13.0 BUILDING 3123: BEAVER CREEK GRADER STATION

13.1 Description of Existing Water Supply System

Building 3123, the Beaver Creek Grader Station maintenance garage, is currently served by a water supply system that delivers water from a 32.8 m deep well. The well is located in a pit at the northeast end of the grader station. The well location and other details about the surrounding area are provided in Figure 3123-A in Appendix A13. The coordinates of the wellhead, as measured by a handheld GPS device, were recorded as:

- UTM ZONE 7
- Northing: 6916580
- Easting: 506318

There is an inline filter (5 micron cartridge) present, but there is otherwise no treatment or disinfection system for the water supplying the grader station maintenance garage. A schematic detailing the well supply system is provided as Figure 3123-B in Appendix A13.

13.2 Description of Existing Wastewater Systems

There is a septic tank present at the southeast corner of the building approximately 20 m from the well. Septic effluent is discharged to an in ground disposal field south of the tank approximately 34 m from the well and potentially upgradient of the well. There is a rock pit that is used to drain the garage sumps located approximately 34 m south that is also potentially up gradient from the well. There is also an old abandoned septic tank and field approximately 22 m north and likely downgradient from the well. A site plan showing the septic system is provided as Figure 3123-A in Appendix A13.

13.3 Water Quality Results

13.3.1 Water Quality Results from Previous Sampling

Bacteriological

Eight samples were collected from the Beaver Creek Grader Station water system between October 2004 and June 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 3123-1 in Appendix A13. Coliform bacteria and *E. coli* were reported as absent in each of the eight samples for which results are provided.

Potability

Water samples were previously collected from the Beaver Creek Grader Station water system on September 21, 2004 and June 15, 2005. The samples were submitted to Northwest Labs in Surrey, BC and ALS Environmental in Vancouver, BC for potability analyses. The results of these analyses are summarized in Table 3123-2 in Appendix A13. 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 indicators of potential contamination. Details are summarized below:

- The water quality results indicated that all health based and aesthetic objectives were met for the parameters analyzed;
- The water quality results indicated that the groundwater from which this system receives its water supply is a calcium bicarbonate type water; and,
- The hardness (as $CaCO_3$) was 97.3 mg/L during the first sampling event, and is considered moderately hard. During the second sampling event the hardness (as $CaCO_3$) was 152 mg/L, and is considered very hard.

13.3.2 Identification of Additional Analytical Testing Required

Additional analytical for the Beaver Creek Grader Station maintenance building that was identified to be included during the water system assessments is detailed below:

- UV absorbance and UV transmissivity, as well as tannins and lignin, to determine potential for UV treatment as a disinfection option for this water system;
- Total organic carbon (TOC);
- Extractable Petroleum Hydrocarbons (EPH) and Polycyclic Aromatic Hydrocarbons (PAH) to determine if there are any indications of hydrocarbon contamination; and,
- Measurements in the field for total dissolved solids, conductivity, pH, and temperature.

Additional Analytical Results

A water sample was obtained during the water system assessment on July 27, 2005, and was submitted to ALS Environmental in Vancouver, BC for analysis. These results are summarized in Table 3123-2 in Appendix A13 and the laboratory reports are included in Appendix B. The following items are of note:

- EPH and PAH concentrations were below analytical detection limits; and,
- The water quality results from additional analytical sampling indicated that all health based and aesthetic objectives were met for the parameters analyzed.

13.3.3 Indicators of Potential Contamination

Chloride, nitrate and nitrite concentrations can indicate impacts from surfacewater sources or septic waste. Chloride concentrations were reported to be within the normal background ranges for groundwater in the area. Nitrate and nitrite concentrations for this sample were low and within the normal background range for this area. These water quality results do not suggest that the aquifer from which the groundwater is obtained for the Beaver Creek Grader Station is under the influence of surfacewater sources or septic wastes.

