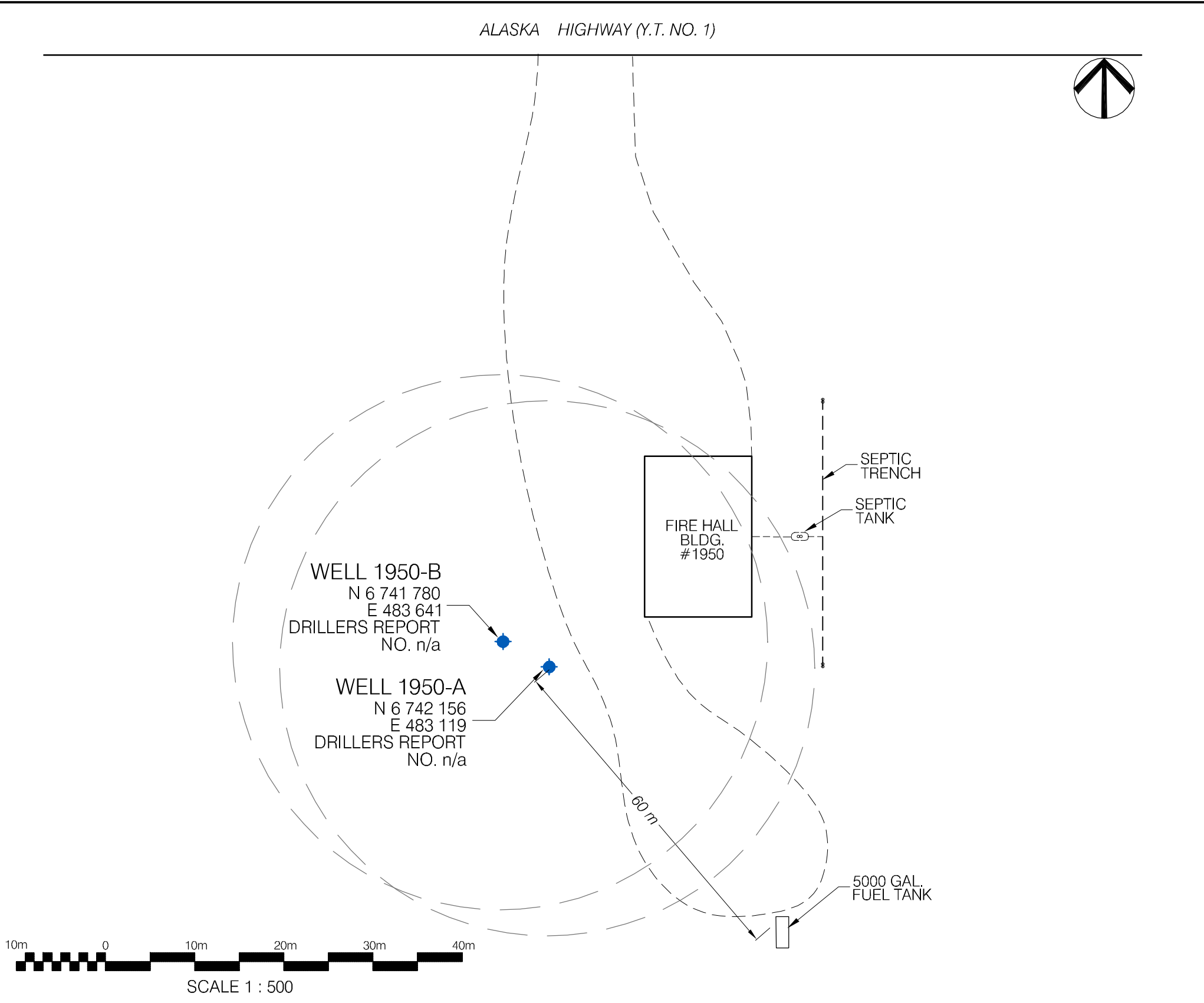
