PROJECT NUMBER G709101

SUITABILITY OF A WATER WELL PROPOSED TO SUPPLY A GREENHOUSE AT CHU'S FARM (B.C.) LTD. AT 1881 - 224TH STREET, LANGLEY, B.C.

Prepared for:

GREAT WALL CANADIAN VENTURES LTD.
895 East 58th Avenue
VANCOUVER, B.C. V5X 1W6

Prepared by:

PACIFIC HYDROLOGY CONSULTANTS LTD.
201 - 1537 West 8th Avenue
VANCOUVER, B.C. V6J 1T5

SEPTEMBER 9, 1999

PACIFIC HYDROLOGY CONSULTANTS LTD. Consulting Hydrogeologists

Suite 201, 1537 West 8th Avenue, VANCOUVER, B.C. V6J 1T5
Telephone: (604) 730-6990 Facsimile: (604) 730-6931

September 9, 1999 Project No. G709101

Great Wall Canadian Ventures Ltd.
895 East 58th Avenue
VANCOUVER, B.C. V5X 1W6

Attention: Michelle Wu
Manager

Subject: **Suitability of a Water Well Proposed to Supply a Greenhouse at Chu's Farm (B.C.) Ltd. at 1881 - 224th Street, Langley**

Dear Ms. Wu:

1.0 INTRODUCTION

This letter is further to a telephone discussion on August 20, 1999 between you (M. Wu) of Great Wall Canadian Ventures Ltd. (GWCVL) and Ann Badry, P. Geo., of Pacific Hydrology Consultants Ltd. (PHCL) and, in particular, to a meeting with Ed Livingston, P. Eng., and Mark Bolton, both of PHCL, at PHCL's office on August 23, about obtaining a permit for a greenhouse facility in Langley. From these discussions, and from documents which you presented at the meeting, we understand the following concerning the water well proposed to be used to supply the greenhouse at 1881 - 224th Street:

1. District of Langley requires assurance, before issuing a permit, that the water supply for the proposed greenhouse operation is adequate with respect to quantity and quality and that use of the well proposed as a water supply for the facility will not impact other well water users.
2. The owner of Chu's Farm (BC) Ltd. proposes to use an existing well, located at the west end of the property, to supply the greenhouse at the east end of the property. The owner estimates that the greenhouse will require a maximum of 68,140±5 litres (15,000 imperial gallons) per day on a warm summer day.
3. According to a record on file with Groundwater Section of B.C. Environment, the well was constructed by Nor-West Well Drilling Ltd. (NWWDL) in 1993 when the property was owned by Karl Heep. The driller's log, which we obtained from NWWDL, and a one-page summary for the well are included in the attachments to this letter.
4. The well for the greenhouse was initially tested for capacity on April 5, 1999 by Union Pumps, with pumping reported to be carried out at a rate of 1.89 *l*ps (25 igpm) for four hours. However, there are no data for this test, except that the pumping water level at the end of the test period was reported to be 46.3 m (152 ft), indicating a drawdown of 11.0 m (36 ft) below an initial static water level of 35.4 m (116 ft).

. . . /2

Because the data from the April 1999 pumping test were inadequate with the reported drawdown a large part of the available drawdown, we were not prepared to state that the well was a suitable source for the greenhouse facility; subsequently, Union Pumps was notified by GWCVL to proceed with a pumping test, which was carried out on August 30.

Attached to this letter as Figures 1 and 2 are area and well/site location plans.

2.0 PUMPING TEST

2.1 Test Procedure

The pumping test of the Chu's Farm well, which was carried out by Union Pumps, used the installed submersible pump powered by hydro' at the site. The flow rate was controlled by a valve and measured by timing the filling of a container of known volume. Water levels were measured by a water level indicator lowered in a 19 mm (¾") diameter P.V.C. measuring tube in the well. At the end of pumping, water level recovery was measured for one hour.

2.2 Test Results

Pumping test data and plots of the data are attached to this letter. The data collected during the pumping phase of the test are plotted in the usual way, with drawdown vs log of the time in minutes since pumping started; recovery data are plotted as residual drawdown vs log of the ratio, time in minutes since pumping started/time in minutes since pumping stopped. The pumping rate at the start was 2.27 *l*ps (30 igpm; 36 USgpm); it was reduced twice, first to 2.08 *l*ps (27.5 igpm; 33 USgpm) at about five hours and then to 1.89 *l*ps (25 igpm; 30 USgpm) at 422 minutes; pumping for the last approximate 13 hours of the 20 hour test was at 1.89 *l*ps.

The drawdown plot of Figure 3 shows that drawdown was quite rapid for about 8 minutes, after which it slowed down, becoming almost constant after about 30 minutes; maximum drawdown of 10.32 m (33.85 ft) occurred at the initial pumping rate of 2.27 *l*ps (30 igpm; 36 USgpm). The water level rose about 0.9 m (3 ft) when the pumping rate was decreased to the final rate of 1.89 *l*ps (25 igpm; 30 USgpm); maximum drawdown at the end of pumping at 1200 minutes after the initial start was 9.62 m (31.55 ft). During the final 11 hours of pumping, the water level was declining at a rate of 17 mm/hr (0.055 ft/hr).