13.4 Conceptual Hydrogeology

The log for this well indicates that the well is completed at a depth of 32.8 m within a fine sand and gravel aquifer. The well lithology indicates the presence of variable interbedded fine grained material from 11.6 to 29.6 m. This is consistent with the lithology for most wells in the Beaver Creek area which typically indicate coarse sand and gravel with cobbles and small boulders to depths of at least 30 m. The well logs also indicate that discontinuous lenses of finer-grained sediments persist throughout the area, but in general the sediments are dominated by coarse alluvium. Some discontinuous permafrost is also interpreted to persist throughout the Beaver Creek area. The interbedded nature of the fine sediments which persist in the area provides limited aquifer protection from surficial sources of contamination. A study previously completed in the Beaver Creek area by EBA determined that the direction of groundwater flow in the vicinity of the site is north to northeasterly.

13.5 Potential Contaminant Sources

Potential contaminant sources from observations during the water system assessment are compiled in field notes in Appendix A13. Photos of potential contaminant sources are also provided in Appendix A13.

Potential contaminant sources within 30 m of the wellhead are:

- An underground fuel storage tank (UST) at 22 m;
- An above ground used oil EnviroTank (AST) at 7 m;

- A cold mix asphalt mix pile at 7.5 m;
- An abandoned septic field located at 22m.

In addition, industrial activities take place in close proximity to the well. There is also a rock pit located approximately 34 m away from the wellhead. Various scrap metal and parts are located around the site. The current septic field (in use) is located 34 m away and upgradient from the well.

13.5.1 Spills Records and Contaminated Sites Search Results

The Government of Yukon Environmental Programs Branch and Environment Canada Environmental Protection Branch did not identify any recorded spill events or contaminated sites issues for this site or neighbouring sites.

13.6 Identified Water System Deficiencies and Associated Risk

13.6.1 High and Medium Risk Deficiencies

- Poor surface completion of the well (located in a PWF wooden enclosure and casing only extends 100 mm above grade);
- There is no surface sanitary seal (grout or bentonite seal as required by the Canadian Groundwater Association's Guidelines for Water Well Construction;
- 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;
- The well is located within 30 m of potential sources of contamination, including an above ground used oil storage tank at 7 m and an asphalt cold mix pile at 8 m;
- There is a former rock pit or septic leach pit located 22 m upgradient from the well;
- It was reported by grader station employees that there had previously been a break in the septic line or discharge line to the rock pit (they were unsure which) within 30 m of the well; and,
- There is no treatment or disinfection system.

13.6.2 Low Risk Deficiencies

- There were no low-risk deficiencies identified for this site. All deficiencies are considered either high or medium risk.

13.7 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).

13.7.1 Priority 1

Additional assessment would be prudent to confirm the location of the leak in the septic or rock pit discharge line, and to repair the leak as required. As well, to mitigate immediate risk issues, it is recommended that the following be completed:

- Superchlorinate the well and water system, and install a chlorination tap at the wellhead for future disinfection; and,
- Install a properly sized NSF/ANSI 55 certified UV system with a 5 micron pre-filter (NSF 61). These are conceptual design recommendations based on the information available for planning and budgeting purposes. Engineering input will be required for final system specifications.

13.7.2 Priority 2

Several options have been presented for consideration for Priority 2 upgrades to mitigate longer-term risks.

Option 1: Upgrade Existing Well and Relocate Potential Contaminant Sources

To rehabilitate the existing well, and ensure that it provides safe drinking water for the long-term, it is recommended that the following work be completed:

- Standard wellhead upgrades to raise casing to at least 500 mm above grade and retrofit a surface sanitary seal (grout or bentonite as deep as possible);
- Relocate AST;
- Relocate UST;
- Relocate cold mix asphalt pile; and,
- Decommission former leach pit.

Option 2: Construct New Well to Serve Facility

This second option proposes that a new well be drilled to serve the facility, and that the existing well be properly decommissioned. It is recommended that the 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 inaccessible to animals and unauthorized personnel;
- The well must be located at a distance greater than 30 m from any potential source of contamination, including the above ground storage tanks and all parts of the septic system;
- 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.

