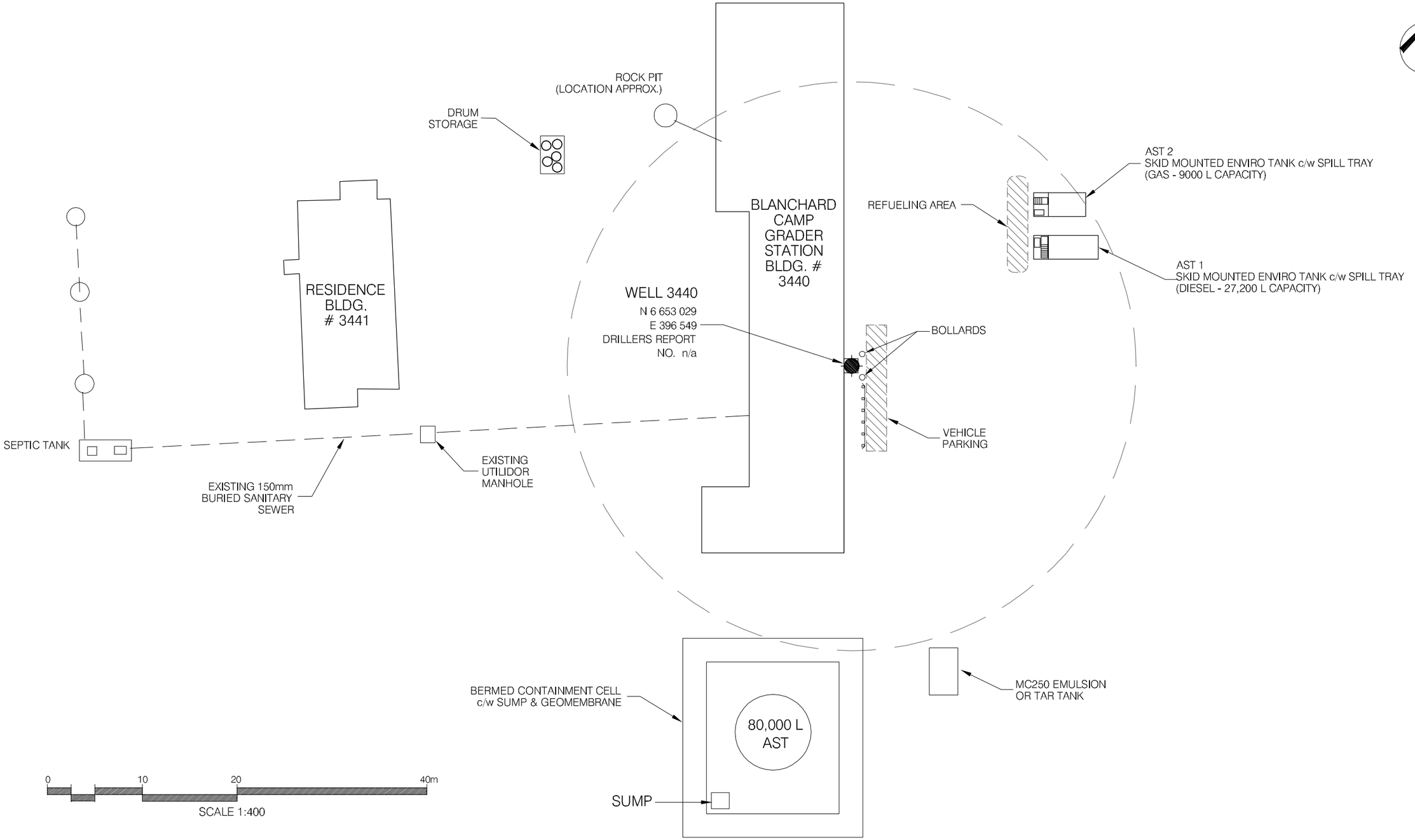


NOTES:

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:	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

BLANCHARD CAMP GRADER STATION BUILDING # 3440 SITE LOCATION DIAGRAM WELL ID: 3440

REVISION ISSUE: 0

FIGURE No.: FIGURE 3440-A

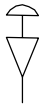
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

