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## **22.0 BUILDING 4873: TUCHITUA PUMPHOUSE**

### **22.1 Description of Existing Water system**

The Tutchitua Grader Station is served by a 13.8 m deep well located inside building 4873, the Tutchitua Pumphouse. At the time of inspection the well was not equipped with a cap. The well location and other site details are provided in Figure 4873-A, provided in Appendix A22. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 9
- Northing: 6754733
- Easting: 488237

Currently there is no treatment present for this water system. A schematic detailing the water system is provided as Figure 4873-B in Appendix A22.

### **22.2 Description of Existing Wastewater Systems**

There are two active and one abandoned septic system at the Tutchitua Grader Station. The leach pit system serving the maintenance garage is located on the northeast corner the building and is approximately 50 m south of the pumphouse. The septic tank servicing the living complex is located on the eastern side of the building approximately 80 m south of the pumphouse, and effluent is likely discharged in a leach pit to the west of the tank. There is also an abandoned septic tank and leach pit approximately 60 m southeast of the pumphouse. The site plan included in Appendix A22 provides details on the location of the sewage systems.

### **22.3 Water Quality Results**

#### **22.3.1 Water Quality Results from Previous Sampling**

##### *Bacteriological*

Eight samples were collected from the Tutchitua Pumphouse water system between September 2004 and March 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 4873-1 in Appendix 22. *E. coli* bacteria were

reported as absent in each of the eight samples for which results were provided. One sample from September 14, 2004, however, tested positive for Total Coliforms.

### *Potability*

A water sample was collected by YTG representatives from the Tutchitua Pumphouse water system on September 13, 2004. The sample was submitted to Northwest Labs in Surrey, BC for detailed potability analyses. The results of these analyses are summarized in Table 4873-2 in Appendix A22. 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.

- The water quality results indicated that all health based and aesthetic objectives were met for the parameters analyzed; and,
- The hardness (as CaCO<sub>3</sub>) was 197 mg/L, and is considered very hard.

### 22.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Tutchitua Pumphouse that was included in the water system assessment is detailed below:

- UV absorbance, as well as tannins and lignin, to determine potential for UV treatment as a disinfection option for this water system;
- Total Organic Carbon to provide necessary information for future treatment system selection;
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

### *Additional Analytical Results*

A water sample was obtained by EBA during the field program on June 23, 2005, and was submitted to ALS Environmental in Vancouver, BC for analysis. These results are summarized in Table 4873-2 in Appendix A22 and the laboratory reports are included in Appendix B.

### 22.3.3 Indicators of Potential Contamination

No elevated concentrations of indicator parameters were observed in the sample results reviewed.

## 22.4 Conceptual Hydrogeology

The log for this well indicates that the well is completed at a depth of 13.8 m in an unconfined sand aquifer. The lithology encountered consists of alternating sand, gravel and cobbles with no significant confining layer. The static water level is approximately 2.0 m below grade. The well location is approximately 4 m south of the Tutchitua River bank. The groundwater flow gradient may reverse during periods of rapid water level rise in the river, however the final discharge point for groundwater in the vicinity is expected to be the river. The expected direction of groundwater flow direction is north to northeast towards the Tutchitua River.

## 22.5 Potential Contaminant Sources

Potential contaminant sources observed during the site investigation are provided in field notes in Appendix A22. Photos of potential contaminant sources are also provided at the back of this appendix.

A summary of potential contaminant sources within 30 m of the well is provided below:

- Tutchitua River is located 4 m from the well;
- There are full and discarded fuel, paint, and kerosene drums within 30 m.

### 22.5.1 Spills Records and Contaminated Sites Search Results

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch identified one recorded spill events for this site.

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According to the spill report, on April 4 1977, 7560 L of diesel was spilled at the waterhouse at Tutchitua Maintenance Camp. According to the Environment Canada spill record, however, the oil was absorbed into snow only and the snow was removed to a gravel pit a significant distance from the camp. The site was then cleaned up and reportedly there was little chance of contamination. This has not been verified.