Option 3: New Cluster Well Construction

Option 3 presents the alternative of a cluster well installation to provide water supply to the Grader Station, Health Centre, Visitor Reception Centre and Fire Hall. For this option, it is assumed that a heated building enclosure would be constructed to house the well and treatment system. Advantages of this option relative to the other options presented is that it would offer combined savings on capital costs, reduced life cycle costs, additional system security, and reduced maintenance requirements.

13.7.3 Priority 3

No Priority 3 mitigative options have been identified.

13.8 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.

13.8.1 Priority 1

The estimated costs for the recommended Priority 1 upgrades are detailed below:

- Install chlorination tap on wellhead - **$200**
- Well and water system superchlorination - **$200.**

- Filtration to 1 micron absolute filtration and UV disinfection system- **$3,000.**

The estimate total cost for Priority 1 recommended upgrade is estimated at **$3,400** including materials and labour.

13.8.2 Priority 2

Option 1: Wellhead Upgrades

Option 1 estimated costs are provided below:

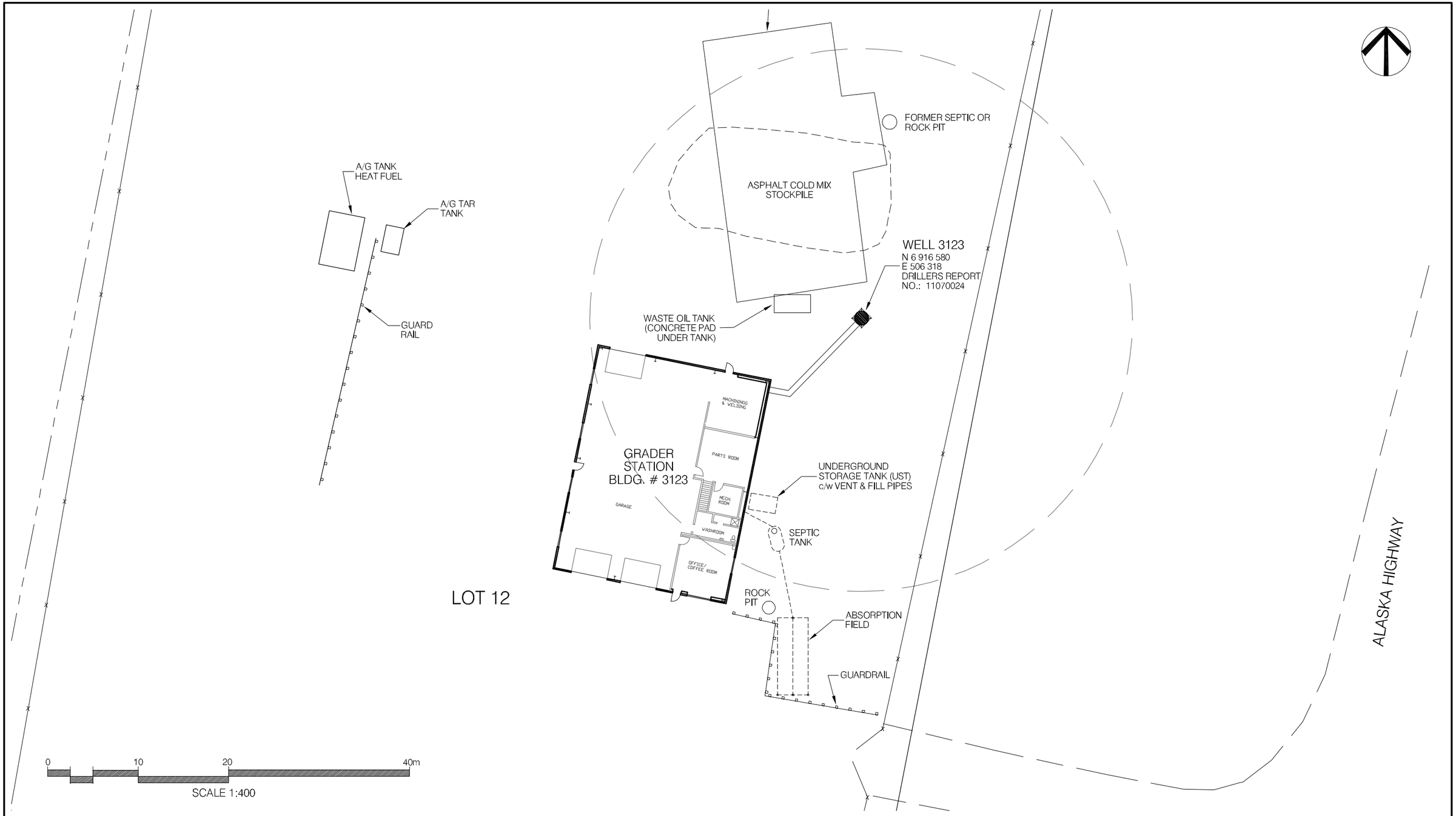
- The estimated cost for standard wellhead upgrades is approximately **$5,000.**
- A Class D estimate of the cost to relocate all potential contaminant sources within 30 m of well would be in the order of **$15,000**.