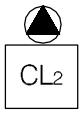

SOLENOID

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

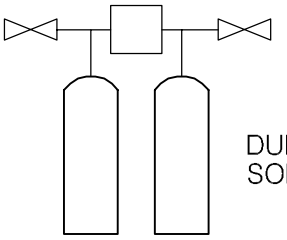
FLOW METER

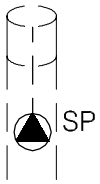
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

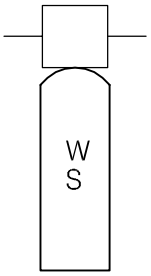


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

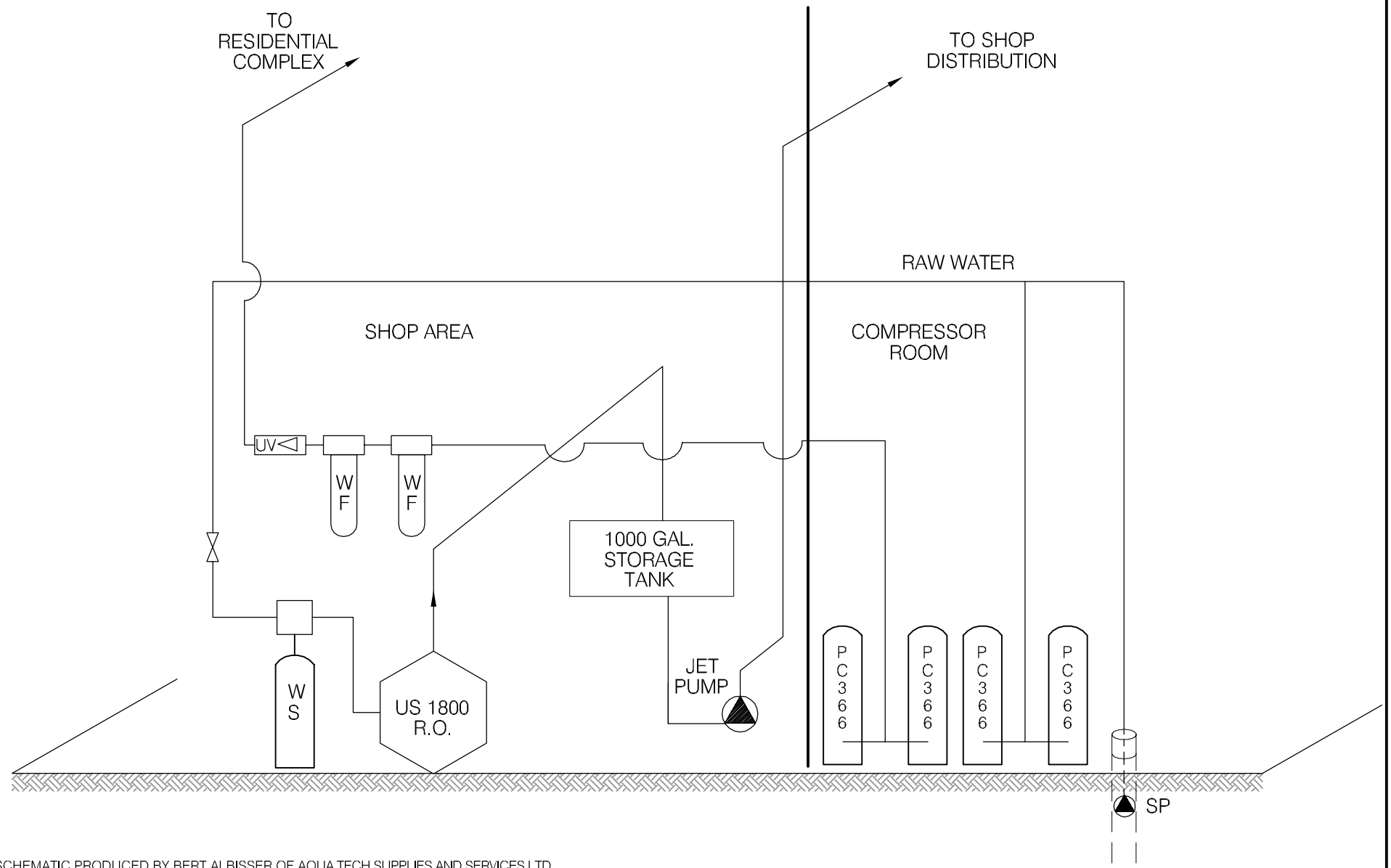


WELL WITH
SUBMERSIBLE PUMP



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.: 3440 BLANCHARD CAMP GRADER STATION	
DATE SEPT. 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.003		DWG.: FIGURE 3440-B

