15.0 BUILDING 3964: BEAVER CREEK HEALTH CENTRE

15.1 Description of Existing Water Supply System

Building 3964, the Beaver Creek Health Centre, is currently served by a water supply system that delivers water from a well of unknown depth. The well is located in a pit approximately 3 m east of the health centre. The well location and other details about the surrounding area are provided in Figure 3964-A in Appendix A15. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 7
- Northing: 6916660
- Easting: 506315

There is no treatment or disinfection system for the water supplying this site. A schematic detailing the well supply system is provided as Figure 3964-B in Appendix A15.

15.2 Description of Existing Wastewater Systems

Septic effluent is discharged to a septic system on the west side of the health centre. The septic tank is located approximately 20 m northwest of the well. The exact location of the septic field is unknown, however, it is likely that it is within 30 m of the well. Conceptual hydrogeology indicates that the septic system is likely cross-gradient from this well. There is also an abandoned septic tank or rock pit approximately 45 m south of the well on the Beaver Creek Grader Station property, and a septic field serving the Visitor Reception Centre approximately 42 m northeast and downgradient from the well. A site plan showing the existing wastewater system is given by Figure 3964-A in Appendix A15.

15.3 Water Quality Results

15.3.1 Water Quality Results from Previous Sampling

Bacteriological

Ten samples were collected from the Beaver Creek Health Centre water system between September 2004 and June 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 3964-1 in Appendix A15. Both *E. coli* and Total Coliform were reported as absent in each of the ten samples for which results are provided.

Potability

Water samples were previously collected from the Beaver Creek Health Centre water system on September 21, 2004 and June 15, 2005. The samples were submitted to Northwest Labs in Surrey, BC and ALS Environmental in Vancouver, BC for analyses included in their drinking water packages. The results of these analyses are summarized in Table 3964-2 in Appendix A14. 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 analytical, and to identify potential indicators of contamination as detailed below:

- During the first sampling event turbidity was 1.6 NTU, in exceedence of CDWQG MAC of 1.0 NTU. Turbidity at the time of the second sampling event, however, was less than the CDWQG MAC;
- The water quality results indicated that all other health based and aesthetic objectives were met for the parameters analyzed;
- The water quality results indicated that the groundwater from which this system receives its water supply is a calcium bicarbonate type water; and,
- The hardness (as $CaCO_3$) was 234 mg/L during the first sampling event and 255 mg/L during the second sampling event, and is considered very hard.

15.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Beaver Creek Health Centre that was identified to be included during the water system assessments is detailed below:

- UV absorbance and UV transmissivity, as well as tannins and lignin, to determine potential for UV treatment as a disinfection option for this water system;
- Total organic carbon (TOC); and,
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

Additional Analytical Results

A water sample was obtained during the water system assessment on July 29, 2005, and was submitted to ALS Environmental in Vancouver, BC for analysis. These results are summarized in Table 3964-2 in Appendix A15 and the laboratory reports are included in Appendix B. The water quality result from additional analytical sampling indicated that all health based and aesthetic objectives were met for the parameters analyzed.

15.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from surfacewater sources or septic waste. Nitrate and nitrite concentrations were reported to be low and within the normal background range for the area. Chloride concentrations, although were not in exceedence of the CDWQG aesthetic objective, were elevated above normal background concentrations in the Beaver Creek area. Water quality results suggest that the aquifer from which the groundwater is obtained for the Beaver Creek Health Centre may be under the influence of surfacewater sources or septic wastes. It should also be noted that a well on an adjacent property at the Beaver Creek Visitor Reception Centre had reported both chlorides and nitrates elevated above normal background concentrations for the area.

15.4 Conceptual Hydrogeology

There is no log available for review for this well. Most of the wells in the Beaver Creek area indicate coarse sand and gravel with cobbles and small boulders to depths of at least 30 m. The well logs also indicate that discontinuous lenses of finer-grained sediments persist throughout the area, but in general the sediments are dominated by coarse alluvium. Some discontinuous permafrost is also interpreted to persist throughout the Beaver Creek area. The variability of sediments in the Beaver Creek area indicates limited aquifer protection from surficial sources of contamination. A study had been previously completed in the Beaver Creek area by EBA, and it was determined that the direction of groundwater flow is north to northeasterly.