Option 2: New Well Construction

The estimated cost for the Option 1 which includes the construction of a new well to serve the Pool and Community Centre is approximately **$30,000** for drilling, testing and hook-up, assuming that the well would be approximately 30 m deep and constructed as described above.

Option 3: New Cluster Well Construction

The estimated cost for Option 2, consisting of a cluster well installation to provide water supply from a central well to the Grader Station, Health Centre, Visitor Reception Centre and Fire Hall would be in the order of **$25,000** per system. The estimated capital costs include supplies and labour for well construction, testing, treatment and distribution piping.



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.

BUILDING STRUCTURES RELATIVE TO PROPERTY LINES ARE APPROXIMATE ONLY.

No.	DESCRIPTION	DATE	APPROVED
0	ISSUED FOR CLIENT REVIEW	DD/MM/YY	XXX

REVISION

EBA Engineering Consultants Ltd.

DESIGNED BY:	R. MARTIN
DRAWN BY:	J. BUYCK
DATE:	AUG. 2005
SCALE:	AS SHOWN
PROJECT No.:	1260002.003
ACAD FILENAME:	003-WESTERN REGION

CLIENT: Yukon Highways and Public Works Property Management Branch

SMALL PUBLIC WATER SYSTEMS ASSESSMENT
WESTERN REGION

GOVERNMENT OF YUKON
HIGHWAYS & PUBLIC WORKS

BEAVER CREEK GRADER STATION BUILDING # 3123 SITE LOCATION DIAGRAM WELL ID: 3123

REVISION ISSUE: 0

FIGURE No.: FIGURE 3123-A

Z:\020\Drawings\1260002 Water Assessment YTG\003 -Western Region\beaver\1260002 B Crk Grader Station_3123A Site Plan.dwg, 9/20/2005 10:40:39 PM, Adobe PDF

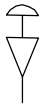
LEGEND


PUMP


PRESSURE GAUGE


GATE VALVE


CHECK VALVE

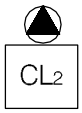

SOLENOID

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

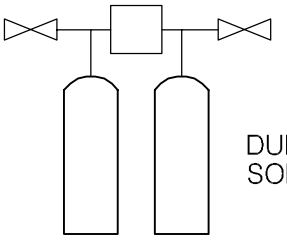
FLOW METER

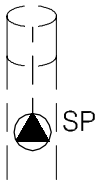
WATER FILTER
(CARTRIDGE TYPE)