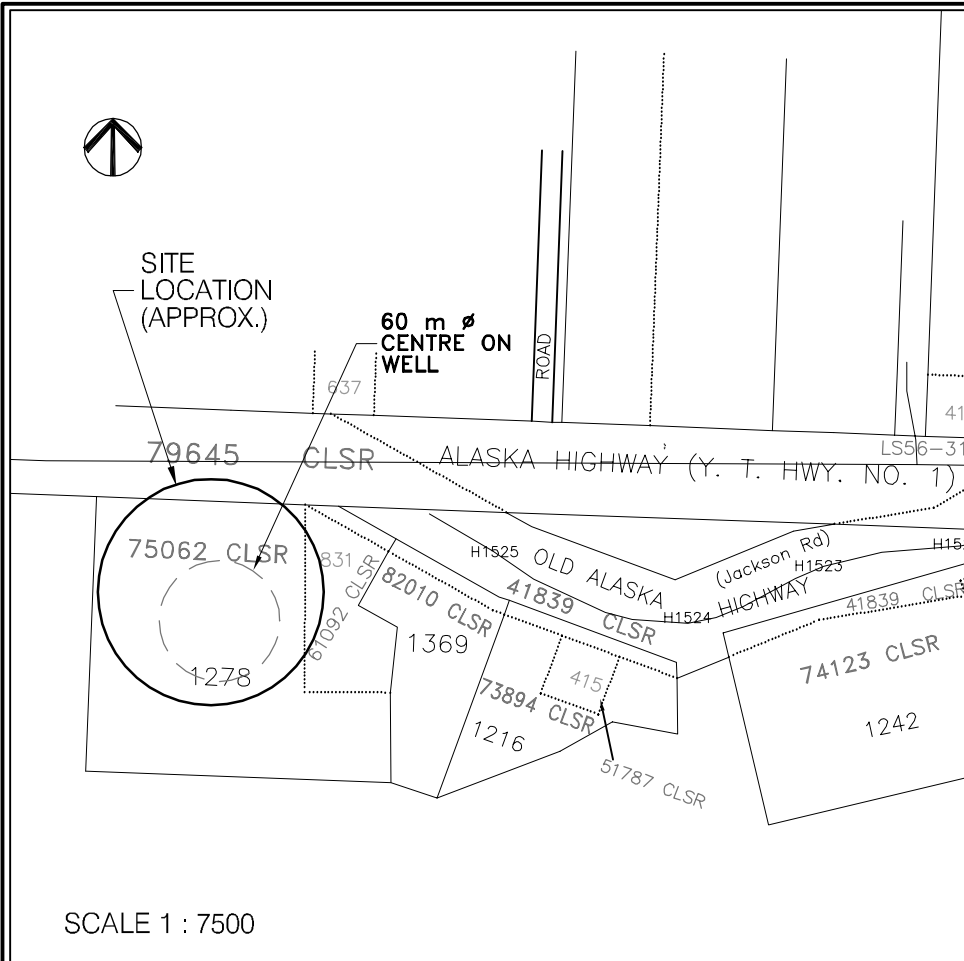


