9.0 BUILDING 1334: LAKEVIEW FIRE HALL

9.1 Description of Existing Water Supply System

The existing water supply at the Lakeview Fire Hall consists of a single well that supplies water to an elevated holding tank (4,550 L). Sodium Hypochlorite is injected by a Grundfos Digital Dosing chlorinator into the piping system prior to delivery to the overhead storage tank. There is a back-up LMI system in place as well. The water flows from the tank by gravity to an overhead truck fill for water delivery to local residents and also feeds into a pressurized domestic system servicing the fire hall. There is also an exterior public water station where local residents retrieve water. In addition, water is fed to two water-holding tanks used to fill the fire truck. The coordinates of the wellhead, as measured by a hand held GPS device, were recorded as:

- UTM ZONE 8
- Northing: 6702194
- Easting: 540097

The well was drilled by Fredalena Enterprises in 1992, and is reported to be 28 m deep. The static groundwater level at the time of drilling was reported to be 19.5 m below ground, and the wellhead is located approximately 1.8 m below grade inside a 1.2 m diameter steel culvert with a wooden box enclosure at surface.

Figures detailing the site features and system details are provided in Appendix 9.

9.2 Description of Existing Wastewater Systems

The wastewater disposal system for the Lakeview Fire Hall consists of a septic tank that discharges to an adjacent ground disposal field located about 34 m south of the well. The septic field is located at an elevation that is approximately 5 m lower than the ground surface at the wellhead, and downslope of the well.

9.3 Water Quality Results

9.3.1 Water Quality Results from Previous Sampling

Bacteriological

Bacteriological sampling of water from the Lakeview Fire Hall water system has previously been completed on a number of occasions by EBA for the Property Management Agency as part of a separate contract. EBA was provided access to the YTG database in order to review the results of this previous bacteriological sampling. Nine samples were collected from this system between October 2004 and March 2005, and were tested using the presence/absence test method for Total Coliform and *E. coli* by Yukon Environmental Health Services. Results are tabulated in Table 1334-1 in Appendix A9. According to the YTG database, *E. coli* Bacteria and Total Coliform bacteria was reported as absent in each of the nine samples for which results were provided.

Detailed Potability Analyses

A water sample was previously collected from the Lakeview Fire Hall water system on June 15, 2004. The sample was submitted to ETL EnviroTest in Surrey BC for detailed potability analyses. The results of these analyses are summarized in Table 1134-2 and are included in Appendix B. EBA reviewed the analytical results to compare them with the Canadian Drinking Water Quality Guidelines (CDWQG) and to observe general water quality, identify and recommend additional sampling and analytical, and to identify potential indicators of contamination.

- The water quality for the sample obtained on October 5, 2004 indicated that the groundwater source was calcium-bicarbonate type with high hardness and a pH of approximately 8.22.
- At 0.556 mg/L, the iron concentration exceeded the Canadian Drinking Water Quality Guidelines (CDWQG) aesthetic limit of 0.3 mg/L.
- The water quality results indicated that all other health based and aesthetic objectives were met for the parameters analyzed.

9.3.2 Identification of Additional Analytical Testing Required

Analyses for trihalomethane and haloacetic acids were identified as additional requirements due to the operation of a chlorine disinfection system. The results of these additional

analyses indicated that all compounds analyzed were present in concentrations less than the detection limits of the respective analyses.

The assessment team completed analysis of the residual chlorine concentration of a water sample from the kitchen tap. The results indicated a concentration of 0.36 mg/L at the time of the inspection. Residual chlorine is currently monitored weekly at the Lakeview Fire hall, and results recorded over the previous six weeks indicated concentrations ranging between 0.25 and 0.31 mg/L. The results have been reported to range between 0.2 and 0.7 mg/L (pers. Comm. Fire Chief Jurgen Williams). These results indicate that the residual chlorine concentration is often less than the required concentration of 0.4 mg/L for water delivery (e.g. for pick-up at the truck fill). However, the results satisfy the requirement of 0.2 mg/L for the point of consumption for the domestic system within the Fire hall.

9.3.3 Indicators of Potential Contamination

No indicator parameters were assessed to be elevated above inferred background levels, indicating that the well water supply is not likely impacted by nearby surface sources of contamination.

9.4 Conceptual Hydrogeology

The groundwater flow direction in the vicinity of the Lakeview Fire hall is inferred to be southwesterly towards Marsh Lake. Predominantly well-graded granular sediments were reportedly encountered during the well drilling, and the well appears to have been terminated within a reasonably productive overburden aquifer. The static water level was reported to be about 19.5 m below ground and the well was terminated at about 28 m depth.