When pumping was terminated, the water level recovered very rapidly, with 97% recovery to the pre-pumping static level within 15 minutes. The trend of the recovery data plot (Figure 4) shows that complete recovery would occur. The specific capacity of the well after 20 hours of pumping,

when pumping at the final rate of 1.89 *l*ps (25 igpm; 30 USgpm), was 0.20 *l*ps/m (0.79 igpm/ft).

2.3 Well Capacity Rating

For the Chu's Farm well, our capacity rating is based on using 60% of the total available drawdown (TAD), which is the distance from the static water level in the well to the top of the well screen. That is, well capacity = 60% TAD x specific capacity of the well at the end of the pumping test.

Total available drawdown (TAD) = 47.2 - 36.0 m (154.75 - 118.10 ft) = 11.2 m (36.65 ft) and 60% of TAD = 6.7 m (22.0 ft); then, well capacity, based on 60% TAD x specific capacity = 1.28 *l*ps (111 m^3/day) or 17 igpm (24,480 igal/day). Therefore, the capacity of the Chu's Farm well, with a safety factor of 40% on the drawdown, is much larger than the estimated maximum water requirement of 68,140±5 litres (15,000 igal)/day for the greenhouse.

3.0 WATER QUALITY

Water samples for chemical and bacteriological analyses were taken by Union Pumps at the time of the first pumping test carried out on April 5, 1999; these samples were sent for analysis to Norwest Labs (NWL) in Langley. The results from these analyses are compared in Table 1, which is included in the attachments, to the limits of the **Guidelines for Canadian Drinking Water Quality (GCDWQ**, Health Canada, Sixth Edition, 1996). The NWL analysis shows that the groundwater from Chu's Farm well is a slightly hard, calcium bicarbonate water; except for the nuisance constituents of iron and manganese, which exceed the **CGDWQ** respective limits of 0.3 mg/*l* and 0.05 mg/*l*, the water satisfies drinking water limits. Although iron and manganese at the contents reported in the NWL analysis may cause staining of plumbing fixtures, this is not certain; therefore, before considering installing any treatment equipment to reduce iron and/or manganese contents, the water should first be used to find out whether staining occurs. The chemical quality of the water is generally suitable for the intended use as a source of irrigation water for the greenhouse as well as for domestic purposes.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our understanding of conditions and the results of the pumping test of the existing Chu's Farm Well, which is proposed as a source of water for a new greenhouse facility, and taking into account the fact that the pumping rate during the test was considerably greater than the maximum estimated greenhouse requirement, it is our opinion that the well is a satisfactory source of water for the proposed greenhouse facility and that use of the well for the intended

purpose will not impact existing well water users.

From our present understanding of the situation concerning the Chu's Farm Well and proposed greenhouse facility at 1881 - 224th Street in Langley, as outlined in this letter, we make the following recommendations:

1. Equip the well with a 19 mm (¾") diameter PVC measuring tube extending to the top of the pump or deeper and also an electric water level indicator which displays the water level in the well at all times.
2. Equip the well with a totalizing water meter and an hour meter to show the running time of the pump.
3. Read the water meter and water level indicator about once each week and record the data on a simple spreadsheet. These data will record and indicate the condition of the well, the pump and possibly also the aquifer on a continuous basis.
4. About once each year, review the data to detect any changes.
5. If the water is to be used for domestic purposes, put the well in use without water treatment equipment. If staining from iron and/or manganese occurs and is unacceptable, proceed with treatment of the water to reduce these aesthetic parameters.