Z:\0201Drawings\S.Mondike-Haines Junction Hwy\1260008 Ibox Valley Fire Hall Water Well\1260008 Ibox Overall Plan.dwg, 4/11/2006 8:40:46 AM, Adobe PDF, jbuyck



NOTES:

- UTM COORDINATES OBTAINED WITH A HAND HELD GPS USING NAD83 SYSTEM AND ARE CONSIDERED TO BE ACCURATE TO 10.0 m, APPROXIMATELY.
- LOCATION OF BUILDING ON PROPERTY IS APPROXIMATE ONLY.

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: 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

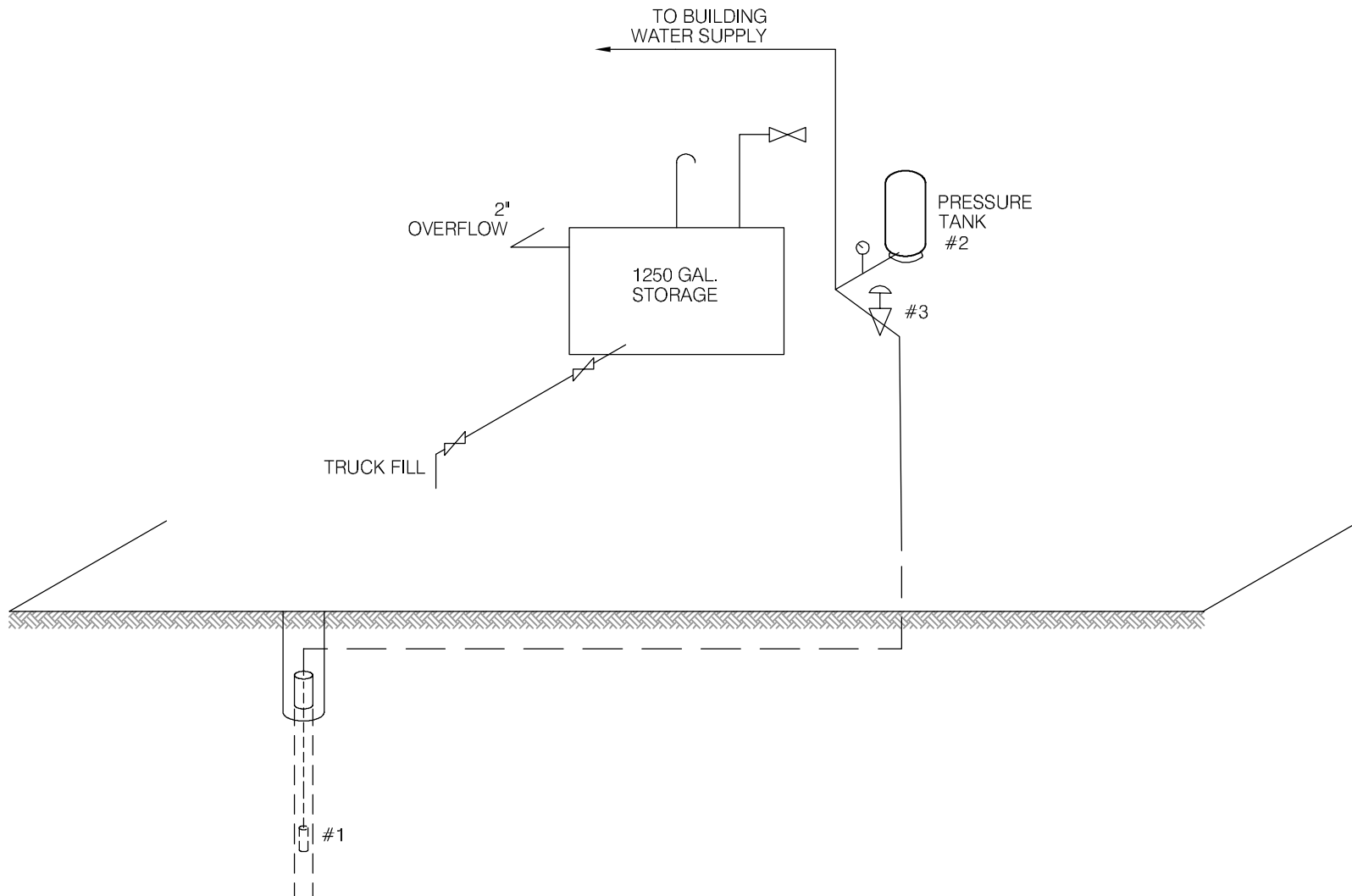
GOVERNMENT OF YUKON  
HIGHWAYS & PUBLIC WORKS

IBEX FIRE HALL  
BUILDING 1950  
SITE LOCATION DIAGRAM  
WELL ID: 1950

REVISION ISSUE  
0

DRAWING No.  
FIGURE 1





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.: 1950  
IBEX FIRE HALL

DATE APRIL 2006

DWN. JSB

CHKD. RMM

FILE NO. 1260002.001

DWG.: FIGURE 1950B

Whitehorse Region – Ibx Firehall  
Building # 1950

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	4" SUB. PUMP	GOULDS				4" x 1/2 HP.
2	PRESSURE TANK	AQUA AIR	V140		A33	1 1/4 NPT.
3	SOLENOID FILL VALVE	<del>ASSCO</del> RAINBIRD	DV100			1" - 24V
4	FLOAT CONTROL	SJE	Pump-up			
5	PUMP TECH	FRANKLIN	PT 58000			1/2 - 1 1/2 HP.
6						
7						
8						
9						
10						