15.5 Potential Contaminant Sources

Potential contaminant sources from observations during the water system assessment are compiled in field notes in Appendix A15. Photos of potential contaminant sources are also provided in Appendix A15.

Potential contaminant sources within 30 m of the wellhead are:

- An effluent discharge field as close as 18 m (exact location unknown);
- An indoor fuel storage tank at 20 m;
- Various fuel, oil and paint drums on the Grader Station property at 20 m.

In addition, an asphalt mix pile is located approximately 40 m south from the wellhead on the Grader Station property.

15.5.1 Spills Records and Contaminated Sites Search Results

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch did not identify any recorded spill events or contaminated sites issues for this site or neighbouring sites.

15.6 Identified Water System Deficiencies and Associated Risk

15.6.1 High and Medium Risk Deficiencies

High and medium risk deficiencies are summarized as follows:

- Poor surface completion of the wellhead (located in a pit below grade);
- There is no surface sanitary seal (grout or bentonite seal as required by the Canadian Groundwater Association's Guidelines for Water Well Construction;
- By definition of the Draft Yukon GUDI Assessment Guideline, the well is potentially under the direct influence of surface water because it does not meet the requirements of the Guidelines for Water Well Construction;
- The well is located within 30 m of potential sources of contamination, including a fuel storage tank at approximately 20 m and fuel, oil, and paint drums at 20 m;
- The closest point of the effluent discharge field for the health centre is likely 18 m cross gradient from the well;
- Water quality reported chloride above normal background concentrations for the area, and suggest that the well may potentially be under the influence of surfacewater or septic sources; and,
- There is no treatment or disinfection system.

15.6.2 Low Risk Deficiencies

- The heat trace as not been installed to code. There is no thermostat, no ground fault indicator (GFI), and the heat trace does not appear to be working properly;
- There is no pressure gauge on the system; and,
- There was a previous exceedence of turbidity.

15.7 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).

15.7.1 Priority 1

The following recommendations are provided in order to mitigate deficiencies that are of immediate concern for the Beaver Creek Health Centre Building. Priority 1 remedial recommendations include:

- The casing should be extended to at least 500 mm above the base of the well pit, and a localized near surface bentonite seal installed immediately around the wellhead, while leaving the remainder of the base of the well pit for drainage.
- The well and water system should be superchlorinated.
- Disinfection treatment consisting of filtration to 1 micron absolute, and a UV system that is NSF/ANSI certified should be installed. Pretreatment will likely be required for proper UV performance. Alternatively, a proportional feed chlorination system with retention tanks and appurtenances could be installed. These are conceptual design recommendations based on the information available for planning and budgeting purposes. Engineering input will be required for final system specifications.

15.7.2 Priority 2

Priority 2 upgrade options to mitigate long-term risk and meet the proposed regulation are presented below:

Option 1: New Well Construction

For this option, it is recommended that a new well should be drilled and the current well be decommissioned. It is recommended that a new well be installed to meet the following conditions:

- 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 not inaccessible to animals and unauthorized personnel;
- The well must be located at a distance greater than 30 m from any potential source of contamination, including the above ground storage tank and all parts of the septic system;
- 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. A disinfection system may be recommended.

Option 2: New Cluster Well Construction

Option 2 presents the option of a cluster well installation to provide water supply to the Grader Station, Health Centre, Visitor Reception Centre and Fire Hall. The advantages would include combined savings on capital costs, reduced life cycle costs, added control and system security, and reduced maintenance requirements. For this option, it is assumed

that a heated building enclosure would be constructed to house the well and central treatment system.

15.7.3 Priority 3

Priority 3 upgrades include:

- Install pressure guage on system if option 1 of Priority 2 is chosen. Consider completing this at the same time as Priority 2 upgrades.

15.8 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.

15.8.1 Priority 1

The exact location of the septic field should be confirmed.

The estimated costs for the recommended Priority 1 upgrades are detailed below:

- Casing extension and localized sanitary surface seal - **$600**;
- Well and water system superchlorination - **$200**; and,
- UV system installation with required pre-filtration and softener pre-treatment - **$5,400.** Alternatively, a proportional feed chlorination system with retention tanks and appurtenances could be installed for approximately **$7,000.**

The total cost for Priority 1 recommended upgrade is estimated at **$3,400** including materials and labour.