## **22.6 Identified Water System Deficiencies and Associated Risk**

### 22.6.1 High or Medium Risk Deficiencies

- The wellhead is located within 30 m of potential sources of contamination, including the Tutchitua River (4 m from the well), and fuel, paint, and kerosene drums;
- The well is likely downgradient from leach pit septic systems serving the maintenance garage and living complex;
- There is no surface sanitary seal (grout or bentonite seal as required by the Canadian Groundwater Association's Well Construction Guidelines);
- Poor surface completion of the wellhead (there was no cap on the well casing);
- The wellhead is only 70 mm above grade and is at risk of potential flooding;
- The production zone of the well is from 8.9 m to 10.4 m according to the well log.
- By definition of the Draft Yukon GUDI Assessment Guideline, the well is potentially under the direct influence of surface water because it is a vulnerable type (unconfined aquifer with a production zone that is less than 15 m below grade), in close proximity to a surface water body and does not meet the requirements of the Guidelines for Water Well Construction;
- A bacteriological sample from September 14, 2004 tested positive for Total Coliforms;
- This water system is not equipped with a treatment or disinfection system; and,
- The plumbing from the well was found during the site inspection to be in disrepair. The pressure tank is very old, and it as well as much of the piping was leaking.

### 22.6.2 Low Risk Deficiencies

The following deficiencies were identified as low-risk for the Tutchitua Pumphouse:

- In 1977, a diesel fuel spill occurred near the pumphouse; however, the spilled fuel had reportedly been removed and according to the spill report there was little chance of contamination.

## 22.7 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).

The septic systems present at this grader station are poorly constructed and likely upgradient from the well. Even though they are greater than 30 m from the well, because of their construction, the aquifer characteristics, and the well construction, these septic systems have the potential to pose significant risk to the water system. The well is also in very close proximity to surface water and has a very shallow depth. Considering these deficiencies it is proposed that a new well be drilled upgradient from any potential source of contamination.

### 22.7.1 Priority 1

The following Priority 1 options are those that are of immediate concern in order to provide short-term mitigative options that reduce the most risk for this water system:

- The well and water system should be immediately superchlorinated and a cap be installed to seal the well from the surface;
- The casing should be raised to a minimum of 500 mm above grade;
- All fuel, paint, and kerosene drums that are within 30 m of the pumphouse should be relocated. Fuel or chemicals are not to be stored within 30 m of the pumphouse; and,
- An NSF/ANSI 55 certified UV disinfection system with pre-filter should be installed. This is a conceptual design recommendation based on the information available, and is intended to be used for planning and budgeting purposes. Engineering input will be required for final system specifications or design.

## Priority 2

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, and at least 60 m from the Tutchitua River, and be upgradient from all parts of the existing septic systems;
- 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. The treatment/disinfection system can be removed from the pumphouse and installed on the water system from the new well.

### 22.7.2 Priority 3

- There are no Priority 3 mitigative option recommended for this site.

