

GROUNDWATER EVALUATION, PALMS COVE SUBDIVISION WITHIN W.1/2-34-39-2-W5M

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Executive Summary

Qualico Developments proposed Palms Cove Subdivision is located within W1/2-34-39-2-W.5, a short distance north of Sunbreaker Cove on Sylvan Lake. Stantec was retained to conduct a groundwater evaluation study of the Palms Cove Subdivision to ensure adequate quantities of ground water are available to support the additional future growth around Sylvan Lake prior to development of the property.

As required under the Alberta Groundwater Evaluation Guidelines, two wells were drilled into the Paskapoo Formation, Dalehurst member on February 10 and 11, 2010. These wells have been identified as PW1 and OB1. Both wells were drilled to 48.8 meters below the land surface.

Hydrogeologically, a sandstone aquifer was encountered in PW1 at a depth of 36.9 meters below the land surface that could be developed for the Palms Cove Subdivision. The sandstone aquifer is capped by 4.9 to 5.8 meters of shale. The static non-pumping water level in the pumping well prior to pumping was 3.98 to 4.61 meters above the top of the sandstone aquifer. Thus the sandstone aquifer is under artesian pressure.

The aquifer tested is at 932.21 to 924.31 m elevation, and the nonpumping water level prior to pumping was at 936.19 m, or 0.47 m lower in elevation than the lake outlet level of 936.66 m, and 3.98 m above the top of the aquifer. This unusual situation results in a nonpumping water level in the well which is artesian, yet slightly below lake surface level, at 585 m distance to the southwest. No other production from this aquifer, other than purely minor domestic use, is present at this time within the immediate area. Sylvan Lake receives groundwater discharge from the northwest and southwest, and there is a flow-through toward the northeast and southeast.

A step test was conducted on PW1 prior to conducting the 71.7 hours aquifer pumping test. This was done to determine the PW1 well efficiency and pumping rate for the 71.7 hour pump test. Based on the step test, PW1 was pumped during the test of 71.7 hours at 445 cubic meters per day, followed by 63.2 hours of recovery, at which time recovery was complete.

The Double Porosity Method developed by Warren and Root was used to calculate the hydraulic characteristics of the fractured bedrock. This data suggest the transmissivity of the sandstone aquifer is in the range of 1110 square meters/day with a storativity of 0.00017.

The Moell method for estimating long-term sustainable groundwater yield shows that the production well is theoretically capable of pumping about 695 cubic meters per day

The theoretical interference caused by this diversion for 20 years would be about 42 to 52 cm in the vicinity of the nearest other well-owners whose wells are completed in the same aquifer.

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This interference would have a minimal affect on other water supply wells developed in the same sandstone aquifer as the Palms Cove Subdivision.

The groundwater evaluation also suggests that there is adequate recharge to meet the needs of this planned subdivision, and that the supply well will not induce infiltration from the lake above the natural flow-through amount, or affect the safe yield of the sandstone aquifer. As a result, the data suggest that the sandstone aquifer tested for this project is not under the influence of surface water associated with Sylvan Lake.

Groundwater samples were obtained from the production well and tested according to Alberta Drinking Water Guidelines. The samples were analyzed for routine metals and bacterial parameters. All chemical parameters are within the Guidelines for Canadian Drinking Water Quality.

Based on this study, there is adequate groundwater of an acceptable water quality for development at the Palms Cove Subdivision. The sustainable yield of 445 m²/day is sufficient for 1986 persons or 794 homes.

Within the context of this study, Qualico can therefore proceed to apply for a groundwater diversion license at this site from Alberta Environment. It is recommended that Qualico maintain monthly water production records for the production well. In addition, monthly water level records should also be maintained for the pumping and observation well. This data should be submitted in an annual report to Alberta Environment to ensure good management practices within the Sylvan Lake watershed.

Because of the substantial proposed diversion, it is recommended that a professional hydrogeologist carry out an annual review of the water levels and water production at the end of each of the first two years of production. Further water monitoring should continue for the life of the diversion, but future annual reporting needs can be evaluated at the end of the first two years.

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1.0 Introduction

Qualico Developments West Ltd. (Qualico) owns a property located at the northwest end of Sylvan Lake, in the West ½ of 34-39-2-W.5. Presently, Qualico Developments wishes to develop the property for residential use.

1.1 SITE LOCATION AND SETTING

Figure 1 was developed from the Sylvan Lake Alberta, Topographic Quadrangle map of the area. The map depicts the location of the property with respect to important geographic features. Based the map, the site consists of agricultural land. Access to the site is from Rainy Creek Road.

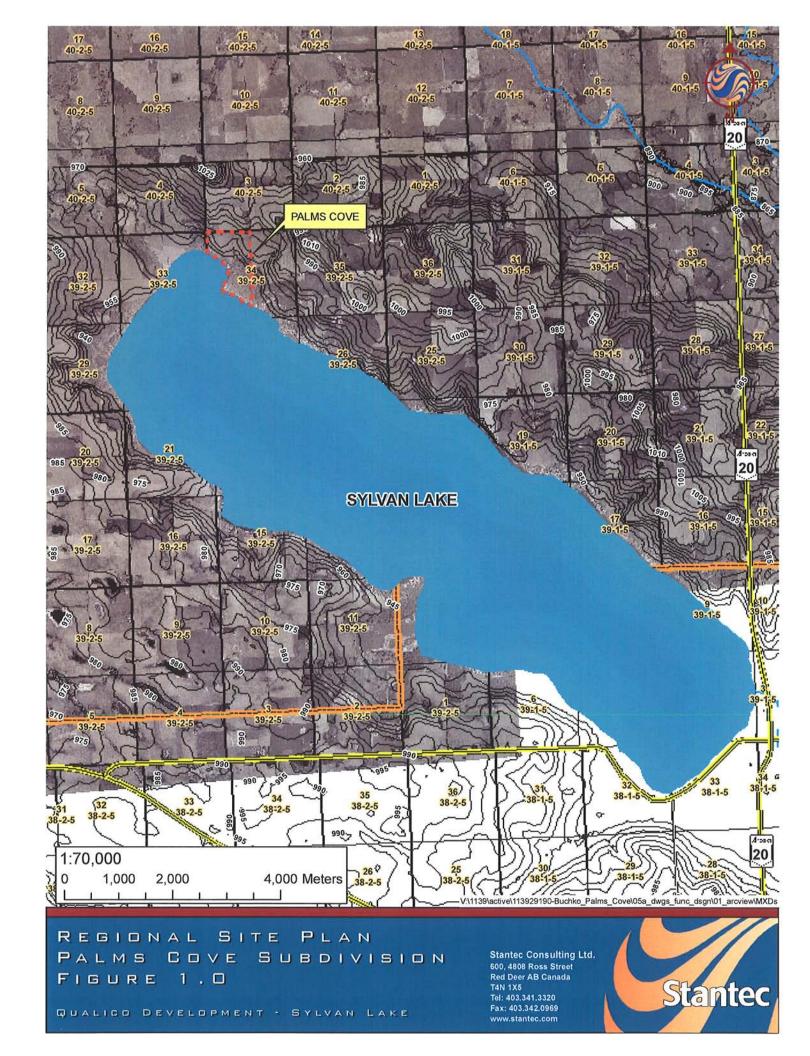
Topographically, the area is characterized by a typical dendritic drainage pattern. Major streams in the area are the Blindman River to the northeast and Medicine River southwest of Sylvan Lake. The lake is characterized by a tight local self-contained drainage basin between the rivers. There is an intermittent small drainage to Cygnet Lake from the southeast side of Sylvan Lake. Surface drainage from the Qualico Development's Palm Cove site will flow toward Sylvan Lake.

Surface elevation across the area ranges from 1005 Meters above mean sea level on the hilltops to approximately 940 Meters above sea level in the valleys. Thus, the total topographic relief across the region is approximately 65 meters. The normal pool level of the lake is approximately 937 meters above sea level.

1.2 GEOLOGIC SETTING OF THE PASKAPOO FORMATION

Geologically, the bedrock is overlain by unconsolidated Pleistocene till deposits. These consist of a mixture of blue and brown clay, silt, sand and gravel with some boulders. These deposits are generally less than 10 m thick, and are draped over the underlying bedrock strata. This area is characterized by numerous flutes and drumlins aligned in a parallel manner from northeast to southwest (Shetsen, 1990). The Pleistocene materials thin somewhat in higher topographic areas.

Bedrock below the till is composed of the Paleocene Paskapoo Formation, which consists of grey to greenish grey thick-bedded calcareous cherty sandstone, grey and green siltstone and mudstone, minor conglomerate, thin limestone, and coal beds. The formation was deposited in a non-marine fluvial-deltaic environment (Hamilton, et al, 1999).



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The Paskapoo Formation has been subdivided by Demchuk and Hills (1991) into three (3) members:

- (1) Dalehurst Upper Member
- (2) Lacombe Middle Member
- (3) Haynes Lower Member

The Dalehurst Member sediments compose the bedrock sediments near the surface and under the Sylvan Lake region. These sediments consist of inter-bedded sandstone, siltstone, mudstone, shale and coal. The sandstones have a light gray to yellow-brown color. They are predominantly massive or planar bedded with minor planar cross-bedding and wavy-disturbed bedding. Carbonaceous (coaly) laminas are common, siderite staining is common, and plant fragments and rooting are rare. The siltstones, mudstones and shales are light grey to black or olive-green, with few primary sedimentary structures, except for minor planar or wavy-disturbed laminations. There are at least five coal seams in this member ranging from 1.3 to 6.1 m in thickness. The strata are almost flat-lying, dipping westward at about 4 m per km.

1.3 HYDROGEOLOGIC SETTING OF THE PASKAPOO FORMATION

A regional groundwater study including the Sylvan Lake area was carried out by Orest Tokarsky, Alberta Research Council, in 1970 of the Rocky Mountain House map sheet, at a scale of 1:250,000. Based on the study, the Paskapoo Dalehurst member in the vicinity of Sylvan Lake has the potential to produce between 25 to 100 gallons per minute (160 to 650 cubic meters per day) of water from a single properly designed well.

The hydrogeologic setting of Sylvan Lake is unusual, in that there is both groundwater contribution to the lake and also simultaneous groundwater outflow from the lake. Baker (2003) discusses this and shows in her Figure E (p. 21) that groundwater flows into the lake from the northwest and from the southwest. However, there is also flow-through at the same time to the northeast toward Blindman River and to the southeast to Cygnet Lake. AXYS Environmental Consulting Ltd. (2005, sec. B.2.1.2)) further elaborates on this unusual situation, as follows:

"Baker (2003) shows that groundwater discharges into Sylvan Lake. The thesis also suggests there is significant groundwater flow-through in Sylvan Lake. Specifically, it is postulated that groundwater discharges into Sylvan Lake from the northwest and southwest sides, and that the lake recharges groundwater on the northeast and southeast sides. It is suggested that there is a possibility that a highly conductive layer of sandstone exists at and below the elevation of Sylvan Lake with significant quantities of groundwater flowing through it."

There is an unconfined aquifer located northeast of the lake, which was penetrated and tested by means of the wells of the adjacent Skyy Country Subdivision. The wells tested in Palms Cove Subdivision penetrated and tested the deeper confined and highly conductive layer of sandstone, mentioned above in the quote from AXYS.

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1.4 GROUNDWATER QUALITY IN THE PASKAPOO FORMATION

Based on the study by Orest Tokarksy, the groundwater is characterized predominantly by sodium bicarbonate dissolved in the groundwater. Generally, the groundwater quality is within acceptable Canadian Drinking Water Guideline standards. Fluoride content should be within acceptable limits.

The more recent groundwater evaluation carried out for Lacombe County in 2001, contains 31 years of additional data, indicating that individual wells can yield between 100 and 300 cubic meters per day, and that the water would be mainly of a sodium bicarbonate type. Total dissolved solids range from under 400 to 600 mg/L, sulfate mainly between 10 and 50 mg/L, and chloride under 10 mg/L. The depth to the base of groundwater protection is considered to be about 350 m depth. This is the depth at which groundwater attains a total dissolved solids level of 4000 mg/L, and is hence considered unfit for human consumption.

1.5 CONSULTING REPORTS COMPLETED IN THE SYLVAN LAKE AREA

For a rural subdivision to obtain a right to divert surface water or groundwater, it must apply to Alberta Environment for a license to divert water. This application must be supported by a technical report which demonstrates:

- The quantity of water available on a sustainable basis, based on a rigorous testing program, and that this quantity is sufficient to meet anticipated needs.
- The quality of water available and that it is adequate for human consumption, with or without treatment,
- The impact that the proposed diversion will have on other pre-existing well owners in the area,
- The impact that the proposed diversion will have on the environment, ie, fauna, wetlands, etc.

Several detailed consulting reports have been prepared previously for other subdivisions in the immediate area. These include:

- DeGroat Subdivision February, 2004 G.E.R.L.
- Westend Landing May, 2006 Stantec Consulting Ltd.
- Eagles Quay July, 2006 Stantec Consulting Ltd.
- Westside Estates August, 2006 Stantec Consulting Ltd.
- Westside Estates, Part 2 February, 2007 Stantec Consulting Ltd.
- Eagles Quay, Part 2 April, 2007 Stantec Consulting Ltd.
- Skyy Country May, 2008 Stantec Consulting Ltd.

Thus, a considerable amount of technical data on groundwater supply has been obtained in the last five years within the immediate area. In every case, these consulting reports were prepared

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for the purpose of obtaining a license to divert water from a central well or wells for subsequent distribution to individual lots within the subdivision. These reports include drilling information on the water supply wells tested, testing data for each well, water quality analyses, and a calculation of the sustainable production rate of each well and its impact on neighboring wells.

The information in consulting reports, once submitted to Alberta Environment, becomes public information, unless there is some special reason to maintain confidentiality for a finite period of time. All the subdivisions listed above are now licensed or in the process of doing so. The information in these reports includes detailed records of the wells drilled, results of aquifer testing, calculated sustainable yield of the wells, quality of groundwater, impact of pumping on other groundwater users, and possible impacts on the environment and on Sylvan Lake.

2.0 Methods of the Investigation

Prior to implementing this project, the Alberta Groundwater Evaluation Guidelines were consulted. In addition, standard engineering practices were used to conduct all field work and data analysis.

2.1 EXISTING LICENSED DIVERSIONS

Traditional Agricultural Registrations (TAR's) are diversions which were not licensed at the time of drilling, because there was no requirement to do so at that time. However it became possible later on to register them up to a cutoff date in 1999, with their priority of use dating from the year of first use. This was done by means of a simple application only, and protects older traditional users of water for stock-watering and pesticide applications, by means of a grandfathering clause.

A license, on the other hand, is obtained through a formal technical study such as this one, which must be prepared by a qualified groundwater specialist who is a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta. This study must show that the desired amount of water is available for a minimum of 20 years, and that the diversion of this water will not harm any other water well owners in the immediate area. In the future, If the license holder no longer uses or needs his allocation, the license may be cancelled, so that the water will become available to other applicants. The Water well drilling reports for neighboring wells can be found in Appendix A.

2.2 FIELD VERIFIED SURVEY

Stantec Consulting Ltd. prepared a questionnaire to be used for a field verified survey, and carried out a survey of all owners who could be contacted within a 1 km radius of the well. Because the area is largely used for summer cottages, many well-owners were not at home and could not be contacted. Nevertheless, these data can be found in Appendix B.

2.3 WELL COMPLETION DETAILS

The Pumping Well and the adjacent Observation Well were drilled on February 10 and 11, 2010 respectively by Alken Basin Drilling Ltd., Bentley, Alberta. Figure 2 shows the locations of the two wells drilled for this project. Figures 3 and 4 are well completion diagrams showing the details of how each of the wells was completed in the subsurface.



SITE PLAN SHOWING PW1 & OB1 WELL DRILLING LOCATIONS FIGURE 2.0

QUALICO DEVELOPMENT - SYLVAN LAKE

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Table 1 shows the surveyed coordinates of the two wells used in the test.

Table 1
Coordinates of PW1 and OB1 Wells

Well	Northing	Easting	Casing Stickup(m)	S.W.L. Feb. 10, 2010 (m)	Casing Elevation msl (m)	Ground Elevation msl (m)
PW1	5809866	689957	0.91	33.83	970.024	969.114
OB1	5809864	689902	0.91	31.70	968.150	967.240

The driller's reports for the two (2) wells are in Appendix C.

Upon completion of the drilling and well construction, each well was tested for 2 hours pumping and recovery to determine the pumping rate on a preliminary basis. Production well PW1 produced approximately 262 cubic meters per day with approximately 0.838 meters of drawdown. The estimated specific capacity of the pumping well PW1 was determined in this short test to be 312.6 cubic meters per day per meter of drawdown.

The pumping rate in the observation well OB1 was approximately 282 cubic meters per day with 7.88 meters of drawdown. Thus the preliminary specific capacity of the well was 35.8 cubic meters per day per meter of drawdown.

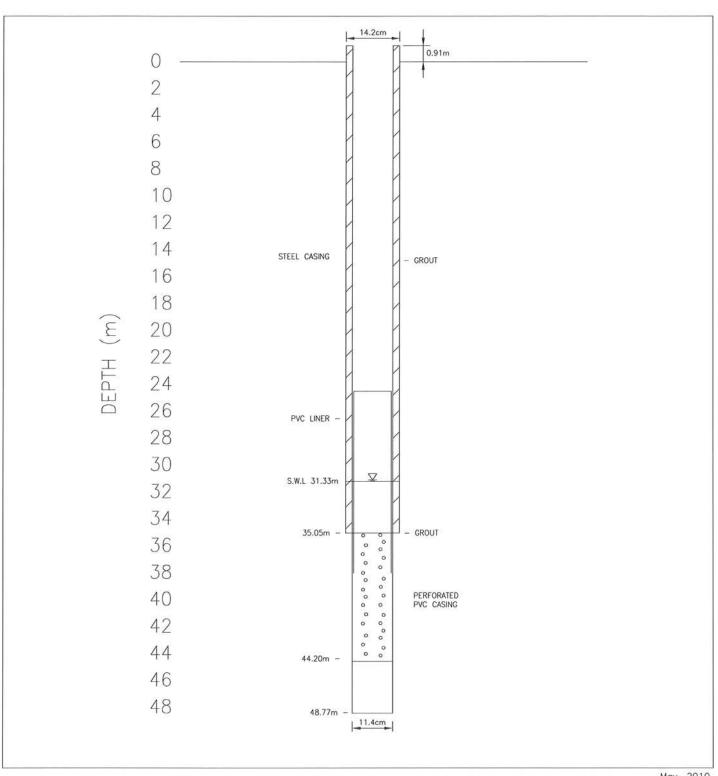
Based on the preliminary testing of the wells, it was decided to conduct a step test on PW1 to determine the desirable pumping rate for the 72-hour pumping test.

2.3.1 STEP DRAWDOWN TEST METHODS

The step test was done by pumping PW1 well at increasing rates to stress the well as much as possible. Pumping rates from PW1 were increased at 131 cubic meters per day intervals. The pumping rates for the step test were 131, 262, 393 and 445 cubic meters per day. Based on the step test data, a pumping rate for the 71.7 hour pump test was set at 445 cubic meters per day.

2.3.2 72-HOUR PUMP TEST METHODS

The well drilling contractor, Alken Basin Drilling Ltd., supplied the electric generator and submersible pump for the test, which took place on February 16 to February 22, 2010. The discharge from the PW1 Well was set at 445 cubic meters per day for the purpose of the aquifer test, with levels being measured in both wells. Water levels were recorded by Alken Basin using data loggers during the time-drawdown period of the test of 71.7 hours pumping and the recovery period of 63.2 hours, when recovery was complete. Discharge from the well was verified several times during the test by means of checking the time to fill a 20 liter container. Aquifer testing data can be found in Appendix D.



May, 2010 113929190



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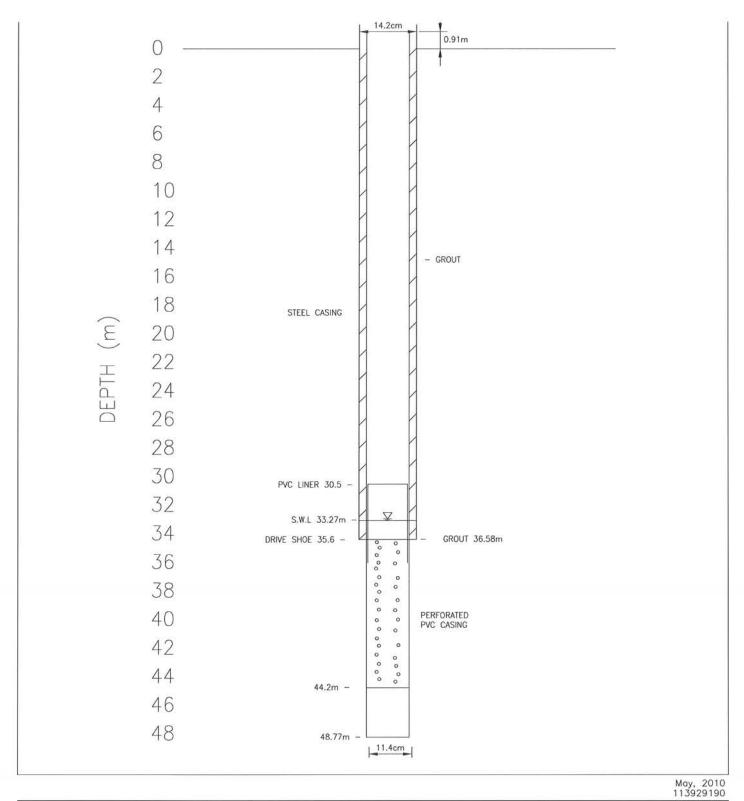
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SCHEMATIC OF OB-1

Figure No.