15.8.2 Priority 2

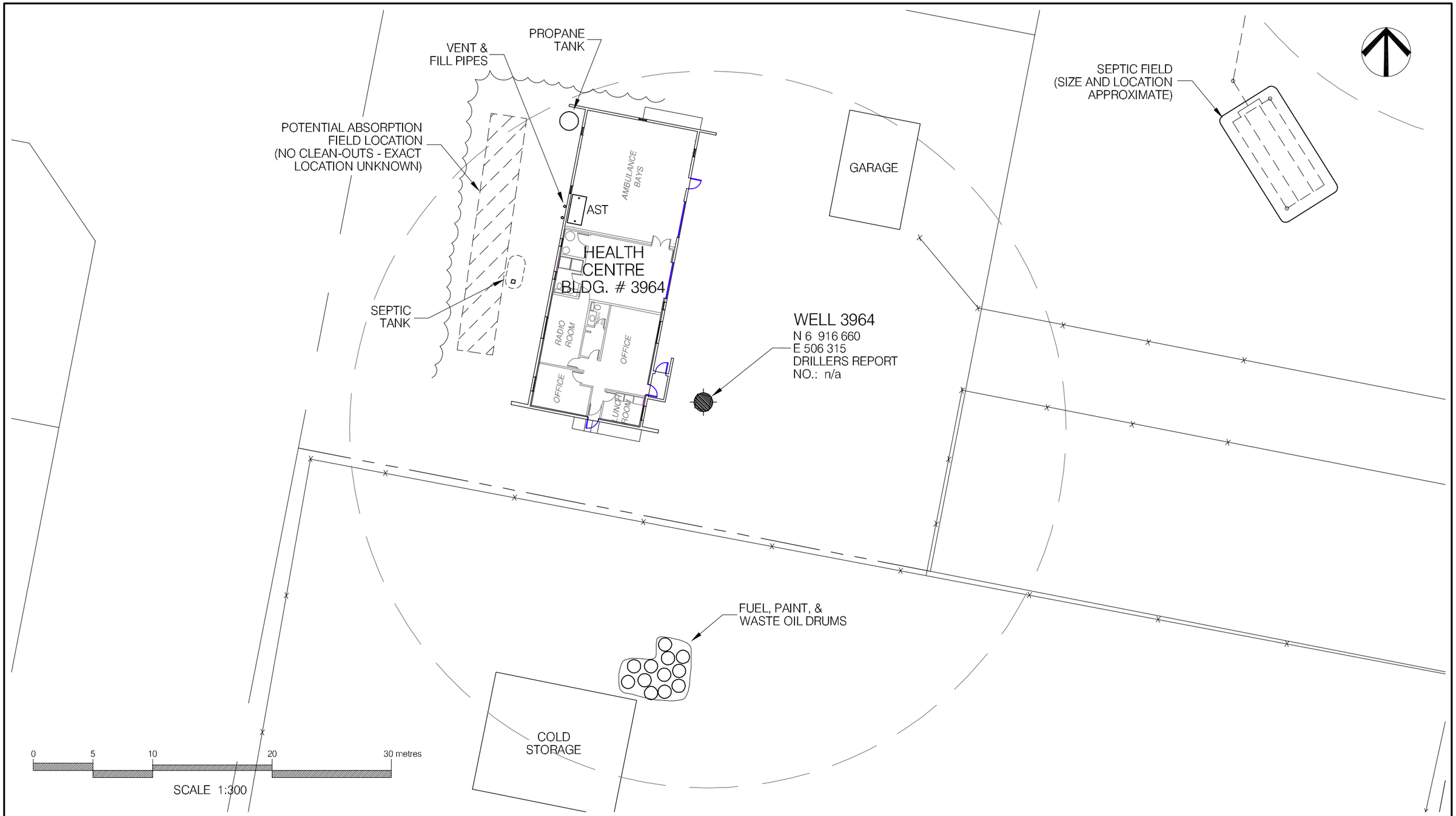
Since the well is likely within 30 m of the septic field, and elevated chloride may indicate that there is potential influence of surfacewater or septic waste, it is recommended for the long-term that a new water source be obtained. Two options are presented below:

Option 1: New Well Construction

The estimated cost for the Option 1 which includes the construction of a new well to serve the Health Centre building is approximately **$30,000** for drilling, testing and hook-up, assuming that the well would be approximately 30 m deep and constructed as described above.