9.5 Potential Contaminant Sources

Potential contaminant sources from observations during the site investigation are compiled in Table 1334-4 in Appendix A9. Photos of potential contaminant sources are provided in Appendix A9.

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

- Above ground fuel storage tank at 27m.

9.5.1 Spills Records and Contaminated Sites Search Results

Investigation of available spills record information and contaminated sites search results found that there had been a spill reported November 22, 1987. The spill has been recorded in the Environment Canada Spill Report Information Database as Spill # 8717. There had reportedly been a transport that had lost control and crashed approximately 500 m south of the Lakeview Marina turnoff on the Alaska Highway. Due to frozen condition and lack of surface drainage area, environmental damage was reportedly minimal. Since the reported spill location is at least 1 km away from Lakeview Fire Hall, this spill is not considered to be a potential concern to the water quality at the Lakeview Fire Hall.

9.6 Identified Water System Deficiencies and Associated Risk

9.6.1 High and Medium Risk Deficiencies

The following high-risk and medium deficiencies were identified for the Lakeview Fire Hall water supply system:

- Poor surface completion of the wellhead below ground;
- 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;
- Chlorine injection valve cracked;
- Present piping configuration may allow water from the fire truck fill tanks to enter the potable water system which presents a health risk; and
- There is no backflow preventer on the hose bib line.
- Fire truck fill tanks do not appear to be cleaned regularly.
- The well is approximately 20 m from the sewer discharge pipe.

9.6.2 Low Risk Deficiencies

The following low-risk deficiencies were identified for the Lakeview Fire Hall water supply system:

- Peak demand flow may not be sufficient. According to YTG plumber, the domestic water tank is too small for peak demand, and the piping size should be increased.
- The overflow pipe discharges inside the building in the event of overfilling.
- The arsenic concentration exceeds the proposed maximum acceptable concentration.
- The gasoline AST is approximately 27 m from the wellhead. This has been identified as low risk because it is double walled tank with a Kam lock fill and small overflow containment.

9.7 Mitigative Options for Deficiencies

Mitigative options were developed to address the deficiencies identified in the previous section. Deficiencies are prioritized by risk in the following sections.

9.7.1 Priority 1

The wellhead completion should be improved to decrease the susceptibility to surface contamination. This would involve raising the well casing to a minimum of 500 mm above ground level and retrofitting a proper surface seal to 3 m depth around the well casing. The ground surface should then be graded to promote surface drainage away from the well. A fence should also be placed around the well to prevent access for animals and people.

The draft guidelines provide that wells "under the direct influence of surfacewater" require filtration and disinfection. As such, it is recommended that an adequate filter system to remove particles down to 1 micron (absolute) be installed.

Reportedly, the chlorine injection valve has already been be repaired by YTG.

The configuration of the piping must be adjusted to eliminate the existing cross-contamination potential from the fire truck fill tanks. This would involve moving the solenoid valve for the fire truck fill tanks closer to the tanks and installing a backflow preventer. The domestic feed line should be installed prior to the solenoid valve, and should be increased from ¾ inch to 1-inch diameter. If not already completed, a backflow preventer should be installed on the hose bib line.

These are conceptual design recommendations based on the information available for the purpose of planning and budgeting. Engineering input will be required for final system specifications.

9.7.2 Priority 2

The fire truck fill tanks should be cleaned on a regular schedule, every 12 months should be sufficient.

The overflow piping should be extended to the outside of the building. This upgrade should be undertaken at the same time as the high risk piping adjustments.

9.7.3 Priority 3

Further investigation of the reported water quantity problems under peak demand should be evaluated. This would involve assessment of the actual demand versus the capabilities of the existing system. Modifications to the pump and/or tank sizes should be made as required, provided the well is capable of supplying water at the increased rate. The sustainable well yield may also have to be assessed.

As indicated previously, the proposed maximum acceptable concentration for arsenic is likely to change in the near future. Arsenic treatment would likely be required at such time as the guidelines change. This has been considered a lower risk at this time given that there will most likely be a grace period to give water system owners some time to implement the necessary treatment.

9.8 Cost Estimates for Mitigative Options

Engineering costs for pre-design and preparation of process diagrams and specifications for project tendering for water treatment systems are estimated to be 25% of construction costs. Engineering costs for other 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.