3





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SCHEMATIC OF PW-1

Figure No.

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2.3.3 72-HOUR AQUIFER TEST ANALYSIS METHODS

All the time-drawdown and time-recovery data for both the pumping and observation wells were analyzed using AquiferTest Pro 4.2, a software program developed by Waterloo Hydrogeologic (2008). This software enables the specialist to select the most appropriate aquifer analytical method and to adapt the software to confined, leaky or unconfined aquifers and to calculate the transmissive capacity, storativity and hydraulic conductivity. These parameters are the basis for predicting the future behavior of the aquifer under different conditions and times.

2.4 LABORATORY TESTING PROCEDURES FOR PALMS COVE GROUND WATER SUPPLY

Shortly before terminating the aquifer test of the PW1 Well on February 18, 2010, samples of the water were taken for routine analysis, metals and bacteriological analysis. The samples were refrigerated and sent to WSH Labs (1992) Ltd, Calgary. Laboratory results are found in Appendix E.

2.5 20-YEAR GROUND WATER YIELD CALCULATION METHODS

The theoretical long-term safe yield of the production well may be calculated by two main methods, the Farvolden Method and the Moell Method, based upon results of the aquifer testing.

The Farvolden Method is expressed as follows:

 $Q_{20} = (0.68)(T)(H_A)(0.7)$, in which

Q₂₀ = calculated safe yield for 20 years continuous pumping, in m³/day

T = transmissive capacity, in m²/day

H_A = available head, the difference between nonpumping water level and the top of the completion interval of the well, in m.

0.7 = a safety factor, to compensate for unknown limiting factors

The Farvolden Method is suitable when there is little or no well loss in the initial minutes of the test, but in most cases, the well loss is appreciable and must be taken into account. For this reason the Moell Method is usually preferable. It provides a more conservative and more realistic result. Only calculations based on the Moell Method will be used in this report for that reason.

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The Moell Method is expressed as follows:

$$Q_{20} = (Q)(H_A)(0.7)$$
, in which $s_{100} + 5\Delta s$

Q₂₀ = calculated safe yield for 20 years continuous pumping, in m³/day

Q = pumping rate used during the aguifer test, in m³/day

H_A = available head, the difference between nonpumping water level and the top of the completion interval of the well, in m.

0.7 = a safety factor to compensate for unknown limiting factors

 s_{100} = the observed drawdown after 100 minutes pumping, in m

 $\Delta s =$ the drawdown per log cycle, in m.

2.6 METHOD FOR DETERMINING LOCAL IMPACT ON NEARBY WATER WELLS

The impact, or interference, at different times and distances from the pumping well is calculated from two basic equations:

$$U = r^2 S/4Tt$$
, or 7.98 E-9* r^2

$$S = QW(u)/4\pi T$$
, or 0.0703 $W(u)$

Since the calculations using these formulae are somewhat laborious for each time and/or distance increment, the computer program WELLz was used. It is based on the same mathematical processes described above and accomplishes the same results much more rapidly.

METHOD FOR DETERMINING IMPACT ON SYLVAN LAKE WATER LEVELS 2.7

Alberta Environment maintained a network of 20 observation wells around the west end of Sylvan Lake for varying periods of 5.25 to 12.8 years. Several of these observation wells were located less than 1 km immediately west of the proposed Palms Cove Subdivision. None are still in use at present, as all measurements terminated in late 1997. Several were located in the ditch west of Range Road 2-4, and have been destroyed because of widening of this road.

In work done in a previous study, the hydrographs of these observation wells were analyzed by Stantec Consulting Ltd. to determine their long-term behavior and to estimate the recharge in this area. Each rise in water level in each hydrograph was assumed to represent a recharge event. Since measurements were taken only monthly, there are likely additional minor recharge events which are not evident in this analysis. The individual hydrographs are located in Appendix F.

3.0 Results of the Investigation

The sections that follow define the important facts and trends in the data that have been obtained from the public records, field and laboratory data.

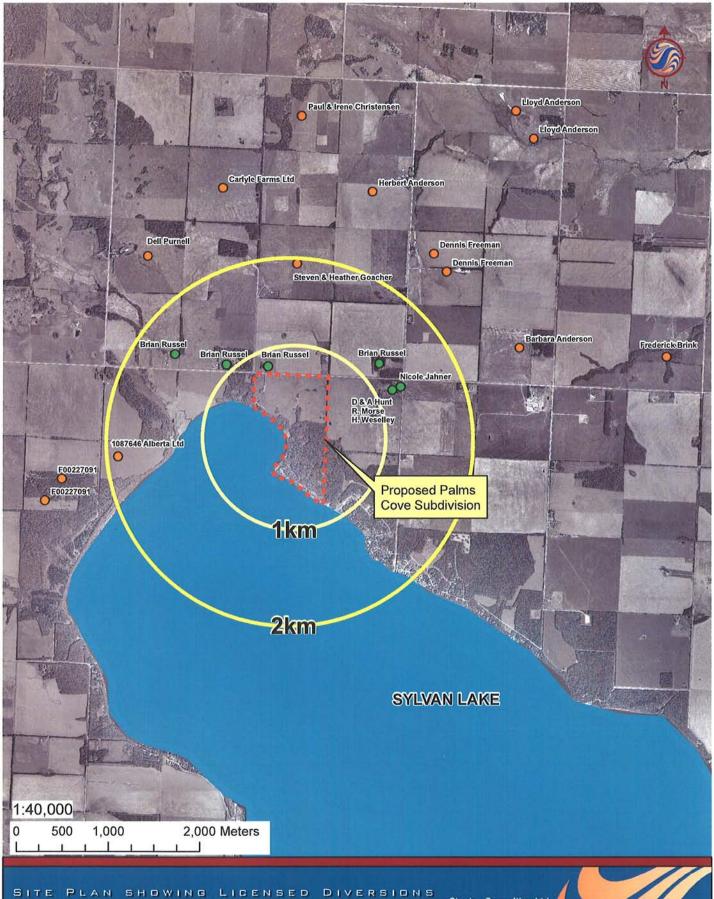
3.1 EXISTING LICENSED DIVERSIONS WITHIN 2-KILOMETERS OF PALMS COVE SUBDIVISION

Figure 5 shows the locations of the wells identified as existing in the immediate vicinity (within a 2 km radius), based on information in the Alberta Environment database

The authorized diversions shown in Table 2 are not necessarily the amount being diverted, but rather the maximum amount that the owner may divert in a year. Generally the actual diversion is lower than the authorized volume, although it normally varies from one year to the next.

Table 2
Licenses and Registrations Near Palms Cove Subdivision

			Interim		Quantity	Effective	Expiry	Aquifer
Location	Owner	Approval ID	License #	Type	(m³/year)	Date	Date	Interval (m)
SE-10-40-2-	Herbert	00167931-	00167961	-				
W.5	Anderson	00-00	00 00	REG	535	14-Mar-02		61 - ?
	Frederick	00167997-	00167997					
SE-1-40-2-W.5	Brink	00-00	00 00	REG	2,751	15-Mar-02		? - 18.3
NW-10-40-2-	Paul & Irene	00170501-	00170501					
W.5	Christensen	00-00	00 00	REG	165	20-Mar-02		? - 27.4
	Carlyle	00175140-	00175140					
SE-9-40-2-W.5	Farms Ltd	00-00	00 00	REG	740	28-Feb-06		? - 53
NE-11-40-2-	Lloyd	00177149-	00177149					
W.5	Anderson	00-00	00 00	REG	44	14-Mar-02		? - 27.4
NE-11-40-2-	Lloyd	00177149-	00177149					
W.5	Anderson	00-00	00 00	REG	1,025	14-Mar-02		? - 27.4
	Barbara	00178614-	00178614					
SE-2-40-2-W.5	Anderson	00-00	00 00	REG	200	15-Mar-02		? - ?
NW-2-40-2-	Dennis	00184061-	00184061					
W.5	Freeman	00-00	00 00	STOCK	797	26-Aug-03	25-Aug-28	48.7 - 61
NW-2-40-2-	Dennis	00184061-	00184061					
W.5	Freeman	00-00	00 00	STOCK	797	26-Aug-03	25-Aug-28	57.9 - 70.1
NW-4-40-2-		00190732-	00190732					
W.5	Dell Purnell	00-00	00 00	STOCK	1,145	30-Jan-03	31-Jan-28	21 - 38
SW-33-39-2-	1087646	00206640-	00206640					
W.5	Alberta Ltd	00-00	00 00	SUBDIV	35,856	16-Nov-05	15-Nov-30	28.9 - 38.1
	Steven &							
	Heather	00207642-	00207642					
NW-3-40-2-W5	Goacher	00-00	00 00	STOCK	353	15-Feb-06	14-Feb-31	61 - 67.1
SE-32-39-2-		00227091-	00227091					
W5	F00227091	00-00	00 00	SUBDIV	41,168	26-Sep-06	25-Sep-31	27.4 - 36.6
SE-32-39-2-		00227091-	00227091				•	
W5	F00227091	00-00	00 00	SUBDIV	41,168	26-Sep-06	25-Sep-31	27.4 - 36.6
TOTAL			Maria Bro		126,744			



SITE PLAN SHOWING LICENSED DIVERSIONS AND FIELD SURVEY WELLS WITHIN A 2KM RADIUS OF PALMS COVE DEVELOPMENT

FIGURE 5.0

QUALICO DEVELOPMENT - SYLVAN LAKE

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3.2 FIELD VERIFIED SURVEY WITHIN 1-KILOMETER OF PALMS COVE SUBDIVSION

Table 3 summarizes the information available on the wells which could be identified based on information from their owners. These data indicate that there are approximately eight (8) wells within one kilometer of the Palms Cove Subdivision.

Table 3
Field Verified Water Well Survey

Name	Location	GPS Location	Year Drilled	Total Depth (ft)	Use
Martine to the second		11U0690800			
Nicole Jahner	NE-34-39-2 W.5	UTM5809844			Domestic
D. & A Hunt, R.		11U0690770			Domestic.
Morse, H. Weselley	NE-34-39-2 W.5	UTM5809859			Livestock (~30)
1921/2 N 277	Special Communication of the C	11U0688289			
Brian Russel	SW-4-40-2 W.5	UTM5810055	1980	300'	Domestic
		11U0688289			
Brian Russel	SW-4-40-2 W.5	UTM5810055	1970		Livestock
Brian Russel		11U0688881			
Dilaii Nussei	SE-4-40-2 W.5	UTM5809990	~1940		Domestic
		11U0688881			
Brian Russel	SE-4-40-2 W.5	UTM5809990			Livestock
After the same least		11U0689351			
Ralph Nores	SW-3-40-2 W.5	UTM5810009	~1982	130'	Domestic
		11U0690599			
Randy Screpnek	SE-3-40-2 W.5	UTM5810144		280'	Domestic

3.3 PALMS COVE SITE HYDROGEOLOGIC SETTING

Figure 6 is a site plan that shows the location of the cross section drawn through the production and the observation wells drilled on the Palms Cove Subdivision Property. Figure 7 depicts the stratigraphic section for the Paskapoo Formation, Dalehurst Member sediments encountered in the subsurface under the Palms Cove Subdivision Property. Based on the drilling the following results are presented for review:

- Approximately 43.6 meters of alternating sandstone and shale were encountered during the drilling of PW1 and OB1 wells
- (2) A water bearing sandstone was encountered at a depth of approximately 36.9 meters below the land surface in PW1 and about 35.4 meters below the land surface in OB1.
- (3) The thickness of the sandstone varies from 7.9 to 10.4 meters.
- (4) An impermeable shale bed is located above the sandstone. The shale is 4.9 to 5.8 meters in thickness.

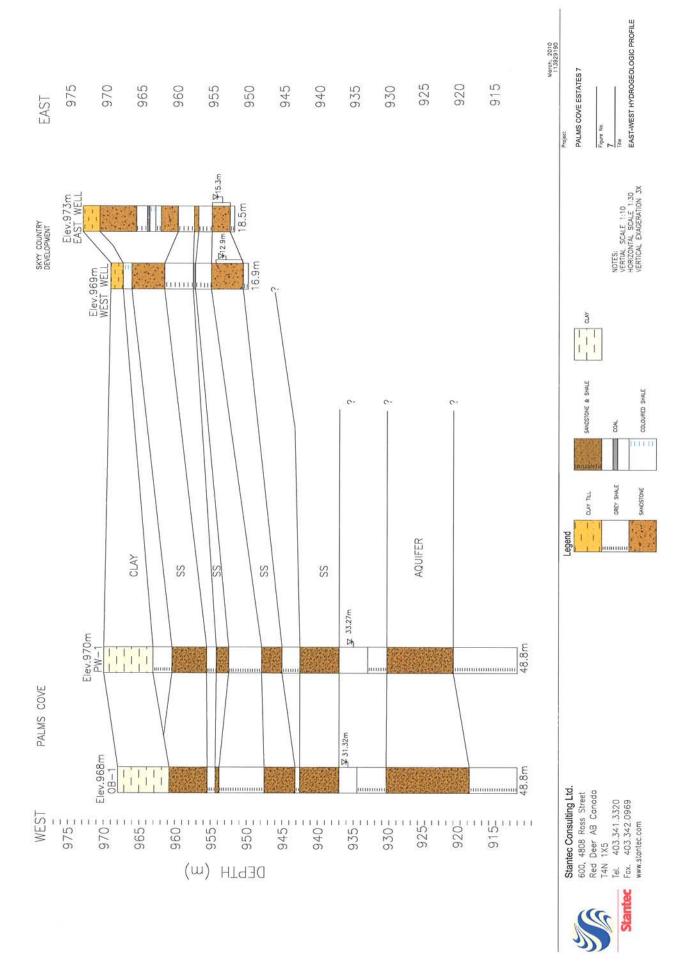


HYDROGEOLOGIC CROSS SECTION A - A' FIGURE 6.0

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GROUNDWATER EVALUATION, PALMS COVE SUBDIVISION WITHIN W.1/2-34-39-2-W5M

Results of the Investigation March 2010

- (5) The initial non-pumping groundwater level was at 33.83 meters in PW1 and 31.70 meters below the land surface in OB1.
- (6) Water levels in PW1 and OB1 are 3.98 to 4.61 meters above the top of the water bearing sandstone respectively, indicating that the water is under artesian pressure.

3.4 AQUIFER TESTING RESULTS FOR PALMS COVE SITE

The aquifer test results have been subdivided into three (3) sections which describe the step test results, the 71.7 hour pump test results, and the 20-year groundwater safe yield calculation used to determine the impact of groundwater development by the Palms Cove Subdivision on nearby wells and Sylvan Lake.

3.4.1 STEP TEST RESULTS

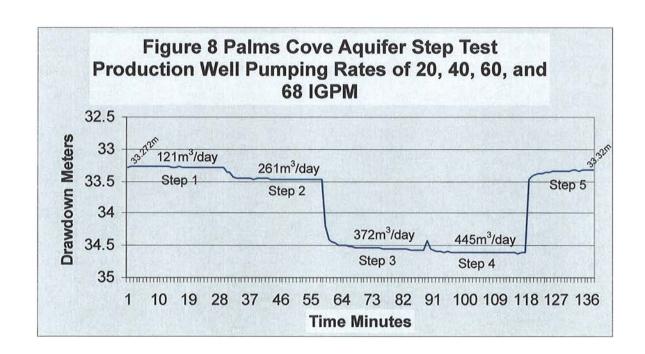
Figures 8 and 9 show the data results for the step test for the pumping and observation wells. These data show that the drawdown in the pumping well was nil at 121 cubic meters/day. The drawdown at 261 and 372 cubic meters per day was more pronounced. When the pumping rate increased to 445 cubic meters per day, there was almost no significant increase in the drawdown of the pumping well or observation well.

3.4.2 72-HOUR PUMP TEST RESULTS

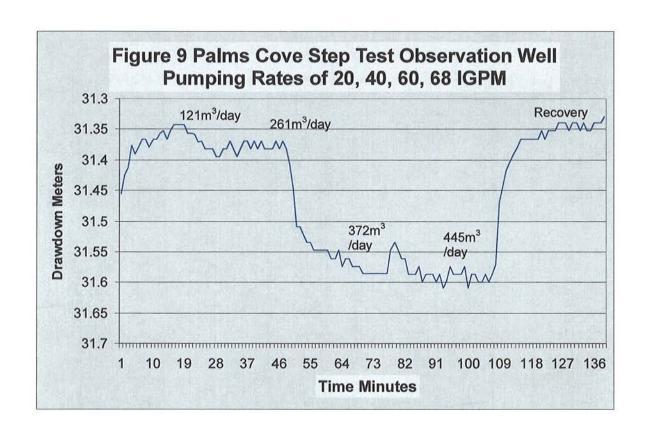
Figures 10 to 18 show the time-drawdown and time-recovery plots and calculations of transmissive capacity during the testing, beginning February 16, and ending February 22, 2010. For the both wells, the Double Porosity analysis was used, which takes into account the divergence in porosity of the fractured bedrock and the pore space in bedrock.

At the end of 71.7 hours of pumping, the total drawdown in PW1 was 1.488 m. There was very little drawdown in the well due to its excellent hydraulic characteristics. The time-drawdown and time-recovery data from the Observation well were also analyzed using the Double Porosity procedure. In the recovery, water levels rose higher than the initial non-pumping level prior to pumping, probably due to barometric changes during the test. This resulted in negative values which could not be plotted on the time-drawdown and time-recovery curves. For this reason, a small correction factor was added, in order to eliminate the negative values. It was not used however in the calculations of sustainable yield. Most of the changes in levels in the recovery data, especially in OB1, were only in the order of millimeters, and thus are of minor significance.

The aquifer parameters were calculated for both the pumping and recovery portions of the test for the pumping well. Table 4 summarizes the results for PW1. Table 5 summarizes the results for the OB1. In selecting the parameters to be used for the further evaluation of aquifer behavior, those values considered to be unrepresentative or invalid were discarded, and only valid parameters were used.