Option 2: New Cluster Well Construction

The estimated cost for Option 2, consisting of a cluster well installation to provide water supply from a central well to the Grader Station, Health Centre, Visitor Reception Centre and Fire Hall would be in the order of **$25,000** per system. The estimated capital costs include supplies and labour for well construction, testing, treatment and distribution piping.



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.

BUILDING STRUCTURES RELATIVE TO PROPERTY LINES ARE APPROXIMATE ONLY.

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:	AUG. 2005
SCALE:	AS SHOWN
PROJECT No.:	1260002.003
ACAD FILENAME:	003-WESTERN REGION

CLIENT: Yukon
Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WESTERN REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

BEAVER CREEK HEALTH CENTRE
BUILDING # 3964
SITE LOCATION DIAGRAM
WELL ID: 3964

REVISION ISSUE 0

FIGURE No. FIGURE 3964-A

Z:\0201Drawings\1260002 Water Assessment YTG\003 -Western Region\beaver\1260002 B Crk Health Centre 3964A Site Plan.dwg, 8/11/2005 10:25:26 AM, Adobe PDF

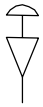
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

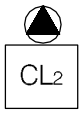

SOLENOID

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

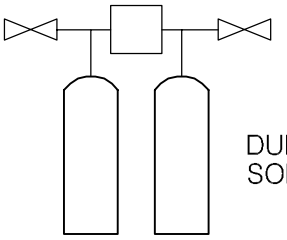
FLOW METER

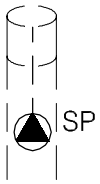
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