9.8.1 Priority 1

The cost for the recommended wellhead improvements is estimated to be about **$5,000.**

The cost to adjust the piping configuration as recommended is estimated to be about **$3,500** for materials and labour (4” backflow preventer costs approx. $2500).

The cost to install a backflow preventer (1 “ DCA) within the outside hose bib water line would cost approximately **$400** installed.

9.8.2 Priority 2

The cost to include the fire truck fill tanks into the regular cleaning program for the domestic tank is estimated to be about **$500** per cleaning and should be included in operations and maintenance of these systems.

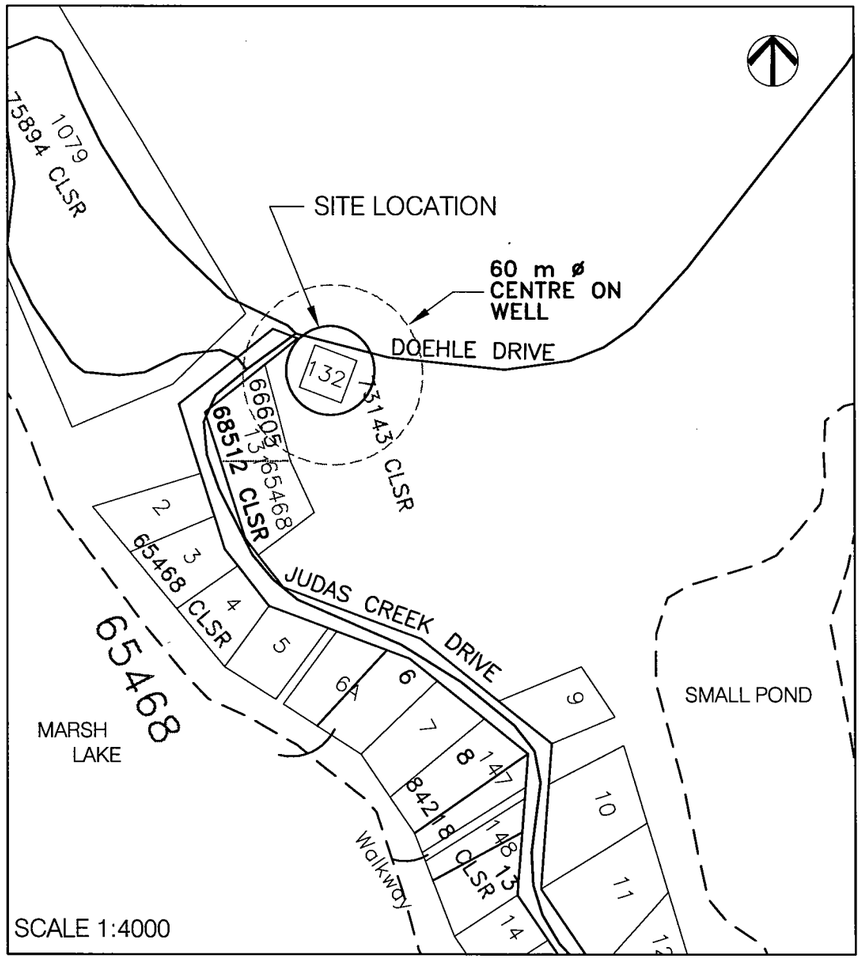
The cost to adjust the overflow piping is included in the above high risk piping improvement estimate.

