4.0 BUILDING 1134-CARCROSS SCHOOL

4.1 Description of Existing Water Supply System

Building 1134, the Carcross School, is currently serviced with a "split" water supply system that distributes two separate water sources. Non-potable water for the toilets and irrigation are supplied by two wells located in well pits in the front yard of the School as indicated on Figure 1134-1 in Appendix A4. The wells are within 2 m of each other, and the coordinates of the wellheads, as measured by a hand held GPS device, were recorded as:

- UTM ZONE 8
- Northing: 6670157
- Easting: 516083

Potable water is delivered by bulk truck delivery to the School from a treated (filtered and chlorinated) Bennett Lake source and stored on site in a 6000 L fibreglass lined plywood tank. The potable water is distributed within the school through a pressurized system to the sink faucets and water fountains. A schematic of the potable water system is included in Appendix A4 as Figure 1134-B.

4.2 Description of Existing Wastewater Systems

Wastewater for the school is collected in a holding tank and pumped out regularly. There are also several residential septic tanks for houses located near the School; however, it appears that there are none located within 30 m of the wells.

4.3 Water Quality Results

4.3.1 Water Quality Results from Previous Sampling

There were no previous detailed potability results available for review for the Carcross School potable water system, or the non-potable system. The water quality from the wells was reported to have high concentrations of arsenic (Terry Jackson, pers. comm.), and these wells are therefore not in use for the potable supply to the School. The Government of Yukon Property Management Agency provided EBA with the results of bacteriological testing completed between October 2004 and March 2005. As indicated in Table 1134-1 in Appendix A4, for the 12 sampling events in this period, there were no positive results for *E.Coli* or Total Coliform.

4.3.2 Identification of Additional Analytical Testing Required

Additional analytical completed for the Carcross School potable supply included a detailed potability suite, ammonia and residual chlorine. The results of the detailed potability and ammonia analyses indicated that all parameters analyzed were in compliance with the GCDWQ criteria.

Field chemistry readings; however, indicated that the residual chlorine concentration obtained in the field at the time of the assessment indicated a concentration of 0.0 mg/L. According to the proposed Government of Yukon - Public Drinking Water Systems Regulation, the required concentrations for residual chlorine are 0.4 mg/L at the point of loading, and 0.2 mg/L or greater throughout the distribution system and at the point of consumption.

4.3.3 Indicators of Potential Contamination

There were no elevated concentrations of any indicator parameters that were analyzed for the Carcross School potable water supply. The source for the potable supply is delivered water from Bennett Lake, and therefore, potential nearby sources of contamination are not a direct concern for the School potable water system.

4.4 Conceptual Hydrogeology

The groundwater flow direction is inferred to range from westerly to easterly in the vicinity of the Carcross School, towards Bennett Lake and/or Nares Lake, likely with a southerly component. The School is located nearly equidistant to the surfacewater bodies and may be situated on or near a groundwater flow divide.

4.5 Potential Contaminant Sources

Potential groundwater contaminant sources from observations during the site investigation are compiled in Table 1134-4 in Appendix A4. Photos of potential contaminant sources are also provided in Appendix A4.

The only potential contaminant source within 40 m of the wells is an underground fuel storage tank that is approximately 2 m from nearest wellhead.

4.5.1 Spills Records and Contaminated Sites Search Results

Yukon Environment Branch were requested to perform a search of their spills records and contaminated sites inventory to identify spills or contaminated sites on or adjacent to the subject sites. Search results indicated that there had been a spill at the school which was reported on December 7, 1987 (Spill #8722). Approximately 50 L of liquid furnace oil had spilled and had reportedly contaminated the well water supply. There was no information provided as to whether the water at that time was used as potable water for the school, but at the present time the well water is not used for potable water. According to the spill report, there were efforts made at the time by the Yukon Territorial Government and the Environment Canada Environmental Protection Service to clean the spill area and decontaminate the water supply. The Environment Branch did not provide the spills records until after EBA had completed the assessment, and therefore, hydrocarbon parameters were not added to the analytical program. Additional assessment including EPH and PAH analysis to verify whether groundwater in the vicinity of these wells has been remediated prior to considering re-instating the use of these wells for domestic water supply.