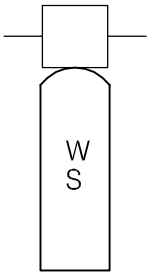


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

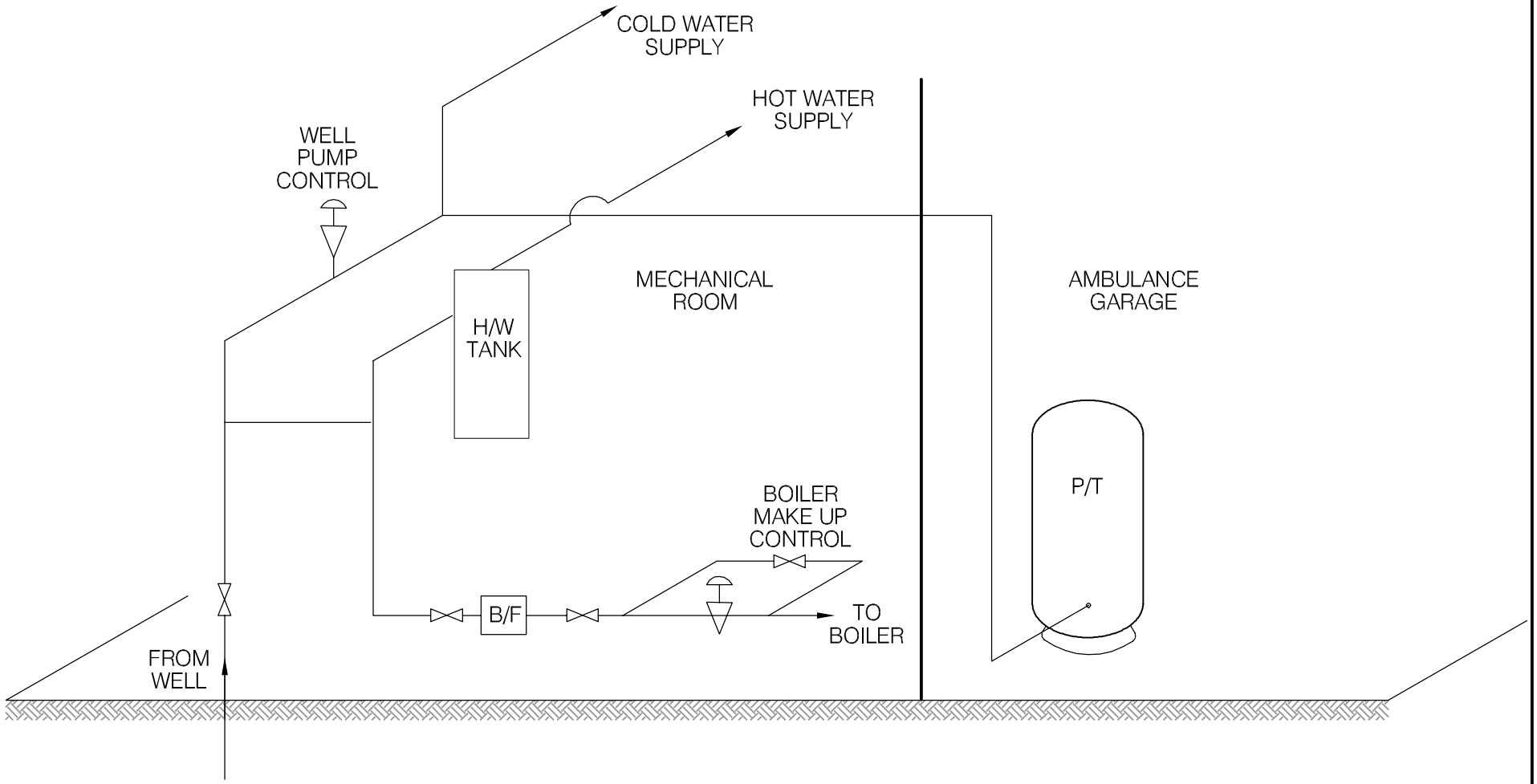


WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WESTERN 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 AND SERVICES LTD.

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WESTERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 3964 BEAVER CREEK HEALTH CENTRE	
DATE SEPT. 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.003		DWG.: FIGURE 3964-B

Z:\0201Drawings\1260002 Water Assessment YTG\003 -Western Region\beaver\1260002 B Crk Health Centre_3954B Schematic.dwg, 4/4/2006 12:46:05 PM, Adobe PDF, jbuyck

Western Region – Beaver Creek Health Centre
Building # 3964

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SUB PUMP	UNKNOWN	3/4 HP.			4" SUB.
2	PRESSURE TANK	WELL X TROL	WX 203			
3	PRESSURE SWITCH	SQUARE D	FSG-2			2 HP - 1/4" NPT
4						
5						
6						
7						
8						
9						
10						

TABLE 3964- 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?
3964	Beaver Creek Health Centre	9	Sept-04 to Jun-05	no	0/9	no	16-Jun-05	no

Table 3964-2: Water Quality Results

SOURCE:	Building 3964 - Beaver Creek Health Centre			GCDWQ Criteria		
Location/ Resident	Beaver Creek					
Address						
Treatment	None					
Disinfection	None					
Source of Water	On-site well					
Purpose of Sampling	Base Line	Base Line	Additional Analytical			
Sample Location			Washroom tap			
Date Sampled	21-Sep-04	15-Jun-05	27-Jul-05	**Lower**	**Upper Limit**	
Physical Tests *(ALS)*				**AO**	**MAC**	**AO**
Colour (CU)	<5	<5.0	-			15
Conductivity (uS/cm)		515	-			
Total Dissolved Solids	259	316	-			500
Hardness CaCO3	234	255	-	AO >200 = poor, > 500 unacceptable[A]		
pH	8.06	8.13	-	6.5		8.5
Turbidity (NTU)	**1.6**	0.74	-		1	5
UV Absorbance			0.0130			
% UV Transmittance			97.0			
Dissolved Anions *(ALS)*						
Alkalinity-Total CaCO3	191	218	-			
Chloride Cl	17.4	16.2	-			250
Fluoride F	<0.05	0.048	-		1.5	
Silicate SiO4			-			
Sulphate SO4	32.4	37.1	-			500
Nitrate Nitrogen N	0.6	0.61	-		10	
Nitrite Nitrogen N	<0.05	<0.10	-		3.2	
Ammonia Nitrogen N			-			
Total Phosphate PO4			-			
Total Metals *(ALS)*						
Aluminum T-Al	<0.005	<0.010	-			
Antimony T-Sb	<0.0002	<0.00050	-		0.006	
Arsenic T-As	0.0003	0.00026	-		0.025	
Barium T-Ba	0.052	0.050	-		1	
Boron T-B	0.027	<0.10	-		5	
Cadmium T-Cd	<0.00001	<0.00020	-		0.005	
Calcium T-Ca		83.0	-			
Chromium T-Cr	0.0011	<0.0020	-		0.05	
Copper T-Cu	0.140	0.0678	-		1	
Iron T-Fe	0.15	0.052	-			0.3
Lead T-Pb	0.0013	0.0040	-		0.01	
Magnesium T-Mg		11.6	-			
Manganese T-Mn	0.008	0.0096	-			0.05
Mercury T-Hg		<0.00020	-		0.001	
Potassium T-K		1.45	-			
Selenium T-Se		<0.0010	-		0.01	
Sodium T-Na		5.0	-			200
Uranium T-U	<0.0005	0.00037	-		0.02	
Vanadium T-V			-			
Zinc T-Zn	0.485	0.176	-			5
Organic Parameters						
Tannin and Lignin			0.10			
Total Organic Carbon C			1.41			
Field Chemistry (EBA)						
pH			7.68	6.5		8.5
TDS (ppm)			297			500
EC (uS/cm)			593			
Temperature (°C)			14.7			
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)