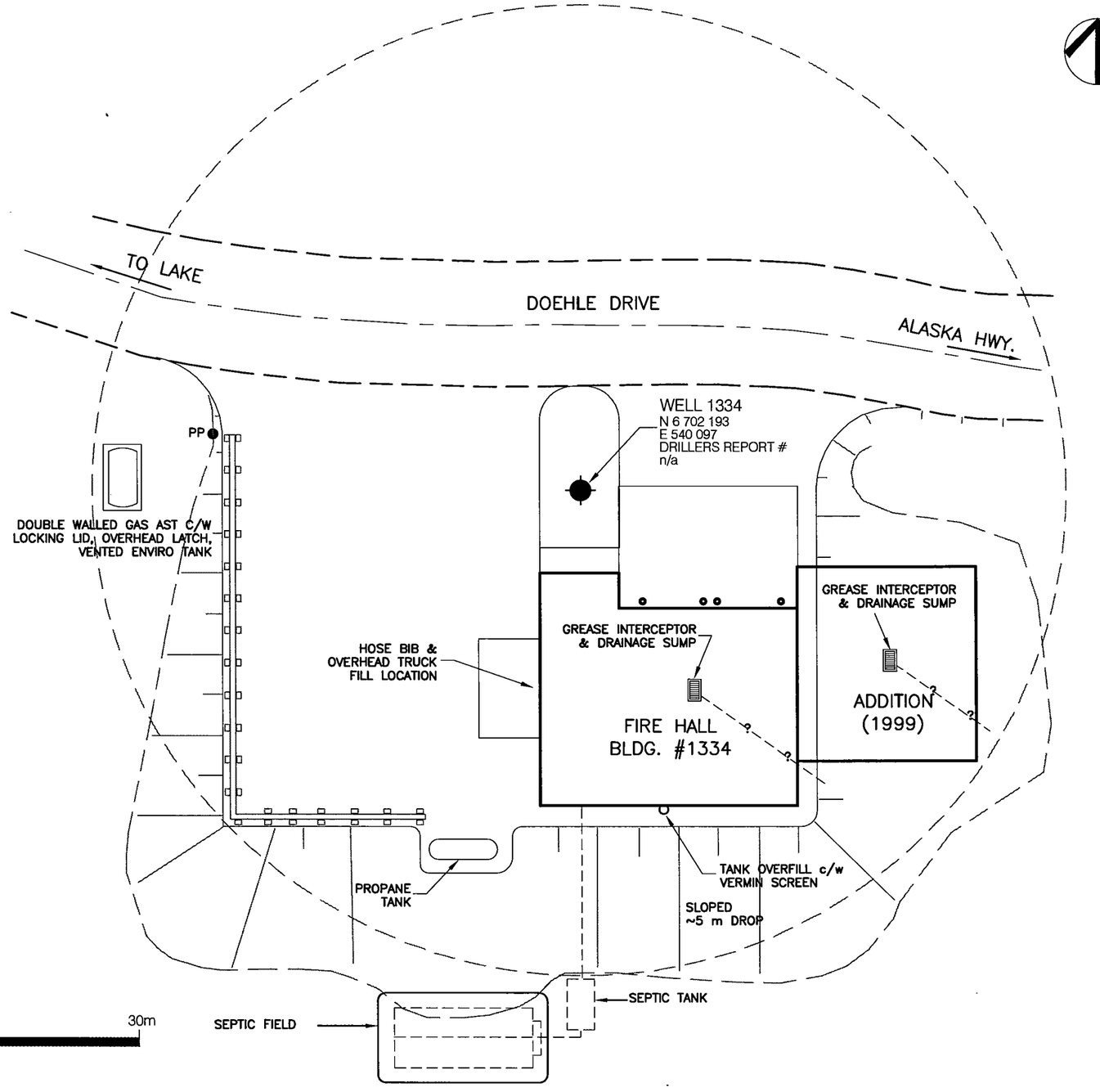
An assessment of the actual water demands and detailed evaluation of the existing system capabilities (not including a well yield evaluation) is estimated to be about **$2,000**.

9.8.3 Priority 3

The costs to increase the domestic storage volume and/or increase the pump capacity are estimated to range from **$5,000 to $10,000.**

The cost for a point of entry arsenic removal system is in the order of **$4,000.**





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	DD/MM/YY DATE	XXX APPROVED
0	ISSUED FOR CLIENT REVIEW		

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:	D:\ReviewTemplate\Rev0.dwg

CLIENT: Yukon
Highways and Public Works
Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WHITEHORSE REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

LAKEVIEW FIREHALL
BUILDING 1334
SITE LOCATION DIAGRAM
WELL ID: 1334

REVISION ISSUE: 0

DRAWING No.: FIGURE 1334A

Z:\0201Drawings\1260002 Water Assessment YTG\001 - Whitehorse Region\lakeview\1260002 Lakeview Firehall Plan.dwg, 6/10/2005 1:49:18 PM, \\whi-eb-dc001\WHI201COMMON

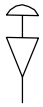
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

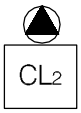

SOLENOID

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

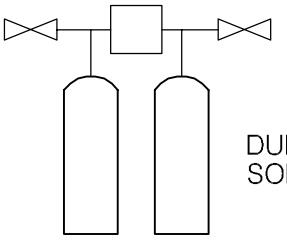
FLOW METER

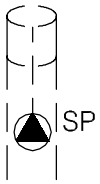
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