4.6 Identified Water System Deficiencies and Associated Risk

4.6.1 High and Medium Risk Deficiencies

- As indicated previously, the concentration of residual chlorine in the Carcross School potable water system was measured at 0.0 mg/L at the time of the assessment. The lack of residual chlorine in the potable water distribution system is considered to be a high-risk deficiency.
- The potable water system lacked of a fill cap on the water holding tank and screen on the vent pipe for the delivered potable water system.

The assessment team did not have time or accessibility to inspect and confirm that no cross connection exists between the potable, and non-potable water supply systems.

4.6.2 Low Risk Deficiencies

As the wells are currently used for non-potable water only, the groundwater source quality is not an immediate concern. However, if the wells were to be considered for use as a potable supply, it should be noted that there were high-risk deficiencies observed including the proximity to an underground fuel storage tank, completion in well pits without proper surface seals and arsenic concentrations reportedly above the CDWQG. These wells should not be used for potable water in the current condition, nor prior to confirming arsenic and hydrocarbon parameter concentrations. These wellhead deficiencies (well pit, sanitary seal, accessibility (no lock etc.) are considered to be low risk at this time. There is; however, some risk of contamination of the aquifer. Proper well construction above grade is recommended.

4.7 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).

4.7.1 Priority 1

To mitigate the high-risk deficiency, the residual chlorine concentration in the potable water system must be increased. This may be achieved through ensuring the delivered free residual chlorine concentration is at least 0.4 mg/L, or by introducing a chlorine injection system within the school supply. Further assessment of the residual chlorine concentrations within the school system is required to properly address the problem. The first step towards addressing the low chlorine concentration in the School potable supply is to monitoring of residual chlorine concentrations at various points throughout the school system. If a chlorine injection system is required, the system could be comprised of inlet pipe with a flow meter, a chemical feeding pump, day tank, injection piping, spill containment deck and appurtenances. Alternatively, a smaller water storage tank with adequate access for maintenance and cleaning might ensure adequate residual chlorine concentrations. We understand that at the time of this final report, PMA has already commissioned a study of the chlorine concentrations throughout the system, and will be obtaining design recommendations to remedy this problem.

4.7.2 Priority 2

A proper fill cap should be placed in the water tank intake, and a proper screen should be placed over the vent pipe.

It is recommended that a YTG plumber familiar with the system inspect these systems to confirm that there is no cross-connection, and to label the plumbing appropriately.

4.7.3 Priority 3

Consideration should be given to upgrading these non-potable water wells to ensure contamination of the aquifer in which these wells are completed does not occur. Mitigative upgrades would include installation of a sanitary surface seal, casing extension, and re-plumbing and electrical upgrades.

The underground storage tank should be removed and proper testing completed to ensure that there is no residual hydrocarbon contamination associated with the previously mentioned fuel spill.

4.8 Cost Estimates for Mitigative Options

Engineering costs for pre-design and preparation of process diagrams and specifications for project tendering for water treatment systems are estimated to be 25% of construction costs. Engineering costs for other 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.

4.8.1 Priority 1

The cost to monitor residual chlorine concentrations at four points throughout the School's potable water distribution system over a month period to establish whether a chlorine system is required to be installed in the building to ensure the minimum residual chlorine concentration is estimated at **$1,500.**