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STEP DRAWDOWN TEST FOR OBI WELL FIGURE 9.0

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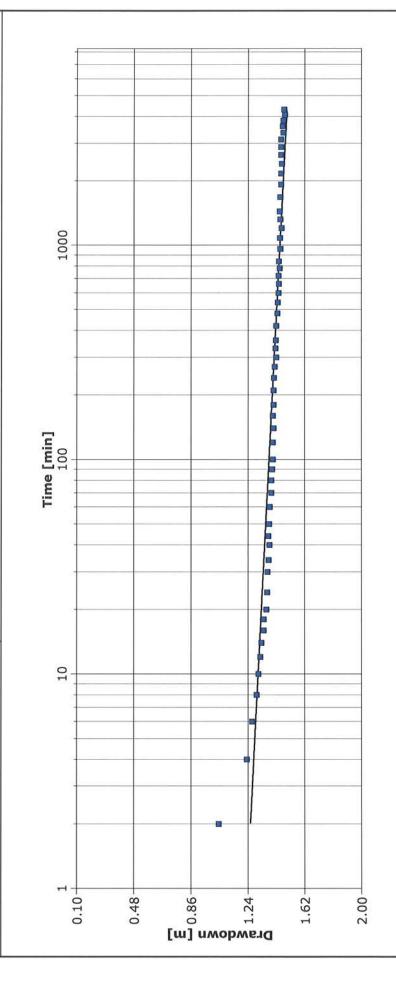
asin Dr	Project: Palms Cove Aquifer test Project: Palms Cove Aquifer test		Stantec Consulting Ltd.		Pumping Test Analysis Report	leport	
Tel. 403-341-3320 Number: 113929190	Tel 403-341-3320 Number: 113929190		600 - 4808 Ross Street Red Deer, AB			fer test	
Client: Qualico Developments	Client: Qualico Developments		Tel. 403-341-3320		Number: 113929190		
Registration Pumping Test Pumping Utd. Pumping well: PW41 of by, Alken Basin Drilling Ltd. Test date: 2/12/2010 ness: 10.40 m Discharge: variable, average rate 454.89 [m²/d] Date: 3/24/2010 1 1660.8 3320.6 Time [min] 4980.4 6640.2	Second Pumping Test: Pumping Test Pumping Test Pumping velt: Pwt-1	Stantec				nents	
## Nelsen Time [min] A980.4 6640.2	Test date. 2/12/2010 Test date. 2/12/2010 Test date. 2/12/2010 Date: 3/24/2010 Discharge: variable, average rate 454.89 [m³/d] 4980.4 6640.2 6	cation: W1/2-34-	39-2-W.5	Pumping Test: Pumping Test 1		Pumping well: PW-1	
1660.8 3320.6 Time [min] 4980.4 6640.2	# Nielsen Discharge: variable, average rate 454.89 [m³/d] Time [min] 4980.4 6640.2 1660.8 3320.6 Time [min] 4980.4 6640.2 Figure 10. Time - drawdown linear plot of wells PW/1 and OB-1	st conducted by:	Alken Basin Drilling Ltd.			Test date: 2/12/2010	
Discharge: variable, average rate 454.89 [m²/d] Time [min] 4980.4 6640.2	Discharge: variable, average rate 454.89 [m³/d] Time [min] 4980.4 6640.2	alysis performed	by: Grant Nielsen		= 1,	Date: 3/24/2010	
Time [min] 4980.4 6640.2	Time [min] 4980.4 6640.2	uifer Thickness:	10.40 m	Discharge: variable, average rate	454.89 [m³/d]		
	Figure 10.	H -	1660.8			6640.2	8300
	Figure 10. Time - drawdown linear plot of wells PW-1 and OB-1	0.48 0.86 1.24 0.86 1.62 1.62 2.00					

	Stantec Consulting Ltd.	Pumping Test Analysis Report	Report
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	Tel. 403-341-3320	Number: 113929190	
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ocation: W1/2-34-39-2-W.5		Pumping Test: Pumping Test 1	Pumping well: PW-1

DR Ross Street		N. M. Constant	1
r, AB T4N 1X5	Project: Palms Cove Aquifer test	r test	
341-3320	Number: 113929190		
	Client: Qualico Developments	nts	
Pumping Te	Pumping Test: Pumping Test 1	Pumping well: PW-1	ı
		Test date: 2/12/2010	
₹.		Date: 3/24/2010	
Discharge:	Discharge: variable, average rate 454.89 [m³/d]		

Test conducted by: Alken Basin Drilling Ltd. Analysis performed by: Grant Nielsen

Aquifer Thickness: 10.40 m



Calculation after Double Porosity	ity						
Observation well	Transmissivity	¥	Specific storage	Sigma	Lambda	Radial distance to PW	
	[m ² /d]	[m/d]				[m]	
PW-1	1.14 × 10 ³	1.09×10^{2}	1.00 × 10 ⁻¹⁵	5.95 × 10°	1.00 × 10 ⁻¹⁵	90.0	
	Figure 11.	Figure 11. Time - drawdown ser	semi-log plot of well PW-1, using the double-porosity method	1, using the double-p	oorosity method		

	Stantec Consulting Ltd.	Pumping Test Analysis Report	Report
	600 - 4808 Ross Street	Project: Palms Cove Aquifer test	infer test
	Red Deer, AB 14N 1X5 Tel 403-341-3320	N. M.	
Chanda		14411001	
Stantec		Client: Qualico Developments	pments
Location: W1/2-34-39-2-W.5		Pumping Test: Pumping Test 1	Pumping well: PW-1

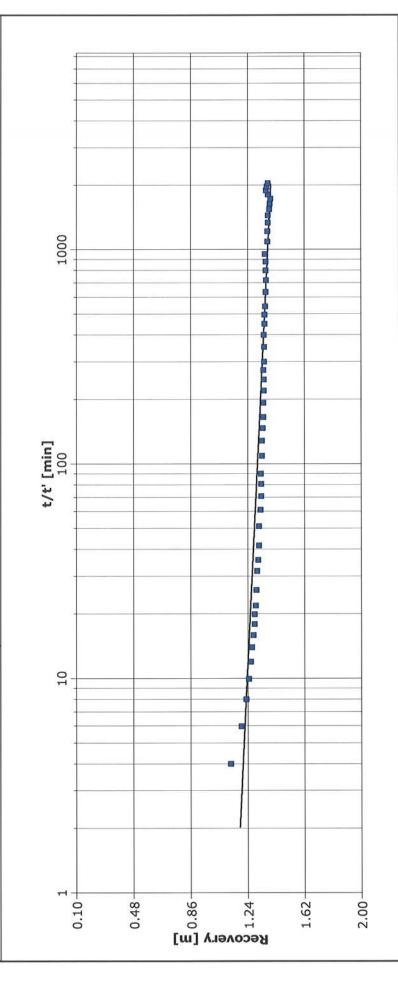
		and an are from the condition to	
	Project:	Project: Palms Cove Aquifer test	er test
	Number:	Number: 113929190	
	Client:	Client: Qualico Developments	ents
st: Pumping Test 1			Pumping well: PW-
2			Test date: 2/12/20

Date: 3/24/2010

Discharge: variable, average rate 454.89 [m³/d]

Test conducted by: Alken Basin Drilling Ltd. Analysis performed by: Grant Nielsen

Aquifer Thickness: 10.40 m



Observation well	Transmissivity	¥	Specific storage	Sigma	Lambda	Radial distance to PW	
	[m ² /d]	[m/d]				[m]	
PW-1	1.19 × 10 ³	1.15 × 10 ²	3.87 × 10 ⁻¹⁵	1.78×10^{0}	1.91 × 10 ⁻⁶	0.06	
	i i i	Figure 12 Time - recovery semi-log plot of well PW-1 using the double-porosity method	mi-log plot of well PW.	1 using the double-r	orosity method		

Calculation after AGARWAL + Double Porosity

(Stantec Consulting Ltd.	Pumping Test Analysis Report	Report
	Red Deer, AB T4N 1X5	Project: Palms Cove Aquifer test	luifer test
	Tel. 403-341-3320	Number: 113929190	
Stantec		Client: Qualico Developments	pments
ocation: W1/2-34-39-2-W.5		Pumping Test: Pumping Test 1	Pumping well: PW-1
Test conducted by: Alken Basin Drilling Ltd.	n Drilling Ltd.		Test date: 2/12/2010

lest date: 2/12/2010	Test date: 2/12/2010	Pumping well: PW-1	Client: Qualico Developments
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Discharge: variable, average rate 454.89 [m³/d]

Analysis performed by: Grant Nielsen

Aquifer Thickness: 10.40 m

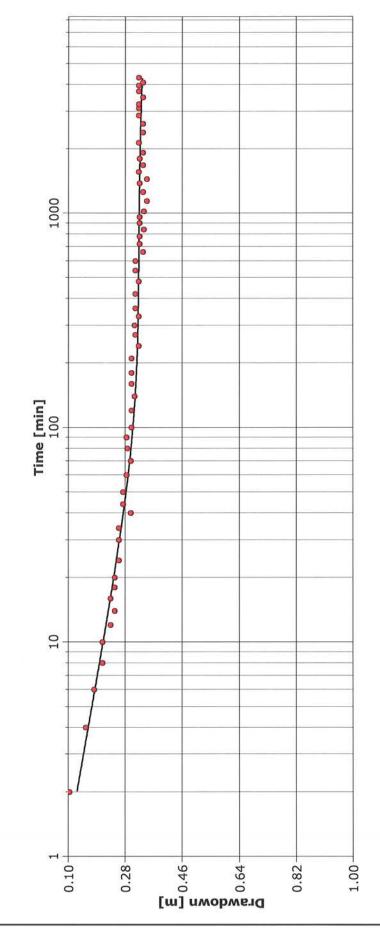
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Calculation after Double Porosity	ty						
Observation well	Transmissivity	×	Specific storage	Sigma	Lampda	Radial distance to PW	
	[m²/d]	[p/m]		7		[m]	
PW-1	1.14 × 10 ³	1.09 × 10 ²	3.48 × 10 ⁻¹⁵	1.00 × 10 ⁰	3.62 × 10 ⁻¹⁵	0.06	
	Figure 13 Time - drawd	me - drawdown log-lo	own log-log plot of well PW-1 using the double-parasity method	sing the double-poros	ity method		

	1 1111						
	600 - 4808 Ross Street Red Deer, AB T4N 1X5	et IX5	а.	Project: Palms Cove Aquifer test	Aquifer test		
	Tel. 403-341-3320			Number: 113929190			
Stantec				Client: Qualico Developments	elopments		
Location: W1/2-34-39-2-W.5	W.5	Pumping	Pumping Test: Pumping Test 1		Pumping well: PW-1	V-1	
Test conducted by: Alken Basin Drilling Ltd.	n Basin Drilling Ltd.				Test date: 2/12/2010	010	
Analysis performed by: Grant Nielsen	Srant Nielsen				Date: 3/24/2010		
Aquifer Thickness: 10.40 m	m.	Discharge	Discharge: variable, average rate 454.89 [m³/d]	4.89 [m³/d]			
0.10		10	t/t'	t/t' [min] 100	1000	00	
Eecove 1.00 10.00 Calculation after AGARWAL + Double Porosity Transmissivit		Ä X X	Specific storage	Sigma	Lambda	Radial distance to PW	
PW-1	103	1.06 × 10 ²	1.79 × 10 ⁻¹³	1.00 × 10 ⁰	1.00 × 10 ⁻¹⁵	0.06	
	64256 X 401				10.00 (1947) AUS.		

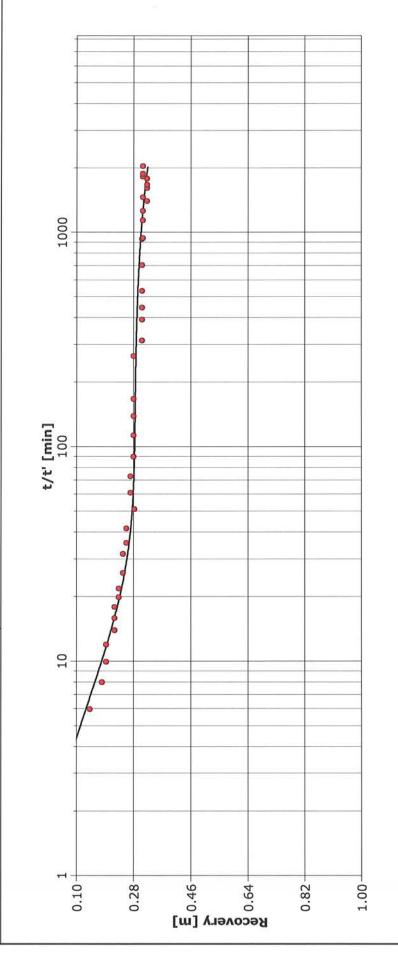
	Stantec Consulting Ltd.	Pumping Te	Pumping Test Analysis Report
	600 - 4808 Ross Street Red Deer, AB T4N 1X5	Project: Pal	Project: Palms Cove Aquifer test
	Tel. 403-341-3320	Number: 113929190	3929190
Stantec		Client: Qu	Client: Qualico Developments
l ocation: W/1/2-34-39-2-W 5		Primping Test: Primping Test 1	P.MAGII. DIMA

אמן ונבר	Client: Qualico Developments	nents
Location: W1/2-34-39-2-W.5	Pumping Test: Pumping Test 1	Pumping well: PW-1
Test conducted by: Alken Basin Drilling Ltd.		Test date: 2/12/2010
Analysis performed by: Grant Nielsen		Date: 3/24/2010
Aquifer Thickness: 10.40 m	Discharge: variable, average rate 454.89 [m³/d]	



Calculation after Double Porosity	ty						
Observation well	Transmissivity	×	Specific storage	Sigma	Lambda	Radial distance to PW	
	[m²/d]	[m/d]				[m]	
OB-1	6.60 × 10 ²	6.35 × 10 ¹	6.87 × 10 ⁻⁵	1.40 × 10 ²	3.61 × 10 ⁻³	55.04	
	Figure	15. Time - drawdown	Figure 15. Time - drawdown semi-log plot of well OB1, using the double-porosity method)B1, using the dou	ble-porosity method		

	Stantec Consulting Ltd.		Pumping Test Analysis Report	sis Report
	600 - 4808 Ross Street Red Deer, AB T4N 1X5		Project: Palms Cove Aquifer test	Aquifer test
	Tel. 403-341-3320		Number: 113929190	
Stantec		•	Client: Qualico Developments	elopments
Location: W1/2-34-39-2-W.5	7.5	Pumping Test: Pumping Test 1		Pumping well: PW-1
Test conducted by: Alken Basin Drilling Ltd.	Basin Drilling Ltd.			Test date: 2/12/2010
Analysis performed by: Grant, Nielsen	rant Nielsen			Date: 3/24/2010
Aquifer Thickness: 10.40 m	ш	Discharge: variable, average rate 454.89 [m³/d]	154.89 [m³/d]	



Observation well	Transmissivity	×	Specific storage	Sigma	Lambda	Radial distance to PW	
	[m²/d]	[m/d]				[m]	
OB-1	2.08 × 10 ²	2.00 × 10 ¹	3.69 × 10 ⁻⁴	2.62×10^{2}	3.33 × 10 ⁻¹	55.04	
	Figure 16.	Г	ime - recovery semi-log plot of well OB1 , using the double-porosity method	, using the double-p	oorosity method		

Calculation after AGARWAL + Double Porosity

Stantec	600 - 4808 Ross Street	+00					
Stantec	Red Deer, AB T4N 1X5	1X5	-g	Project: Palms Cov	Palms Cove Aquifer test		
Stantec	Tel. 403-341-3320	?	Ž	Number: 113929190			
I ocation: W/1/2-34-39-2			ਹ	Client: Qualico De	Qualico Developments		
Education: VVIIE OF CO.	2-W.5	Pumping Tea	Pumping Test: Pumping Test 1		Pumping well: PW-1	PW-1	
Test conducted by: Alken Basin Drilling Ltd	en Basin Drilling Ltd.				Test date: 2/12/2010	72010	
Analysis performed by: Grant Nielsen	Grant Nielsen				Date: 3/24/2010	0	
Aquifer Thickness: 10.40 m	40 m	Discharge: v	Discharge: variable, average rate 454.89 [m³/d]	.89 [m³/d]			
1 -		10	Time [min]	[min]	1	1000	-
Drawdown [m] 10.00							
Calculation after Double Porosity	20.00			District Chine			
Observation well	Transmissivity [m²/d]	K [m/d]	Specific storage	Sigma	Lambda	Radial distance to PW [m]	
OB-1	7.05 × 10 ²	6.78 × 10 ¹	5.77 × 10 ⁻⁵	1.25 × 10 ³	2.21 × 10 ⁻³	55.04	

	Stantec Consulting Ltd.		Pumping Test Analysis Report	eport
	600 - 4808 Ross Street Red Deer AB		Project: Palms Cove Aquifer test	er test
	Tel. 403-341-3320		Number: 113929190	
Stantec			Client: Qualico Developments	lents
Location: W1/2-34-39-2-W.5	4-39-2-W.5	Pumping Test: Pumping Test 1		Pumping well: PW-1
Test conducted by	Test conducted by: Alken Basin Drilling Ltd.			Test date: 2/12/2010
Analysis performe	Analysis performed by: Grant, Nielsen			Date: 3/24/2010
Aquifer Thickness: 10.40 m	s: 10.40 m	Discharge: variable, average rate 454.89 [m³/d]	54.89 [m³/d]	
y [m]	10	t/t	t/t' [min] 100	1000
Becover 1.00				

Radial distance to PW

Lambda

Sigma

Specific storage

Transmissivity

Observation well

Calculation after AGARWAL + Double Porosity

[m] 55.04

 2.75×10^{-2}

 9.51×10^{1}

1.95 × 10⁻⁴

[m/d] 4.49 × 10¹

> $[m^2/d]$ 4.67 × 10^2

> > 0B-1

, using the double-porosity method

Figure 18. Time - recovery log-log plot of well OB1

GROUNDWATER EVALUATION, PALMS COVE SUBDIVISION WITHIN W.1/2-34-39-2-W5M

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A transmissive capacity of 1110 m²/day was selected for PW1. Storativity was calculated to be 0.00017, the average from the different analytical procedures.

The specific capacity of a well is given by the productive capacity of a well divided by its drawdown. In the case of the Production Well, the discharge during the test was 445 m^3 /day, and the maximum drawdown after 71.7 hours pumping was 1.488 m. Thus the specific capacity of the well is 445/1.498 = 299.1 cubic meters per day per meter of drawdown.

Table 4
Aquifer Hydraulic Characteristics for PW1

Well	Test	Analysis	Drawdown (m)	Discharge m³/day	Transmissivity m ² /day	Spec. Cap. m³/day/m
PW1	Drawdown Semi-Log Plot Drawdown	Double Porosity Warren Root Method	1.488	445	1140	299.1
PW1	Log-Log Plot	Double Porosity Warren Root Method	1.488	445	1140	299.1
PW1	Recovery Semi-Log Plot	Double Porosity Warren Root Method	-	0	1190	-
PW1	Recovery Log-Log Plot	Double Porosity Warren Root Method		0	1110	_

Table 5
Aquifer Hydraulic Characteristics for OB1

Well	Test	Analysis	Drawdown (m)	Discharge m³/day	Transmissivity m²/day	Spec. Storage Dimensionless
OB1	Drawdown Semi-Log Plot	Double Porosity Warren Root Method	0.293	0	660	0.0000687
OB1	Drawdown Log-Log Plot	Double Porosity Warren Root Method	0.293	0	705	0.0000577
OB1	Recovery Semi-Log Plot	Double Porosity Warren Root Method	-	0	660	0.000369
OB1	Recovery Log-Log Plot	Double Porosity Warren Root Method	-	0	467	0.000195

3.4.3 20-year ground water yield Calculation Results for Palms Cove Development

The 20 year sustainable yield of the West Well, as calculated by the Moell Method is as follows:

$$Q_{20} = \frac{(445)(3.98)(0.7)}{1.39 + (5)(.079)}$$
$$= 695 \text{ m}^3/\text{day}.$$

3.5 RESULTS REGARDING IMPACT ON WATER LEVELS NEAR THE PALMS COVE DEVELOPMENT

It was observed that the nonpumping water level in PW1 was at 936.19 m elevation, which is 0.47 m lower than the level of Sylvan Lake outlet at 936.66 m. The aquifer is at 932.21 to 924.31 m elevation. This is a very unusual situation, in that the nonpumping level under natural conditions is lower in elevation than the level of the lake, located about 585 m to the southwest. It was decided to check the elevation of the nonpumping levels in other wells of the immediate area to determine whether PW1 is an isolated case. It was discovered, as shown in the accompanying table, that there are at least five other wells in the immediate area whose original nonpumping level was below lake level. These were all domestic farm wells. None from Sunbreaker Cove, or others with uncertain location, were considered, because of the difficulty in determining their precise location and hence their elevation. Elevations were extrapolated from a detailed contour map with 5 metre contours. Thus the well elevations will not be in error by more than 1 or 2 metres, and show a consistent pattern.

Table 6
Wells with nonpumping levels below lake level

		Land	Year	Surface Elev.	Aquifer	Nonpumping	Lake
Well ID	Owner	Location	Drilled	(m)	Interval(m)	Water level	Level
						m	m
437633	Buit Bros.	SW-3-40- 2	?	966	925-917	924	936.66
362710	R. Hicks	SW-34- 39-2	1981	939	911-902	931	936.66
467432	E. Haack	SW-34- 39-2	1997	939	915-905	927	936.66
362722	P. Carlson	NE-34-39- 2	1978	980	910-902	934	936.66
362718	W. Reid	NW-34- 39-2	1981	955	918-909	932	936.66

As mentioned earlier, Sylvan Lake is unusual in that there is groundwater inflow from the northwest and the southwest from areas of higher elevation and higher piezometric surface. At the same time however there is groundwater through-flow out of the lake to the northeast and

GROUNDWATER EVALUATION, PALMS COVE SUBDIVISION WITHIN W.1/2-34-39-2-W5M

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the southeast. The wells constructed in a neighboring property were completed in an unconfined aquifer above the confined sandstone aquifer used in the Palms Cove subdivision. Although the Palms Cove wells have a piezometric surface above the aquifer and hence are confined, the water level is still slightly lower than that of Sylvan Lake. The base level for through-flow appears to be the lower elevation of Blindman River to the northeast and to a lesser extent, Cygnet Lake to the southeast. The aquifer tested appears to be the highly conductive layer of sandstone at and below the elevation of Sylvan Lake, which was postulated by AXYS Environmental Consulting Ltd. (Section B-2.1.2).