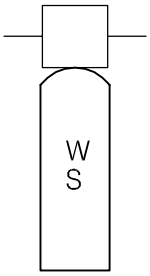


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

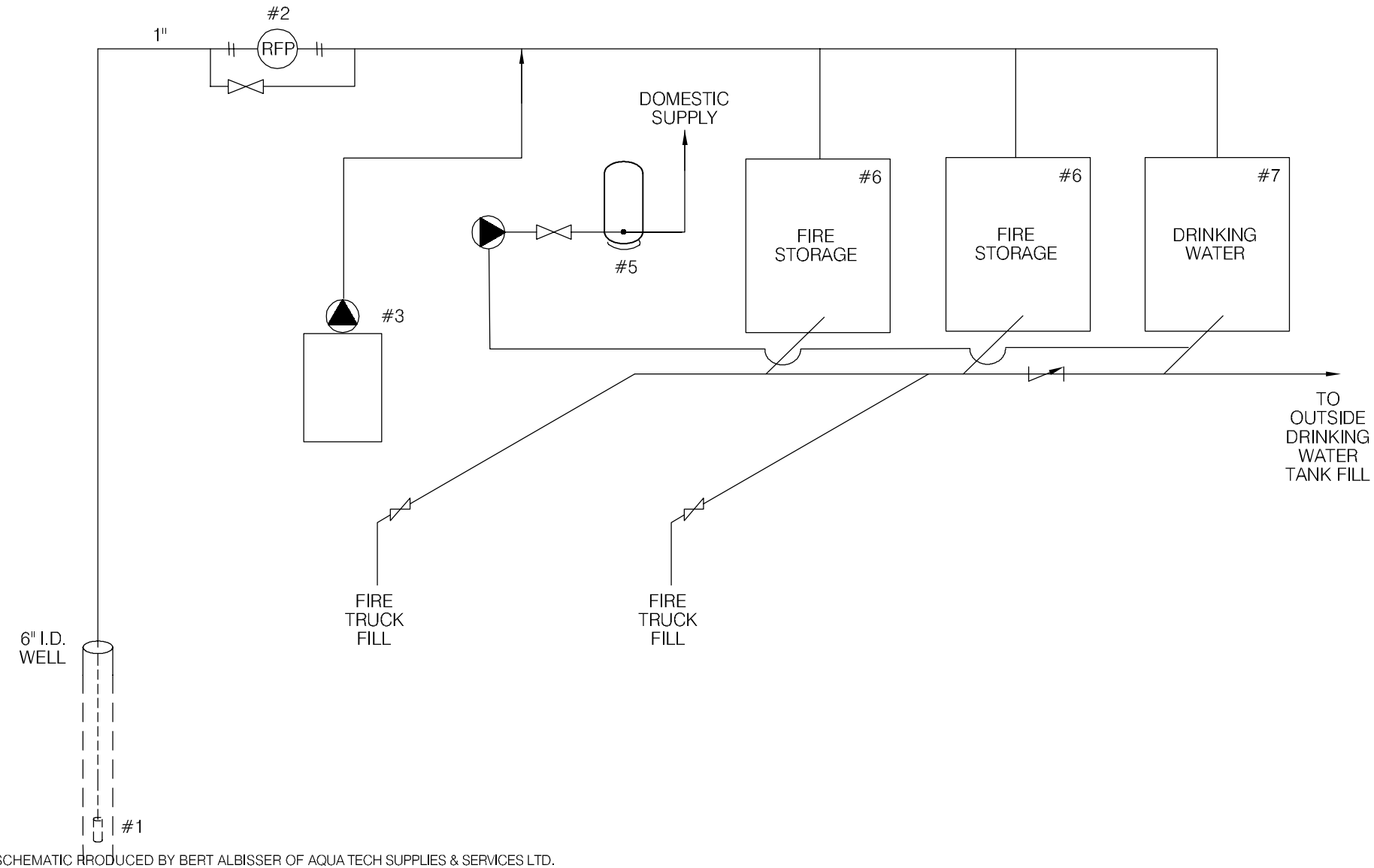


WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WHITEHORSE 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 RRODUCED BY BERT ALBISSER OF AQUA TECH SUPPLIES & SERVICES LTD.