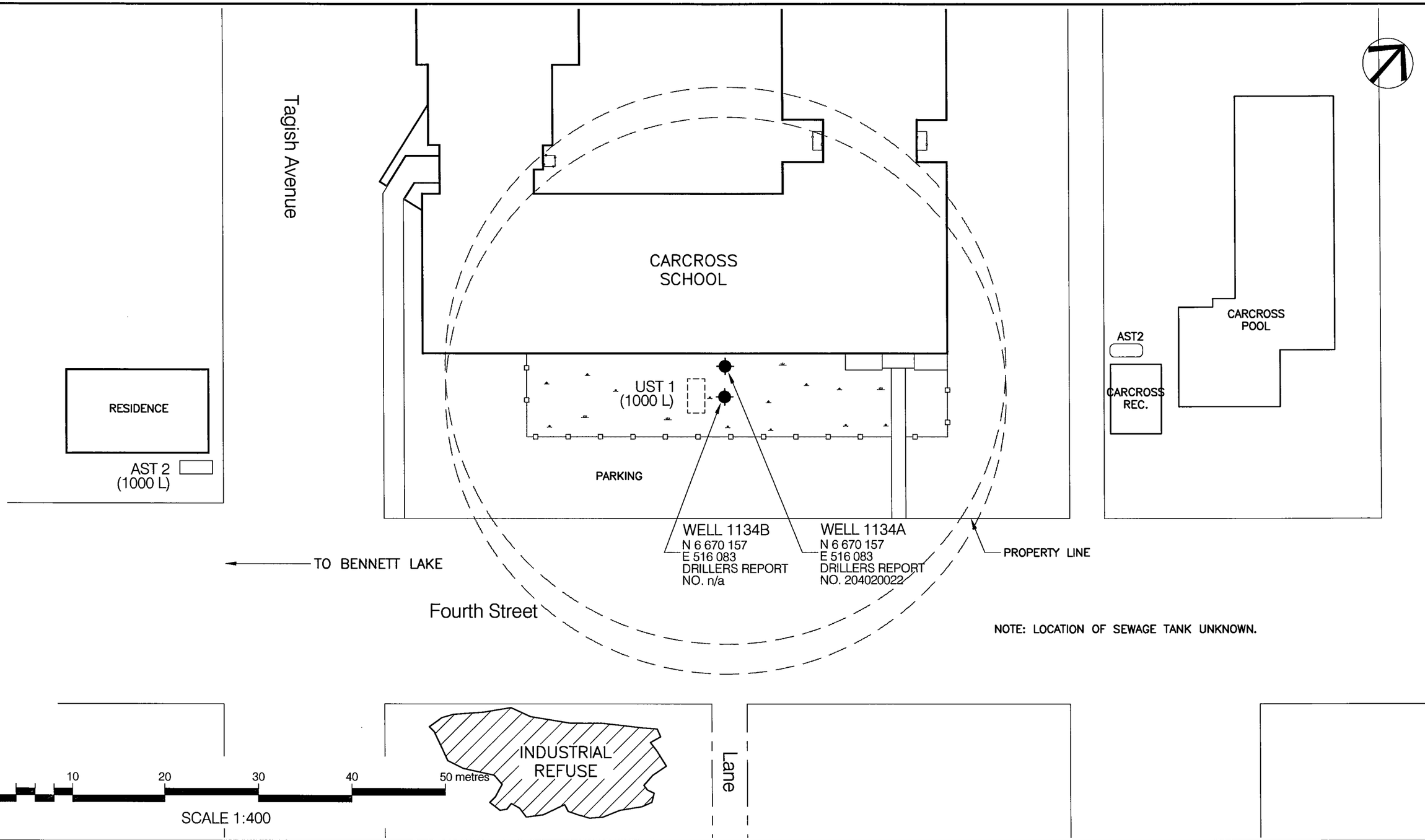
The cost to install a chlorine injection system to ensure adequate residual chlorine concentrations within the system is estimated to be **$5000** for materials and labour. Routine monitoring of residual chlorine concentrations within the system will be required and occasional adjustment of chlorine dosing rates may be required to maintain target residual chlorine concentrations.

4.8.2 Priority 2

The cost for a proper intake cap and screen with labeling and coding of the interior plumbing would be in the order of **$300**, assuming that this work is completed by a YTG maintenance personnel or plumber.

4.8.3 Priority 3

Consideration should be given to ensuring that the water wells have a proper sanitary seal, and are raised above grade. It is estimated that the "standard well upgrade" could be completed for both wells for approximately **$8000**.



NOTE: LOCATION OF SEWAGE TANK UNKNOWN.

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 NON-POTABLE WATER WELL.

