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

See report

b. Recommendations: See Report

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PART B: EBA Site Inspection

Inspector: Ben Abisser

Date MAY 11-05

WELL ID #	Owner	Location Description
1134	VTG	CARROSS SCHOOL

6. Water Treatment

NOT USED FOR POTABLE WATER.

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 H₂S Other _____

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- 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:

Where is it located?

Comments: CRAWLSPACE

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: _____

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Overall Tank

What are the tank size and dimensions?

6FT X 3FT X 12FT RECTANGULAR

What material is the tank constructed of? 3/4" PLY WOOD / FG LINER.

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 UNKNOWN

Comments: TANK HAS TO BE DRAINED ACCESS ON SIDE OF TANK.

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 UNKNOWN

Have there been any bacteriological analyses conducted previously? YES NO UNKNOWN

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

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

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8. Conclusions

a. Comments on overall installation:

WATER SYSTEM IS A SPLIT SYSTEM.
NON POTABLE WATER IS USED FOR TOILETS &
IRRIGATION. POTABLE WATER FOR SINKS &
OTHER FACILITIES.
TIME CONSTRAINTS FOR THIS WORK DOES NOT
ALLOW US TO ESTABLISH FOR CERTAIN THAT
NO CROSS CONNECTION EXISTS.

b. Recommendations:

COMPLEX PIPING SYSTEM MUST BE CODED
TO IDENTIFY NON POTABLE & POTABLE
SOURCES. SYSTEM NEEDS TO BE CHECKED
TO ASSURE NO CROSS CONNECTION EXISTS.
POTABLE STORAGE TANK SHOULD BE IN
A LOCATION THAT ALLOWS EASY INSPECTION
AND CLEANING. CHLORINATION EQUIPMENT
MUST BE INSTALLED TO EFFECT PROPER
CHLORINE RESIDUALS & CONTACT TIME.
SYSTEM COMPONENTS SHOULD BE
IDENTIFIED.

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PART C Property Manager/ System Operator Questionnaire

Inspector: FERRY JACKSON Date May 08/05

Property manager: Carross school

1) Water Source:

- a. Is the well water the major source of drinking water? Yes No
- b. Is the well water used for other non-drinking purposes? Yes No {Toilets, urnals, irrigation}

2) Well information:

- a. When was your well installed? Year 22 hp Jacuzzi 1 well 1 hp pumps Month 1989
- b. Type: drilled dug sand point other _____
- c. Is there a driller's log for the well?: Yes No
- d. Do you know the depth of your well? If so, please indicate: _____
- e. Who was the well constructed by?
Indicate contractor's name: _____
- f. Are you, the owner Yes or other: YTG.
- g. Who maintains the well? YTG
- h. Are there other wells on this property? Yes No
How many? ____; Are they: in use abandoned require proper sealing
- i. Is there a buried fuel tank on the property? Yes No
If yes, is it in use abandoned
Is the location known? Beside Well heads
How was it abandoned? _____

3) Pump Installation

- a. Who installed your pump, and when did they install it? #2 1989 YTG
- b. What type of pump do you have? 2 hp Jacuzzi
1 hp. pumps
- c. Pump delivers water to: pressure tank elevated tank other _____

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4) Water Treatment

a. Is your well water treated? Yes No

Type of treatment: chlorination iron and or manganese removal

other sediment filter

5) Well Capacity:

a. Well capacity: User's opinion adequate inadequate

b. Are there any times of year when your well goes dry, or does not produce enough water?

c. Has well capacity decreased since it was installed? Yes No

6) Water Quality:

a. In general, do you like your water?: yes no

b. Does the water stain household plumbing? yes No slight severe

Type of stain: brown red black

c. Does the water contain sediment? Yes No occasional constant

d. Is there an unpleasant odour? Yes No

Sulphur (rotten egg smell) Other _____

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

f. Hardness: Is it hard to lather with soap?: yes, very moderate no

g. Is water softener being used? Yes No

h. Are samples for bacterial analysis (coliforms) taken regularly? Yes No

If so, at what time intervals? _____

Who takes them? _____

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

j. Is there a chemical analysis? Yes No adequate incomplete

7) Do you have any overall comments or complaints about your water well system?

Well are used for Toilets, urinals, and
irrigation only



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 #	8722
Jurisdiction	Yukon
Community	Carcross
Address	
Highway	
Milepost	
Feature	Carcross
Location and Cause	School - overfilling of fuel tank
Latitude	60.166026
Longitude	-134.708601
Incident Date	12/7/1987 9:00:00 AM
Lead Agency	Yukon Territorial Government - other
Other Agency	Environment Canada - Environmental Protection Service
Company(s)	
Amount	50
Units	Litres
Quantity	Estimate
Release Description	Spilled
Additional Quantity	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Furnace Oil
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	spill occurred approx 1 wk ago - working to decontaminate school water supply - fuel entered water supply through broked filler pipe



Photo 0115: 1134 Wells 1 and 2, Water Fill, Underground Fuel Storage Tank



Photo 0120: 1134 Well 2 Well Head in Pit



Photo 0121: 1134 Well 1 Well Head in Pit



Photo 122: 1134 Pressure Tanks and Flow Switch



Photo 0497: 1134 Heating Expansion Tank



Photo 0498: 1134 Potable Water Pressure Tank



Photo 0500: 1134 Storage Tank



Photo 0495: 1134 Jet Pumps and Tank