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WHITEHORSE REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 1334 LAKEVIEW FIRE HALL - MARSH LAKE	
DATE APRIL 2006	DWN. JSB	CHKD. RMM	FILE NO. 1260002.001		DWG.: FIGURE 1334B

Z:\0201Drawings\1260002 Water Assessment YTG\001 - Whitehorse Region\lakeview\1260002 Lakeview Fire Hall 1334 Schematic.dwg, 4/6/2006 9:39:29 AM, Adobe PDF, jbuyck

Whitehorse Region – Lakeview Firehall
Building # 1334

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	4" Sub. Pump	Goulds	25G10012		K24278	4"
2	1" Flow Meter Pulser	Hayes.				1"
3	Chlorination System	Grundfos.	DME8-10	96412847	692	3/8"
4	Domestic Pump	Myers.	HT50S			1 1/4" x 3/4
5	Pressure Tank.	Well Rite	WR60-02			
6	Storage Tanks		Fire Water			6'4" x 5'H
7	Storage Tank		Drinking Water			6'4" x 5'H
8	Spare Chlorine Pump	LMI	A161-162S.			3/8"
9						
10						

TABLE 1334 - 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
1334	Lakeview Firehall (Fill Station)	9	Sept-04 to Mar-05	no	0/9	no	2-Mar-05

Table 1334-2: Water Quality Results

SOURCE:	Building 1334 - Lakeview Fire Hall		GCDWQ Criteria		
Location/ Resident	Judas Creek Subdivision,				
Address					
Treatment	Chlorination				
Source of Water	On-Site Well				
Purpose of Sampling	Baseline	Additional Sampling			
Sample Location		Kitchen Tap			
Date Sampled		9-May-05	**Lower Limit**	**Upper Limit**	
Physical Tests *(ALS)*			**AO**	**MAC**	**AO**
Colour (CU)	<5.0				15
Conductivity (uS/cm)	678				
Total Dissolved Solids	405				500
Hardness CaCO3	163		AO >200 = poor, > 500 unacceptable[A]		
pH	8.22		6.5		8.5
Turbidity (NTU)	0.38			1	5
Dissolved Anions *(ALS)*					
Alkalinity-Total CaCO3	276				
Chloride Cl	6.67				250
Fluoride F	0.328			1.5	
Sulphate SO4	109				500
Nitrate Nitrogen N	<0.10			10	
Nitrite Nitrogen N	<0.10			1	
Total Metals *(ALS)*					
Aluminum T-Al	<0.010				
Antimony T-Sb	<0.00050			0.006	
Arsenic T-As	0.0059			0.025	
Barium T-Ba	0.021			1	
Boron T-B	0.25			5	
Cadmium T-Cd	<0.00020			0.005	
Calcium T-Ca	52.3				
Chromium T-Cr	<0.0020			0.05	
Copper T-Cu	0.020			1	
Iron T-Fe	0.095				0.3
Lead T-Pb	<0.0010			0.01	
Magnesium T-Mg	47.5				
Manganese T-Mn	0.0327				0.05
Mercury T-Hg	<0.00020			0.001	
Potassium T-K	3.22				
Selenium T-Se	<0.0010			0.01	
Sodium T-Na	19.4				200
Uranium T-U	0.00054			0.02	
Zinc T-Zn	<0.050				5
Trihalomethanes					
Bromodichloromethane		<0.0010			
Bromoform		<0.0010			
Chloroform		<0.0010			
Dibromochloromethane		<0.0010			
Total Trihalomethanes		<0.0040		0.1	
Haloacetic Acids					
Bromoacetic Acid		<0.0020			
Bromochloroacetic Acid		<0.0020			
Chloroacetic Acid		<0.020			
Dibromoacetic Acid		<0.0020			
Dichloroacetic Acid		<0.0020			
Trichloroacetic Acid (TCA)		<0.0020			
Field Chemistry (EBA)					
pH		7.99	6.5		8.5
TDS		330			500
EC (uS/cm)		650			
Temperature		10			
Free Available Chlorine		0.36			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 (^{o}C) and Turbidity (NTU)

< = Less than the detection limit indicated.

AO = Aesthetic Objective

MAC = Maximum Acceptable Concentration (Health Based)

Table 1334-3: 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)**
1334	**Lakeview Fire Hall**	**Marsh Lake**	6702194	540097	678

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	1992	Yes	28	Silt - 0m to 7m Clay - 21m to 28m	?	?	17.8

Well Construction Details				
Wellhead Above ground (m)	**Well Cap**	**Well Screen**	**Surface Seal**	**Apron Grading**
1.7 below grade	Split Cap Gasket	Yes 1.2m	Unlikely	No, but slopes away from pit