The aquifers of Alberta are known to be generally discontinuous, lenticular, anisotropic and heterogeneous in their configuration. This gives rise to a number of concerns that must be considered in the calculation of long-term pumping rates and the design of water systems. Among these concerns are the following;

- Transmissive capacity is not constant everywhere in an aquifer, nor in time. The
 hydrogeologic cross-section (Figure 7) shows the extent to which unit thickness and
 hence transmissive capacity may vary, even in short distances (although part of the
 variability may result from differences in driller interpretation). Even within the same
 lithostratigraphic unit, there are significant variations in thickness, permeability, degree of
 fracturing, variation in cementation, etc. All these factors contribute to create a wide
 range of transmissive capacity.
- Because of the lenticular nature of most aquifers in Alberta, even neighboring wells are
 often completed in different and distinct water-bearing strata. Therefore one cannot
 necessarily assume that adjacent wells are connected hydraulically to each other.
- Nor is it likely, as the above analysis assumes that a well will be pumped on a
 continuous basis over its lifetime. There are always periods of lower or no pumping
 during well maintenance, or when the owner is absent. In this case, the wells will not be
 pumped, or very little, outside the summer season.
- The basic assumptions behind the Theis analytical procedures for calculating transmissive capacity are that the aquifer is horizontal, of infinite extent, homogeneous and isotropic, and that the wellbore is of infinitesimal diameter. In reality, none of these assumptions is strictly true. The variations from the ideal can usually be recognized however and corrections made.

To calculate the degree of interference at different distances from the pumping wells and at different times, the following parameters have been used, as derived from the aquifer test. Since only the pumping well will be pumped, the local impact is calculated as the sum of the impact of the well over time. The inhomogeneities of the aquifer, as noted in the previous sections, will modify the real-life results to some extent, of course.

Pumping Rate = 445 cubic metres per day Transmissive capacity = 1110 m²/day Storativity = 0.00017(dimensionless)

The calculations of interference shown in Table 7 are based on the assumption that the wells will pump without stopping for 20 years, and that there will be no recharge to the aquifers during

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that time. Obviously, both assumptions are incorrect, as there will certainly be interruptions of the pumping time, especially outside the vacation season, and there will also be recharge to the aquifer from infiltration of snowmelt and rainfall. This item will be discussed in detail further below. Thus the table shows only a "worst case scenario" of what might happen. In reality, because of the recharge, the aquifer will exhibit even less drawdown and interference than these calculations would indicate. This recharge effect has been quantified and will be discussed later in this report.

In addition, the maximum interference indicated below would take place only in wells which are completed in the same aquifer interval. Wells which are completed in shallower or deeper zones would probably show little or no interference.

Table 7
Interference caused by pumping of Palms Cove Wells

Distance(m)	1 Year	2 Years	5 Years	10 Years	20 Years
100	.42	.44	.47	.49	.52
200	.38	.40	.43	.45	.47
500	.32	.34	.37	.39	.41
750	.29	.31	.34	.37	.39

3.6 GROUND WATER LABORATORY RESULTS

The chemical results are shown below in Table 8. As predicted in the Lacombe County groundwater report, the water is a sodium-bicarbonate type, as would be expected.

None of the parameters exceed the Canadian Drinking Water Quality Guideline. A shock chlorination and routine chlorination of the well during operation will protect the well from bacterial contamination. No E.coli bacteria were present. The water meets all chemical guidelines for human use, with only the minimal statutory chlorination required. No chemical parameters in the routine analysis exceeded the Canadian Drinking Water Quality Guidelines.

Table 8
Groundwater Quality Results

		Pumping	Drinking Water
Parameter	Units	Well	Guidelines
Date		03/01/2010	
Calcium	mg/L	12.5	No Guidelines
Iron	mg/L	0.04	0.3
Magnesium	mg/L	4.7	No Guidelines
Manganese	mg/L	0.02	0.05
Potassium	mg/L	1.2	No Guidelines
Sodium	mg/L	175	200
Bicarbonates	mg/L	432	No Guidelines
Bromides	mg/L	<0.1	No Guidelines
Carbonates	mg/L	12	No Guidelines
Chlorides	mg/L	0.8	250
Fluorides	mg/L	0.50	1.5
Nitrates as N	mg/L	<0.02	10
Nitrites as N	mg/L	<0.02	No Guidelines
NO3+NO2	mg/L	<0.02	0.1
Sulfates	mg/L	61	500
Electrical Conductivity	μS/cm	723	No Guidelines
рН	pH units	8.11	6.5-8.5
Hardness	mg/L	51	No Guidelines
Total alkalinity	mg/L	378	No Guidelines
P-alkalinity	mg/L	6	No Guidelines
Hydroxide	mg/L	0	No Guidelines
Total dissolved solids	mg/L	483	500
Total coliforms	CFU/100 mL	0	0
E-coli	CFU/100 mL	0	0
Boron	μg/L	222	5000
Aluminum	μg/L	20.2	100
Chromium	μg/L	<0.1	50
Copper	μg/L	<0.08	1000
Zinc	μg/L	60.2	5000
Arsenic	μg/L	0.88	10
Selenium	μg/L	0.06	10
Cadmium	μg/L	<0.05	5
Antimony	μg/L	0.3	6
Barium	μg/L	31.6	1000
Mercury	μg/L	<0.05	1
Lead	μg/L	<0.1	10
Uranium	μg/L	<0.04	20

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3.7 RESULTS REGARDING SYLVAN LAKE SURFACE AND GROUNDWATER LEVELS

Alberta Environment has recognized that Sylvan Lake is maintained largely by flow from springs and diffused groundwater discharge from the northwest and southwest. For this reason, they are concerned with any activity which might modify the natural groundwater flow. It is considered undesirable that pumping increase to the point at which the cones of depression of the wells would extend to the lakeshore, and thus begin to divert water from the lake to the water supply wells.

There has been considerable concern expressed by those who live near and who use the lake for recreation that the continued development of groundwater resources is impacting discharge to the lake. This reduction of discharge into Sylvan Lake could cause the level to drop and thus would also contribute to deterioration of lake water quality.

The level at which there is surface discharge from the lake is 936.66 m. A few scattered measurements of water levels of Sylvan Lake began starting in 1918 and continued until 1930. One single level was read in each of 1939 and 1940. Systematic readings began again in 1956 and continue to the present, with several readings daily during the season when the lake is not frozen, ie, about May 1 to November 30 of each year.

In an unpublished document prepared by Stantec Consulting Ltd., it was shown that in 69 years of records (updated through 2009), there were 40 years with at least some documented discharge from the lake, and 29 years with no discharge. Years 2004 to 2006 had no discharge. However, 2007 to 2009 experienced levels above the discharge outlet during almost the entire ice-free season, ie, from about May 1 until freeze-up in late October. 2007 was a year with almost no beach exposed because of high water. As 2009 has been the year of maximum subdivision development and groundwater use to date, it is evident that no harm has been done to date to lake levels due to groundwater production around the lake. In addition, the six months of discharge from the lake and flow-through of groundwater would certainly flush out accumulated water from previous years and lake water quality would reflect to a large degree the quality of the surface water and groundwater entering into the lake during 2009.

Table 8 was developed to show historic ground water levels near Sylvan Lake. A trend indicated as "Level" does not mean that there is no change in the water level in this hydrograph. It means rather that the long-term trend over the life of the record is approximately level, with no evident long-term downward or upward trend. It may be seen that there are only two hydrographs with a downward trend, and the other 18 were either level or gradually rising. This suggests that due to the amount of recharge in the immediate area, there is no immediate danger of over-exploiting the aquifers adjacent to Sylvan Lake.

AXYS Environmental Consulting, quoted in the Stantec Consulting Ltd. report, calculated average annual recharge at about 4.75 mm/year in low-lying areas, increasing to as much as 50 mm in upland areas (Stantec Consulting Ltd., 2006, p. 4.4), where there is little till cover on the

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Paskapoo Formation bedrock. Without groundwater pumping, they estimated total groundwater recharge at 15,727 cubic meters/day or 5,740,355 m³/year within the drainage basin of Sylvan Lake.

It appears that the production of water from this location is primarily from the interception of groundwater which is already flowing through northeastward toward Blindman River. The principal impact on the hydrological regime would be a slightly decreased diffused discharge along sand into the Blindman River to the northeast.

AXYS evaluated the groundwater regime, using a Modflow simulation in 2005. Using the year 2003 groundwater production at the Town of Sylvan Lake (79 % of total diversion) they concluded: "Comparing this distribution to the distribution shown on Figure B-15 shows that the Town's groundwater production would have little effect on the hydraulic head distribution." All other diversions are minor in comparison with that of the Town.

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Table 9
Historic Groundwater Levels – Sylvan Lake Area

	r			Sylvan Lake Al		221000000000000000000000000000000000000
Well Location*	Well Ref. No.	Years of Record	Total well depth	Confined/ Unconfined	Annual Recharge(m	Trend of Hydrograph
			(m)	Aquifer	m)	R 470 183
1-32-39-2	2623E	12.8	32.9	С	3.0	Down
1-32-39-2	2604E	12	33.8	С	2.5	Up
1-32-39-2	2605E	13	19.2	С	1.9	Level
1-32-39-2	2606E	13	6.4	С	4.7	Level
1-19-39-2	2609E	7	25.9	С	3.4	Up
1-19-39-2	2610E	7	11.6	С	2.4	Level
1-19-39-2	2611E	7	6.4	U	15.4	Level
14-9-39-2	2613E	7	30.0	С	4.4	Up
13-26-39-2	2616E	7	42.3	С	2.2	Up
13-26-39-2	2617E	7	24.0	С	3.0	Up
13-26-39-2	2618E	7	5.7	U	11.2	Level
1-25-39-2	2619E	7	51.2	С	3.2	Up
1-25-39-2	2620E	7	40.5	С	2.5	Up
1-25-39-2	2621E	5.25	5.0	U	2.9	Level?
15-9-39-1	2622E	7	36.3	С	2.2	Up
8-10-39-2	2693E	5.25	0.7 ?	U	3.1	Up
8-10-39-2	2694E	5.25	0.64?	С	5.2	Down
9-1-39-2	2696E	5.25	0.68?	С	4.7	Up
9-1-39-2	2697E	5.25	0.63?	С	7.6	Level
9-1-39-2	2698E	5.25	0.54?	U	7.0	Level
			Average recl	narge, Confined	3.5	
41.45.5117	Kaliford (Average rechai	rge, Unconfined	9.1	
			Avera	age, all aquifers	4.62	

^{*}All locations are west of 5th Meridian

4.0 General Conclusions for Palms Cove Development

4.1 CONCLUSIONS REGARDING HYDROGEOLOGY OF THE PALMS COVE DEVELOPMENT

- The two wells which were drilled for this project, PW1 and OB1 were completed in the consolidated sandstone aquifer of the Paskapoo Formation, Dalehurst Member.
- This Production Well PW1 was tested at a constant rate of 445 cubic meters per day for almost seventy-two hours, followed by another sixty-three hours of recovery, at which point recovery was complete.
- The aquifer has a transmissive capacity at this location of about 1110 m2 /day, a storativity of 0.00017 was calculated, with a specific capacity of 299.1 m³/day/m in the Production Well, PW1.
- The Production Well PW1 is shown to be capable theoretically of producing a discharge of about 695 cubic meters per day, by the Moell calculation.
- The wells tested in this subdivision are under artesian pressure, yet the nonpumping water level is below the base level of discharge of Sylvan Lake at 936.66 m amsl.
- Based on the data obtained and interpreted according to accepted standards, the well and aquifer at this location are adequate for a sustainable supply of 445 cubic metres per day. The per capita daily consumption of water in Edmonton, AB is documented to be 224 L/day/person, or 0.224 m³/day/person. Extrapolating this to Palms Cove and assuming 2.5 persons per family (Canada Census, 2006), this supply is adequate for 445/0.224 = 1986 persons, or 1986/2.5 = 794 homes.

4.2 CONCLUSIONS REGARDING THE GROUNDWATER QUALITY

- Based on the laboratory analytical data, all groundwater parameters tested were below the Guidelines for Canadian Drinking Water Quality.
- No coliform or fecal coliform bacteria were present in the water from PW1, but as a
 precaution the water should be chlorinated on a routine basis as a public health
 precaution.

4.3 CONCLUSIONS REGARDING THE LOCAL IMPACT ON NEARBY WATER LEVELS

 Based on the data obtained for this project, it has been concluded that Palms Cove development would have little to no impact on nearby water well owners. This analysis assumes that pumping of the Palms Cove Subdivision well will be continuous for 20 years. With no recharge and constant pumping, the maximum impact on any other existing user would be about 42 to 52 cm after 20 years, if these users have wells completed in the same horizon.

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General Conclusions for Palms Cove Development March 2010

 There is sufficient recharge to meet the requirements for the Palms Cove Subdivision, and this production will not induce additional infiltration from Sylvan Lake above the existing through-flow.

 The County of Lacombe and Alberta Environment are considering the feasibility of water and waste water pipelines around Sylvan Lake. If they are constructed, the diversion evaluated in this report will no longer be necessary, and the groundwater diversion license could be cancelled at that time.

4.4 CONCLUSIONS REGARDING IMPACT ON SYLVAN LAKE WATER LEVELS

The non-pumping water level in the Production Well PW1 was at 936.19 m at the time of the test. Pumping could reduce the regional static groundwater levels by about 0.4 to 0.5 m over 20-year period, which is slightly below lake level. In conclusion, since the Palms Cove Aquifer is under artesian pressure, the aquifer is capable of meeting the needs of this subdivision without exceeding the natural recharge rate and through-flow rate of the area or affecting the natural lake levels.

The level of Sylvan Lake is maintained by a complex interrelationship of groundwater inflow from the southwest and northwest, groundwater flow-through outward to the northeast and southeast, surface runoff into the lake, and evaporation from the lake. Imposed on this relationship is the diversion of groundwater

4.5 GWUDI EVALUATION

All groundwater supplies destined for municipal consumption must be evaluated to determine if they are under the influence of surface water. If so, this triggers a much more complex treatment process than would otherwise be required. This supply has been evaluated according to the GWUDI flowchart and screening process prepared by Alberta Environment (Jan., 2006).

Phase 1

- (1) Sensitive setting the source does not fall within any of the four categories listed.
- (2) Proximity to surface water the source is not within 100 m of any surface water body. It is about 585 m northeast of Sylvan Lake.
- (3) Well construction The source well meets the requirements of the current version of the Water (Ministerial) Regulation. It has a surface seal of cement grout down to the aquifer at over 30 m depth. The wellhead extends 0.91 m above natural ground level, and hence no surface water will enter into the well.
- (4) Water quality the water shows no evidence of contamination from surface water. Indeed, it meets all standards of the Guidelines for Canadian Drinking Water Quality, including the total absence of bacteria.

GROUNDWATER EVALUATION, PALMS COVE SUBDIVISION WITHIN W.1/2-34-39-2-W5M

General Conclusions for Palms Cove Development March 2010

Since all criteria of Phase 1 are met, there is no need to proceed further with the analysis. It is therefore concluded that, based on the above criteria and the data already provided earlier in this report, that the groundwater is not GWUDI.

5.0 Recommendations

- It is recommended that the maximum daily discharge rate should not exceed 445 cubic meters per day, which was the discharge during the test.
- It is recommended that the owner measure and record the dynamic water level weekly in both the Production and Observation wells.
- It is recommended that an inline cumulative water meter be installed at or near the wellhead of the production well, and that cumulative discharge be recorded each month. This should be done preferably at the same time as the water level readings.
- It is recommended that an annual summary of monthly water levels and water production be sent to Alberta Environment shortly after the end of each calendar year.
- The well water should be chlorinated on a continuous basis starting at the time when the facility opens to the public.
- It is recommended that an annual review of production and water levels be carried out
 by a professional hydrogeologist at the end of each of the first two years to ensure that
 aquifer performance is as expected. Further reviews thereafter will depend on results of
 the first two years.

6.0 References

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7.0 Corporate Authorization

This document entitled "Groundwater Evaluation, Palms Cove Subdivision within W1/2-34-39-2-W5M" was prepared by Stantec Consulting Ltd. for Qualico Developments West Ltd. The material in it reflects Stantec Consulting Ltd..'s best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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PERMIT TO PRACTICE STANTEC CONSULTING LTD.

Signature

Date June

PERMIT NUMBER: P 0258

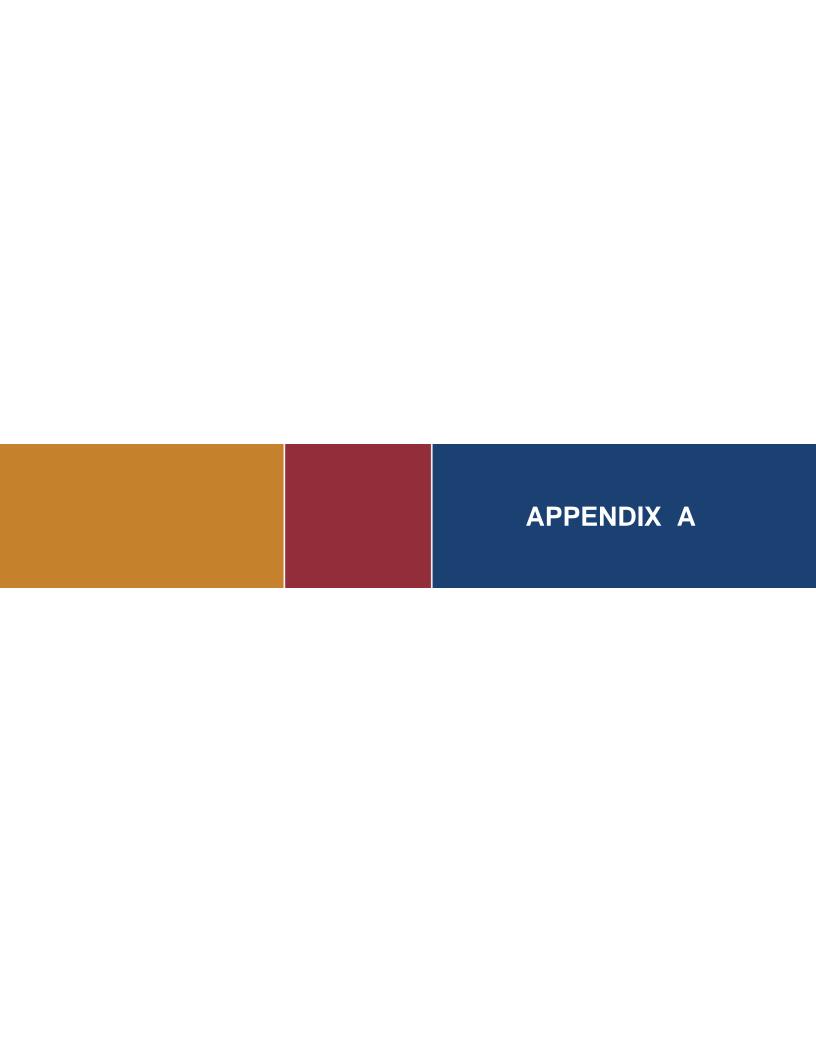
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

9,2010

CORPORATE AUTHORIZATION

June 8, 2010

RESPONSIBLE ENGINEER



Water	Well Drilling	Report	Well I.D.: Map Verified:	0406356 Not Verifled
The data contained in this	report is supplied by the	Driller, The province disclaims	Date Report	1995/06/26
Environment	responsibility for its accur	acy.	Received: Measurements:	
I. Contractor & Well Owner Informa	41			<u>Metric</u>
Company Name:	tion	Dating Comments	2. Well Location	
ALKEN BASIN DRILLING LTD.	•	Drilling Company Approval No 38394	.: 1/4 or Sec Twr LSD	Rge Wes M
Mailing Address: City or Tov	vn:	Postal Code:	NW 33 039	
BOX 47 BENTLEY WellOwner's Name: Well Locat	AB CANADA	TOC 0J0	Location in Quarter	
SABADOS, ALEX	ion Identifier:		0 M from	Bounda
P.O. Box Number: Malling Ad	dress:	Postal Code:	0 M from Lot Block	Bound Plan
	JRD SW, CALGARY	T2V 1W8	EGT BIOOR	, idii
Dity: Province:		Country:		ow Obtain:
Drilling Information				ot Obtain
B. Drilling Information ype of Work: New Well			6. Well Yield	
Reclaimed Well		Proposed well use: Domestic	Test Date (yyyy/mm/dd):	Start Time:
Pate Reclaimed: Mater	rials Used:	Anticipated Water	1995/06/08	11:00 AM
Method of Drilling: Rotary		Requirements/day	Test Method: Air	
	Liters	1324.89 Liters	Non pumping	8.23 M
	esent: No	1	static level:	454.40
I. Formation Log	5. Well Completio		removal:	151.42 Liters/Min
rom	Date Started(yyyy/mm/d	dd): Date Completed	Depth of	19.2 M
round Lithology Description	1995/06/08	(yyyy/mm/dd): 1995/06/08	pump intake:	
evel	Well Depth: 19.2 M	Borehole Diameter: 0 CM	Water level at	19.2 M
meters) .05 Brown Clay & Rocks	Casing Type: Steel	Liner Type: Plastic	end of pumping:	
.05 Brown Clay & Rocks .62 Brown Sandstone	Size OD: 13,97 CM	Size OD: 11.43 CM	Distance from top o	of CM
1.58 Gray Shale	Wall Thickness: 0.62 Cl	***************************************	casing to ground	
7.98 Brown Sandstone	Bottom at: 10.36 M	Top: 7.01 M Bottom:	level;	
9.2 Gray Sandstone		19.2 M	Depth To water	
	Perforations from: 10,36 M to: 19,2 M	Perforations Size:	Elapsed Drawdown Minutes	TIME s:Sec Recov
	from: 0 M to: 0 M	V 0.95 CM x 0.95 CM 0 CM x 0 CM	2:0	
	from: 0 M to: 0 M	0 CM x 0 CM	3:0	0 14.63
•	Perforated by: Hand Dri	10	4:0	
	Seal: Drive Shoe	. 40.00	5:0	
	from: 0 M Seal:	to: 10.36 M	7:0	
•	from: 0 M	to: 0 M	30:0	
	Seal:	74. · · · · · · · · · · · · · · · · · · ·	60:0	
·	from: 0 M	to: 0 M	120:	:00 8.23
·	Screen Type: from: 0 M to: 0 M	Screen ID: 0 CM Slot Size: 0 CM	Total Drawdown: 1	0.97 M
•	Screen Type:	Screen ID: 0 CM	lf water removal wa	as less than 2
	from: 0 M to: 0 M	Slot Size: 0 CM	duration, reason w	пу:
	Screen Installation Met	nod:]	AT TO STATE
	Fittings	B-4		
	Top: Pack;	Bottom:	Recommended pur	mping rate:
•	Grain Size:	Amount:	37.85 Liters/Min Recommended pur	mn intake:
	Geophysical Log Taken		13.72 M	•
	Retained on Files:		Type Pump Installe	ed .
•	Additional Test and/or F Chemistries taken By D	rump Data	Pump Type:	
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	Pitiess Adapter Type:		Any further pumpte	est information
	Drop Pipe Type:	BI		
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	CASING TO GROUND		1	
			1	
			1	
	ŀ			
•				
	7. Contractor Cert	tification	- F	
	7. Contractor Cert	tification UNKNOWN DRILLER		

