

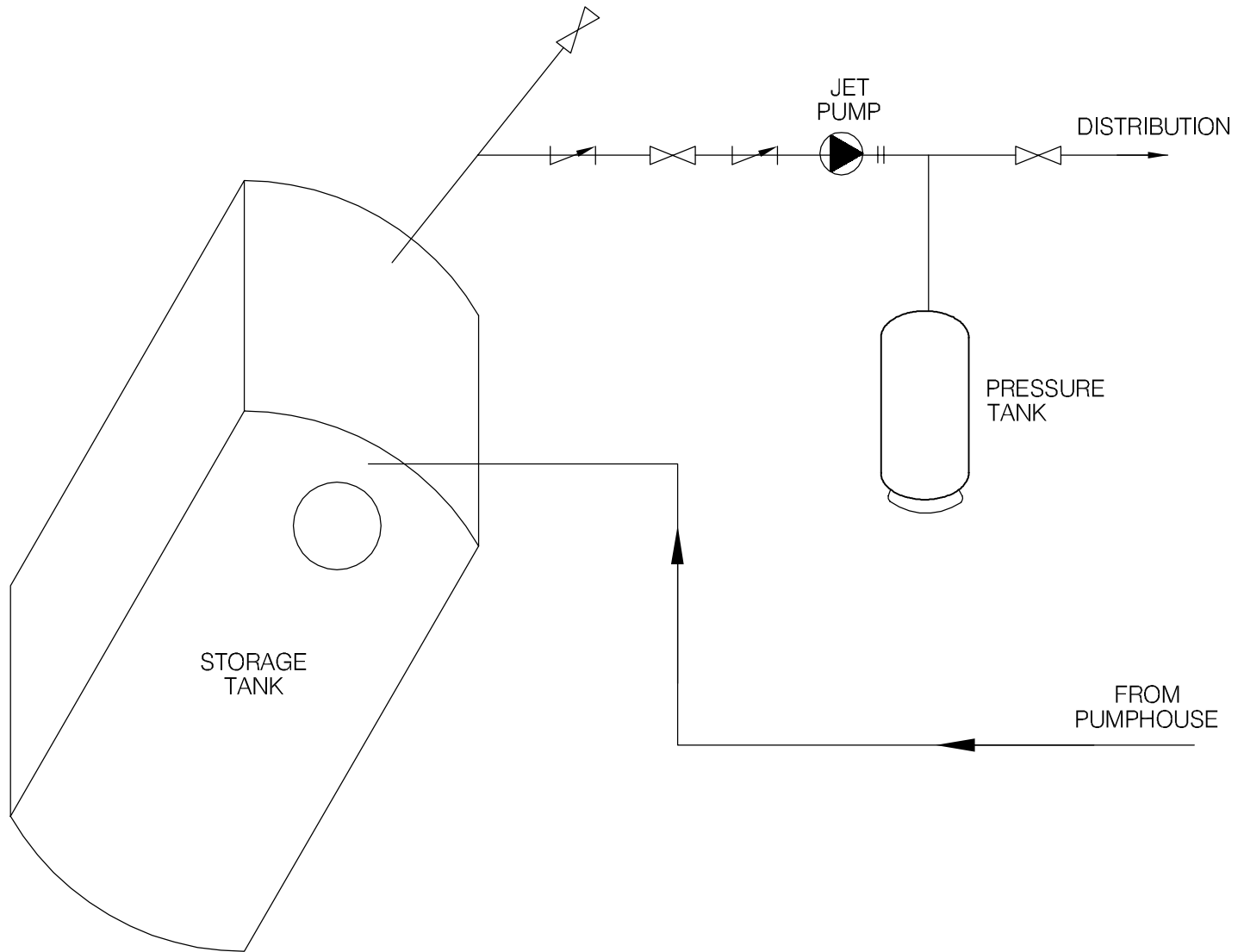


SCHEMATIC PRODUCED BY BERT ALBISSER OF AQUA TECH SUPPLIES & SERVICES LTD.

 EBA Engineering Consultants Ltd.		PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT WHITEHORSE REGION	
CLIENT 		TITLE WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 1953 TAGISH FIRE HALL	
DATE	APRIL 2006	DWN.	JSB
CHKD.	FMM	FILE NO.	1260002.001
		DWG.:	FIGURE 1953B



SCHEMATIC PRODUCED BY BERT ALBISSER OF AQUA TECH SUPPLIES & SERVICES LTD.



EBA Engineering Consultants Ltd.