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:	JUNE 2005
SCALE:	AS SHOWN
PROJECT No.:	1260002.001
ACAD FILENAME:	001-WHITEHORSE REGION

CLIENT: Yukon
Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WHITEHORSE REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

CARCROSS SCHOOL
BUILDING 1134
SITE LOCATION DIAGRAM
WELL ID: 1134A & 1134B

REVISION ISSUE: 0

DRAWING No.: FIGURE 1134A

Z:\0201Drawings\1260002 Water Assessment YTG\001 - Whitehorse Region\carcross\1260002 Carcross Overall Plan.dwg, 6/13/2005 11:03:55 AM, \\whi-eb-dc001\WHI201COMMON

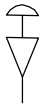
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

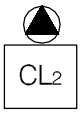

SOLENOID

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

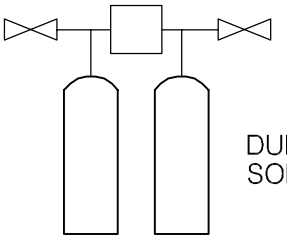
FLOW METER

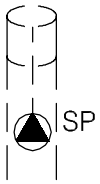
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

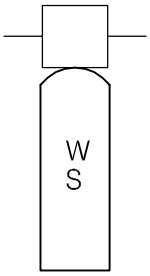


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

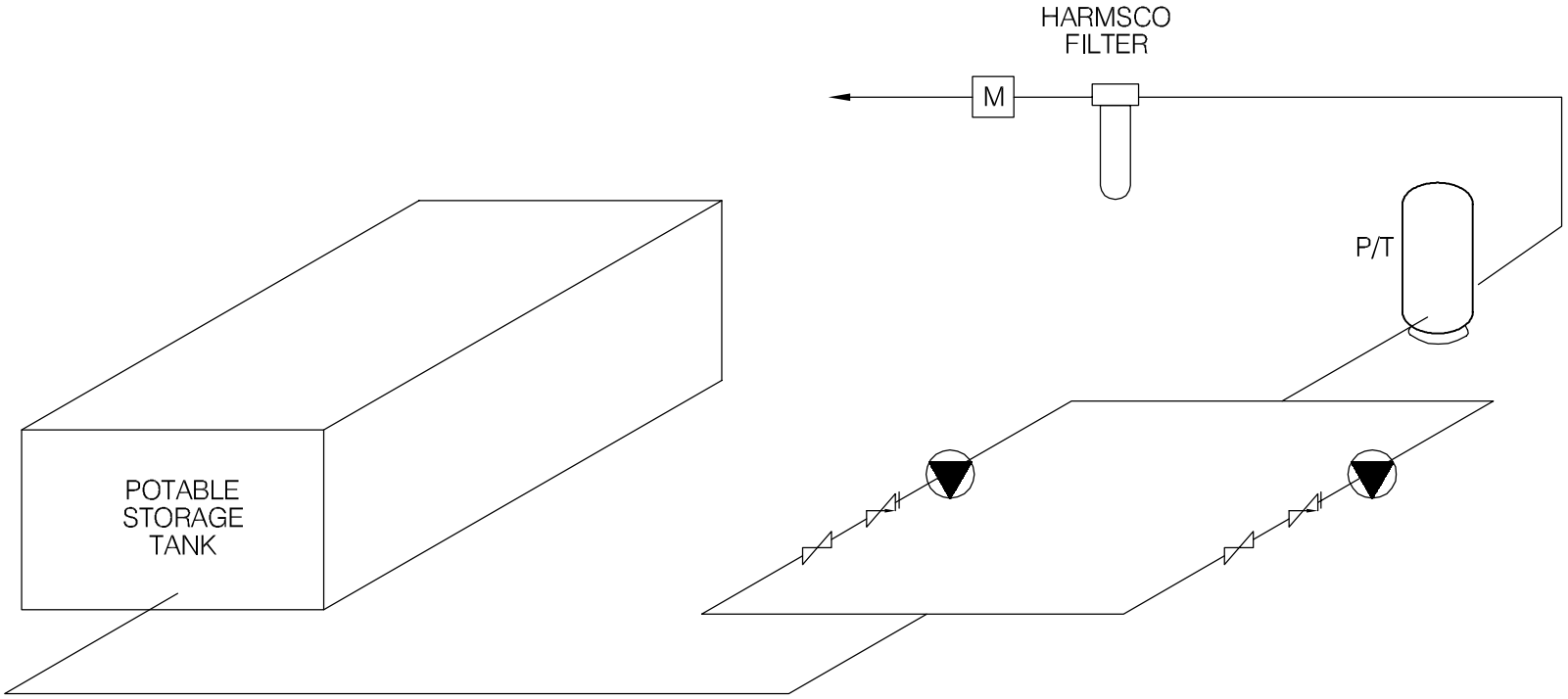


WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WHITEHORSE 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 WHITEHORSE REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 1134 CARCROSS SCHOOL	
DATE APRIL 2006	DWN. JSB	CHKD. RMM	FILE NO. 1260002.001		DWG.: FIGURE 1134B