## 22.8 Cost Estimates for Mitigative Options

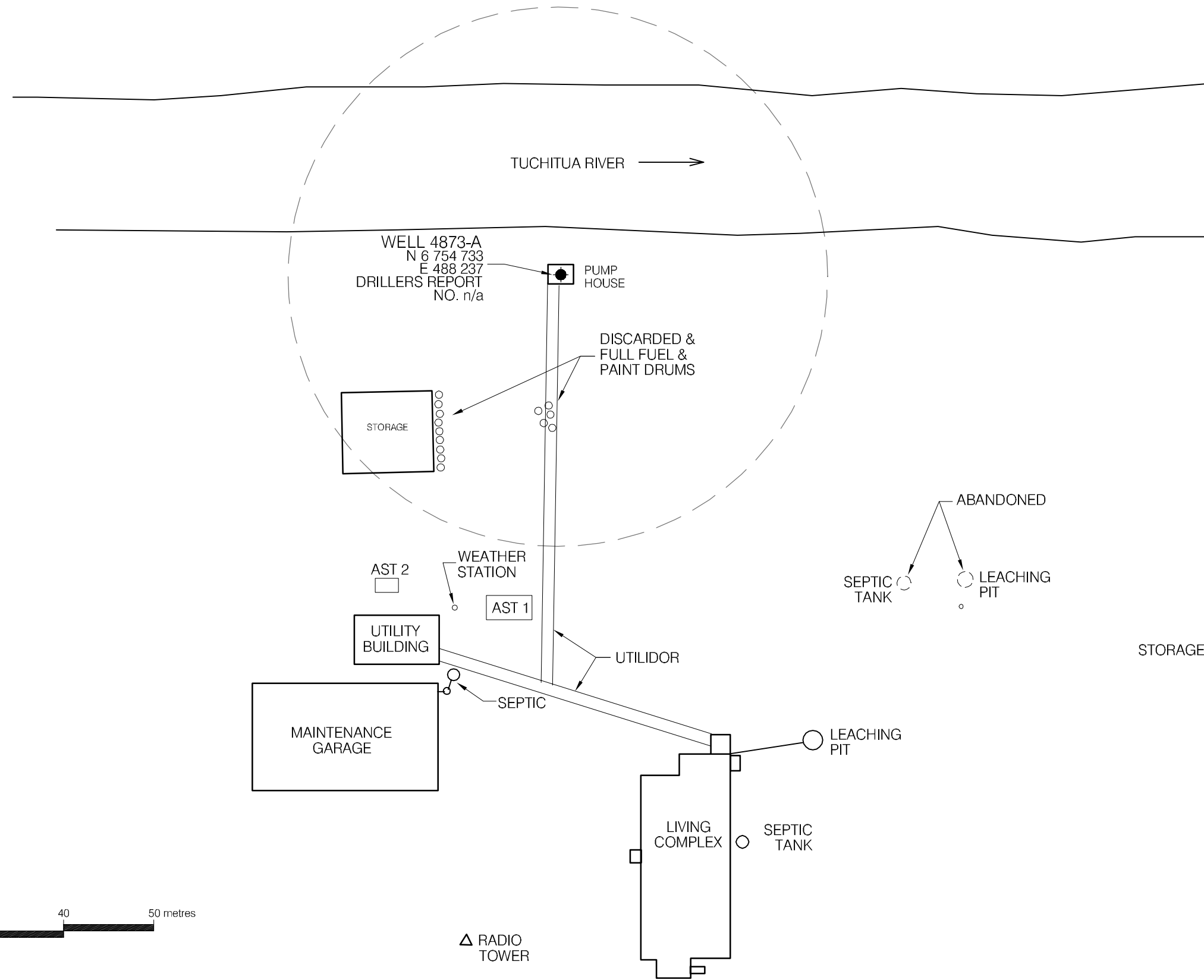
Engineering costs for mitigative options are estimated to be 20% of construction costs, and would include inspection and completion reporting. The costs for materials and labour (not including engineering) are provided in the sections below. An additional contingency allowance of 20% is suggested for budgetary purposes.

### 22.8.1 Priority 1


- The estimated cost to raise the casing, superchlorinate the well, and install a proper cap would be in the order of **\$200**;
- Relocating the fuel, paint, and kerosene would incur minimal costs; and,
- The cost for the proposed disinfection/treatment system would amount to a total installed cost of about **\$2,500**.
- Approximately **\$4,000** should be allocated as a contingency for additional water treatment if necessary.

### 22.8.2 Priority 2

- If a new well is to be installed with a proper surface seal and wellhead enclosure, in overburden to a depth of 30 m, and considering the probable distance for distribution piping, it is recommended that **\$50,000** be budgeted for materials and labour to drill, test, complete and hook-up the well with properly insulated and heat-traced underground waterlines.
- If the new well is successful, the old well should be properly decommissioned in accordance with the Guidelines for Water Well Construction. It is estimated that this would cost approximately **\$1,000**.