**TABLE 1950 - 1: SUMMARY OF BACTERIOLOGICAL RESULTS**

		<b>Number of Sampling Events</b>	<b>Time Period over which Sampling was Done</b>	<b>Any Positive Total Coliform Results? (yes or no)</b>	<b>Fraction of Positive Total Coliform Results vs. Total Sampling Events</b>	<b>Any positive E.Coli results? (yes or no)</b>	<b>Most Recent Sampling Event Available for EBA Review</b>	<b>Is Most Recent Result Positive?</b>
<b>Building #</b>	<b>Building Name</b>							
1950	Ibex Firehall	9	Sept-04 to Feb-06	yes	2/18	no	28-Feb-06	no



**Table 1950-2: Water Quality Results**

SOURCE:		Building 1950 - Ibex Valley Firehall		GCDWQ Criteria		
Location/ Resident Address		Ibex Valley				
Treatment		No				
Source of Water		On-Site Well				
Purpose of Sampling		Baseline	Additional Sampling			
Sample Location		Washroom Tap	Kitchen Tap			
Date Sampled		5-Oct-04	10-May-05	Lower Limit	Upper Limit	
Physical Tests (ALS)				AO	MAC	AO
Colour (CU)		5	<5.0			15
Conductivity (uS/cm)		512	847			
Total Dissolved Solids		304	579			500
Hardness CaCO3		265	392	AO >200 = poor, > 500 unacceptable <sup>A</sup>		
pH		7.8	8.21	6.5		8.5
Turbidity (NTU)		0.5	4.92		1	5
UV Absorbance			<0.0010			
Dissolved Anions (ALS)						
Alkalinity-Total CaCO3		190	230			
Chloride Cl		52	1.67			250
Fluoride F		0.23	1.05		1.5	
Sulphate SO4		23	109			500
Nitrate Nitrogen N		1.5	<0.10		10	
Nitrite Nitrogen N		<0.05	<0.10		1	
Ammonia Nitrogen N			0.075			
Total Metals (ALS)						
Aluminum T-Al		<0.02	<0.020			
Antimony T-Sb		0.0008	<0.0010		0.006	
Arsenic T-As		0.0037	0.00384		0.025	
Barium T-Ba		0.0928	0.13		1	
Boron T-B		<0.02	<0.20		5	
Cadmium T-Cd		<0.0002	<0.00040		0.005	
Calcium T-Ca		74.2	115			
Chromium T-Cr		0.0014	<0.0040		0.05	
Copper T-Cu		0.344	0.295		1	
Iron T-Fe		0.064	<b>0.852</b>			0.3
Lead T-Pb		0.0013	0.0041		0.01	
Magnesium T-Mg		17.7	25.4			
Manganese T-Mn		0.006	0.038			0.05
Mercury T-Hg		<0.0002	<0.00020		0.001	
Potassium T-K		1.6	1.75			
Selenium T-Se		0.0006	<0.0020		0.01	
Sodium T-Na		13	27.7			200
Uranium T-U		0.0058	0.00869		0.02	
Zinc T-Zn		0.04	<0.10			5
Field Chemistry (EBA)						
pH			7.50	6.5		8.5
TDS			393			500
EC (uS/cm)			773			
Temperature			12.8			

**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 1950-3: Summary of Well Assessment Results  
SMALL PUBLIC DRINKING WATER SYSTEMS**