Z:\0201Drawings\1260002 Water Assessment YTG\001 - Whitehorse Region\carcross\1260002 Carcross School 1134 Schematic.dwg, 4/6/2006 10:41:08 AM, Adobe PDF, jbuyck

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		5402	3/4 HP.
5	PRESSURE TANK	MONARCH	FG42			42 GALLON
6	STORAGE TANK	CUSTOM				W x H x L 6FT x 3' x 12'
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:	Buiding 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 (^{o}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 Permeabilty 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	***Organic*** and inorganic chemicals.	40 m		
Cemetery	***Biological[1],*** inorganic[2] and organic parameters.	>120 m		
Sewage lagoon	***Biological,*** inorganic and organic parameters.	>300 m		
Sewage lines, tanks and lift stations	***Biological,*** inorganic and organic parameters.	unknown		
Septic fields	***Biological and Inorganic*** parameters.	>60 m		
Gas stations	***Organic and Inorganic*** parameters.	>30 m		
Undergrounds Fuel Storage Tanks (USTs)	***Organic*** parameters.	**2 m**		
Above ground storage tanks (ASTs)	***Organic*** *parameters.*	50 m, 50 m		
Naturally occurring sources of contamination	***Radionuclides, Bacteria and Viruses from surfacewater sources.***	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

EBA Engineering Consultants Ltd.
Creating and Delivering Better Solutions

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 elv, ±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 (There are, however many residential septic tanks in the area likely >60m lateral

i. Distance from well to nearest point of known field: Holding tank only

j. Well location relative to field: ☐ upslope ☐ downslope ☐ lateral

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 thier 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 Neither well was locked. WL1 has unfastened 4x6 beams on top. WL2 has a purplywood casing screwed on only
Entrance by animals? ☐ Yes ☐ No WL2 had no evidence of animals, WL1 did contain some mouse droppings

o. Is well site subject to flooding? ☐ Yes ☐ No
WL1 has evidence of water staining
WL2 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 1.5 m

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: 40 m

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

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

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)

2. Well and Wellhead information:

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

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

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

*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 W1 - 15cm W2 - 15cm Material: ☒ steel ☐ plastic ☐ concrete

g. Depth of well: W2 > 60m ☒ 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 purf enclosure
☒ 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 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 - 1hp W2 - 2hp capacity _____ voltage _____

d. Date installed: unknown By: _____

e. For submersible pump, depth of setting below surface 58.375m bc → 42

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

PART B: EBA Site Inspection

Inspector: BEN ALBISSER Date MAY 11-05

WELL ID #	Owner	Location Description
1134	YTG	CARCROSS 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 ☐ 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:

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: _____

Overall Tank

What are the tank size and dimensions?
6FT x 3FT x 12FT RECTANGULAR.

What material is the tank constructed of? 3/4" PLYWOOD / 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: TANKS 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)

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 FAUCETS.
TIME CONSTRAINTS FOR THIS WORK DOES NOT ALLOW US TO ESTABLISH FOR CERTAIN THAT NO CROSS CONNECTION EXISTS.

b. Recommendations:

COMPLET 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.

PART C: Property Manager/ System Operator Questionnaire

Inspector: Terry Jackson Date May 00/05
Property manager: Carcross 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, urinals, irrigation)

2) Well information:

a. When was your well installed? Year 1 well 1 hp grundfoss 2 hp Jacuzzi 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. Grundfoss

c. Pump delivers water to: ☑ pressure tank ☐ elevated tank ☐ other _____

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

☐ Sulpher (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 Quanitit	
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 Presure 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