5.0 CLOSURE

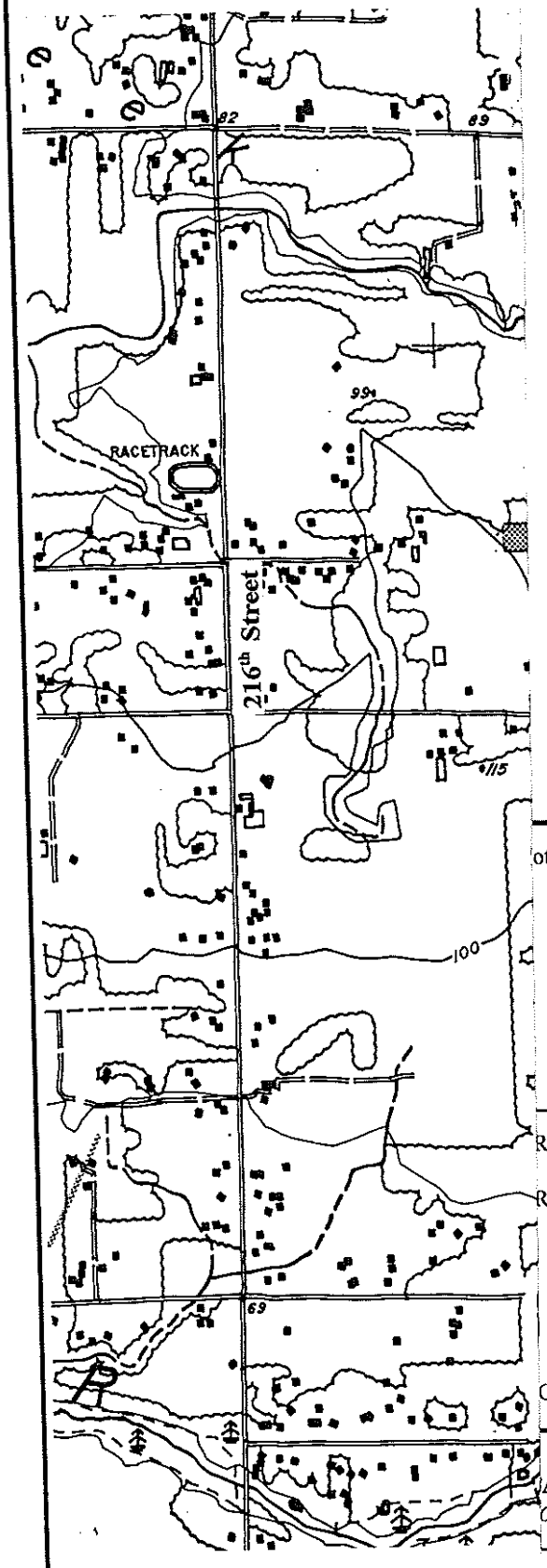
This letter presents our evaluation of information provided by others. We trust that the letter contains the information required by District of Langley. However, please do not hesitate to call the undersigned or Ann Badry for further discussion.

Yours truly,
PACIFIC HYDROLOGY CONSULTANTS LTD.

Ed Livingston, P. Eng.
Associate Consultant

Attachments - *Area and Well/Site Location Maps*
Litholog and Well Construction Details
Pumping Test Data and Plots
Chemical Quality Table and Laboratory Reports

ATTACHMENTS



otes:

The base map is prepared from B.C. Ministry of Crown Lands, Surveys and Resource Mapping Branch, TRIM Maps 92G.007 and 92G.008, of 1:20,000 scale and with a 20 metre contour interval.

denotes approximate locations of Chu's Farm (B.C.) Ltd. and Campbell Valley Farm Ltd. proposed greenhouse facilities; for site layout and approximate well locations, see Figure 2 for the respective projects.

ROJECT NO.: G709101/G709102

ROJECT:

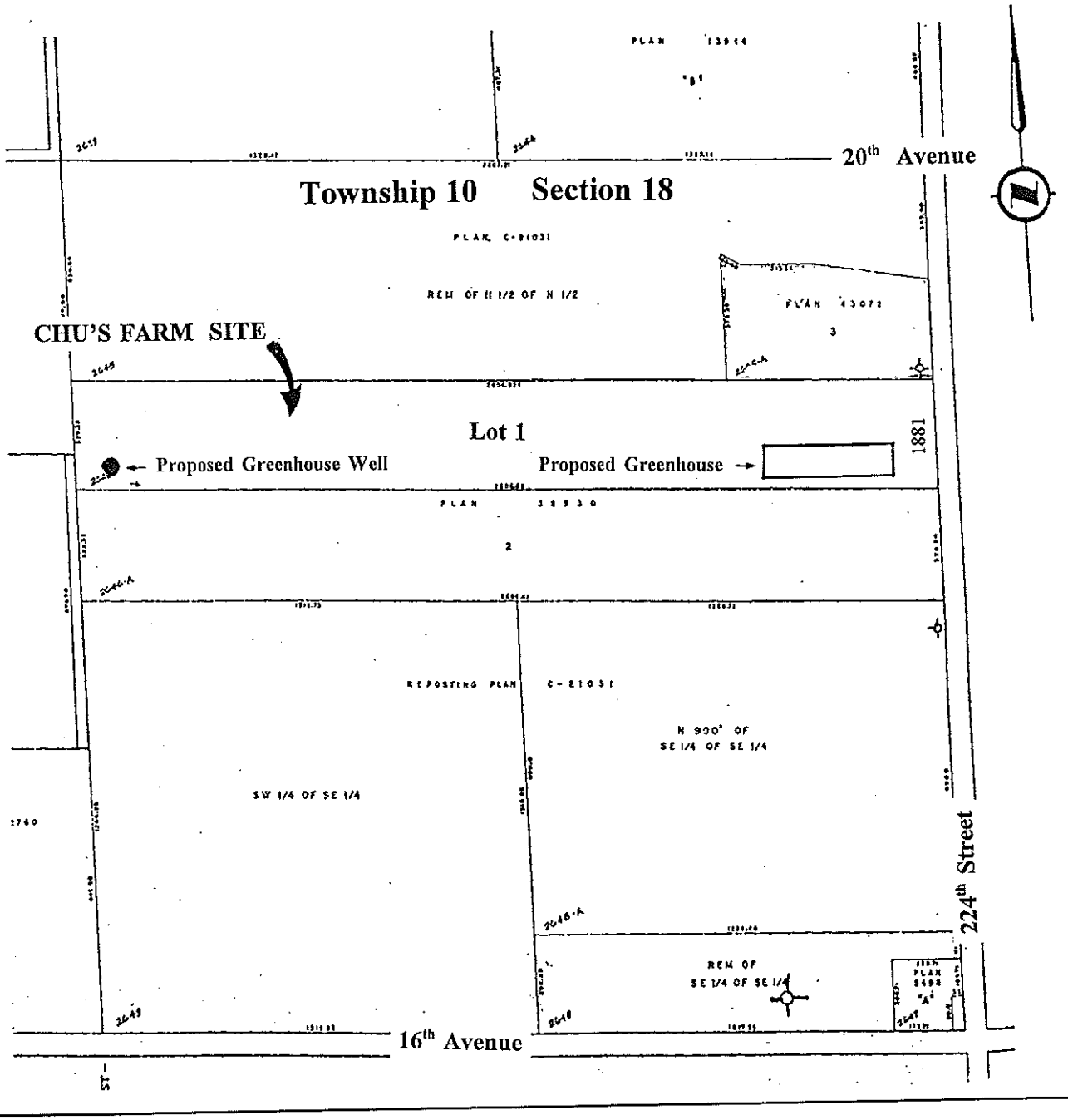
GREAT WALL CANADIAN VENTURES LTD.
CHU'S FARM (B.C.) LTD.
AND CAMPBELL VALLEY FARM LTD.