Z:\0201Drawings\1260002 Water Assessment YTG\003 -Western Region\blanchard\1260002 Blanchard Camp_3440 Schematic.dwg, 4/4/2006 1:43:37 PM, Adobe PDF, jbuyck

Western Region – BLANCHARD....CAMP
Building # ..3440

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SOFTENER	HYDROTECH	ELITE6730MI			30K.
2	R.O. SYSTEM	US FILTER	US1800		RATED @	2200 GPD
3	HOLDING TANK	ZEEBEST	1250 AG.			1250 GALLONS
4	FLOAT CONTROL	SJE PUMPMASTER	PUMPUP			240 230 V
5	JET PUMP.	MONARCH	JKS-3			3/4 HP.
6	PREFILTER	AQUA TECH	DUPLEX BIG BLUE	R30BB J01DP97	CARTRIDGES	
7	UV STERILIZER	R-CAN	UVAQ012		2023381	
8						
9						
10						

TABLE 3440- 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?
3440	Blanchard Grader Station	9	Sept-04 to Jun-05	no	0/9	no	16-Jun-05	no

Table 3440-2: Water Quality Results

SOURCE:	Building 3440 - Blanchard Grader Station				GCDWQ Criteria		
Location/ Resident	Haines Road						
Address							
Treatment	None			Filtration, softener, RO			
Disinfection	None			UV disinfection			
Source of Water	On-site well						
Purpose of Sampling	Base Line	Base Line	Additional Analytical	Additional Analytical			
Sample Location	Grader Station	Grader Station	Grader Station	Living Complex			
Date Sampled	21-Sep-04	15-Jun-05	29-Jul-05	29-Jul-05	Lower	Upper Limit	
Physical Tests *(ALS)*					AO	MAC	AO
Colour (CU)	<5.0	<5.0	-	<5.0			15
Conductivity (uS/cm)		218	-	2.8			
Total Dissolved Solids	212	124	-	<10			500
Hardness CaCO3	198	102	-	<0.66	AO >200 = poor, > 500 unacceptable[A]		
pH	8.09	8.17	-	**6.10**	6.5		8.5
Turbidity (NTU)	0.3	0.4	-	0.64		1	5
UV Absorbance			<0.0050	-			
% UV Transmittance			99.3	-			
Dissolved Anions *(ALS)*							
Alkalinity-Total CaCO3	163	89.7	-	1.9			
Chloride Cl	5.7	8.59	-	<0.50			250
Fluoride F	<0.05	0.028	-	<0.020		1.5	
Silicate SiO4			-	-			
Sulphate SO4	30.4	10.4	-	<0.50			500
Nitrate Nitrogen N	0.5	<0.10	-	<0.10		10	
Nitrite Nitrogen N	<0.05	<0.10	-	<0.10		3.2	
Ammonia Nitrogen N			-	-			
Total Phosphate PO4			-	-			
Total Metals *(ALS)*							
Aluminum T-Al	<0.005	<0.010	-	<0.010			
Antimony T-Sb	<0.0002	<0.00050	-	<0.00050		0.006	
Arsenic T-As	0.0005	0.0006	-	<0.00010		0.025	
Barium T-Ba	0.039	0.066	-	<0.020		1	
Boron T-B	0.023	<0.10	-	<0.10		5	
Cadmium T-Cd	<0.00001	<0.00020	-	<0.00020		0.005	
Calcium T-Ca		30.3	-	<0.10			
Chromium T-Cr	0.001	<0.0020	-	<0.0020		0.05	
Copper T-Cu	0.032	0.0484	-	0.107		1	
Iron T-Fe	0.01	<0.030	-	<0.030			0.3
Lead T-Pb	0.0004	0.0011	-	0.0011		0.01	
Magnesium T-Mg		6.38	-	<0.10			
Manganese T-Mn	<0.005	<0.0020	-	<0.0020			0.05
Mercury T-Hg		<0.00020	-	<0.00020		0.001	
Potassium T-K		2.66	-	0.45			
Selenium T-Se		0.0017	-	<0.0010		0.01	
Sodium T-Na		<2.0	-	<2.0			200
Uranium T-U	<0.0005	0.00075	-	<0.00010		0.02	
Vanadium T-V			-	-			
Zinc T-Zn	0.175	0.057	-	<0.050			5
Organic Parameters							
Tannin and Lignin			<0.10	-			
Total Organic Carbon C			0.81	-			
Extractable Hydrocarbons							
EPH10-19			<0.30	-			
EPH19-32			<1.0	-			
Field Chemistry (EBA)							
pH			**8.59**	7.86	6.5		8.5
TDS (ppm)			83	<1			500
EC (uS/cm)			175	<1			
Temperature (°C)			7.3	16.4			
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)