CLIENT



PROJECT

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WHITEHORSE REGION

TITLE

WATER SYSTEM DISTRIBUTION/TREATMENT
SCHEMATIC SYSTEM ID.: 1953
TAGISH FIRE HALL

DATE APRIL 2006

DWN. JSB

CHKD. RMM

FILE NO. 1260002.001

DWG.: FIGURE 1953C

Whitehorse Region – Tagish Firehall
Building # 1953

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	4" SUBMERSIBLE	RED JACKET	8 FC	(175530) 9F 1996.		3HP 2"
2	PRESSURE CONTROL	RED JACKET	HYDROSWANT			2"
3	FLOW METER PULSER	LMI	RFP-020			2"
4	CHLORINE INJECTION	GRUNDOS	DME 8-10	96472847		
5	IRON FILTERS	WATERTECH	BTW-30 DUPLEX REF 3072			TANK 30x72 RING 1/2"
6	WATER METER	NEPTUNO	2" TRIDENTO			2" FLANGED.
7	PRESSURE TANK	AMTROL	WX-30R			
8	SOL. FILL VALVE	KECO	2" BRONZE			2" FIPT
9	PRESS CONTROL	WATTS	45BLP.			1/2" FIPT
10	AIR CHARGER	WATERTECH	30" DUPLEX			2x1" HYDRO CHARGER

TABLE 1953 - 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
1953	Tagish Firehall (Fill Station)	9	Sept-04 to Mar-05	no	0/9	no	2-Mar-05

Table 1953-2: Water Quality Results

SOURCE:		Building 1953 - Tagish Firehall (Fill Station)			GCDWQ Criteria		
Location/ Resident Address		Tagish					
Treatment		Chlorination					
Source of Water		On-Site Well					
Purpose of Sampling		Baseline	Baseline	Additional Sampling			
Sample Location				Kitchen Tap			
Date Sampled		15-Jun-04	4-Oct-04	9-May-05	Lower Limit	Upper Limit	
Physical Tests (ALS)					AO	MAC	AO
Colour (CU)		<5.0	<3				15
Conductivity (uS/cm)		533	335				
Total Dissolved Solids		309	242				500
Hardness CaCO3		263	228		AO >200 = poor, > 500 unacceptable ^A		
pH		8.23	8.1		6.5		8.5
Turbidity (NTU)		0.69	0.3			1	5
Dissolved Anions (ALS)							
Alkalinity-Total CaCO3		280	217				
Chloride Cl		3.36	1				250
Fluoride F		0.167	0.17			1.5	
Sulphate SO4		23.8	24.6				500
Nitrate Nitrogen N		<0.10	<0.1			10	
Nitrite Nitrogen N		<0.10	<0.05			1	
Total Metals (ALS)							
Aluminum T-Al		<0.010	<0.02				
Antimony T-Sb		<0.00050	0.0007			0.006	
Arsenic T-As		0.0017	0.0006			0.025	
Barium T-Ba		0.071	0.0646			1	
Boron T-B		<0.10	<0.02			5	
Cadmium T-Cd		<0.00020	<0.0002			0.005	
Calcium T-Ca		72.1	51.2				
Chromium T-Cr		<0.0020	<0.0008			0.05	
Copper T-Cu		<0.010	0.024			1	
Iron T-Fe		0.637	0.016				0.3
Lead T-Pb		<0.0010	0.0011			0.01	
Magnesium T-Mg		20.2	21.8				
Manganese T-Mn		0.0218	0.003				0.05
Mercury T-Hg		<0.00020	<0.0002			0.001	
Potassium T-K		2.69	2.6				
Selenium T-Se		<0.0010	<0.0004			0.01	
Sodium T-Na		8.5	7				200
Uranium T-U		0.00646	0.0065			0.02	
Zinc T-Zn		0.141	0.02				5
Trihalomethanes							
Bromodichloromethane				0.0023			
Bromoform				<0.0010			
Chloroform				0.0054			
Dibromochloromethane				<0.0010			
Total Trihalomethanes				0.0078		0.1	
Haloacetic Acids							
Bromoacetic Acid				<0.0020			
Bromochloroacetic Acid				<0.0020			
Chloroacetic Acid				<0.020			
Dibromoacetic Acid				<0.0020			
Dichloroacetic Acid				0.002			
Trichloroacetic Acid (TCA)				<0.0020			
Field Chemistry (EBA)							
pH				7.73	6.5		8.5
TDS				440			500
EC (uS/cm)				480			
Temperature							
Free Available Chlorine				0.02			250

Notes:

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

Shading indicates exceedence of Proposed MAC guideline (arsenic).