OCATION: District of Langley

ACIFIC HYDROLOGY CONSULTANTS LTD.
ONSULTING HYDROGEOLOGISTS

REA LOCATIONS OF PROPOSED GREENHOUSES

ATE:	DRAWN BY:	FIGURE:
09/09/1999	ab	**1**



Notes:

1. The scale of the base map is approximately is 1:6,060.
2. ● denotes approximate location of onsite well proposed to supply a greenhouse at the east end of the lot.
3. Legal property description: Lot 1, Township 10, Section 18, N.W.D., Plan 38930; for area location, see Figure 1.

PROJECT NO.: G709101	**PACIFIC HYDROLOGY CONSULTANTS LTD.** *CONSULTING HYDROGEOLOGISTS*		
PROJECT: **GREAT WALL CANADIAN VENTURES LTD. CHU'S FARM (B.C.) LTD.**	**SITE LAYOUT AND WELL LOCATION**		
LOCATION: 1881 - 224th Street, Langley	DATE: 09/09/99	DRAWN BY: ab	FIGURE: 2

WATER SUPPLY WELL AT CHU'S FARM (B.C.) LTD.

Location: 1881 - 224th Street, Langley, B.C. (former owner was Karl Heep).

Legal description: Lot 1, Township 10, Section 18, New Westminster District, Plan 38930.

Contractor: Nor-West Water Well Drilling Ltd.

Date of installation: September 22, 1993.

Driller's litholog:

0.0 - 0.9 m	(0 - 3 ft)	sandy soil
0.9 - 1.8 m	(3 - 6 ft)	brown clay
1.8 - 3.7 m	(6 - 12 ft)	brown stoney clay
3.7 - 28.7 m	(12 - 94 ft)	grey stoney clay
28.7 - 41.1 m	(94 - 135 ft)	till
41.1 - 47.5 m	(135 - 156 ft)	silty sand and gravel, dirty; water-bearing
47.5 - 51.5 m	(156 - 169 ft)	grey sand with some gravel; water-bearing
at 51.5 m	(at 169 ft)	brown clay.

Completed depth: 50.3 m (165 ft).

Diameter: 150 mm (6") diameter.

Static water level: 35.1 m (115 ft) reported on driller's record in September 1993; 35.4 m (116 ft) reported at time of testing in April 1999 and 36.0 m (118.10 ft) measured on August 30, 1999 prior to the start of well capacity testing.

Well completion: The well is completed with a 3.1 m (10.25 ft) long well screen assembly containing a K-type packer and riser pipe at the top at 47.2 m (154.75 ft), 1.2 m (4 ft) of 0.508 mm (0.020") slot screen and 1.2 m of 0.254 mm (0.010") slot screen, with the assembly set from 47.2 to 50.3 m (154.75 to 165 ft).

Well performance: Constant-rate pumping for 4 hours at 1.89 *l*ps (25 igpm) in April 1999 caused a reported maximum drawdown of 11.0 m (36 ft), for a specific capacity of 0.17 *l*ps/m (0.69 igpm/ft). More complete data from a pumping test in August 1999 show that final pumping at 1.89 *l*ps (25 igpm) caused maximum drawdown of 9.62 m (31.55 ft), for a specific capacity of 0.20 *l*ps/m (0.79 igpm/ft).