▲ Water	Well Drilling	Repo	ort	Well I. Map V	.u.: /erified;		036267 Not Ver	
The data contained in this	report is supplied by the Dri	iller. The p	province disclaims	Date F	Report		1976/0	
Alberta Environment	esponsibility for its accuracy	y	*.	Recei	ved: urement		Metric	5,20
Contractor & Well Owner Information	tion				ell Loc			
ompany Name:		rilling Con	npany Approval No.:		Sec	Twp	Rge \	Wes
ICHMÓND WW DRLG		Timing Con	ipany ripprovarias.	LSD	000		, vgc	M
ailing Address: City or Tow	n: P	ostal Cod	e:	NE	33	039	02	5
/ellOwner's Name: Well Locati	on Identifier:			Location 0 M	on in Qu from	arter	Bo	unda
OLSON, SUSAN			-	0 M				und
O. Box Number: Mailing Add	dress: P	ostal Cod	e:	Lot	Blo	ock	Plań	
36 ECKVILLE ity: Province:		ountry:		Well E	lev:	Но	w Obtai	n·
Trovinge.		ourid y.		949.45			timated	
Drilling Information				6. We	ell Yie	ld		
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owing Well: No Rate:			0 Liters	Non p	umping		18.29 N	V
as Present: Oil Pr				static I			54.5=	
. Formation Log	5. Well Completion			Rate o	f water		31.82 Liters/N	viin
epth	Date Started(yyyy/mm/dd)		ompleted	Depth			27.43 N	
om Cound Lithology Description	1976/05/12	^{)•} (yyyy/m 1976/05		pump	intake:			
vel	Well Depth: 42.67 M		le Diameter: 0 CM		level at		27.43 N	M
neters)	Casing Type: Galvanized			end of pumpi				
2.19 Sandy Clay & Rocks	Steel	Liner Ty			ce from	top of	CM	, ,
1.34 Brown Shale 5.91 Black Shale	Size OD: 11.43 CM		D: 0 CM		to grou			•
2.67 Gray Shale & Sandstone	Wall Thickness: 0.36 CM	_	ickness: 0 CM	level:	11. T			
	Bottom at: 39.62 M	Top: 0 I		Dep	th Tow Fla	/ater le .psed T		ters
• .	Perforations from: 0 M to: 0 M	Perforation Perfor	tions Size:	Draw	down Mi			COVE
	from: 0 M to: 0 M	0 CM x		Total I	Drawdov	wn: 0 N	<u>и</u>	
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	from: 0 M to: 0 M		re: 0 CM	Pump	Type:		•	
•	Screen Type:		ID: 0 CM	Pump H.P.:	Model:	-		
	from: 0 M to: 0 M Screen installation Method		te: 0 CM		ırther pu	ımptes	t inform	atio
	Fittings	u.		1	, , , , ,			
	Top:	Bottom:	<u>. </u>	1				
	Pack:		•	1				
	Grain Size: Geophysical Log Taken:	Amount	t: 0	-				
	Retained on Files:		•	1				
	Additional Test and/or Pur	mp Data		1				
. 1	Chemistries taken By Drill	ler: No						
·	Held: 1 Pitless Adapter Type:	Docume	ents Held: 2	-				
	Drop Pipe Type:		•	1				
	Length: M	Diamete	er: CM	1				
	Comments:			1				
	1 .			1				
	•							
	7. Contractor Certifi	ication		-				
	7. Contractor Certification of the Priller's Name:		OWN DRILLER	- -			• * .	

A V	Vater	Well Drilling	Repor	t	Well I.D.: Map Verified:	0362666 Not Verifie
Alberta Ine data conta	ined in this	report is supplied by the [Oriller, The prov	ince disclaims	Date Report	1971/10/25
Environment		esponsibility for its accura	асу.	•	Received: Measurements:	Metric
. Contractor & Well Owner	Informat	tion			2. Well Location	
Company Name:			Drilling Compa	ny Approval No.:	1/4 or Sec Tw	
NELSON DRILLING & PLUMBING Mailing Address:					LSD	p rige we: N
vialling Address:	City or Tow	n:	Postal Code:		SW 33 03	9 02 5
WellOwner's Name:	Well Location	on Identifier:			Location in Quarte	
PARNEY	_	on identifier.			0 M from 0 M from	Bound Bound
P.O. Box Number:	Mailing Add	lress:	Postal Code:	· · · · · · · · · · · · · · · · · · ·	Lot Block	Plan
-	COTTAGE	@ N END OF SYLVAN		0.0		
314	LAKE, CAL Province:		0	<u></u>	[low Obtain:
<u></u>	. rovince.		Country:	* 4		stimated
3. Drilling Information					6. Well Yield	
ype of Work: New Well	·		Pron	osed well use:	Test Date (yyyy/mm/dd):	Start Time:
Reclaimed Well				estic	1971/08/01	11:00 AM
ete Reclaimed: lethod of Drilling: Rotary	Materi	als Used:		ipated Water	Test Method: Baile	
lowing Well: No	Pater	litore		irements/day	Non pumping	8.23 M
Gas Present:	Rate: I		0 Lite	ers	static level:	45 45
. Formation Log	Carle	5. Well Completion			Rate of water removal:	45.46 Liters/Min
Depth Control	·			otod.	Depth of	0 M
rom	•	Date Started(yyyy/mm/do	d): Date Compl (yyyy/mm/dd	4).	pump intake:	
round Lithology Descri	ption		1971/08/01	•	Water level at	0 M
neters)		Well Depth: 36.58 M	Borehole Di	ameter: 0 CM	end of pumping:	
.18 Brown Clay		Casing Type: Galvanized Steel	Liner Type:		Distance from top o	of CM
2.19 Brown Shale		Size OD: 5.08 CM	Size OD: 0		casing to ground	JI OIVI
2 Blue Shale		Wall Thickness: 0 CM	Wall Thickne	الاات	level:	
2.31 Sandstone Stringers		Bottom at: 30.78 M	Top: 0 M	Bottom: 0 M	Depth To water	evel (meters)
4.14 Water Bearing Shale 6.58 Blue Shale		Perforations	Perforations		Elapsed Drawdown Minutes	Time
o.oo Blue Shale		from: 0 M to: 0 M	0 CM x 0 CM		Total Drawdown: 1	5.24 M
		from: 0 M to: 0 M	0 CM x 0 CM	Ä İ	If water removal wa	s less than 2
	•	from: 0 M to: 0 M	0 CM x 0 CM	<u> </u>	duration, reason wh	ıy:
		Perforated by: Seal:				
•		from: 0 M	to: 0 M	-		
		Seal:	10. 5 11		Recommended pur	nping rate: 0
		from: 0 M	to: 0 M		Liters/Min	
		Seal: from: 0 M	6m. Ó 8.8		Recommended pur Type Pump Installe	np intake: 0 N
		Screen Type:	to: 0 M Screen ID: 0		rype Pump installe Pump Type:	u
		from: 0 M to: 0 M	Slot Size: 0	см	Pump Model:	
		Screen Type:	Screen ID: 0	CM	H.P.:	
		from: 0 M to: 0 M	Slot Size: 0 (СМ	Any further pumpte:	st information
		Screen Installation Metho Fittings	ia:		*4	
•		Top:	Bottom:	i		
		Pack:				
		Grain Size:	Amount: 0			
		Geophysical Log Taken: Retained on Files:				
		Additional Test and/or Pu	mn Data			•
		Chemistries taken By Drill	ler: Yes	ł		
	1	Held: 0	Documents I	leld: 1	•	
		Pitless Adapter Type: Drop Pipe Type:				
		Length: M	Diameter: CN	4		
	Į	Comments:		·		
	ŀ	SOFT WATER.				
			•			
•	- 1			Ĭ		
	.]					
	Ł	7 0 1				
		7. Contractor Certifi				
		Orilier's Name: Certification No.:	UNKNOWN	RILLER		

S	Alberta The da	VVate ita contained in t	r Well Drilling is report is supplied by the responsibility for its accur	Drilles TL	Port le province disclain	Well I.D.; Map Venified: Date Report Received:	0362665 Not Verified
1. Co	ntractor & Well (Wher Inform	2412			Measurements:	Metric
CONTRACTOR OF THE PROPERTY OF	niv ivame.		lation	B. 100		2. Well Locat	ion
Mailing Mailing	ON DRILLING & PLUM Address:		·	Drilling (Company Approval	No.: 1/4 or Sec Tv	
iviaititä	Address;	City or T	own:	Postal C	ode:	LSD SW 33 03	M
WellOw	vner's Name:	Well Loc	ation Identifier:			Location in Quarte	
RANAC	HAN		adon identifier:			0 M from	Bounda
г.О. во	ox Number:	Mailing A	ddress:	Postal Co	ode:	0 M from	Bounda
		CABIN N	SIDE OF SYLVAN LAKE,	. 55,0,0	Jue.	Lot Block	Pian
City:		CALGAR Province:				Well Elev:	low Obtain:
		•	•	Country:			stimated
3. Dril	ling Information					6. Well Yield	
l ype of	Work: New Well ed Well				D	Test Date	Start Time:
Date Re	ed vveii claimed:				Proposed well us Domestic	e: (yyyy/mm/dd): 1970/08/01	44.00.444
viethod i	of Drilling: Rotary	Mate	erials Used:		Anticipated Water	Test Method Pum	11:00 AM
lowing	Well: No	Rate	: Liters		Requirements/da	y Non pumping	23.77 M
3as Pre			resent:		0 Liters	static level:	
- POFF	nation Log		5. Well Completion		-	Rate of water removal:	45.46
epth om	_				Completed	Depth of	Liters/Min 0 M
round	Lithology D	Anarin4:	Date Started(yyyy/mm/d	d): (yyvv/	completed mm/dd):	pump intake:	OIM
vel	-ranology D	escription	Well David Brown	1970/(08/01	Water level at	23.77 M
neters) .1			Well Depth: 57.91 M Casing Type: Galvanized	Boreh	ole Diameter: 0 CN	end of	
7.98	Brown Sandy Clay		Steel	Liner	Гуре:	pumping: Distance from top of	× CM
8.29	Brown Shale Sandstone Stringers		Size OD: 5.08 CM		DD: 0 CM	casing to ground	JE CIVI
	Brown Shale	<u> </u>	Wall Thickness: 0 CM	Wall T	hickness: 0 CM	level:	
).42	Sandstone Stringers		Bottom at: 30.48 M	Top: 0		Depth To water	evel (meters)
.91	Brown Hard Shale		Perforations		ations Size:	M Elapsed Drawdown Minute:	Time
3.96 2.67	Brown Shale		from: 0 M to: 0 M	0 CM >	OCM	Total Drawdown: 0	Sec Recovery M
	Water Bearing Shale	& Sandstone	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM >	OCM	If water removal wa	s less than 2 h
	Blue Shale & Sandst	one Ledges	Perforated by:	0 CM >	OCM	duration, reason wi	ıy:
			Seal: Driven			_	
		•	from: 0 M Seal:	to: 0 M			
	• •		from: 0 M	4		Recommended pur	nping rate: 0
			Seal:	to: 0 M		Liters/Min Recommended pur	
			from: 0 M	to: 0 M		30.48 M	тр іптаке:
			Screen Type:	Screen	ID: 0 CM	Type Pump Installer	<u> </u>
			from: 0 M to: 0 M Screen Type:	Slot Siz	e: 0 CM	Pump Type: HAND	PUMP
			from: 0 M to: 0 M	Slot Siz	ID: 0 CM e: 0 CM	Pump Model: H.P.:	
			Screen Installation Method	<u> </u>	O. O CIVI	Any further pumptes	t information?
			Fittings Top:			-	
		*	Pack:	Bottom:			
		•	Grain Size:	Amount	· n		
			Geophysical Log Taken:	· ==Out			
			Retained on Files:	<u> </u>	·		i
	e.	İ	Additional Test and/or Pun Chemistries taken By Drille	np Data	- 	•	
		•	Held: 0		nts Held: 1		
	•	اِ ا	Pitless Adapter Type:				
			Drop Pipe Type: Length: M	Die	011	1	
			Comments:	Diamete	r: CM	4	
	1	·	SOFT WATER.			1	
	•		•				
		. [f
•							
		ŀ	7 Cambai (=				[
			7. Contractor Certific Oriller's Name:	ation		1	
		ar.	Trillor's Na		VN DRILLER	P	-

	Water	Well Drillin	a Report		Well I.D.: Map Verified:		0341885
A 12	The data contained in this	S report is supplied by the	Poriller The proving	a dicalaima	Date Report		Not Verif
Alberta Environment		responsibility for its accu	Jracy.	e discialms	Received:		2002/11/
	Mall Owner or le f				Measuremen	ts: <u>N</u>	Vietric
Company Name:	Well Owner Informa	ation			2. Well Loc	cation	-
LKEN BASIN DRIL	LING LTD.		Drilling Company	Approval No.:		Twp	Rge W
Vailing Address:	City or To	wn:	38394 Postal Code:		LSD SW 33	220	00
3OX 47	BENTLEY	AB CANADA	TOC 0J0		SW 33 Location in Qu	039	02
VellOwner's Name: DEGROAT, RICHAR	Well Loca	tion Identifier:			0 M from	101 (C)	Bour
O. Box Number:	Mailing Ac				0 M from		Bour
	, ivialing Ac 300 509 8	AVE SW, CALGARY	Postal Code: T2P 1G1		Lot Bi	ock	Plan
City:	Province:	THE ON OALOAKT	Country:		Well Elev:	How	Obtain:
			Obana y.		M		Obtain:
. Drilling Inforr	nation				6. Well Yie		O B COM I
ype of Work: New V Reclaimed Well	Vell		Propos	ed well use:	Test Date		Start Tim
ate Reclaimed:	Mata	male I lead.	Domes	tic	(yyyy/mm/dd):		
lethod of Drilling: Ro	wate	erials Used:	Anticip	ated Water	2002/11/13	_ 1	1:00 AM
lowing Well: No	· · · · · · · · · · · · · · · · · · ·	: Liters	Requir 0 Liters	ements/day	Test Method: Non pumping).6 M
Sas Present: No	Oil P	resent: No	Jo Liters		static level:	9	.o w
. Formation Lo	g	5. Well Completion	on		Rate of water	3	40.95
epth		Date Started(yyyy/mm.			removal:		iters/Mir
rom round Lithe	ology Description	•	(yyyy/mm/dd):		Depth of	1	9.81 M
evel	nogy Description	2002/11/13 Well Depth: 24.38 M	2002/11/13		pump intake: Water level at	- 1	1.28 M
neters)		Casing Type: Steel	Borehole Dian Liner Type: Pl	neter: 0 CM	end of	•	1.20 10
49 Brown San	dy Clay	Size OD: 14.12 CM	Size OD: 11.4	astic 3 CM	pumping:		
.14 Brown San 6.15 Brownish G	dstone	Wall Thickness: 0.66 C	M Wall Thicknes		Distance from	top of C	:M
	ray Sandstone Stringers e Grained Sandstone	Pottom et 40 5 M	Top: 6.1 M	Bottom:	casing to grou level:	na	
oray coars	e Grameu Sanustone	Bottom at: 12.5 M	24.38 M	Dottorn.	Depth To w	ater leve	el (meter
.*		Perforations	Perforations S	ize:	E lai	psed Tin	ne
		from: 16.76 M to: 24.38	8 M 0.95 CM x 0.9	5 CM	Drawdown Mi		
	-	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x 0 CM 0 CM x 0 CM		9.61 11.26	0:00 1:00	11.3 9.6
		Perforated by: Hand Di	rill		11.31	2:00	9.6
		Seal: Driven & Bentoni			11.34	3:00	9.6
		from: 0 M	to: 16.76 M		11.38	4:00	9.6
		Seal: from: 0 M	to: 0 M	•	11.39	5:00	9.6
		Seal:	to: 0 M		11.39 Total Drawdov	120:00	9.6
		from: 0 M	to: 0 M	-	If water remov		
		Screen Type:	Screen ID: 0 C		duration, reaso	on why:	200 tilaii
	•	from: 0 M to: 0 M Screen Type:	Slot Size: 0 Cl		ĺ		
•		from: 0 M to: 0 M	Screen ID: 0 C Slot Size: 0 CM				
		Screen Installation Met	thod:	-	Recommende	d numnii	no rate:
	2	Fittings			68.19 Liters/M		ig rate.
	· · · · · · · · · · · · · · · · · · ·	Top: Pack:	Bottom:		Recommended	i qmuq t	ntake:
	•	Grain Size:	Amount:		18.29 M Type Pump Ins	nt-12 - 1	
		Geophysical Log Taker	T:		i ype Pump ins Pump Type:	stalled	
		Retained on Files:			Pump Model:		
		Additional Test and/or F	Pump Data		H.P.:		_
		Chemistries taken By D Held: 0	Oriller: No 	ld: 1	Any further pur	nptest ir	normatic
		Pitless Adapter Type:	Documents He	iu. 1	ž.		
		Drop Pipe Type:		·			
-	•	Length: M	Diameter: CM				
		Comments:		,			
		}			ı		
4.0		1					
		7. Contractor Cert	tification			•	
		7. Contractor Cert Driller's Name: Certification No.:	tification UNKNOWN DE	RILLER			