Table 1334-4: Potential Contaminant Sources
Building 1334 – Lakeview Fire Hall

Potential Contaminant Source	Potential Contaminants	Distance from Water Source	Northing	Easting
Dump or Landfill	***Organic*** and inorganic chemicals.	>120 m		
Cemetery	***Biological***[1]**,** inorganic[2] and organic parameters.	Approximately 800 m		
Sewage lagoon	***Biological,*** inorganic and organic parameters.	>300 m		
Sewage lines, tanks and lift stations	***Biological,*** inorganic and organic parameters.	**Approx. 20 m**		
Septic fields	***Biological and Inorganic*** parameters.	34 m		
Gas stations	***Organic and Inorganic*** parameters.	>30 m		
Undergrounds Fuel Storage Tanks (USTs)	***Organic*** parameters.	>30 m		
Above ground storage tanks (ASTs)	***Organic*** *parameters.*	**27 m**	6681117	538692
Aviation Fuel Drums	***Organic*** *parameters*	48 m	6621185	538644
Naturally occurring sources of contamination	***Radionuclides, Bacteria and Viruses from surfacewater sources.***	>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 Date May 9, 2005

WELL ID #	Owner	Location Description
1334	YTG	Lakeview Fire Hall

1. Well Location and Potential Contaminant Sources

a. General location of well: (Community, Subdivision, etc.)
Judas creek subdivision, Marsh Lake

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

c. GPS location: 0540097 Easting ; 6702194 Northing Elv. 678m ± 6m

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_____
water is piped to a public-use storage tank

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

f. Nearest building, specify Lakeview FireHall, 4 m

g. Distance from well to building 4 m
0540097 Easting; 6702193 Northing, Elv 676m ± 22m

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

i. Distance from well to nearest point of known field: 34 m and with ~5m drop

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

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
Fuel tank 27m away

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
There is only a broken lock and a large flower pot on top

Entrance by animals? ☐ Yes ☒ No
There was no evidence of animals near the wellhead

o. Is well site subject to flooding? ☒ Yes ☐ No
It is located in a pit

p. Is the well site well drained? ☒ Yes ☐ No
The grade elevation at the pit is higher than the surrounding ground

q. 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 _____

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

☒ Yes ☐ No Describe _____

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

0540068
6702188
Elv 675m ± 15m

Potential Source 1: Gas Storage Tank; Distance from well to Potential Source 1: 27m

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

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

2. Well and Wellhead information:

a. When was well installed? Year 1992 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 1.2m ☐ No
Galvanized steel colvert with a pwf 0.78m square box at surface

f. Well casing: Diameter 15cm (6") Material: ☒ steel ☐ plastic ☐ concrete

g. Depth of well: 28.2m ☐ measured (if possible) ☐ reported ☒ from log

h. Static water level below ground: 19.6m 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

k. If there is a well screen: length 4 ft slot size(s) 25 slot
Location of screen: from 88 ft to 92 ft from (log) reported

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
The pit is walled by a 1.2m galvanized steel colvert with a pwf box on top
☐ 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 1.8m below grade

ii. Are there signs of ponding on the enclosure(e.g. water stains, etc.)? ☒ Yes ☐ No
Evidence of water stains on culvert and the pit is in a generally unsanitary condition

iii. Is the wellhead enclosed by fiberglass insulations? ☐ Yes ☒ No

iv. Any evidence of rodents? Specify There is no direct evidence of rodents, despite general unsanity condition of pit

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 ☒ Yes ☐ No

Explain (filtration, disinfection etc...) Chlorine treatement

---

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 _____

d. Date installed: June 8, 1992 By: Fredelenen Enterprises

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

f. Drop pipe for submersible pump: ☒ steel (likely) ☐ 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
a valve must first be installed

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

l. Comments on pump installation: _____

6. Conclusions

a. Comments on overall installation:

b. Recommendations:

PART B: EBA Site Inspection

Inspector: _____ Date _____

WELL ID #	Owner	Location Description
1334	YTG.	LAKEVIEW FIRE HALL.

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 . 36 _____ (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 NOT APPLICABLE.

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:

Where is it located?
Comments: IN 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: _____

Overall Tank (FIRE HALL STORAGE TANK

What are the tank size and dimensions?

~~N/A~~ AG 1250

What material is the tank constructed of? ~~N/A~~ FIBREGLASS

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 ~~N/A~~

Does the lid have a tight seal and is it watertight when closed? YES (NO) ~~N/A~~

Does the tank have an overflow or high level whistle? (YES) NO ~~N/A~~ S/B PIPED OUTSIDE.

Is the water tank drain accessible? YES (NO) ~~N/A~~ NO DRAIN.