Well capacity: Rated according to standard procedure, the capacity of the Chu Farm well is 1.28 *l*ps (111 m^3/day; 17 igpm).

NOR-WEST WATER WELL DRILLING LTD.

WTN 71997

P.O. Box 3446 Langley 534-4108
23191 Fraser Highway, Langley
Evenings: Langley 534-4222

WELL LOG

OWNER MR. KARL HEEP

ADDRESS 15911 - 32nd AVENUE

SURREY, B. C. V4P 2J9

LOCATION 1881 - 224th STREET

LANGLEY, B. C.

SEPTEMBER 22nd 19 93

Date Begun SEPTEMBER 21/93 Completed SEPTEMBER 22/93

Yield 15 Gallons per minute

Static Water Level 115 feet from surface

Pumping Water Level 150 feet from surface

Casing Used 159FT 6 INCHES OF 6 INCH

Bottom of Casing 156FT 6 INCHES feet from surface

Stick-up above ground 3FT feet

Screen Used TOP: #20 SLOT STAINLESS STEEL SCREEN
BOTTOM: #10 SLOT STAINLESS STEEL SCREEN
C/W 2FT RISER PIPE

Top of Screen 154FT 9 IN feet from surface

Bottom of Screen 165FT feet from surface

Sources of Water ..... g.p.m. at ..... feet

Sources of Water ..... g.p.m. at ..... feet

Sources of Water ..... g.p.m. at ..... feet

Sources of Water ..... g.p.m. at ..... feet

Rig No. A/R #2

Driller T.E. WALSH & C.B. WALSH

RECOMMENDED PUMP SET AT 150. FT. RATE 10 G.P.M.

Depth	Material
0	
	SANDY SOIL
3	
	BROWN CLAY
6	
	STONEY BROWN CLAY
12	
	STONEY GREY CLAY
	STONEY GREY CLAY
94	
	TILL
	TILL
135	
	DIRTY WATER BEARING SILTY SAND AND GRAVEL
156	
	WATER BEARING GREY SAND, SOME GRAVEL
169	
	BROWN CLAY

PUMPING TEST - DRAWDOWN DATA

Project: **Chu's Farm (B.C.) Ltd. Water Supply Well**

Location: 1881 - 224th Street, Langley, B.C.

Static Water Level: 118.10 ft (36.0 m)
Datum: Top of well casing
Well Completion: Well screen assembly set from 154.75 to 165 ft (47.2 to 50.3 m)

DATE (m/d/yr) & TIME (hr:min:sec)	ELAPSED TIME t(min)	DISTANCE TO WATER (ft)	DRAWDOWN (ft)	PUMPING RATE (igpm)	PUMPING RATE (lps)	REMARKS
08/30/99						
11:00:00	0.0	118.10	0.00			Static water level; start pump.
11:01:00	1.0	133.50	15.40	30.0	2.27	
11:02:00	2.0	140.70	22.60			
11:03:00	3.0	144.70	26.60			
11:04:00	4.0	147.00	28.90			
11:05:00	5.0	148.30	30.20			
11:06:00	6.0	149.15	31.05			
11:07:00	7.0	149.70	31.60			
11:08:00	8.0	150.10	32.00			
11:09:00	9.0	150.35	32.25			
11:10:00	10.0	150.55	32.45			
11:15:00	15.0	151.00	32.90			
11:20:00	20.0	151.20	33.10			
11:25:00	25.0	151.30	33.20			
11:30:00	30.0	151.35	33.25	30.0	2.27	
11:45:00	45.0	151.45	33.35			
12:00:00	60.0	151.50	33.40			
12:30:00	90.0	151.60	33.50			
13:00:00	120.0	151.62	33.52			
14:00:00	180.0	151.82	33.72			
15:00:00	240.0	151.90	33.80			
16:00:00	300.0	151.95	33.85	30.0	2.27	
16:02:00	302.0					Reduce flow rate.
16:15:00	315.0	151.74	33.64	27.5	2.08	
16:30:00	330.0	151.75	33.65			
17:00:00	360.0	151.80	33.70			
17:30:00	390.0	151.30	33.20			
18:00:00	420.0	151.35	33.25			
18:02:00	422.0	149.60	31.50			Reduce flow rate.
18:15:00	435.0	149.10	31.00	25.0	1.89	
20:00:00	540.0	149.05	30.95	25.0	1.89	
08/31/99						
07:00:00	1200.0	149.65	31.55	25.0	1.89	Stop pump.

PUMPING TEST - RECOVERY DATA

Project: **Chu's Farm (B.C.) Ltd. Water Supply Well**

Location: 1881 - 224th Street, Langley, B.C.