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin, Luke Lebel Date July 27, 2005

WELL ID #	Owner	Location Description
3964	YTG	Beaver Creek Health Centre

1. Well Location and Potential Contaminant Sources

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

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

c. GPS location: N 6916660 E 506315 ±9m

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_____
Beaver Creek Health Centre

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

g. Nearest building, specify Beaver Creek Health Centre

h. Distance from well to building 3m

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

j. Distance from well to nearest point of known field: 18- 22 m

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

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
Septic tank @ ~20m, Visitor Reception Centre septic @ 42m

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

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

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 Enclosure unlocked
Entrance by animals? ☐ Yes ☒ No Access possible

p. Is well site subject to flooding? ☐ Yes ☒ No

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

r. 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 _____

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: Indoor AST ; Distance from well to Potential Source 1: ~20m
Potential Source 2: Fuel, oil, paint drums ; Distance from well to Potential Source 2: ~20m
Potential Source 3: Asphalt pile ; Distance from well to Potential Source 3: ~40m
Potential Source 4: _____ ; Distance from well to Potential Source 4: _____

t. Are there other wells on this property? ☐ Yes ☒ No

How many? _____ ☐ in use ☐ abandoned ☐ require proper sealing

2. Well and Wellhead information:

a. When was well installed? Year unknown Month _____

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

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 15cm Material: ☒ steel ☐ plastic ☐ concrete

g. Depth of well: unknown ☐ measured (if possible) ☐ reported ☐ from log

h. Static water level below ground: unknown

☐ 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 likely

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 ~ 1.15 m below grade

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. Some evidence

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

If no, describe condition Solid plate cap

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 or disinfection ☐ Yes ☐ No

Explain (filtration, disinfection etc…)_____

---

4. Aquifer Supplying This Well:

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

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

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 likely

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

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: heat trace and insulation

l. Comments on pump installation: _____

_____

6. Conclusions

a. Comments on overall installation:

_____

_____

_____

_____

_____

_____

_____

b.Recommendations: _____

_____

_____

_____

_____

_____

_____

PART B: EBA Site Inspection

Inspector: BERT ALBASSER Date July 26/05

WELL ID #	Owner	Location Description
3964	YTG.	HEALTH CENTRE BEAVER CREEK

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: AMBULANCE GARAGE

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?

_____

What material is the tank constructed of? _____

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:

HEAT TRACE NO THERMOSTAT, NO GFI PROTECTION, THE HEAT TRACE STAT IN PLACE DOES NOT APPEAR TO BE WORKING. NO PRESSURE GAUGE ON SYSTEM.

b. Recommendations:

BRING HEAT TRACE INSTALLATION TO CODE. INSTALL PRESSURE GAUGE. THIS BEING A HEALTH CENTRE - INSTALL PROPORTIONAL CHLORINATOR INLINE AT POINT OF ENTRY WITH PROPER RETENTION TANKS, INSTITUTE PROPER FREE CHLORINE RESIDUAL TESTING. INSTITUT BI-ANNUAL WELL MAINTENANCE PROGRAM.

Photo 0526: 3964 Beaver Creek Health Centre

Photo 0522: 3964 Wellhead enclosure (centre), health centre (left)

Photo 0521: 3964 Wellhead in pit

Photo 0524: 3964 Septic tank and field at rear of health centre building

Photo 0525: 3964 Looking south at Beaver Creek Grader Station (site 3123) as seen from wellhead

Photo 0076: 3964 Piping and water heater in mechanical room

Photo 0077: 3964 Pressure tank

Photo 0079: 3964 Point of entry