Water	Well Drilling	Rend	ort	Well I.D.: Map Verified:	0355186
The data contained in this	report is supplied by the	Driller The n	/I L	Date Report	Мар
Alberta Environment	responsibility for its accur-	acv.	iovince discialms	Received:	1985/06/1
			····	Measurements:	Metric
I. Contractor & Well Owner Informa	tion			2. Well Loca	tion
MEDICINE VALLEY WATER WELLS			pany Approval No.:	1/4 or Sec T	wp Rge We
Mailing Address: City or To-	wn:	119346 Postal Code		LSD NE 33 C	N 00 00
RR 3 ECKVILLE	AB CA	TOM 0X0		Location in Quar	39 02 5
VellOwner's Name: Well Loca UTTYNEN, DICK	tion Identifier:			0 M from	e. Bound
O. Box Number: Mailing Ac	draga			0 M from	Bound
5312 105	AVE, EDMONTON	Postal Code		Lot Block	Plan
ity: Province:		Country:		Well Elev:	How Obtain:
Delling Informati		,		960.12 M	Estimated
. Drilling Information ype of Work: New Well				6. Well Yield	
eclaimed Well		P	oposed well use:	Test Date	Start Time:
ate Reclaimed: Mate	rials Used:		omestic & Stock	(yyyy/mm/dd):	
ethod of Drilling: Cable Tool				1982/05/12 Test Method: Bai	11:00 AM
	Liters			Non pumping	12.8 M
City	esent:			static level:	.2.0 101
Formation Log	5. Well Completion	n		Rate of water	63.64
eptn m	Date Started(yyyy/mm/d	d). Date Cor		removal:	Liters/Min
ound Lithology Description	1982/05/10	· (yyyy/mm	iruu).	Depth of pump intake:	0 M
/ei	Well Depth: 36.58 M	1982/05/1		Water level at	36.58 M
eters)	Casing Type: Steel	Liner Typ	Diameter, U CIVI	end of	00.00 IVI
27 Brown Clay 14 Brown Shale	Size OD: 13.97 CM	Size OD:	O CM	pumping:	
.11 Gray Shale Stringers	Wall Thickness: 0.62 CM		les 0 014	Distance from top casing to ground	of CM
.29 Brown Sandy Shale	Bottom at: 29.57 M			casing to ground	
.43 Gray Sandstone	7	Top: 0 M	Bottom: 0 M	Depth To wate	level (meters)
.92 Blue Gray Shale	Perforations	Perforation	ns Size:	Elapse	d Time
.83 Gray Sandstone	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x 0	CM	Drawdown Minut Total Drawdown:	es:Sec Recove
.58 Gray Shale	from: 0 M to: 0 M	0 CM x 0 0 CM x 0	CM I	if water removal v	23.// IVI
	Perforated by:	OOWIXU	CIVI	duration, reason v	yhy;
•	Seal: Driven				•
	from: 0 M Seal:	to: 29.57	М		
	from: 0 M	to: 0 M	h	Recommended pu	Imping rate: 0
	Seal:	to. O IV	· ·	<u>_ite</u> rs/Min	_
	from: 0 M	to: 0 M		Recommended pu	ımp intake: 0 M
	Screen Type: from: 0 M to: 0 M	Screen ID	: 0 CM	Type Pump Install	ed
	Screen Type:	Slot Size: Screen ID		Pump Type: Pump Model:	- %
•	from: 0 M to: 0 M	Slot Size:	осм:	1.P.:	
	Screen Installation Metho	od:	/	Any further pumpt	est information
	Fittings	-			
	Top: Pack:	Bottom:		÷ .	
	Grain Size:	Amount: 0		*	
	Geophysical Log Taken:	- anound O			
	Retained on Files:				
•	Additional Test and/or Pu Chemistries taken By Dril	mp Data			
	Held: 0	ier: No Document	s Held: 1		
	Pitiess Adapter Type:		. 10344		
	Drop Pipe Type:	- -			-
	Length: M Comments:	Diameter:	CM		
	Originally @ SW-33-39-2-	W5.	Ī		
•	2 2 2 2 2 2 2 2 2 2		1		
					•
				•	
	7. Contractor Certifi				
	Driller's Name:		DRILLER		
	Certification No.: This well was constructed				

& Water	Well Drilling	Repo	ort	Well I.D.; Map Venified:	0362671 Map
Alberta I he data contained in thi	s report is supplied by the Dril responsibility for its accuracy	lier The r	province disclaims	Date Report Received:	•
1. Contractor & Well Owner Information	ation			Measurements:	Metric
Company Name:		rilling Cor	npany Approval No.:	2. Well Locat : 1/4 or Sec Tv	
KINGSEP ROBERT Mailing Address: City or To		- Co	mpany Approval No.	LSD Sec IV	wp Rge Weston M
Sity of 10	wn: Po	ostal Cod	e:	11 33 03	39 02 5
INOTIUS, W	tion Identifier:		·	Location in Quarte 0 M from	Boundary
P.O. Box Number: Mailing Ac		ostal Code	9:	0 M from Lot Block	Boundary Plan
	ITN HOUSE				
Province:	Co	ountry:			How Obtain: Estimated
3. Drilling Information				6. Well Yield	Louinated
Type of Work: New Well Reclaimed Well			roposed well use:	Test Date	Start Time:
Date Reclaimed: Mate	rials Used:		Domestic Inticipated Water	(yyyy/mm/dd): 1962/05/02	44.00.444
Method of Drilling: Cable Tool			Requirements/day	Test Method: Unk	11:00 AM
	: Liters resent:			Non pumping	8.23 M
4. Formation Log	5. Well Completion			static level: Rate of water	113.56
Depth	· — — — —	Date Co	mpleted	removal:	Liters/Min
from ground Lithology Description	Date Started(yyyy/mm/dd):	(yyyy/mi	m/dd):	Depth of pump intake:	0 M
lievel .	Well Depth: 19.2 M	1962/05 Borehold	/01 Diameter: 0 CM	Water level at	0 M
(meters) 3.05 Clay	Casing Type: Unknown	Liner Ty		end of	
6.1 Brown Shale	Size OD: 12.7 CM Wall Thickness: 0 CM	Size OD		pumping: Distance from top	of CM
9.75 Blue Shale	yvali mickness: 0 Civi	Wall In	ckness: 0 CM	casing to ground	0. 0.0
19.2 Brown Sandstone	Bottom at: 10.97 M	Top: 0 N	M Bottom: 0 M	level: Depth To water	lovel (metern)
	Perforations	Perforati	ons Size:	Elapsed	d Time
	from: 0 M to: 0 M	0 CM x (CM	Drawdown Minute	s:Sec Recovery
·	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x (CM ·	Total Drawdown: ' If water removal w	1.52 M /as less than 2 hr
•	Perforated by:		7 0 11	duration, reason w	/hy:
	Seal: Driven from: 0 M	to: 0 M			£.
	Seal:	10. 0 10	•		
	from: 0 M Seal:	to: 0 M		Recommended pu Liters/Min	Imping rate: 0
	from: 0 M	to: 0 M	•	Recommended pu	ımp intake: 0 M
•	Screen Type:	Screen I	D: 0 CM	Type Pump Install	ed
	from: 0 M to: 0 M Screen Type:	Slot Size	D: 0 CM	Pump Type: Pump Model:	
	from: 0 M to: 0 M	Slot Size	: 0 CM	H.P.:	
	Screen Installation Method:			Any further pumpt	est information?
·	Fittings Top:	Bottom:			
•	Pack:				
	Grain Size: Geophysical Log Taken:	Amount:	0		
• •	Retained on Files:				
	Additional Test and/or Pump Chemistries taken By Driller	p Data	, , , , , , , , , , , , , , , , , , ,		,
	Held: 0		nts Held: 1		
	Pitless Adapter Type:				
•	Drop Pipe Type: Length: M	Diameter	- CM		
	Comments:				
	MEDIUM HARD WATER.			·	
			1		
					· •
•					1
•	7. Contractor Certific		401 500		
	Certification No.:		VN DRILLER		
	This well was constructed in	accorda	nce with the Water		

A	Water	Well Drilling	Ren	ort	Well I.D.: Map Verifled:	0362668 Not Verified
The da	ata contained in this	report is supplied by the D	riller. The	province disclaims	Date Report	1979/06/12
Alberta Environment		esponsibility for its accura-	су	,	Received:	
1. Contractor & Well	Ouros Info	llau .			Measurements:	<u>Metric</u>
Company Name:	Owner informa		D-885		2. Well Location	
FORRESTER WATER WEL	L DRILLING (1981)	LTD.	רווווטם Co	ompany Approval No.:	1/4 or Sec Tw LSD	
Mailing Address:	City or Tow		ostal Co	de:	NW 33 03	9 02 5
WellOwner's Name:		•			Location in Quarte	
URG, DEAN	Well Locati	on Identifier:			0 M from	Bounda
P.O. Box Number:	Mailing Add	iress:	ostal Co	da:	0 M from Lot Block	Bounda Plan
	RR2, RED	·	- 05(a) C0 Γ4Ν 5Ε2	ue.	LOI BIOCK	rian
City:	Province:		Country:	·	Well Elev:	low Obtain:
3 Drilling Information	_					stimated
3. Drilling Information Type of Work: New Well	<u> </u>	· · · · · · · · · · · · · · · · · · ·			6. Well Yield	
Reclaimed Well				Proposed well use:	Test Date	Start Time:
Date Reclaimed:	Mater	ials Used:		Domestic Anticipated Water	(yyyy/mm/dd): 1979/03/01	11:00 AM
Method of Drilling: Cable To	ol			Requirements/day	Test Method: Baile	I LOU AW
Flowing Well: No	Rate:			0 Liters	Non pumping	18.29 M
Gas Present:	Oil Pr			<u> </u>	static level:	
4. Formation Log		5. Well Completion		4)	Rate of water	37.85
Depth from		Date Started(yyyy/mm/do	Date C	Completed	removal: Depth of	Liters/Min
	Description		· (yyyy/i	mm/dd):	Deptn of pump intake:	30.48 M
level	Pescubtion	1979/02/26 Well Depth: 38.1 M	1979/0		Water level at	38.1 M
(meters)		Casing Type: Steel	Liner	ole Diameter: 0 CM	end of	JOI : 187
0.3 Topsoil		Size OD: 13.97 CM		DD: 0 CM	pumping:	
8.84 Light Brown Sandy 10.06 Light Brown Hard	/ Clay	Wall Thickness: 0.66 CM		hickness: 0 CM	Distance from top	of CM
	Clay			******	casing to ground level:	
11.58 Brown Soft Sandst 12.5 Gray Soft Shale &	Cool	Bottom at: 32 M	Top: 0	M Bottom: 0 M	Depth To water	level (metere)
13.11 Gray Shale	<u>- Odai</u>	Perforations	Perfor	ations Size:	Elapsed	Time
13.72 Gray Hard Sandsto	one	from: 0 M to: 0 M		c 0 CM	Drawdown Minute	s:Sec Recover
15.24 Blue Shale		from: 0 M to: 0 M	0 CM 2	CO CM	Total Drawdown: 1	9.81 M
19.2 Blue Bentonitic Sa	ndstone	from: 0 M to: 0 M Perforated by:	0 CM 3	O CM	if water removal we duration, reason w	as less than 2 l
19.81 Blue Gray Hard Sa	ındstone	Seal: Driven			muracuri, reasuri W	uy.
21.95 Blue Sticky Shale 26.52 Blue Gray Sandy S	N- 1-	from: 0 M	to: 32	м .		
26.52 Blue Gray Sandy S 28.35 Blue Gray Hard Sh	onale onale	Seal:		-		:
31.7 Dark Gray Sticky S	Shale	from: 0 M	to: 0 N		Recommended pur Liters/Min	mping rate: 0
35.05 Dark Gray Water E	Bearing Sandstone	Seal: from: 0 M	to: O N	· I	Recommended pu	mp intaka: 0 M
37 8 Bluish Green Water	r	Screen Type:	to: 0 M Screen	ID: 0 CM	Type Pump Installe	<u>paxe. ∪ W</u> ed
pearing Sandstone)	from: 0 M to: 0 M		ze: 0 CM	Pump Type:	- .
38.1 Greenish Gray Sar	ndy Shale	Screen Type:	Screer	ID: 0 CM	Pump Model:	
		from: 0 M to: 0 M	Slot Si	ze: 0 CM	H.P.; Any further pumpte	et informatio-
		Screen Installation Metho Fittings	a:		Lary records pulliple	ot morniation :
	•	Top:	Bottom	1 :		
		Pack:	-04011	·· <u> </u>	1	
:		Grain Size:	Amour	t: 0		
		Geophysical Log Taken:				
		Retained on Files: Additional Test and/or Pu	mp Dete			
		Chemistries taken By Dril	er: Yes			
	•	Held: 0		ents Held: 1		
•		Pitless Adapter Type:			•	
· ·		Drop Pipe Type:	D:	. Olt		
and the second second		Length: M Comments:	Diame	er: CM		
•		MEDIUM HARD WATER.				
	•					
•						
	•	· ·		•		
		7. Contractor Certif	ication			
		Driller's Name:		OWN DRILLER		
		Certification No.:				
		This well was constructed	in accord	ance with the Water		

Water The data contained in thi	Well Drilling	riller. The p	ort rovince disclaims	Well I.D.; Map Verified; Date Report	0362669 Map 1984/10/02
Environment	responsibility for its accura	cy.		Received: Measurements:	Metric
1. Contractor & Well Owner Inform	ation			2. Well Location	
Company Name: MAGNUM DRLG		Drilling Con	pany Approval No.:	1/4 or Sec Twr	Rge Westo
Mailing Address: City or To	wn:	Postal Code	n:	LSD NW 33 039	M
WellOwner's Name: Well Loca	ition Identifier:			Location in Quarter	
MOTTUS, WALLY	ition identifier:			0 M from 0 M from	Boundar Boundar
P.O. Box Number: Mailing A 215 ECKVILL		Postal Code	e:	Lot Block	Plan
City: Province:		Country:		Well Elev: H	low Obtain;
3. Drilling Information					stimated
Type of Work: New Well			roposed well use:	6. Well Yield Test Date	Start Time:
Reclaimed Well		, E	omestic	(yyyy/mm/dd):	
Date Reclaimed: Mate Method of Drilling: Rotary	erials Used:		inticipated Water	1984/07/31	11:00 AM
Flowing Well: No Rate	: Liters		lequirements/day Liters	Test Method: Baile Non pumping	7.62 M
Gas Present: No Oil F	resent: No			static level:	
4. Formation Log	5. Well Completion			Rate of water removal:	7.57 Liters/Min
rom .	Date Started(yyyy/mm/do	i): Date Co		Depth of	10.36 M
pround Lithology Description	1984/07/31	1984/07		pump intake:	
evel meters)	Well Depth: 18.29 M		e Diameter: 0 CM	Water level at end of	9.14 M
9.57 Brown Sand 9.14 Brown Clay & Sand	Casing Type: Steel Size OD: 11,43 CM	Liner Ty	pe: Steel	pumping:	
	Size OD: 11.43 CM Wall Thickness: 0.4 CM		: 7.62 CM ckness: 0 CM	Distance from top of	of CM
8.29 Blue Sandstone	Bottom at: 10.67 M	Top: 9.1 18.29 M	4 M Bottom:	casing to ground level: Depth To water I	laval (matem)
	Perforations		ons Size:	Elapsed	Time
	from: 12.19 M to: 18.29 N	1 2.54 CM	x 30.48 CM	Drawdown Minutes	s:Sec Recovery
	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x (Total Drawdown: 1. If water removal wa	.52 M
	Perforated by: Torch	0 CM x (J CIVI	duration, reason w	
-	Seal: Driven			·	•
	from: 0 M Seal:	to: 10.36) M		
	from: 0 M Seal:	to: 0 M		Recommended pur 11.36 Liters/Min	mping rate:
	from: 0 M	to: 0 M		Recommended pur	np intake:
	Screen Type:	Screen I		10.36 M	
	from: 0 M to: 0 M	Slot Size		Type Pump Installe Pump Type: SUB	ed
	Screen Type: from: 0 M to: 0 M	Screen I Slot Size		Pump Model:	
•	Screen Installation Metho	od:		H.P.: .5	•
•	Fittings			Any further pumpte	st information?
	Top: Pack:	Bottom:			•
	Grain Size:	Amount:	0	-	-
	Geophysical Log Taken: Retained on Files:				
	Additional Test and/or Pu			·	
	Chemistries taken By Dril		and a literal to at		
•	Heid: 0 Pitless Adapter Type:	Docume	nts Held: 1		
•	Drop Pipe Type:	•			
	Length: 7.92 M	Diamete	r: 2.54 CM		
	Comments:	-			
• •					
•					•
	7.0	PT 48			
	7. Contractor Certif Driller's Name:		A/NI DDULED		
	Certification No.:	UNKNO	WN DRILLER		
	This well was constructed	l in accorda	nce with the Water		

≜ Wate	r Well Drillin	a Report	Well I.D.: 0437630 Map Verified: Map
The data contained in the	his report is supplied by the	g Neport Driller. The province disclaims	Date Report
Alberta Environment	responsibility for its accu		Received: 1950/07/21
Y		-	Measurements: Metric
1. Contractor & Well Owner Inform Company Name:	nation	5.48 6 4	2. Well Location
OWNER DRILLED		Drilling Company Approval N	o.: 1/4 or Sec Twp Rge Westof LSD M
Mailing Address: City or 1	own:	Postal Code:	SE 03 040 02 5
WellOwner's Name: Well Loc ANDERSON, A.	cation Identifier:		0 M from Boundary
P.O. Box Number: Mailing	Address:	Postal Code:	0 M from Boundary Lot Block Plan
BENTLE City: Province		Country:	Well Elev: How Obtain:
2 Drilling Information			997.31 M Survey-Tra
3. Drilling Information Type of Work: Federal Well Survey		D	6. Well Yield
Reclaimed Well		Proposed well use Domestic & Stock	: Test Date Start Time: (yyyy/mm/dd):
Date Reclaimed: Ma	terials Used:	Anticipated Water	(3333711111000).
Method of Drilling: Drilled		Requirements/day	
	te: Liters	0 Liters	Non pumping M
4. Formation Log	Present: No	I	static level: Rate of water Liters/Min
Depth	5. Well Completic	Data Carrellated	removal:
from Lithology Description	Date Started(yyyy/mm/	/dd): Date Completed (yyyy/mm/dd):	Depth of M pump intake:
evel Entrology Description	Well Depth: 70.1 M	Borehole Diameter: 0 CM	Water level at M
(meters)	Casing Type: Unknowr		end of
·	Size OD: 5.08 CM	Size OD: 0 CM	— pumping: — Distance from CM
	Wall Thickness: 0 CM	Wall Thickness: 0 CM	top of casing
	Bottom at: 0 M	Top: 0 M Bottom: 0 I	to ground
	Perforations	Perforations Size:	Depth To water level (meters)
•	from: 0 M to: 0 M	0 CM × 0 CM	Elapsed Time
•	from: 0 M to: 0 M	0 CM × 0 CM	Drawdown Minutes:Sec Recovery
	from: 0 M to: 0 M Perforated by:	0 CM x 0 CM	
	Seal:		
	from: 0 M	to: 0 M	Total Drawdown: M
	Seal:	40.014	If water removal was less than 2 hr duration, reason why:
	from: 0 M Seal:	to: 0 M	duration, reason why.
•	from: 0 M	to: 0 M	1
	Screen Type:	Screen ID: 0 CM	
	from: 0 M to: 0 M Screen Type:	Slot Size: 0 CM	Recommended pumping rate: Liters/Min
	from: 0 M to: 0 M	Screen ID: 0 CM Slot Size: 0 CM	Recommended pump intake: M
	Screen Installation Met		Type pump installed
	Fittings		Pump type: Pump model:
	Top: Pack:	Bottom:	H.P.:
	Grain Size:	Amount:	Any further pumptest information?
	Geophysical Log Taker Retained on Files:		
	Additional Test and/or F	Pumn Data	- .
	Chemistries taken By D		
	Held: 0	Documents Held: 1	_
	Pitless Adapter Type: Drop Pipe Type:		
	Length:	Diameter:	
	Comments:	····	7 I
	DRILLED IN 1930. MEI	D WATER @ 160' (SCALES	·
	HEAD OF STOCK.	MPED DRY, WATERS 120	
	7. Contractor Cer	tification	┥
	Driller's Name:	UNKNOWN DRILLER	7
	Certification No.:	adia aaaada 10 0 10 10 1	
	innis well was constructe	ed in accordance with the Wate	er i l

	L	Water	Well Drilling	Rep	ort	Well I.D.: Map Verified:	0437631 Map
En	Alberta Vironment	data contained in this	report is supplied by the Dr responsibility for its accurac	iller. The i	province disclaims	Date Report Received: Measurements:	1988/10/19 Metric
1. Con	tractor & We	I Owner Informa	ntion			2. Well Locati	
Compan	y Name:			Prilling Cor	mpany Approval No.		
	BASIN DRILLING		3	8394		LSD	М
viailing <i>F</i> 30X 47	Address:	City or To		ostal Cod	le:	SE 03 04	
	er's Name:		ion Identifier:	00 000		Location in Quarte 0 M from	er Bounda
	IEK, RANDY					0 M from	Bounda
P.O. Box	Number:	Mailing Ad		ostal Cod	e:	Lot Block	Plan
City:		RR1, BEN Province:		OC 0J0		Well Elev:	low Obtain:
		T TOVINGE,	C	ourilly.		1	Not Obtain:
3. Drill	ing Informati	on				6. Well Yield	101 001011
ype of v	Vork: New Well	 			Proposed well use:	Test Date	Start Time:
Reclaime		••		į	Domestic	(yyyy/mm/dd):	
	claimed: of Drilling: Rotary	Mate	rials Used:		Anticipated Water	1988/10/15 Test Method: Air	11:00 AM
lowing \	Well: No	Rate	Liters		Requirements/day 0 Liters	Non pumping	51.82 M
as Pres	ent: No		resent: No	f		static level:	- 102 IVI
	nation Log		5. Well Completion			Rate of water	90.92
epth			Date Started(yyyy/mm/dd)		ompleted	removal: Depth of	Liters/Min 73.15 M
rom Iround	litholog	y Description	· ·	(уууу/п		pump intake:	10.10 M
evel	Littlolog	y Description	1988/08/15 Well Depth: 73.15 M	1988/08 Borehol	3/16 le Diameter: 0 CM	Water level at	73.15 M
meters)			Casing Type: Steel		ype: Plastic	end of	
3.05 3.14	Clay Shale		Size OD; 13.97 CM	Size O	D: 11.43 CM	pumping: Distance from top	of CM
6.76	Sandstone		Wall Thickness: 0.62 CM	Wall Th	ickness: 0.6 CM	casing to ground	OI CIVI
8.9	Lost Circulation		Bottom at: 60.96 M	Top: 48		level:	
1.95	Shale			73.15 N		Depth To water	level (meters)
3.15	Interbedded Sha	ale & Sandstone	Perforations from: 60.96 M to: 73.15 M		tions Size:	Elapsed Drawdown Minute	i ilme :s:Sec Recover
			from: 0 M to: 0 M	0.95 CN	4 x 0.95 CM 0 CM	Total Drawdown: 2	21.34 M
			from: 0 M to: 0 M	0 CM x		if water removal w	
			Perforated by: Machine			duration, reason w	hy:
			Seal: Drive Shoe from: 0 M Seal:	to: 60.9	6 M		
			from: 0 M Seal:	to: 0 M		Recommended pu 68.19 Liters/Min	
	3		from: 0 M	to: 0 M		Recommended pu	mp intake:
			Screen Type:		ID: 0 CM	67.06 M Type Pump Installe	ed
			from: 0 M to: 0 M Screen Type:	Slot Size	D: 0 CM	Pump Type: GOUL	_D
		•	from: 0 M to: 0 M	Slot Size	e: 0 CM	Pump Model: 13 E	М
			Screen Installation Method	i:		H.P.: 1.5 Any further pumpte	set information
			Fittings Ton:	Dette		rany toraner pumpte	at mormation
			Top: Pack:	Bottom:			
			Grain Size:	Amount	: .		•
			Geophysical Log Taken:				
			Retained on Files: Additional Test and/or Pum	on Dota			
			Chemistries taken By Drille		,		
			Held: 1	Docume	ents Held: 2		
			Pitless Adapter Type: 230\	√ <u> </u>			
			Drop Pipe Type: GALV Length: 64.01 M	Diameto	er: 2.54 CM		
			Comments:	Piamete	7. 4.07 ON		
			1		I I		
			7 Contractor Certific	cation			
			7. Contractor Certific		WN DRILLER		