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: JULY 2005  
 SCALE: AS SHOWN  
 PROJECT No.: 1260002.002  
 ACAD FILENAME: 002-EASTERN REGION

CLIENT:  
  
 Highways and Public Works  
 Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT  
EASTERN REGION

GOVERNMENT OF YUKON  
HIGHWAYS & PUBLIC WORKS

TUCHITUA PUMPHOUSE  
BUILDING # 4873  
SITE LOCATION DIAGRAM  
WELL ID: 4873-A

REVISION	ISSUE
	0
FIGURE No.	4873-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)

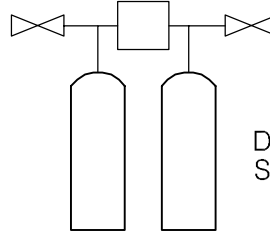


PRESSURE TANK



CL<sub>2</sub>

CHLORINE RESERVOIR AND  
INJECTION PUMP

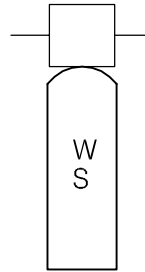


DUPLEX WATER  
SOFTENER



SP

WELL WITH  
SUBMERSIBLE PUMP



ACTIVATED  
CARBON

Z:\0201\Drawings\1260002 - Water Assessment YTG\002 - Eastern Region\1260002\003 Eastern Schematic\_LEGEND.dwg, 4/11/2006 10:31:08 AM, Adobe PDF, jbuyck



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PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT  
EASTERN REGION