Bold Underline with Yellow shading indicates exceedence of CDWQG MAC

Results are expressed as milligrams per litre except for pH and Colour (CU), Conductivity (umhos/cm), Temperature (°C) and Turbidity (NTU)

< = Less than the detection limit indicated.

AO = Aesthetic Objective

MAC = Maximum Acceptable Concentration (Health Based)



**Table 1953-3: 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)
1953	Tagish Firehall	Tagish	6681131	538646	670

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)
150	1990	Yes	48.8	Silt and Clay - 0m to 43m	?	3hp submersible pump Size of pump meets needs	7.8

Well Construction Details				
Wellhead Above ground (m)	Well Cap	Well Screen	Surface Seal	Apron Grading
0.20 above grade	Split Cap Gasket	Yes 0.9m	Unlikely	No, but slopes away from pit



**Table 1953-4: Potential Contaminant Sources:
Building 1953 – Tagish Fire Hall**

Potential Contaminant Source	Potential Contaminants	Distance from Water Source	Northing	Easting
Dump or Landfill	<i>Organic</i> and inorganic chemicals.	>120 m		
Cemetery	<i>Biological</i> ¹ , inorganic ² and organic parameters.	Approximately 800 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.	36 m		
Septic fields	<i>Biological and Inorganic</i> parameters.	40 m		
Gas stations	<i>Organic and Inorganic</i> parameters.	>30 m		
Undergrounds Fuel Storage Tanks (USTs)	<i>Organic</i> parameters.	>30 m		
Above ground storage tanks (ASTs)	<i>Organic parameters.</i>	N/A	6681117	538692
Aviation Fuel Drums	<i>Organic parameters</i>	48 m	6621185	538644
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

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin
Luke Lebel

Date May 9, 2005

WELL ID #	Owner	Location Description
1953	YTG	Tangish Fire Hall

1. Well Location and Potential Contaminant Sources

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

Taku Subdivision, Tangish

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

c. GPS location: 0538646 Easting ; 6681131 Northing 670m elevation
accuracy ± 8m

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 _____

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

f. Nearest building, specify 1.7m to pump house.
27 m to fire hall garage

g. Distance from well to building _____

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

i. Distance from well to nearest point of known field: 40 m to tank, start field.

j. Well location relative to field: upslope downslope lateral

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

Septic N-0538683 E 6681145 ELEV 670

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

rock pit on west side bldg, septic system on east side bldg
(53m) (40m)

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
↳ cemetery is at start of road

n. Is the infrastructure protecting the wellhead, pumphouse, storage tank and/or water treatment plant designed and secured to prevent:

Unauthorized access by humans? Yes No Entrance by animals? Yes No
Buildings, well head all lockable Evidence of mice in well enclosure

o. Is well site subject to flooding? Yes No

p. Is the well site well drained? Yes No

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

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

Potential Source 1: fire equip. cache; Distance from well to Potential Source 1: 30m

Potential Source 2: Av. gas; Distance from well to Potential Source 2: 48m

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

How many? _____ in use abandoned require proper sealing

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

2. Well and Wellhead information:

- a. When was well installed? Year 1990 Month July
- 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: 160 ft measured (if possible) reported from log
- h. Static water level below ground: 25 ft at time of drilling
 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 N/A
- k. If there is a well screen: length 3' slot size(s) 20 slot
Location of screen: from 157' to 160' from log reported
- l. Is there a sump below the screen? Yes No
- 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,

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

- i. Is the well head below grade? describe in detail Above grade (0.2 m)
- 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 - styrofoam SM.
- iv. Any evidence of rodents? Specify Yes, mouse droppings.
- v. Does the well casing have a proper seal cap? Yes No

If no, describe condition SPLIT GASKET CAP -
NOTE MOUSE DROPPINGS ON TOP OF 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 Yes No

Explain (filtration, disinfection etc...) Chlorination

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 _____ Model _____
horsepower _____ capacity _____ voltage _____

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

d. Date installed: _____ By: _____

e. For submersible pump, depth of setting below surface _____

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 PUMPHOUSE

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: INSULATED & HEAT TRACE

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

- well enclosure accessible to rodents

b. Recommendations:

- design enclosure that is mouse proof
- consider raising casing slightly

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

PART B: EBA Site Inspection

Inspector: _____

Date _____

WELL ID #	Owner	Location Description
1953	VTG	TACISIT FIREHALL

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 PROPORTIONAL CHLORINE FEED (LIQUID)

c. If treated with chlorine, is the free residual chlorine concentration less than 0.2 mg/L

Yes No _____ reading.