<b>Well Identification and Location</b>					
<b>Building #</b>	<b>Building Name</b>	<b>Location</b>	<b>Northing (+/- 10 m)</b>	<b>Easting (+/- 10 m)</b>	<b>Grade Elevation (+/- 10 m)</b>
1950	Ibex Fire Hall	Ibex Valley	6742155	483119	736

<b>Well Details</b>							
<b>Well Casing Diameter (mm)</b>	<b>Year Well Installed</b>	<b>Well Log?</b>	<b>Well Depth (m bg)</b>	<b>Reported Low Permeabilty Protective Layer?</b>	<b>Pump Setting (m bg)</b>	<b>Well Capacity - Tested, or Reported by User</b>	<b>Static Water Level Below Ground (m-btwc)</b>
150	?	No	11.830	Unlikely, shallow well	?	1/2hp submersible pump Size of pump meets needs	8.605

<b>Well Construction Details</b>				
<b>Wellhead Above ground (m)</b>	<b>Well Cap</b>	<b>Well Screen</b>	<b>Surface Seal</b>	<b>Apron Grading</b>
1.75 below grade	Split Cap Gasket	Yes 0.2m	Unlikely	No, but slopes away from pit

**Table 1950-4: Potential Contaminant Sources  
Building 1950 – Ibx Fire Hall**

<b>Potential Contaminant Source</b>	<b>Potential Contaminants</b>	<b>Distance from Water Source</b>	<b>Northing</b>	<b>Easting</b>
Dump or Landfill	<i>Organic</i> and inorganic chemicals.	>>120 m		
Cemetery	<i>Biological</i> <sup>1</sup> , inorganic <sup>2</sup> 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.	<b>Approx. 28 m</b>	6742163	483152
Septic fields	<i>Biological and Inorganic</i> parameters.	30 m		
Fire fighting equipment fueling station	<i>Organic and Inorganic</i> parameters.	70 m	6742117	483168
Undergrounds Fuel Storage Tanks (USTs)	<i>Organic</i> parameters.	>>30 m		
Above ground storage tanks (ASTs)	<i>Organic parameters.</i>	>60 m	6742117	483168
Naturally occurring sources of contamination	<i>Radionuclides, Bacteria and Viruses from surfacewater sources.</i>	>150 m		

**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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\* No Well Log

## SMALL PUBLIC WATER SYSTEM ASSESSMENT

### PART A: EBA Site Inspection

Inspector: Ryan Martin  
Luke Lebel

Date May 10, 2005

WELL ID #	Owner	Location Description
1950	YTG	Ibex Valley FireHall

### 1. Well Location and Potential Contaminant Sources

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

Ibex Valley

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

Ibex Valley Fire Hall, Alaska Highway

c. GPS location: 483119 Easting; 6742155 Northing; 763m elevation; ±10m

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 Supplies the Fire Hall however, there is an outside hose bib that the public sometimes uses

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

f. Nearest building, specify Ibex Valley FireHall

g. Distance from well to building 11.6m

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

i. Distance from well to nearest point of known field: ~30m

j. Well location relative to field:  upslope  downslope  lateral

0483152 Easting  
6742163 Northing ± 5m  
757m elevation

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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

The septic tank/effluent field is down the likely water-level gradient from the well

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

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

Only an unlocked, screwed on piece of port plywood is present

Entrance by animals?  Yes  No

Mouse droppings and cobwebs present

o. Is well site subject to flooding?  Yes  No

It is, however, underground in only a plywood enclosure, and since it is relatively new, evidence may not be present as of yet

p. Is the well site well drained?  Yes  No

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

No evidence observed

If yes, is it  in use  abandoned

Is the location known?  Yes  No

Distance from the well to known buried tank \_\_\_\_\_

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

Yes  No Describe \_\_\_\_\_

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

48368  
674217  
753m (16m) ← Potential Source 1: AST ; Distance from well to Potential Source 1: >60m

Potential Source 2: \_\_\_\_\_ ; Distance from well to Potential Source 2: \_\_\_\_\_

Potential Source 3: \_\_\_\_\_ ; Distance from well to Potential Source 3: \_\_\_\_\_