CLIENT



TITLE  
**SCHEMATIC SYSTEM  
LEGEND**

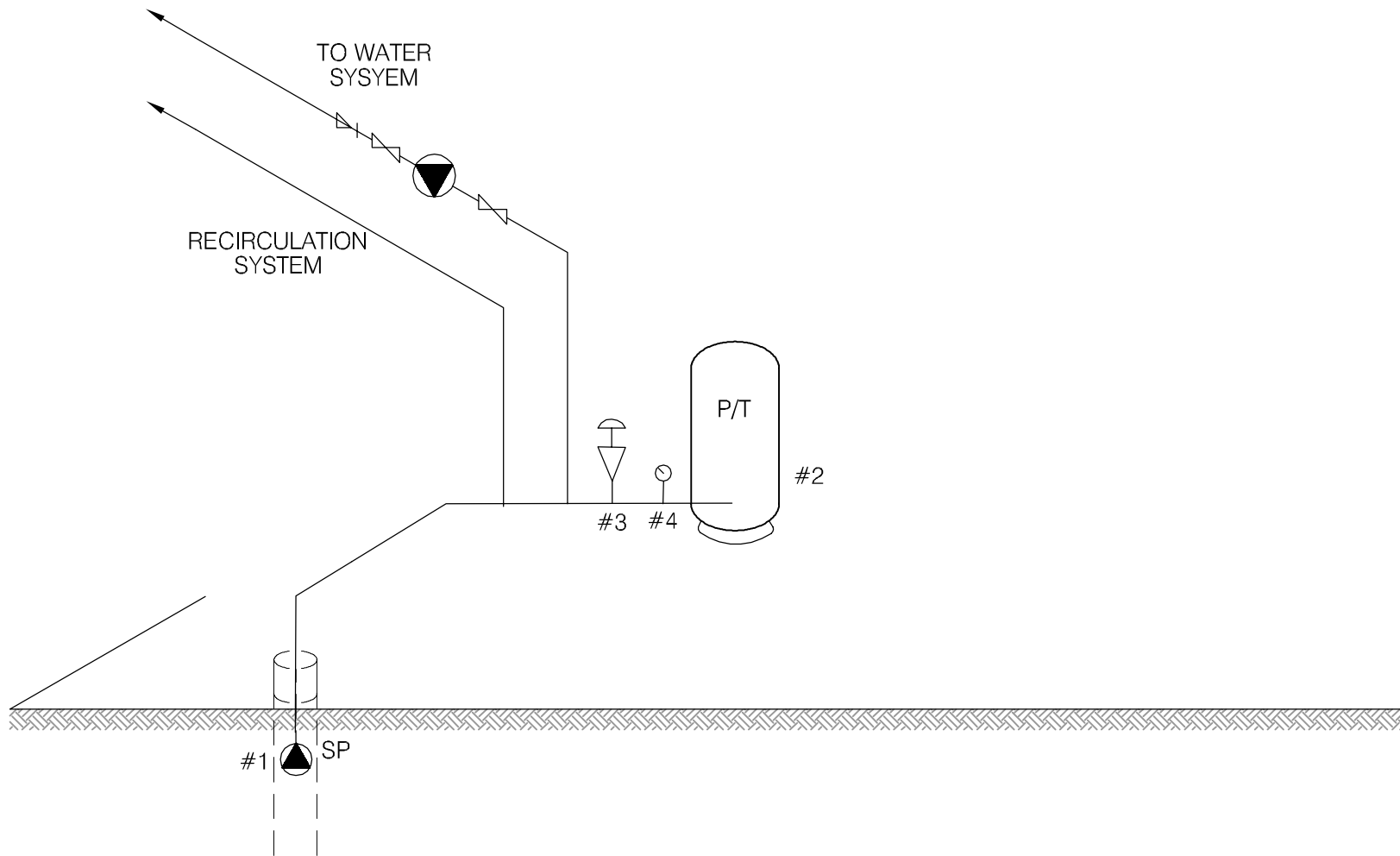
DATE APRIL 2006

DWN. JSB



CHKD. RMM

FILE NO. 1260002

DRWG. LEGEND



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

 <b>EBA Engineering Consultants Ltd.</b>		PROJECT SMALL PUBLIC WATER SYSTEMS ASSESSMENT EASTERN REGION	
CLIENT 		TITLE WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 4873 TUCHITUA PUMPHOUSE	
DATE	JULY 2005	DWN.	JSB
CHKD.	FMM	FILE NO.	1260002.002
		DWG.:	FIGURE 4873-B

**Eastern Region – Tuchitua Pumphouse  
Building # 4873**

**DISTRIBUTION & TREATMENT SYSTEM DATA**

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	Sub Pump					4" - 1HP.
2	PRESSURE TANK	PERMA TANK	FG120			120 GALLON
3	PRESSURE SWITCH	SQ. D	ESG-2			5HP - 1/4" FIPT
4	PRESSURE GAUGE	MARSH	0-100			2 1/2" 1/4" FIPT
5	RECIRC PUM	ARMSTRONG.	N/A			
6						
7						
8						
9						
10						

**TABLE 4873- 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?
4873	Tutchitua Pumphouse	8	Sept-04 to Mar-05	yes	1/8	no	Mar-05	no



**Table 4873-2: Water Quality Results**

SOURCE:		Building 4873 - Tutchitua Pumphouse		GCDWQ Criteria		
Location/ Resident		Campbell Highway				
Address		km 110.5 Campbell Highway				
Treatment		No				
Disinfection		No				
Source of Water		On-Site Well				
Purpose of Sampling		Baseline	Additional Sampling			
Sample Location		Kitchen Tap				
Date Sampled	13-Sep-04	23-Jun-05	Lower	Upper Limit		
<b>Physical Tests (ALS)</b>			<b>AO</b>	<b>MAC</b>	<b>AO</b>	
Colour (CU)	<5				15	
Total Dissolved Solids	199				500	
Hardness CaCO3	197		AO >200 = poor, > 500 unacceptable <sup>A</sup>			
pH	8.10		6.5		8.5	
Turbidity (NTU)	0.7			1	5	
UV Absorbance		0.0200				
<b>Dissolved Anions (ALS)</b>						
Alkalinity-Total CaCO3	199					
Chloride Cl	1.3				250	
Fluoride F	<0.05			1.5		
Sulphate SO4	5.16				500	
Nitrate Nitrogen N	<0.1			10		
Nitrite Nitrogen N	<0.05			1		
<b>Total Metals (ALS)</b>						
Aluminum T-Al	<0.005					
Antimony T-Sb	<0.0002			0.006		
Arsenic T-As	0.0003			0.025		
Barium T-Ba	0.177			1		
Boron T-B	0.004			5		
Cadmium T-Cd	0.00003			0.005		
Chromium T-Cr	<0.0005			0.05		
Copper T-Cu	0.008			1		
Iron T-Fe	0.11				0.3	
Lead T-Pb	0.0004			0.01		
Manganese T-Mn	<0.005				0.05	
Sodium T-Na	2.0				200	
Uranium T-U	0.0007			0.02		
Zinc T-Zn	0.188				5	
<b>Organic Parameters</b>						
Tannin and Lignin		<0.10				
Total Organic Carbon C		1.82				
<b>Field Chemistry (EBA)</b>						
pH		8.17	6.5		8.5	
IDS (ppm)		132			500	
EC (uS/cm)		263				
Temperature (°C)		9.1				