Tested at _____ (location)

d. Is testing for chlorine residual concentration done at the tap (eg. Kitchen faucet) or from representative points in a piped distribution system, including a point from tap at the end line

Yes No If yes how often? _____

e. If the drinking water is being transported by water delivery truck does it have a minimum chlorine free residual of 0.4 mg/L at the time of fill. Yes No

7. Water Quality (observations):

a. Does the water stain plumbing? yes No slight severe

Type of stain: brown red black

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

c. Is there an unpleasant odour? Yes No H₂S Other _____

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

- 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: FIREHALL

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: OVERFLOW NOT PRACTICAL

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

Overall Tank

What are the tank size and dimensions?

AG 1500 OVAL TANK.

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: SLIGHT

Is there any sediment or scum in bottom of tank? YES NO

Comments: SOME RUST SEDIMENT

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:

INSTALLATION IS OF GOOD QUALITY
& WORKMANSHIP.
/

b. Recommendations:

MOVE SOLENOID CONTROL VALVE FOR FIRE
WATER STORAGE FROM PUMP HOUSE TO
VICINITY OF TANK. PUMP DOMESTIC
WATER TAKE OFF UPSTREAM OF SOLENOID
VALVE. THIS WILL FEED TREATED,
CHLORINATED WATER TO THE JET PUMP,
SUPPLYING POTABLE WATER TO THE
BUILDING.

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

PART C: Property Manager/ System Operator Questionnaire

Inspector: TERRY JACKSON Date APRIL 9/05
Property manager: Y.T.G.

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

2) Well information:

- a. When was your well installed? Year 1990 Month _____
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: 160' galvanized pipe
e. Who was the well constructed by?
Indicate contractor's name: Midnight sun Drilling
f. Are you, the owner Yes or other: Y.T.G.
g. Who maintains the well? Community Services Y.T.G.
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? _____
How was it abandoned? _____

3) Pump Installation

- a. Who installed your pump, and when did they install it? Midnight sun 1990
b. What type of pump do you have? 3 h.p. Red Jacket.
c. Pump delivers water to: pressure tank elevated tank other _____

EBA Engineering Consultants Ltd.

Creating and Delivering Better Solutions

4) Water Treatment

a. Is your well water treated? Yes No

Type of treatment: chlorination iron and or manganese removal
other _____

5) Well Capacity:

a. Well capacity: User's opinion adequate inadequate

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

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

6) Water Quality:

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

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

Type of stain: brown red black

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

d. Is there an unpleasant odour? Yes No

Sulphur (rotten egg smell) Other _____

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

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

g. Is water softener being used? Yes No

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

If so, at what time intervals? 2 weeks

Who takes them? Community Services

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?

The tank that feeds the water truck tank should be cleaned
The piping should be changed, that feeds the domestic
water to the fireball 11/11



Photo 0062: 1953 Well Enclosure (right) and Pumphouse

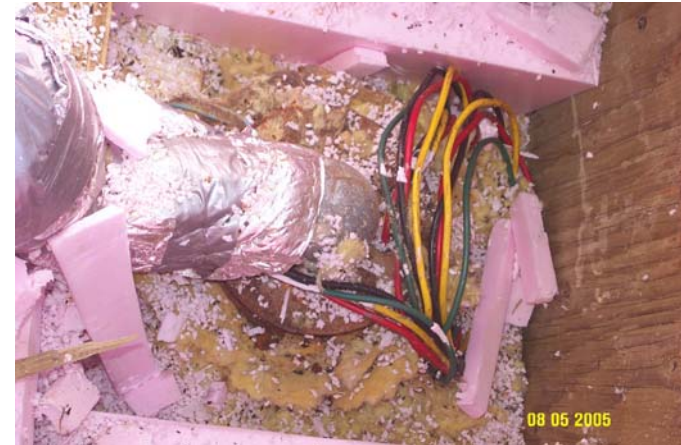


Photo 0059: 1953 Well Head



Photo 0061: 1953 45 gal. Aviation Fuel Drums (front), Pumphouse (back right), and Firehall (back left)



Photo 0060: 1953 Fire Equipment Cache (front), Pumphouse (back left)



Photo 0063: 1953 Fill Station



Photo 0067: 1953 Pipe Hangar – Potential Location for Solenoid



Photo 0068: 1953 Water Supply System, Pressure Tank (left), Iron Removal Tanks (right)



Photo 0066: 1953 Firehall 1250gal Water Storage Tank



Photo 0069: 1953 Grundfos DME Chlorinator

Photo 0070: 1953 Pumphouse Iron Duplex Injection Chlorine System