The data contained in t	r Well Drilling	riller. The		Well I.D.: Map Verified: Date Report	0437633 Map
Alberta Environment	responsibility for its accurac	cy.		Received: Measurements:	Metric
1. Contractor & Well Owner Inform	nation			2. Well Location	
Company Name:			mpany Approval No.	: 1/4 or Sec Twr	
LOUSANA WATER WELLS (1987) LTD. Mailing Address: City or 1		18963		LSD	M
		Postal Co	de:	SW 03 040 Location in Quarter	
WellOwner's Name: Well Loc	ation Identifier:	OW TICO		0 M from	Bounda
BUIT BROS.				0 M from	Bounda
P.O. Box Number: Mailing A SYLVAN		Postal Co	de:	Lot Block	Plan
City: Province	· · · · · · · · · · · · · · · · · · ·	Country:	· · · · · · · · · · · · · · · · · · ·		ow Obtain: stimated
3. Drilling Information				6. Well Yield	Sumateu
ype of Work: New Well			Proposed well use:	Test Date	Start Time:
Reclaimed Well			Domestic & Stock	(yyyy/mm/dd):	
Date Reclaimed: Ma Method of Drilling: Rotary	terials Used:		Anticipated Water	1988/06/08	11:00 AM
	te: Liters		Requirements/day 0 Liters	Test Method: Bailer Non pumping	41.76 M
	Present: No			static level:	T 1.1 U (VI
I. Formation Log	5. Well Completion			Rate of water	63.64
Depth		, Date C	ompleted	removal:	Liters/Min
rom .	Date Started(yyyy/mm/dd	^{):} (yyyy/r	nm/dd):	Depth of pump intake:	42.06 M
round Lithology Description	Well Depth: 48,77 M	1977/0		Water level at	42.06 M
meters)	Casing Type: Steel		ole Diameter: 0 CM vpe: Steel	end of	
.91 Brown Clay	Size OD: 14.12 CM		D: 11.43 CM	pumping:	
.66 Brown Fractured Shale	Wall Thickness: 0.48 CM		hickness: 0.64 CM	Distance from top o casing to ground	of CM
.71 Brown Sandstone		Top: 0		level:	
.01 Hard Sandstone 7.07 Brown Sandstone	Bottom at: 33.83 M	48.77		Depth To water I	evel (meters)
8.59 Brown Shale	Perforations	Perfora	ations Size:	Elapsed	Time
3.77 Brown Sandstone	from: 41.15 M to: 48.77 M			Drawdown Minutes Total Drawdown: 0.	Sec Recover
4.69 Hard Sandstone	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x		If water removal wa	
5.6 Brown Sandstone	Perforated by: Torch	0 CM x	O CIVI	duration, reason wh	
6.52 Hard Sandstone	Seal: Driven			1	
3.22 Brown Sandstone 5.05 Gray Shale	from: 0 M	to: 0 M			
5.97 Gray Sandy Shale	Seal: from: 0 M	4014		Recommended pun	oning rate: 0
6.58 Gray Shale & Coal	Seal:	to: 0 M		Liters/Min	inping rate. o
9.32 Gray Sandstone	from: 0 M	to: 0 M		Recommended pun	np intake:
9.62 Shale & Coal	Screen Type:		ID: 0 CM	45.72 M	
0.23 Gray Shale 8.77 Gray Sandstone	from: 0 M to: 0 M		-C. O OW	Type Pump Installe Pump Type:	a
8.77 Gray Sandstone	Screen Type: from: 0 M to: 0 M		ID: 0 CM ze: 0 CM	Pump Model:	
	Screen Installation Method		Le. O CIVI	H.P.:	
	Fittings			Any further pumptes	st information
	Top:	Bottom	:		
	Pack: Grain Size:	Amoun	. .		
	Geophysical Log Taken:	Amoun	Li .		
	Retained on Files:				
	Additional Test and/or Pur				
•	Chemistries taken By Drill Held: 0		ents Held: 1		
	Pitless Adapter Type:	Docum	euro Lielo: I		
	Drop Pipe Type:				
	Length: M	Diamet	er: CM		
	Comments: DRILLER REPORTS HAR	D WATE	R.		
			;		
	7. Contractor Certifi	cation			
	Driller's Name:		WN DRILLER		
	Certification No.:				
	This well was constructed	in accord	ance with the Water		

Albert	d Water Well	Drill	ing F	{epc	rt	Well ED.	.,	الاستان الاسا
ENVIRON	MENT The dota contained in this report is supplied by All information on this report will be related in	the Orillor. The prov	rince diadelms res	portsibility for its a	rdanteck:	Map verified Date report receive	d	
Contracto	or & Well Owner Information		·, ·	A	- , v	Well Location	·>	· · · · · · · · · · · · · · · · · · ·
Company Name		Approval	No.:	,		1/4 Or USD Sec	Terr	RCE West of
Malling Address:	LKEN BASIN DRILLING	LTD.	Postel Code:	<u>. </u>		NE 34	25	2 105
	TANK LITTLE CA	e manife des en en	4	104-C	محـــ	LOGATION IN CHANGES	<u></u>	Scanner
Well Owner's Na	TRANK . WILSON	Well Cwie	r has a copy of the	nis report:	Yes No	l	/ft from	N
Mailing Address:	8 - 10 Street City or Town	n lake	Postal Code:	7450	೨ ৯2		/it incum; Pum	☐ E ☐ W
Drilling in		-		<u> </u>	** •			
Type of Work:	Testricle New Well Recons	atructed [Despense	Proposod wa	el uso	Taki Yr Ne Dev.		st well
Well ID (if applica		tte Completed:	Yr MG Dey	☐ Househo		Date: 4 7627	Time:	
, , , .	moved (specify):			(up to 12	50 m³ per a residence	Test method:	aller	Altr
Plugging Material: Cer	Amount Amount Learn Ment High Solids Bentonite	1.6	Ay round Light	on the pr	oberty)	Arc mecsurement	B fit fitte	tric or imperial?
Mathod of Drittin		Hydrated Bant	onite	Other Specify:		Non pumping	\succeq	
Widowa & Diffil		Other:			น่องเบบ	static water level:	38	W1
Formation	Log	9 Well C			1,12	Rate of water removal:	32	apm
Depth from	⊓ாதtrês	Date Started:	843 27	Date Completed:	480327	Depth of pump intak if pump tested:		Hom
. ground level	Lithology Description (Lithology Description		monts in metri		704021	Depth balled or air tested from:	سم م ل	<u> </u>
				g Details:		Water level at end of	;	0 0 4
0-15	clay ben 4.6		Surface Seal	Casing	Liner/Inger Casing	Water removal perior Distance from top of		8.98 m
50-60	55 brn 15.2 8H aru 18.3	Ölameter.of Soziahole	11	1 344	12-1	casing to ground lev	ol:	3.61m
50 · 60	SH Gry 18.5	Casing type		12 17	PVC	Messurements take		
let - 65	SH Gru	Size QD		STEEL		Elap	sed Tin	π à
65-70	AH Och 263			5916	41/2	Pumping n	ninutes 0	Recovery :
70 -75	\$\$ ary 229	Well thickness	 	258	.237	38.5	1	7 8. 25
75-75	Shary	Bottom at	36.0		146'32	38.95	2	38.15
79-95	35 ary	Top at	•	· 2'	180 ha	\$ 38.96	3	38.07
100-110	SHARY 32.3	-	Coment Bentonite	☐ Cament ☐ Bentonile	☐ Cement ☐ Bentonite	38.96	4	38.05
110-115	SH oru	Arinular		Eliniven	☐ Driven ☐ Shale Trep	38.97	5	<u> 28.03</u>
118-139	55 are . 42.4	- Sealant	From:	Shele Trap	Flom:	3897	7	<u> 38.62</u>
139-140	SH A EL 42.7		To:	To:] (3 .	Te:	38.98	B	38.01
<u> </u>				intorvel Dotall	\$;	38.78	9	38.0(
<u> </u>	btod w Dyacks.	Perforations:	. 11:	910.140.		38.98	10	దైద్దం
	Monite anest	from:	B 6	to: 42.7	,	38.58 38.98	12	38
	Price Charles	Perforation si	20:	3/8×3/1	•	57.99	16	38 38
		Perforated by	: Saw	→ Torch	5	38.98		
<u> </u>	NAME TO A STATE OF THE PARTY OF	- renorated by	Machine		YEILL	38.98		
		Screen type:		Size OD:		38.98	30	
Water Used to D	rill Wall	Intervals:					45	_
Location of Water	Source: Treutous Well.	from:	ło:	alot size.		 	50.	
	Date: 4 1 63 2 Time: 500 ant ony	from:	to:	not size:		 	60	
Amount Water Ta	ken: 66 Litres/Imp.Gallons	Installation:		to casing 🔲 T			75	
GPS Co-ordinate	es (Docimal Degrees):	, Firlings: Top	Coupler	Bottom 🔲 1	Nash-down Bail 🔲 Plug		30	
Levol of GPS Acc	ILLIECY:	Pack:	tificial/Mechanic	al 🗀 i	lature)	N = -	105	73 eJ
Dilf. Corr. Has Hand Hald A		Grain siza:	•	Amount		38.98 If water removel was		38
	laken: Electric Gamma		ctor Certific			tugu 5 pr. gniatical to		/hy:
1	ar. Mineralized water more than 4000 ppm FDS	Orijier's Name			ndel	J		
,	Gas At what dopth:	Certification		062	7-			
Remedial action	Laken:	This well was	constructed in	accordance	with the Water	Recommended pure Recommended pure		
		(Ministerial) fi this roport is t	legulation of the	a vrener Apr. All	, .	Pump installed		, , , , , , , , , , , , , , , , , , ,
Additional Comm	eue:	1 1/4	uspl	hole	<u> 0803 Z</u>	2 '	res : fel:	Depth: H.P.:
ı		នាងលេខ	- 1	-	Tr Ma Dev	1	****	

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Almono Water Well	Drilling Report	Well LD.
ENTRY The take correlated to this report is considered.	with fiditor the summary districts and the same of the	Map verified
All origination on this report will be retained in Contractor & Well Owner Information	a public database.	Pate report received:
Company Name:	Approval No.	Well Location
ALKEN BASIN DRILLING D	D. Adjanta No. 966	Managion
Mailing Addresses	Postal Code: Toc-650	NE 34 39 2 W5
Well Corners Names	Well Owner has a copy of this report: Yes	Locurs Counce Boscom Million Nos
Meiling Address: City or Tough:		m/ittrom DE W
	NLAKE Postal Code:	Fox Bross Prins
O Drilling Information Type of Work: Testnow Well Reco		A Well Weld L. C.
Type of Work: Testnoin Willew Well Reco	structed Despensed Proposed well use:	Test , 77 Me Day: Start
Well ID (if applicable):	ate Completed: ** ica Day	Date: CA 200 Time:
Casing or liner removed (specify): Plugging formal distance descriptions of the control of t	(up to 1250 m³ per	Test method: Fump Beller Air
	on the property)	Are monsurements in metric or imperial?
Method of Drilling: Auger Boring Cable mol	Hydrated Bentonite Cither Specify:	Non pumping
Rolary Combination Backhoe	Other: CANPGROUSED	static water lovel: 🚽 , 50 VA
O Formation Log	Well Completion	Rate of water removal:
Depth from Introduce Description Company Started: 7562 86 Completed: 32 53 86	Depth of pump intake if pump tested:	
ground level Lithology Description (effect	Are measurements in metric or imperial?	Depth balled or
O-9 Alou bons	Casing Details:	Water level at end of
2	Surface Seal Casing Cooking	water removal period: 25.55
14-49 55 ben 14.9	Diameter of barehole 17.1 (3) (25.1)	casing to ground level:
49-74 SH OF4 2206		Measurements taken from: Costo
74-76 COAL 13-2	- Siet TVL	Elapsed Time
76-84 SHORY 25,6	Siza 00 51/6 41/2	Pumping minutes Recovery
84-118 SS are 36.0	Wall thickness . 258 . 237	B-1128 10 27.46
118-120 St gra 36.6	Bottom at 30.0 951 120	2-04 2235 47.38
	Top at 30	22.35
larauted with	☐ Cement ☐ Cement ☐ Cement ☐ Bentonite ☐ Bentonite	27.33
12 Back / Bentonta lorge	Annular Griven Coriver -	28.50 5 27.33
	1 1 1 1	28.52 8 27.32
	From: From: 6 From: 10: 10: 10: 10:	38.54 7 27.32 38.55 8 27.37
	Production Interval Details:	DR 56 9 21.31
	Perforations: 95 to: 115	38.57 10 27.3/
	24 111	29.58 12 27.30
ed CH	Parta retirus siera	28.59 4 27.36
	Parroration siza: 3/8 X 3/8	28.59 16 27.36
	Perforated by: Saw Torch Machine Cher:	28.55 20
	Screentype: Size OD:	28.59 30 B
White I	Intervals:	A9.57 5
Water Used to Drill Well: Location of Water Source: 5000	from: to: slot size;	40
Water Diversion Date: 555 355 Time: 500 ampre.	from: to: slot see:	50
Amount Water Taker:	Installation: Attached to casing Talescoped	60
GPS Co-ordinates (Decima) Decrees):	Filtings: Top Packes Sottom Wash-down	75
Latitude: 112.00 on pitude 2224.37 Severion: 3174 Level of GPS Accuracy:	Consier Bail Plug	60
Diff. Com Hand Held 5-10m Surveyed GPS < 1m	Pack: Artifiafai/Mechanical Netural Grain	#8.55 120 27.30
Hand Held Auto 20-30/m	sizo: Amount:	water removal was less
Geophysicsi Log taken: 🗆 Electric 🔲 Gamma		han 2 hr. duration, reason why:
Did you encounter, Di Mineralized water more than 4000 ppm TDS	Drillers Name: Kris Schindal -	
☐ Gas — At what depth:	Certification No.: 406284	
Remedial action taken:	the same of the sa	Recommended pumping rate: 10 q A M
Additional Comments;	this record is true.	unip installed Yas Dopth:
		ypa: Model: H.P:
30.00	(mr 40)	

≜ ∨	Vater	Well Drilling	Ren	ort	Well I.D.: Map Verified:	0362714 Not Verified
The data contain	ned in this	report is supplied by the Dr	iller. The	province disclaims	Date Report	1976/09/08
Alberta Environment		esponsibility for its accurac		province discialina	Received:	
. Contractor & Well Owner	Informat	ion			Measurements:	Metric
Company Name:	miormai		rilling C	ompany Approval No.	2. Well Location: 1/4 or Sec Two	
IANSEŃ DRLG		L	mining Co	mpany Approvar No.:	: 1/4 or Sec Twp LSD	Rge west M
Mailing Address:	City or Tow	n: P	ostal Co	de:	SW 34 039	02 5
	Well Location	on Identifier:			Location in Quarter 0 M from	Bounda
'AN BUKEL, JOHN '.O. Box Number:	Moiline Ad-	lanan B			0 M from	Bounda
	Mailing Add SYLVAN LA		ostal Co	ae:	Lot Block	Plan
ity:	Province:	, C	ountry:			ow Obtain:
. Drilling Information					950.98 M Es	stimated
ype of Work: New Well	-	<u> </u>		Proposed well use:	Test Date	Start Time:
eclaimed Well				Domestic	(yyyy/mm/dd):	
ate Reclaimed: lethod of Drilling: Cable Tool	Materi	als Used:		Anticipated Water Requirements/day	1976/08/05 Test Method: Bailer	11:00 AM
lowing Well: No	Rate:			0 Liters	Non pumping	7.32 M
as Present:	Oil Pre				static level:	100.55
. Formation Log		5. Well Completion	- <u> </u>		Rate of water removal:	136.38 Liters/Min
epin om		Date Started(yyyy/mm/dd)		completed nm/dd):	Depth of	0 M
round Lithology Descrip	ption	1976/08/05	1976/0	08/05	pump intake: Water level at	13.72 M
vel neters)	•	Well Depth: 18.59 M		ole Diameter: 0 CM	end of	13.12 IVI
23 Brown Clay		Casing Type: Steel Size OD: 14.12 CM		ype: Steel D: 11.43 CM	pumping:	
3.11 Gray Clay		Wall Thickness: 0.4 CM		hickness: 0 CM	Distance from top or casing to ground	f CM
8.59 Sandstone		Bottom at: 14.63 M	Top: 0		level:	
#* · · · · · · · · · · · · · · · · · · ·			18.59		Depth To water le	
		Perforations from: 15.24 M to: 18.29 M		ations Size: M x 30.48 CM	Drawdown Minutes	
		from: 0 M to: 0 M		0 CM	Total Drawdown: 0 I	
		from: 0 M to: 0 M Perforated by: Torch	0 CM 3	OCM	If water removal was duration, reason wh	s less than 2 v:
		Seal: Driven			1	
		from: 0 M	to: 0 M			
		Seal: from: 0 M	to: 0 M		Recommended pur	ping rate: 0
		Seal:			Liters/Min	
		from: 0 M Screen Type:	to: 0 M	ID: 0 CM	Recommended pur Type Pump Installed	
		from: 0 M to: 0 M		ze: 0 CM	Pump Type:	•
•		Screen Type:	Screer	ID: 0 CM	Pump Model: H.P.:	
		from: 0 M to: 0 M Screen Installation Method		ze: 0 CM	Any further pumptes	st information
		Fittings	•		ĺ	
		Top:	Bottom	:		
		Pack: Grain Size:	Amoun	t: 0		
		Geophysical Log Taken:		.,		
		Retained on Files: Additional Test and/or Pun	n Data		1	
		Chemistries taken By Drille				
		Held: 0 Pitless Adapter Type:	Docum	ents Held: 1		
		Pitiess Adapter Type: Drop Pipe Type:				
		Length: M	Diamet	er: CM		
	i	Comments: SOFT WATER.				
		OUT TIMIEN.				
		7 0 - 4 1 2 -				
		7. Contractor Certification Driller's Name:		OWN DRILLER		
		Certification No.:				
		This well was constructed i	n accord	ance with the Water		