Potential Source 4: \_\_\_\_\_ ; Distance from well to Potential Source 4: \_\_\_\_\_

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

No evidence observed

How many? \_\_\_\_\_  in use  abandoned  require proper sealing

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## 2. Well and Wellhead information:

- \*a. When was well installed? Year \_\_\_\_\_ Month \_\_\_\_\_
- \*b. Type:  drilled  dug  sand point  other \_\_\_\_\_  
*most likely*
- \*c. Is there a drillers log for the well:  Yes  No
- d. Is there a surface seal to 6 m  Yes  No  unknown  unlikely
- e. Surface casing:  Yes Diameter 120 x 120 cm  No  
*square*
- f. Well casing: Diameter 15cm Material:  steel  plastic  concrete  
*one piece plastic expansion cap*
- g. Depth of well: 10,080m  measured (if possible)  reported  from log  
*below casing*
- h. Static water level below ground: 8.605m below casing  
 measured (if possible)  reported  from log  flowing  
*\*Two capfulls of chlorine were added to the well after the measurements were taken*
- i. (If granular) Is the well completed:  open end casing  with a well screen  
*Likely*  
 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 0.38m slot size(s) unknown  
Location of screen: from 9.70m to 10.08m  from log  reported  
*bc bc measured*
- 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  
*An insulated pit w/pwf exterior casing (plywood and 2x6 studs)*  
 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 The well head is 1.75m 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 There is a little amount of mouse droppings in the upper section
- v. Does the well casing have a proper seal cap?  Yes  No  
If no, describe condition Although there is a <sup>plastic</sup> cap, there are open holes for the heat trace and power lines to go down

### 3. Water Supplying This Well:

- a. By definition is the water from a surface water source or under the direct influence of surface water?  
 Yes  No  farther investigation required.

If yes is there treatment  Yes  No

Explain (filtration, disinfection etc...) \_\_\_\_\_

### 4. Aquifer Supplying This Well:

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

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- d. Date installed: \_\_\_\_\_ By: \_\_\_\_\_
- e. For submersible pump, depth of setting below surface 9.70m bc
- 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  
Not easily - tap just above floor level @ pressure tank
- j. Is there a water meter on the system?  Yes  No
- k. Is the pump and piping protected from freezing?  Yes  No  
There is insulation, an insulated compartment, heat trace, and a  
If yes, describe: heater present.
- l. Comments on pump installation: o

## **6. Conclusions**

- a. Comments on overall installation:  
Well in pit, well may be shallow

- b. Recommendations:  
The well should be installed in a concrete pit with a cover.  
The pump should be installed in a concrete enclosure with a cover.

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## PART B: EBA Site Inspection

Inspector: Bert Alosser

Date \_\_\_\_\_

WELL ID #	Owner	Location Description
1950	VTG	IBEX FIREHAU

### 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<sub>2</sub>S  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: FIRE HALL UPPER 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: \_\_\_\_\_

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## **Overall Tank**

What are the tank size and dimensions?

AG 1250

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:

THE BASIC INSTALLATION IS GOOD. THE TANK NEEDS TO BE CLEANED.

b. Recommendations:

NEW CASING TO BE EXTENDED ABOVE GROUND LEVEL & SURFACE SEAL INSTALLED. INSTALL PROPORTIONAL CHLORINATOR AND SURTAGE RETENTION TANK. POTABLE WATER IS TAKEN OFF BEFORE FIRE STORAGE TANK.



**Photo 0100:** 1950 Well-Enclosure – Pit (front), Ibex Valley Firehall (back)



**Photo 0099:** 1950 Wellhead



**Photo 0101:** 1950 Well (front), Skating Rink and Above Ground Oil Storage Tank (back)



**Photo 0102:** 1950 Septic Field



**Photo 0104:** 1950 Outside Water Tap Accessable to Public for Water Pickup



**Photo 0106:** 1950 Pressure Tank



**Photo 0107:** 1950 Solenoid and Water Storage Tank



**Photo 0105:** 1950 Scum on Surface of Well Water Storage Tank