Static Water Level: 118.10 ft (36.0 m)
Datum: Top of well casing
Final Drawdown: 31.55 ft (9.62 m)

DATE (m/d/yr) & TIME (hr:min:sec)	ELAPSED TIME SINCE PUMPING STARTED t(min)	ELAPSED TIME SINCE PUMPING STOPPED t'(min)	RATIO (t/t')	DISTANCE TO WATER (ft)	RESIDUAL DRAWDOWN (ft)	REMARKS
08/31/99						
07:00:00	1200.0	0.0		149.65	31.55	Stop pump.
07:01:00	1201.0	1.0	1201.0	135.80	17.70	
07:02:00	1202.0	2.0	601.0	129.00	10.90	
07:03:00	1203.0	3.0	401.0	125.30	7.20	
07:04:00	1204.0	4.0	301.0	123.10	5.00	
07:05:00	1205.0	5.0	241.0	121.40	3.30	
07:06:00	1206.0	6.0	201.0	120.90	2.80	
07:07:00	1207.0	7.0	172.4	120.39	2.29	
07:08:00	1208.0	8.0	151.0	119.95	1.85	
07:09:00	1209.0	9.0	134.3	119.70	1.60	
07:10:00	1210.0	10.0	121.0	119.46	1.36	
07:15:00	1215.0	15.0	81.0	118.95	0.85	
07:20:00	1220.0	20.0	61.0	118.79	0.69	
07:25:00	1225.0	25.0	49.0	118.70	0.60	
07:30:00	1230.0	30.0	41.0	118.65	0.55	
07:45:00	1245.0	45.0	27.7	118.60	0.50	
08:00:00	1260.0	60.0	21.0	118.54	0.44	

Figure 3. Time-Drawdown Plot for August 1999 Pumping Test of Chu's Farm Well at 1881 - 224th Street, Langley

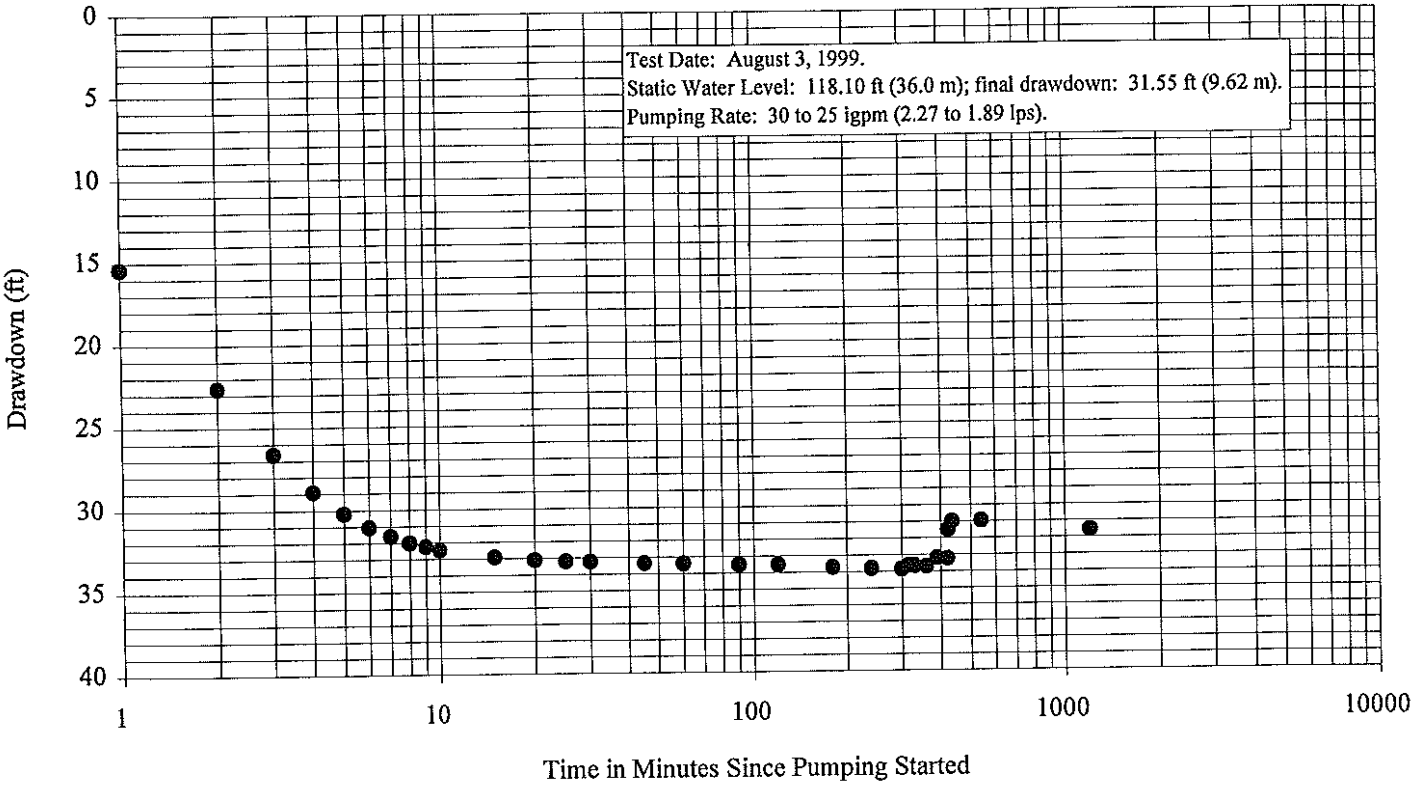


Figure 4. Time-Recovery Plot for August 1999 Pumping Test of Chu's Farm Well at 1881 - 224th Street, Langley