PRESSURE TANK

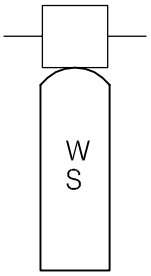


CHLORINE RESERVOIR AND
INJECTION PUMP


DUPLEX WATER
SOFTENER

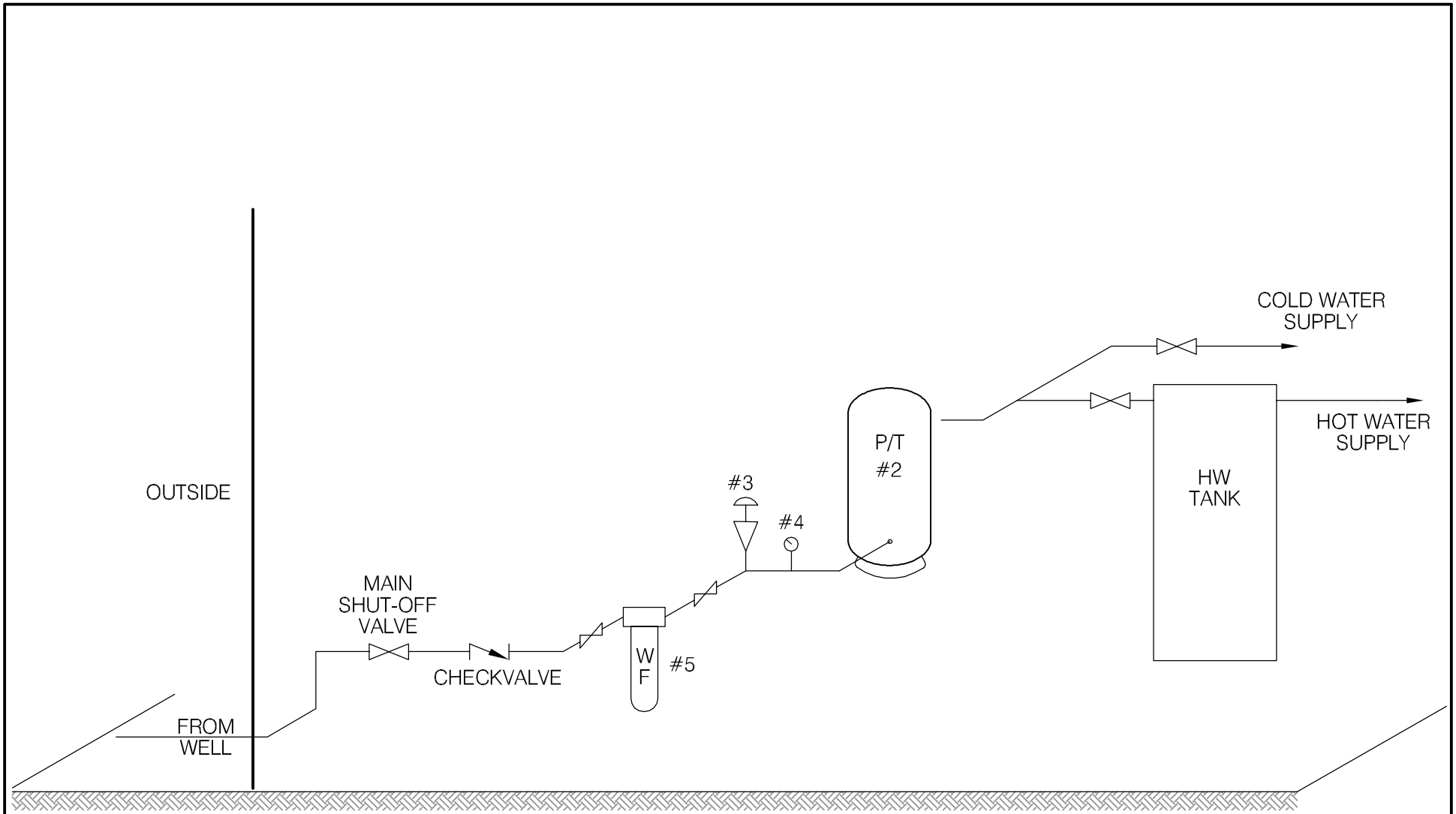


WELL WITH
SUBMERSIBLE PUMP



ACTIVATED
CARBON

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WESTERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	SCHEMATIC SYSTEM LEGEND	
DATE APRIL 2006	DWN. JSB	CHKD. RMM	FILE NO. 1260002		DRWG. LEGEND



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

EBA Engineering Consultants Ltd.			PROJECT	SMALL PUBLIC WATER SYSTEMS ASSESSMENT WESTERN REGION	
CLIENT Yukon Highways and Public Works Property Management Branch			TITLE	WATER SYSTEM DISTRIBUTION/TREATMENT SCHEMATIC SYSTEM ID.: 3123 BEAVER CREEK GRADER STATION	
DATE SEPT. 2005	DWN. JSB	CHKD. RMM	FILE NO. 1260002.003		DWG.: FIGURE 3123-B