**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)



**Table 4873-3: Summary of Well Assessment Results  
SMALL PUBLIC DRINKING WATER SYSTEMS**

Well Identification			GPS Coordinates		
Building #	Building Name	Location	Northing (+/- 10 m)	Easting (+/- 10 m)	Grade Elevation (+/- 10 m)
4873	Tuchitua Pumphouse	Campbell Highway	6754733	488237	730

Well Details						
Well Casing Diameter (mm)	Year Well Installed	Well Log?	Well Depth (m bg)	Reported Low Permeability Protective Layer?	Pump Setting (m bg)	Static Water Level Below Ground (m-btwc)
150	1974	Yes	13.8	No, sand and gravel only	12.7 m	Approximately 2 m (pump was on at time of inspection)

Potential Contaminant Sources					
Distance from well to nearest point of septic field (m)	Distance from well to nearest building (m)	Distance to surface water body (m)	AST present on property?	Distance from well to AST (m)	Other potential sources of contamination observed on property, and distance to well
Approximately 80 m	Located inside pumphouse	4	AST 1	40	Fuel and paint drums between 15 m and 30 m from the well
			AST 2	50	

Well Construction Details					
Wellhead Above ground (m)	Well Cap	Well Screen	Surface Seal	Apron Grading	Comments
0.07 m above grade	None present	Perforated piping from 8.9 m to 10.4 m	No	No, but site is well drained	The well services the living complex, the maintenance garage, and the electric generating station. The bottom of the well is closed and the casing is perforated from 8.9 m to 10.4 m



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## SMALL PUBLIC WATER SYSTEM ASSESSMENT

### PART A: EBA Site Inspection

Inspector: Ryan Martin

Date June 23, 2005

WELL ID #	Owner	Location Description
4873	YIG	Tutchitva Pumphouse

#### 1. Well Location and Potential Contaminant Sources

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

Campbell Hwy

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

km 110 Campbell Hwy

c. GPS location: N 675 47 33 E 489 237 elev 730m ± 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 \_\_\_\_\_

Grader Station, Electric Generating Station, Living Complex

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

g. Nearest building, specify located inside pumphouse

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: >30m

k. Well location relative to field:  upslope  downslope  lateral

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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

River + Discarded Fuel/Paint drums

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

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

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 inside lockable pumphouse

Entrance by animals?  Yes  No

Casing seal had been removed casing open - Access in building and in well possible

p. Is well site subject to flooding?  Yes  No

Nearby pressure tank is leaking however, no signs directly around wellhead

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

Potential Source 1: River; Distance from well to Potential Source 1: 4 m

Potential Source 2: Fuel/Paint Drums; Distance from well to Potential Source 2: 15 m to 30 m

Potential Source 3: AST 1; Distance from well to Potential Source 3: ~40 m

Potential Source 4: AST 2; Distance from well to Potential Source 4: ~50 m

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

How many? 1  in use  abandoned  require proper sealing

Abandoned/Filled dug well (likely)



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## 2. Well and Wellhead information:

a. When was well installed? Year 1974 Month June

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: 12,690m  measured (if possible)  reported  from log  
45ft

h. Static water level below ground: ~2m (pump on)  
 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 perforated piping - bottom is closed

j. (If bedrock) Does the well have a liner?  yes  No  steel  plastic

k. If there is a well screen: length 5 ft slot size(s) perforated piping  
Location of screen: from 29 ft to 34 ft 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,

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- i. Is the well head below grade? describe in detail 7 cm above grade
- ii. Are there signs of ponding on the enclosure(e.g. water stains, etc.)?  Yes  No  
But nearby pressure tank is leaking
- iii. Is the wellhead enclosed by fiberglass insulations?  Yes  No but likely in pump house walls
- iv. Any evidence of rodents? Specify Yes - well casing is open
- v. Does the well casing have a proper seal cap?  Yes  No