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: VERY LITTLE

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:

TANK FILL SOLENOID VALVE SHOULD BE MOVED TO THE TANK AREA. 3/4" DOMESTIC WATER LINE S/B INSTALLED AT A POINT PRIOR TO THE SOLENOID TO SUPPLY FRESH CHLORINATED WATER TO THE BUILDING.
PRESENT PIPING CONFIGURATION PRESENTS A HEALTH RISK FROM CONTAMINATED WATER OF FIRE TANK. Cl_2 INJECTION VALVE CRACKED.

b. Recommendations:

MOVE SOLENOID.
DISCONNECT PRESENT FEED TO DOMESTIC PUMP.
INSTALL 1" FEED LINE TO PUMP SYSTEM.
INSTALL BACKFLOW PREVENTER IN FIREMAN SUPPLY LINE.
PIPE OVERFLOW TO OUTSIDE PIPING TO PREVENT INDOOR FLOODING.
INSTALL NEW INJECTION VALVE RIGHT AWAY.

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 June Month 1992

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: 1992'

e. Who was the well constructed by?
Indicate contractor's name: Fredbyrne Contracting

f. Are you, the owner ☐ Yes or other: inspector

g. Who maintains the well? Community Services

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? Fredbyrne Contracting 1992

b. What type of pump do you have? 1 hp. GOULD 25G10 0412

c. Pump delivers water to: ☐ pressure tank ☑ elevated tank ☐ other _____

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?
The well is good but the tank inside is to small

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

☐ Sulpher (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 week
Who takes them? Community Services VTG.

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?
In Peak Demand pump is small, pipe to tanks from pump should be increased.

Fredlund Enterprises Ltd.
Box [illegible] Phone [illegible]
Whitehorse, Y.T. Y1A [illegible]

JUNE 8, 1992.

WELL LOG JUDAS CREEK FIREHALL

MARSH LAKE FIREHALL.

0 - 6' SILT + SAND.
6 - 23' SILT, SAND, SOME GRAVEL.
23 - 72' SAND
72 - 86 SAND, GRAVEL + CLAY (FAIRLY PACKED).
86 - 92' SAND, SOME GRAVEL + CLAY.

DEPTH OF WELL 92'
STATIC LEVEL 64'
PUMPING LEVEL @ 15 G.P.M 65' AFTER 8HRS OF PUMPING.
RECOVERY ALMOST INSTANT TO STATIC

SCREEN 25 SLOT EXPOSED 4'

COMMENTS: BAILED WELL FOR 2HRS @ 40 G.P.M.
AND DREW WATER DOWN TO 72'.
RECOVERY TO CLOSE, TO STATIC, WAS 20 SECONDS.

WOULD NOT HESITATE TO PUMP @ 50 G.P.M WITHOUT ANY PROBLEMS.

WATER SAMPLES TAKEN IN. TO HEALTH.

FREDLAND ENTERPRISES LTD.

Fred Lamhoff.

393-6216

Environment Canada Environnement Canada

Enforcement and Emergencies Section
91782 Alaska Highway, Whitehorse, YT Y1A 5B7
PH: 867.667.3400 FAX: 867.667.7962

Spill Report Information

Spill #	8714
Jurisdiction	Yukon
Community	
Address	
Highway	Alaska Highway
Milepost	KM 1414
Feature	Marsh Lake
Location and Cause	500 m S Lake View Marina turn-off - transport went off road and jacknifed resulting in punctured saddle fuel tank
Latitude	60.4658333333333
Longitude	-134.252222222222
Incident Date	11/22/1987 3:30:00 PM
Lead Agency	Environment Canada - Environmental Protection Service
Other Agency	Yukon Territorial Government - Highways
Company(s)	Diablo Transportation Inc (California)
Amount	0.4
Units	Tonnes (Metric)
Quantity	Actual
Release Description	Spilled
Additional Quanitit	
Concentration	
Concentration Unit	
Phase	Liquid
Major Contaminant	Diesel
2nd Contaminant	
3rd Contaminant	
4th Contaminant	
Outcome	min env dmg - fuel absorbed by snow and ground in road-side ditch - no surface water drainage in area - transport hauling explosives - not damaged

Photo 0071: 1334 Wellhead

Photo 0072: 1334 DME Chlorinator and LMI Chlorinator back-up system.

Photo 0073: 1334 Flow Meter

Photo 0074: 1334 Tanks and Truck Fill (domestic tank far right)