Z:\0201Drawings\1260002 Water Assessment YTG\003 -Western Region\beaver\1260002 B Crk Grader Station_3123B Schematic.dwg, 4/4/2006 12:47:05 PM, Adobe PDF, jbuyck

Western Region – Beaver Creek Grader Station
Building # 3123

DISTRIBUTION & TREATMENT SYSTEM DATA

Item	Description	Manufacturer	Model	Part No.	Serial No.	Size
1	SUB. PUMP.	?	?	NO CONTROL BOX		VISIBLE
2	PRESSURE TANK	CHALLENGER	PC 66			20 GALLON
3	PRESSURE SWITCH	SQUARE D	FSG-2	224310		2HP 1/4" NPT
4	PRESSURE GAUGE	MARSH	0-100 PST	633640		2" - 1/4" NPT
5	INLINE FILTER	AMETEK	10" CLEAR	AP-110		10" 5 MICRON
6						
7						
8						
9						
10						

TABLE 3123- 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?
3123	Beaver Creek Grader Station	8	Oct-04 to Jun-05	no	0/8	no	16-Jun-05	no

Table 3123-2: Water Quality Results

SOURCE:	Building 3123 - Beaver Creek Grader Station			GCDWQ Criteria		
Location/ Resident	Beaver Creek					
Address						
Treatment	Filtration					
Disinfection	None					
Source of Water	On-site well					
Purpose of Sampling	Base Line	Base Line	Additional Analytical			
Sample Location			Kitchen tap			
Date Sampled	21-Sep-04	15-Jun-05	27-Jul-05	Lower	Upper Limit	
Physical Tests *(ALS)*				AO	MAC	AO
Colour (CU)	<5.0	<5.0	-			15
Conductivity (uS/cm)		363	-			
Total Dissolved Solids	109	222	-			500
Hardness CaCO3	97.3	152	-	AO >200 = poor, > 500 unacceptable[A]		
pH	8.24	8.17	-	6.5		8.5
Turbidity (NTU)	0.3	0.36	-		1	5
UV Absorbance			0.007			
% UV Transmittance			98.4			
Dissolved Anions *(ALS)*						
Alkalinity-Total CaCO3	91	155	-			
Chloride Cl	5.7	3.08	-			250
Fluoride F	<0.05	0.057	-		1.5	
Silicate SiO4			-			
Sulphate SO4	9.73	34.0	-			500
Nitrate Nitrogen N	<0.1	0.60	-		10	
Nitrite Nitrogen N	<0.05	<0.10	-		3.2	
Ammonia Nitrogen N			-			
Total Phosphate PO4			-			
Total Metals *(ALS)*						
Aluminum T-Al	<0.005	<0.010	-			
Antimony T-Sb	<0.0002	<0.00050	-		0.006	
Arsenic T-As	0.0007	0.00036	-		0.025	
Barium T-Ba	0.067	0.033	-		1	
Boron T-B	0.009	<0.10	-		5	
Cadmium T-Cd	<0.00001	<0.00020	-		0.005	
Calcium T-Ca		48.6	-			
Chromium T-Cr	<0.0005	<0.0020	-		0.05	
Copper T-Cu	0.011	0.0295	-		1	
Iron T-Fe	0.03	<0.030	-			0.3
Lead T-Pb	0.0004	<0.0010	-		0.01	
Magnesium T-Mg		7.42	-			
Manganese T-Mn	<0.005	<0.0020	-			0.05
Mercury T-Hg		<0.00020	-		0.001	
Potassium T-K		1.05	-			
Selenium T-Se		<0.0010	-		0.01	
Sodium T-Na	1.5	2.9	-			200
Uranium T-U	<0.0005	0.00030	-		0.02	
Vanadium T-V			-			
Zinc T-Zn	0.058	0.140	-			5
Organic Parameters						
Tannin and Lignin			0.14			
Total Organic Carbon C			0.89			
Polycyclic Aromatic Hydrocarbons						
Acenaphthene			<0.000050			
Acenaphthylene			<0.000050			
Acridine			<0.000050			
Anthracene			<0.000050			
Benz(a)anthracene			<0.000050			
Benzo(a)pyrene			<0.000010		0.00001	
Benzo(b)fluoranthene			<0.000050			
Benzo(g,h,i)perylene			<0.000050			
Benzo(k)fluoranthene			<0.000050			
Chrysene			<0.000050			
Dibenz(a,h)anthracene			<0.000050			
Fluoranthene			<0.000050			
Fluorene			<0.000050			
Indeno(1,2,3-c,d)pyrene			<0.000050			
Naphthalene			<0.000050			
Phenanthrene			<0.000050			
Pyrene			<0.000050			
Quinoline			<0.000050			
Extractable Hydrocarbons						
EPH10-19			<0.30			
EPH19-32			<1.0			
LEPH			<0.30			
HEPH			<1.0			
Field Chemistry (EBA)						
pH			8.01	6.5		8.5
TDS (ppm)			186			500
EC (uS/cm)			370			
Temperature (°C)			13.9			
Free Available Chlorine						