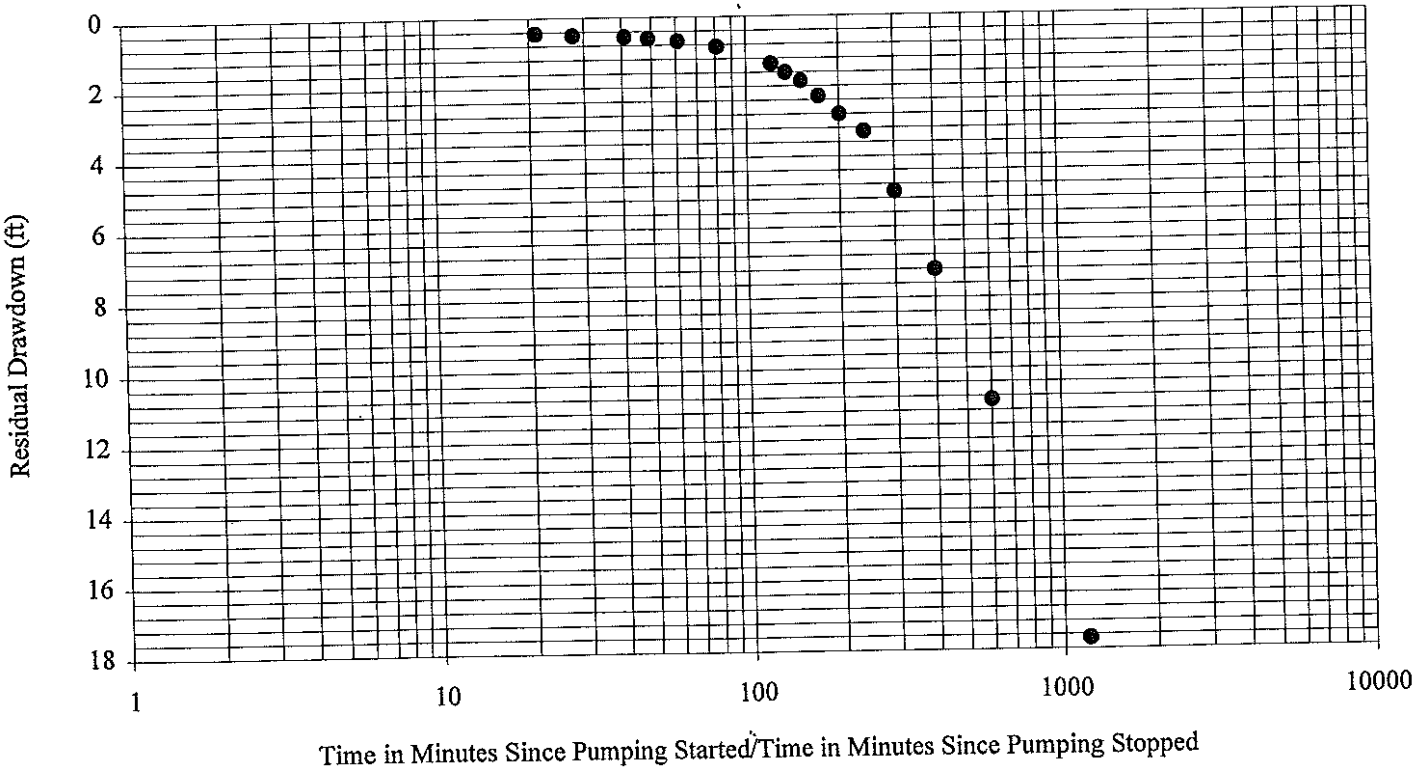


Table 1. Chemical Quality of Groundwater from a Well at Chu's Farm at 1881 - 224th Street in Langley and Comparison to Drinking Water Quality Limits

Parameter		Chu's Farm Well (1)	Drinking Water Limit (2)
Physical Tests			
Colour (CU)		5	15.
Total Dissolved Solids (mg/*l*)		172	500
Total Hardness (mg/*l*)	$CaCO_3$	68.5	-
pH		7.37	6.5 - 8.5
Turbidity (NTU)		3	1/5 (3)
Dissolved Anions (mg/*l*)			
Alkalinity	$CaCO_3$	125	-
calculated	HCO_3	152.4	-
Chloride	Cl	7.7	250.
Fluoride	F	<0.5	1.5
Sulphate	SO_4	<0.5	500.
Nutrients (mg/*l*)			
Nitrate (NO_3)	N	<0.5	10.
Nitrite (NO_2)	N	<0.05	1.0
Total Metals (mg/*l*)			
Aluminum	Al	<0.01	-
Arsenic	As	<0.02	0.025
Barium	Ba	0.0095	1.0
Cadmium	Cd	<0.0005	0.005
Chromium	Cr	<0.001	0.05
Copper	Cu	0.003	1.0
Iron	Fe	0.419	0.3
Lead	Pb	<0.005	0.01
Manganese	Mn	0.0908	0.05
Sodium	Na	25.9	200.
Uranium	U	<0.08	0.10
Zinc	Zn	0.002	5.0
Bacteriological			
Faecal Coliform (colony counts/100 m*l*s)		<1	0
Total Coliform (colony counts/100 m*l*s)		<1	- (4)