If no, describe condition has been removed - well is open

### 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
- 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 \_\_\_\_\_

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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

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: Inside heated, insulated building

l. Comments on pump installation: \_\_\_\_\_  
\_\_\_\_\_

## **6. Conclusions**

a. Comments on overall installation:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

b. Recommendations: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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## PART B: EBA Site Inspection

Inspector: Paul AUBISSER

Date JUNE 23/05

WELL ID #	Owner	Location Description
<u>4873</u>	<u>YTG.</u>	<u>TUEHITUA PUMPHOUSE.</u>

### 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: \_\_\_\_\_

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?

\_\_\_\_\_

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:

INSTALLATION IS OLD - PRESSURE TANK HAS  
NO BLADDER - IS SUBJECT TO WATER  
LOGGING. WELL HEAD IS WIDE OPEN  
NO WELL SEAL.

b. Recommendations:

INSTALL TREATMENT SYSTEM AS PER  
ANALYSIS. INSTALL UV SYSTEM.  
SUPERCHLORINATE THE WELL & PIPING  
SYSTEM.



FIELD REPORT

Started. JUNE 18. 1974

Completed. JUNE 19. 1974

NAME AND ADDRESS OF CLIENT	DESCRIPTION OF WORK	LOCATION OF WORK
YUKON TERR. GOVERNMENT A.K. CHRISTENSON	WATER WELL	MILE 69 CAMPBELL HWY. TUPCHITUA MAINTENANCE CAMP

FORMATION LOG			DESCRIPTION OF WORK	TIME			
FROM	TO	FORMATION		DATE	FROM	TO	HOURS
0'	14'	SAND, GR. COBBLES	MOVE FROM WATSON LAKE	JUNE 18/74	08:00	22:00	14.0
14'	29'	SAND GRAVEL		19/74	08:30	14:00	5.5
29'	45'	SAND					

CRD. OF CASING & PIPE				REMARKS:
SIZE	TYPE	SIZE	TYPE	
5"	250			BOTTOM CLOSED
FEET	INCH	FEET	INCH	PERFORATED FROM 29'-34'
45'	0"			
STATIC LEVEL Ground level 6.5 Top of casing 7.0				Total Rig Time 19.5 hrs. Total Standby / hrs. Drilling Mud 8 sacks

SIGNATURES

MIDNIGHT SUN. [Signature]  
 TITLE. LES. T. CHRISTENSON - DRIVER

CLIENT.....  
 TITLE.....

TUPCHITUA





### Spill Report Information

<b>Spill #</b>	7701
<b>Jurisdiction</b>	Yukon
<b>Community</b>	
<b>Address</b>	
<b>Highway</b>	Robert Campbell Highway
<b>Milepost</b>	M 69
<b>Feature</b>	Tuchitua River
<b>Location and Cause</b>	Waterouse (Tuchitua) Maintenance Camp - frost cracked drain pipe of fuel storage tank
<b>Latitude</b>	60.932539
<b>Longitude</b>	-129.231391
<b>Incident Date</b>	4/4/1977 4:12:00 AM
<b>Lead Agency</b>	Department of Indian Affairs and Northern Development
<b>Other Agency</b>	Yukon Territorial Government - other
<b>Company(s)</b>	YTG
<b>Amount</b>	7560
<b>Units</b>	Litres
<b>Quantity</b>	Estimate
<b>Release Description</b>	Leaked
<b>Additional Quantitit</b>	
<b>Concentration</b>	
<b>Concentration Unit</b>	
<b>Phase</b>	Liquid
<b>Major Contaminant</b>	Diesel
<b>2nd Contaminant</b>	
<b>3rd Contaminant</b>	
<b>4th Contaminant</b>	
<b>Outcome</b>	oil soaked snow moved to gravel pit some distance from camp - cleaned-up - little chance of contamination



**Photo 0053:** 4873 Wellhead



**Photo 0055:** 4873 Leak in piping from pressure tank



**Photo 0054:** 4873 Pressure tank