Notes:

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

Italics and underline indicates exceedence of proposed MAC (ie. arsenic)

Bold with Yellow highlighting indicates exceedence of CDWQG Aesthetic Objective (AO)

Bold Underline with Yellow highlighting indicates exceedence of CDWQG MAC

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

< = Less than the detection limit indicated.

AO = Aesthetic Objective

MAC = Maximum Acceptable Concentration (Health Based)

eba

SMALL PUBLIC WATER SYSTEM ASSESSMENT

PART A: EBA Site Inspection

Inspector: Ryan Martin, Luke Lebel Date July 27, 2005

WELL ID #	Owner	Location Description
3123	YTG	Beaver Creek Grader Station

1. Well Location and Potential Contaminant Sources

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

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

c. GPS location: N 6916580 E 506318 elv 674m ± 5m

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 Maintenance Garage

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

g. Nearest building, specify Maintenance Garage

h. Distance from well to building _____

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

j. Distance from well to nearest point of known field: 26m

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

l. Is there any part of a sewage disposal system(s)or other potential sources of pollution that may pose a health and safety risk within 30 m? ☒ Yes ☐ No
Former septic or rock pit @~22m. Current septic field 34 - 36m

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

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

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

Unauthorized access by humans? ☐ Yes ☒ No
Unlocked enclosure

Entrance by animals? ☐ Yes ☒ No
Access possible. Evidence of mice and ants.

p. Is well site subject to flooding? ☒ Yes ☐ No
Enclose is at low point

q. Is the well site well drained? ☐ Yes ☒ No

r. 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 ~22m

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

☒ Yes ☐ No Describe Assorted scrap metal around the site and industrial activities

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

Potential Source 1: Used oil AST ; Distance from well to Potential Source 1: ~7m

Potential Source 2: Asphault ; Distance from well to Potential Source 2: ~8m

Potential Source 3: Rock Pit ; Distance from well to Potential Source 3: 34m

Potential Source 4: _____ ; Distance from well to Potential Source 4: _____

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

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

2. Well and Wellhead information:

a. When was well installed? Year 1983 Month November

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: 107.5 ft ☐ measured (if possible) ☐ reported ☒ from log

h. Static water level below ground: _____

☐ 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 3 ft slot size(s) 20 slot
Location of screen: from 104.5 ft to 107.5 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,

i. Is the well head below grade? describe in detail No, ~10cm above 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 Evidence of mice and ants

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

If no, describe condition _____

3. Water Supplying This Well:

a. By definition is the water from a surface water source or under the direct influence of surface water?

☒ Yes ☐ No ☐ farther investigation required.