eba

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin, Luke Lebel Date July 29, 2004

WELL ID #	Owner	Location Description
3440	YTG	Blanchard Grader Station

1. Well Location and Potential Contaminant Sources

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

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

c. GPS location: N6653029 E396549 el. 837m ± 9m

d Is there electric power? ☒ Yes ☐ No

e Is there outside water access? ☒ Yes ☐ No
On living complex

f. Does the well system have:

☐ 15 or more service connections to a piped distribution system ? If so how many_____
Living complex and Maintenance garage

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

g. Nearest building, specify Located in enclosure off from maintenance garage

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: >60 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 service lines

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 located in locked building off of pump room
Entrance by animals? ☒ Yes ☐ No But access is 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 unlikely

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
Rock Pit

Potential Source 1: AST 1 ; Distance from well to Potential Source 1: ~21m

Potential Source 2: AST 2 ; Distance from well to Potential Source 2: ~24m

Potential Source 3: Fueling area ; Distance from well to Potential Source 3: ~21m

Potential Source 4: Tar or emulsion tank ; Distance from well to Potential Source 4: ~31m
Bulk tank @~36m (bermed w/ berm @~29m)

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 20cm 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

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 unknown, unlikely

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 ~0.15m above grade, ~0.45 cm above floor

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 in walls of enclosure

iv. Any evidence of rodents? Specify No, access possible

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

If no, describe condition _____

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...) UV, filtration, RO

---

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 unknown

g. Pump delivers water to: ☒ pressure tank ☒ elevated tank (post RO water) ☐ 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: Heated enclosure, Insulation, Likely 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 JULY 29/05

WELL ID #	Owner	Location Description
3440	YTG.	BLANCHARD GRADER STATION

6. **Water Treatment** FOR RESIDENCE (SHOT WATER NOT TREATED).

a. Is well water treated? ☑ Yes ☐ No; Type of treatment: SOFTENER & R.O SYSTEM UV STERILIZER.

☐ 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: 1200 GALLON FIBRE GLASS

Where is it located?
Comments: SHOP FLOOR.

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?

1250 IMP GALLONS

What material is the tank constructed of? FIBRE GLASS

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:

THIS IS A REASONABLE INSTALLATION. IT PROVIDES TO QUALITY WATER TO THE RESIDENCE

b. Recommendations:

INITIATE A PROPER MAINTENANCE SCHEDULE BI-ANNUAL FOR WELL SHOCK CHLORINATION TANK CLEANING AND UV CLEANING.
CHANGE UV BULB YEARLY.
SET UP MAINTENANCE CHECK LIST & TRAINING FOR PEOPLE RESPONSIBLE FOR THE SYSTEM.
LASTLY CHECK WATER QUALITY REGULARLY.

Photo 0139: 3440 Blanchard Grader Station maintenance garage

Photo 0134: 3440 Blanchard Grader Station living complex

Photo 0138: 3440 Wellhead enclosure

Photo 0135: 3440 Bulk fuel storage tank with geomembrane and berm

Photo 0137: 3440 Above ground fuel storage tank

Photo 0136: 3440 Emulsion or tar tank

Photo 0141: 3440 Blanchard River

Photo 0132: 3440 Water storage tank (right), duplex filter (centre), UV disinfection system (top centre), reverse osmosis treatment system (bottom centre), water softener (left)