Sources of Information and Notes:

1. Norwest Labs Work Order 43190; dated April 9, 1999 for a sample collected on April 5, 1999.
2. Maximum acceptable concentration as specified in **Guidelines for Canadian Drinking Water Quality (GCDWQ**, Health Canada, Sixth Edition, 1996), which have been adopted by B.C. Ministry of Health as the basis for assessing water potability.
3. At the point of consumption, as per **GCDWQ**, a turbidity of 5 NTU is permitted, but maximum acceptable source turbidity is 1 NTU, with some relaxation permitted for groundwater sources.
4. No sample should contain more than 10 total coliform organisms per 100 m*l*, none of which should be faecal, and no consecutive samples should be positive.

NORWEST LABS

Surrey	Ph (604) 514-3322	FAX (604) 514-3323
Edmonton	Ph (403) 438-5522	FAX (403) 438-0396
Calgary	Ph (403) 291-2022	FAX (403) 291-2021
Lethbridge	Ph (403) 329-9266	FAX (403) 327-3827
Winnipeg	Ph (204) 982-8830	FAX (204) 275-6019

Client

Name : UNION PUMPS
Address : BOX 3446, 23191 FRASER HWY.
LANGLEY
BC
V3A 4R6
Att'n : Saul Hock
Phone : 533-3727
Fax : 535-4358

WO (Surrey) : 43190
WO (Other) :
PO # :
Project :
Date Sampled : 05-Apr-99
Date Received : 06-Apr-99
Date Reported : 09-Apr-99

43190-1 **WELL WATER @ 1681-224 STREET**

Microbiological Analysis

M99

Analyte	Result	Detection Limit	Units	Drinking Water Guidelines / Recommendations
Total Coliforms	<1	1	MPN/100 mL	Below 1/100 mL acceptable. Conditional pass 10 / 100mL
Standard Plate Count	<1	1	cfu/mL	Below 500 CFU/mL acceptable
Fecal Coliforms	<1	1	MPN/100 mL	Below 1/100 mL acceptable

Water Analysis

W99-Water Potability

Analyte	Result	Detection Limit	Units	Drinking Water Guidelines / Recommendations
pH	7.37			pH values between 6.5 & 8.5 considered acceptable
Colour	5	5	TCU	Aesthetic limit 15 TCU
Turbidity	3	1	NTU	Below 5 NTU acceptable at point of use.
Total Dissolved Solids	172	1	mg/L	Objective level 500 mg/L; higher values indicate high sal
Hardness (CaCO3 equiv)	86.8	0.1	mg CaCO3/L	Soft waters are less than 75 mg/L; hard waters are above
Chloride	7.7	0.1	mg/L	Aesthetic limit 250 mg/L
Fluoride	<0.5	0.5	mg/L	Values up to 1.2 mg/L desirable; under 1.5 mg/L accepta
Nitrite-N	<0.5	0.5	mg/L	
Nitrate-N	<0.05	0.05	mg/L	Below 10 mg/L acceptable; objective level below 1.0 mg/
Sulfate	<0.5	0.5	mg/L	
Aluminum	<0.01	0.01	mg/L	
Arsenic	<0.02	0.02	mg/L	Below 0.025 mg/L acceptable
Barium	0.0045	0.0005	mg/L	Below 1 mg/L acceptable
Cadmium	<0.0005	0.0005	mg/L	Below 0.005 mg/L acceptable
Chromium	<0.001	0.001	mg/L	Below 0.05 mg/L acceptable
Copper	0.003	0.002	mg/L	Aesthetic limit 1.0 mg/L; objective below 0.01 mg/L
Iron	0.413	0.003	mg/L	>0.3 mg/L may cause staining; objective level below 0.0
Lead	<0.005	0.005	mg/L	Below 0.01 mg/L acceptable
Manganese	0.0008	0.0005	mg/L	Aesthetic limit 0.05 mg/L; objective below 0.01 mg/L
Sodium	26.9	0.05	mg/L	Aesthetic limit 200 mg/L; below 20 mg/L for low sodium d
Uranium	<0.05	0.05	mg/L	Below 0.1 mg/L acceptable
Zinc	0.002	0.001	mg/L	Aesthetic limit 5.0 mg/L; objective below 1.0 mg/L
Total Alkalinity	128	5	mg CaCO3/L	

Approved By:

John Davidson, Dipl. T., C.P.H.I. (C)
Supervisor, Inorganics Lab