If yes is there treatment or disinfection ☐ Yes ☐ No

Explain (filtration, disinfection etc...) _____

---

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 unlikely

5. Pump Installation:

a. Is the well equipped with a pump? ☒ yes ☐ No

b. Type of pump: ☐ hand ☒ electric submersible ☐ jet

☐ shallow well centrifugal ☐ other, _____

c. Description: Manufacturer _____ Model _____

horsepower _____ capacity _____ voltage _____

d. Date installed: _____ By: _____

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

f. Drop pipe for submersible pump: ☐ steel ☒ plastic

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: Heat trace + insulation

l. Comments on pump installation: _____

_____

6. Conclusions

a. Comments on overall installation:

_____

_____

_____

_____

_____

_____

_____

b.Recommendations: _____

_____

_____

_____

_____

_____

_____

PART B: EBA Site Inspection

Inspector: BERT ALBISSER Date July 26/05

WELL ID #	Owner	Location Description
3123	YTG	BEAVER CREEK GRADER STATION

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_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: PRESSURE TANK

Where is it located?
Comments: MECHANICAL ROOM

Is the room in which the water tank is located heated to maintain an optimum temperature of 4°C for stored water?
YES NO
Comments: _____

Are there windows in the add-on that may allow direct sunlight onto the water holding tank? YES NO
Comments: _____

Are there other heat sources near the tank? YES NO
Comments: _____

Is there waterproof flooring with a sealed base to contain spills? YES NO
Comments: _____

Overall Tank

What are the tank size and dimensions?

_____

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:

THE INSTALLATION IS OF GOOD QUALITY IN BOTH WORKMANSHIP & INSTALLATION

b. Recommendations:

INSTALL TREATMENT ACCORDING TO WATER ANALYSIS TO SUIT UV INSTALLATION. INSTALL UV (NSF 55 CERTIFIED) TO SUIT FLOW REQUIREMENT; INITIATE BI-ANNUM SUPERCHLORINATION OF WATER WELL & PIPING SYSTEM.

MIDNIGHT SUN DRILLING CO. LTD.
WHITEHORSE Y.T.
PH. 633-3070
P.O. BOX 4391
WHITEHORSE, YUKON

Field Report

111070024

Typo and screen

Started Nov. 2 198

Completed Nov. 3 198

NAME AND ADDRESS OF CLIENT	DESCRIPTION OF WORK	LOCATION OF WORK
Y.T.G.	W/W	shop
Beaver Creek		

FORMATION LOG FROM	TO	FORMATION	DESCRIPTION OF WORK	DATE	TIME FROM	TO	HOURS
			MOVE				
			Travel	Nov. 2	4:00	12:00	8
			move on setup	11	1:00	2:00	1
0'	25'	Gr.		11	2:00	6:00	4
25'	38'	Gr. Cobbs.					
38'	93'	clay Gr. silt					
93'	97'	Gr. some silt					
97'	107.5'	Gr. Sive sand.		Nov. 3	8:00	9:30	1.5
			set screen	11	9:30	10:30	1
			Develop.	11	10:30	1:30	3
			move off.	11	1:30	2:00	0.5

Rcrd. of Casing & Pipe Size	Type	Size	Type
Feet	Inch	Feet	Inch
104'	6"		

Remarks:

1- Drive shoe.
20 slot
1- 5 7/8" bit pin
2 riser lead packer.

30 GPM.

Static Level	Total Rig Time hrs.
Ground Level	Total Standby hrs.
Top Of Casing	Drilling Mud sacks

SIGNATURES

MIDNIGHT SUN ... Les Turgeson ...

TITLE ... Carl McNaull ...

CLIENT ... James N Cook ...

TITLE ....

Willow Printers

Photo 0518: 3123 Beaver Creek Grader Station maintenance garage (back left), wellhead (front left), above ground used oil storage tank (back right)

Photo 0516: 3123 Wellhead in enclosure

Photo 0520: 3123 Leach pit (centre), maintenance garage (left), wellhead enclosure (back centre)

Photo 0515: 3123 Heating fuel and tar above ground storage tank

Photo 0519: 3123 Cold mix asphalt pile (rear), wellhead enclosure (front left)

Photo 0073: 3123 In-line filter

Photo 0074: 3123 Pressure tank and pump controls