A	Water	Well Drilling	Ren	ort	Well I.D.: Map Verifie	d·	036271 Not Ve	
The data	contained in this	report is supplied by the Dr	filler The	on t	Date Repor			
Alberta		responsibility for its accurac		province discialitis	Received:		1981/0	7/21
Environment			-		Measureme		<u>Metric</u>	
. Contractor & Well Ow	<u>mer Informa</u>		+		2. Well Le			
Company Name: BIG QUILL DRILLING LTD.			Orilling Co	mpany Approval No.:	: 1/4 or Sec LSD	: Twp	Rge	West M
Mailing Address:	City or Tov	vn; F	Postal Cod	le:	SW 34		02	5
VellOwner's Name:	Well Locat	ion Identifier:			Location in (0 M fron		Bo	unda
IICKS, R					0 M fron	n	Bo	unda
P.O. Box Number:	Mailing Ad	dress: F MARNOCK CRES NW	Postal Cod	le:	Lot I	Block	Plan	
	CALGARY		3A 1H3		Well Elev:	Н	w Obtai	n:
City:	Province:	C	Country:		944.88 M		timated	
3. Drilling Information					6. Well Yi	eid	Start Ti	
ype of Work: New Well				Proposed well use:	(yyyy/mm/do	i):	Start	me:
Reclaimed Well				Domestic	1981/06/05	-	11:00 A	MA
Date Reclaimed: Method of Drilling: Rotary	Mate	rials Used:		Anticipated Water Requirements/day	Test Method Non pumpin		8.23 M	
lowing Well: No		Liters		0 Liters	static level:			
Sas Present:		esent:			Rate of water	∍r	136.38	
I. Formation Log	0.011	5. Well Completion			removal: Depth of		Liters/N 0 M	/III
Depth rom		Date Started(yyyy/mm/dd		ompleted nm/dd):	pump intake			
round Lithology De	scription	1981/06/05	1981/0	6/05	Water level	at	36.58 N	Л
evel	•	Well Depth: 36.58 M		le Diameter: 0 CM	end of pumping:			
meters) 0.45 Brown Clay & Rocks		_Casing Type: Galvanized Steel	Liner T	уре:	Distance fro		f CM	
3.77 Brown Water Bearing	Sandstone	Size OD: 11.43 CM	Size O	D: 0 CM	casing to gre	ound		
32.31 Gray Medium Grained	Sandstone	Wall Thickness: 0.36 CM	Wall Th	nickness: 0 CM	level: Depth To	water le	vel (met	ers)
35.05 Gray Shale 36.58 Light Blue Shale		Bottom at: 27.74 M	Тор: 0	M Bottom: 0 M	l E	lapsed ⁻	Time	•
10.00 Eight blue Offate		Perforations		tions Size:	Drawdown I Total Drawd			cover
,		from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x 0 CM x		If water rem			an 2
		from: 0 M to: 0 M	0 CM x		duration, rea	ison wh	y:	
		Perforated by:]			
		Seal: Driven from: 0 M	to: 27.4	13 M				
		Seal:	10. 21.4	10 141	Recommend	led pum	ping rate	e: 0
		from; 0 M	to: 0 M		Liters/Min Recommend	led num	n infake	· 0 M
		Seal: from: 0 M	to: 0 M		Type Pump			. 0 19
		Screen Type:		ID: 0 CM	Pump Type:			
		from: 0 M to: 0 M		e: 0 CM	Pump Mode H.P.:	I:		
		Screen Type: from: 0 M to: 0 M		ID: 0 CM ze: 0 CM	Any further p	oumptes	t informa	ation
		Screen Installation Metho			1			
•		Fittings	D-v		}			
		Top: Pack:	Bottom	<u>:</u>				
		Grain Size:	Amoun	t: 0				
		Geophysical Log Taken:						
		Retained on Files: Additional Test and/or Pur	mp Data		1			
		Chemistries taken By Drill	er: No					
		Held: 1 Pitless Adapter Type:	Docum	ents Held: 2				
		Drop Pipe Type:						
		Length: M	Diamet	er: CM	1			
		Comments:						
			-					
					1			
		7. Contractor Certif Driller's Name:		OWN DRILLER				

A Water	Well Drilling	Rend	ort	Well I.D.: Map Verified:	0467432 Not Verified
The data contained in this	report is supplied by the D			Date Report	1997/04/11
Alberta Environment	responsibility for its accura	ıcy.		Received: Measurements:	Metric
. Contractor & Well Owner Informa	ition			2. Well Location	
ompany Name:		Drilling Con	npany Approval No.:		
LBERTA EAGLE DRILLING LTD. lailing Address: City or To		117793		LSD	М
		Postal Code T4S 1S6	e:	SW 34 039 Location in Quarte	
	tion Identifier:			0 M from	Bounda
AACK, ELMER O. Box Number: Mailing A	idress:	Postal Code	a•	0 M from Lot Block	Bounda Plan
15113 42	AVE, EDMONTON	T6H 5P6		21 9	8922703
ity: Province:		Country:			low Obtain: lot Obtain
Drilling Information				6. Well Yield	Ot Obtain
pe of Work: New Well		F	Proposed well use:	Test Date	Start Time:
eclaimed Well ate Reclaimed: Mate	rials Used:		Domestic Anticipated Water	(yyyy/mm/dd): 1996/05/29	12:00 PM
ethod of Drilling: Combination	nais Oscu.	F	Requirements/day	Test Method: Air	12.00 FW
	: Liters			Non pumping	12.5 M
as Present: No OII P	resent: No 5. Well Completion	<u> </u>		static level: Rate of water	227.3
epth		D.1. 0	mpleted	removal:	Liters/Min
om ound Lithology Description	Date Started(yyyy/mm/do 1996/05/29	ב: (yyyy/m	m/dd):	Depth of pump intake:	30.48 M
ound Lithology Description vel	Well Depth: 30.48 M	1996/05 Borehol	e Diameter: 0 CM	Water level at	М
neters)	Casing Type: Plastic	Liner Ty	pe: Plastic	end of pumping:	
44 Fill 71 Brown Till	Size OD: 14.12 CM Wall Thickness: 1.06 CM		D: 11.43 CM ickness: 0.59 CM	Distance from top	of CM
I.94 Gray Till		Top: 24		casing to ground level:	
5.54 Gray Sandstone 3.77 Brown Sandstone	Bottom at: 26.21 M	30.48 M		Depth To water	level (meters)
0.48 Gray Water Bearing Sandstone	Perforations		ions Size:	Elapsed Drawdown Minute	
	from: 26.21 M to: 30.48 M from: 0 M to: 0 M	И 1.59 СМ ОСМ х	1 x 10.16 CM 0 CM	1:0	
	from: 0 M to: 0 M	0 CM x		2:0	
	Perforated by: Hand Drill Seal: Driven & Bentonite			3:0 4:0	
	from: 12.19 M	to: 26.2	1 M	5:0	0 12.69
	Seal: from: 0 M	to: 0 M		6:0 7:0	
	Seal:	to. O W		8:0	
	from: 0 M Screen Type:	to: 0 M	ID: 0 CM	10:0	
	from: 0 M to: 0 M	Slot Size		120: Total Drawdown: 0	
	Screen Type:	Screen	ID: 0 CM	If water removal wa	as less than 2
	from: 0 M to: 0 M Screen Installation Metho	Slot Size	e: U CIM	duration, reason w	hy:
	Fittings				
	Top: Pack:	Bottom:		Recommended pur	mnina rata:
	Grain Size:	Amount		45.46 Liters/Min	, ,
	Geophysical Log Taken: Retained on Files:			Recommended pur 24.38 M	np intake:
:	Additional Test and/or Pu			Type Pump Installe	ed
	Chemistries taken By Dril Held: 0	ller: No		Pump Type: SUB Pump Model:	
	Pitless Adapter Type:	Doounic		H.P.:	
	Drop Pipe Type: Length: M	Diamete		Any further pumpte	st information
	Comments:			-	
	DRILLER REPORTS DIS				
	CASING TO GROUND L	⊏v⊏L: .5 M			
			<u></u>		
	7. Contractor Certif				
	Driller's Name: Certification No.:	UNKNO 11184A	WN DRILLER		
	This well was constructed		noo with the Weter		

A Water	Well Drilling	Report		Well I.D.: Map Verified:	0366507 Not Verified
The data contained in this	report is supplied by the Di	riller. The province dis		Date Report	1992/11/02
Alberta Environment	responsibility for its accurac	cy.		Received: Measurements:	Metric
. Contractor & Well Owner Informa	tion			2. Well Loca	
ompany Name:		Drilling Company Appl			wp Rge Wes
LBERTA EAGLE DRILLING LTD.		17793	Ovai No	LSD	Wp Tye Wes
failing Address: City or To		Postal Code:			39 02 5
OX 9036 SYLVAN I		74S 1S6		Location in Quar	
/ellOwner's Name: Well Loca UMBACH, KEN	tion Identifier:			0 M from 0 M from	Bounda Bounda
O. Box Number: Mailing Ac	ldress: F	Postal Code:		Lot Block	
	IVVALE CRES				
CALGAR		72X 2S3		Well Elev:	How Obtain:
ity: Province:	C	Country:	- 4	M	Not Obtain
Drilling Information				6. Well Yield	
. Drilling Information ype of Work: New Well		Drannad		Test Date	Start Time:
eclaimed Well		Proposed w Domestic		(yyyy/mm/dd): 1992/08/17	11:00 AM
	rials Used:	Anticipated	Water	Test Method: Air	
lethod of Drilling: Combination		Requiremen	nts/day	Non pumping	23.77 M
	: Liters	0 Liters		static level:	400.00
	resent: No	İ		Rate of water removal:	136.38 Liters/Min
. Formation Log	5. Well Completion	Data Campulated		Depth of	36.58 M
eptii om	Date Started(yyyy/mm/dd): Date Completed (yyyy/mm/dd):	E	pump intake:	
round Lithology Description	1992/08/17	1992/08/17		Water level at	36.58 M
vel	Well Depth: 36.58 M	Borehole Diameter		end of pumping:	
neters) 4 Brown Till & Clay	Casing Type: Plastic	Liner Type: Plastic	f	Distance from to	n of CM
4 Brown Till & Clay 62 Brown Shale	Size OD: 14.12 CM	Size OD: 11.43 CN	Λ ,	casing to ground	
5.24 Brown Sandstone	Wall Thickness: 0.95 CM	Wall Thickness: 0.		level:	
5.85 Gray Shale	Bottom at: 31.7 M	Top: 30.48 M 36.58 M	Bottom:		er level (meters) ed Time
6.15 Coal	Perforations			Drawdown Minu	
8.29 Brown Shale	from: 32 M to: 36.58 M	Perforations Size: 1.59 CM x 0 CM		Total Drawdown:	
4.08 Brown Sandstone 6.82 Brownish Gray Shale	from: 0 M to: 0 M	0 CM x 0 CM		f water removal	
6.58 Brownish Gray Sandstone	from: 0 M to: 0 M	0 CM x 0 CM		duration, reason	why:
Distribution Stay Sandstone	Perforated by: Machine				
	Seal: Driven & Bentonite from: 27.43 M	to: 31,09 M			
	Seal:	to. 01.00 N		Recommended p	oumping rate:
	from: 0 M	to: 0 M		45.46 Liters/Min	
	Seal:	4 O M		Recommended p 30.48 M	oump intake:
	from: 0 M Screen Type:	to: 0 M Screen ID: 0 CM		Type Pump Insta	illed
	from: 0 M to: 0 M	Slot Size: 0 CM	∦F	Pump Type: SUE	3
	Screen Type:	Screen ID: 0 CM		Pump Model: 109 H.P.:	S05-9
•	from: 0 M to: 0 M	Slot Size: 0 CM		n.e.: Any further pump	test information
	Screen Installation Methor Fittings	a:	[any received partition	
	Top:	Bottom:			
	Pack:				
	Grain Size:	Amount:			
	Geophysical Log Taken: Retained on Files:				
	Additional Test and/or Pur	mp Data			
	Chemistries taken By Drill				
	Held: 0	Documents Held: 1			
	Pitless Adapter Type: Drop Pipe Type:				
	Length: M	Diameter: CM			
	Comments:	_ annexer on			
	DRILLER REPORT 15 GF	R HARD 7.7 PH LOW	IRON.		
			1		
			1		
			1		
	7. Contractor Certif	ication			
	Driller's Name:	UNKNOWN DRILL			

The data contained in this	Well Drilling report is supplied by the responsibility for its accur	Driller. The	Ort province disclaims	Well I.D.: Map Verified: Date Report Received: Measurements:	0362722 Map Metric
1. Contractor & Well Owner Informat	ion			2. Well Location	
Company Name:		Drilling Cor	mpany Approval No.:	1/4 or Sec Tw	
STAR DRLG CO Mailing Address: City or Tow	n:	Postal Cod	e:	LSD NE 34 039	M
WellOwner's Name: Well Locati	on Identifier:			Location in Quarte 0 M from	r Boundary
CARLSON, PETER		<u> </u>		0 M from	Boundary
P.O. Box Number: Mailing Add 451 BENTLEY	iress:	Postal Cod	e:	Lot Block	Plan
City: Province:		Country:			low Obtain: stimated
3. Drilling Information				6. Well Yield	
Type of Work: New Well Reclaimed Well			Proposed well use:	Test Date	Start Time:
Date Reclaimed: Materi	als Used:		Stock Anticipated Water	(yyyy/mm/dd): 1978/03/13	11:00 AM
Method of Drilling: Rotary			Requirements/day	Test Method: Pum	p
Flowing Well: No Rate: Gas Present: Oil Pre				Non pumping static level:	45.72 M
4. Formation Log	5. Well Completio	n		Rate of water	45.46
Depth	Date Started(yyyy/mm/c	Date Co	ompleted	removal: Depth of	Liters/Min 0 M
from ground Lithology Description	1978/03/09	(yyyy/m	m/dd):	pump intake:	U IVI
level	Well Depth: 77.72 M	1978/03 Borehol	le Diameter: 0 CM	Water level at	54.86 M
(meters)	Casing Type: Steel	Liner Ty	/pe:	end of pumpina:	
9.14 Clay 45.72 Shattered Shale	Size OD: 11.43 CM	Size O		Distance from top	of CM
77.72 Hard Shale Stringers	Wall Thickness: 0.36 CN	M Wall Th	ickness: 0 CM	casing to ground	=
- This office of	Bottom at: 65.53 M	Top: 0 I	M Bottom: 0 M	level: Depth To water	loval (moters)
	Perforations	Porforo	tions Size:	Deptn To water Elapsed	
	from: 0 M to: 0 M	0 CM x		Drawdown Minute:	s:Sec Recovery
	from: 0 M to: 0 M	0 CM x	0 CM	Total Drawdown: 9	
	from: 0 M to: 0 M Perforated by:	0 CM x	0 CM	lf water removal wa duration, reason wl	
	Seal: Driven				
	from: 0 M	to: 1.22	М		
	Seal: from: 0 M	to: 0 M		Recommended pur	mping rate:
	Seal: from: 0 M	to: 0 M		45.46 Liters/Min Recommended pur	np intake:
	Screen Type:	Screen	ID: 0 CM	60.96 M	-
	from: 0 M to: 0 M	Slot Siz	0. 0 0111	Type Pump Installe	ed
	Screen Type: from: 0 M to: 0 M	Screen Slot Size	e: 0 CM	Pump Type: Pump Model:	
	Screen Installation Meth	nod:	0.00111	H.P.:	
•	Fittings			Any further pumpte	st information?
	Top: Pack:	Bottom:			,
	Grain Size:	Amount	: 0		
	Geophysical Log Taken:	:			
	Retained on Files: Additional Test and/or P	ump Data			
	Chemistries taken By Dr	riller: Yes			
	Held: 0		ents Held: 1		
	Pitless Adapter Type: Drop Pipe Type:		·		
·	Length: M	Diamete	er: CM		
	Comments:				
	MEDIUM HARD.				
		÷			
	7. Contractor Cert				
	Driller's Name: Certification No.:	UNKNO	WN DRILLER		
	This well was constructe	ed in accorda	nce with the Water		

Alberta The data contained in this	Well Drilling report is supplied by the Driesponsibility for its accurace	riller. The	ort province disclaims	Well I.D.: Map Verified: Date Report Received:	0362713 Not Verified
1. Contractor & Well Owner Informat		· .		Measurements:	<u>Metric</u>
Company Name:		Orillina Co	mpany Approval No.	2. Well Location: 1/4 or Sec Twp	
BROWN JIM Mailing Address: City or Tow		Postal Cod		LSD SW 34 039	M 0 02 5
WellOwner's Name: Well Locati BROWN, GLEN	on Identifier:			Location in Quarter 0 M from 0 M from	Boundary Boundary
BROWN, GLEN P.O. Box Number: Mailing Add LAKE COT LAKE	ress: TAGE, N.S. OF SYLVAN	Postal Cod	le:	Lot Block 21	Plan ow Obtain:
City: Province:		Country:			stimated
3. Drilling Information Type of Work: New Well	····			Test Date	Start Time:
Reclaimed Well Date Reclaimed: Materi	als Used:		Proposed well use: Domestic Anticipated Water	(yyyy/mm/dd): 1969/08/04 Test Method: Bailer	11:00 AM
Method of Drilling: Unknown Flowing Well: No Rate:			Requirements/day 0 Liters	Non pumping static level:	15.24 M
Gas Present: Oil Pre			<u> </u>	Rate of water removal:	54.55 Liters/Min
4. Formation Log Depth	5. Well Completion	D-4- 0	ompleted	Depth of	0 M
from ground Lithology Description	Date Started(yyyy/mm/dd		nm/dd):	pump intake: Water level at	0 M
level (meters)	Well Depth: 45.72 M	-	le Diameter: 0 CM	end of pumping:	
15.24 Clay & Sand	Casing Type: Unknown Size OD: 13.97 CM	Liner T	ype: D: 0 CM	Distance from top o	f CM
25.91 Clay & Rocks	Wall Thickness: 0 CM		nickness: 0 CM	casing to ground level:	
33.53 Shale 42.67 Sandstone Stringers 45.72 Shale	Bottom at: 28.04 M	Top: 0	M Bottom: 0 M	Depth To water le	
43.72 Shale	Perforations from: 0 M to: 0 M	Perfora	tions Size:	Drawdown Minutes Total Drawdown: 0	
	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x	0 CM	If water removal wa duration, reason wh	
	Perforated by:	O ON A	O OIVI	1	,
	Seal: Driven from: 0 M	to: 0 M		Recommended pur	nning rate: 0
	Seal: from: 0 M Seal:	to: 0 M		Liters/Min Recommended pun	
	from: 0 M	to: 0 M		Type Pump Installed	
	Screen Type: from: 0 M to: 0 M	Slot Siz	ID: 0 CM re: 0 CM	Pump Type: Pump Model:	
	Screen Type: from: 0 M to: 0 M	Slot Siz	ID: 0 CM e: 0 CM	H.P.: Any further pumptes	st information?
	Screen Installation Methor Fittings	d:		1	
	Top: Top:	Bottom			
	Grain Size: Geophysical Log Taken:	Amoun	t: 0		
	Retained on Files: Additional Test and/or Pur	ma Data			
	Chemistries taken By Drill	er: Yes			
	Held: 0 Pitless Adapter Type:	Docum	ents Held: 1	·	
	Drop Pipe Type: Length: M	Diamet	er: CM]	
	Comments: SOFT WATER.				
	7. Contractor Certif				
	Driller's Name: Certification No.:	UNKNO	WN DRILLER		

Water Well Drilling Report The data contained in this report is supplied by the Driller. The province disclaims responsibility for its accuracy.					0365978 Not Verified	
					1992/09/21	
					Metric	
. Contractor & Well Owner Inform	Measurements: 2. Well Locat					
Company Name:	IIIIVII	Drillina Com	pany Approval No.:		wp Rge Wes	
ALBÉRTA EAGLE DRILLING LTD.		117793		LSD	М	
Mailing Address: City or	OWN;	Postal Code	:		39 02 5	
	N LAKE AB CA cation Identifier:	T4S 1S6		Location in Quart 0 M from	er Bounda	
GRUDGEFIELD, GORD	sation ruentiner.			0 M from	Bounda	
P.O. Box Number: Mailing	Address:			Lot Block	Plan	
169 W.C CALGA	ODFORD DR SW,	T2W 4C2		16 8 Well Elev: How Obtain:		
City: Province		Country:	······································	M Not Obtain		
				6. Well Yield		
3. Drilling Information				Test Date	Start Time:	
ype of Work: New Well	- 		roposed well use:	(yyyy/mm/dd):		
Reclaimed Well Date Reclaimed: Ma	iterials Used:		omestic nticipated Water	1992/07/20 Test Method: Air	11:00 AM	
Method of Drilling: Combination				Non pumping	23.77 M	
Flowing Well: No Ra	te: Liters		Liters	static level:		
	Present: No	ı		Rate of water removal:	118.2 Liters/Min	
1. Formation Log Depth	5. Well Completion	D-4- O-	mulated	Depth of	36.58 M	
om rom	Date Started(yyyy/mm/d	ld): Date Cor		pump intake:		
ground Lithology Description	1992/07/20	1992/07/	20	Water level at end of	36.58 M	
evel meters)	Well Depth: 36.58 M		Diameter: 0 CM	end of pumping:		
2.74 Brown Till & Clay	Casing Type: Plastic Size OD: 14.12 CM		e: Plastic 11.43 CM	Distance from top	of CM	
3.35 Brown Shale	Wall Thickness: 0.67 CN		kness: 0.54 CM	casing to ground		
7.32 Brown Sandstone		Top: 30.4		level: Depth To wate	r level (meters)	
1.89 Brown Shale 5.24 Brown Fine Grained Sandstone	Bottom at: 32.31 M	36.58 M		Elapse	d Time	
16.76 Brown Shale	Perforations		ons Size:	Drawdown Minut	es:Sec Recove	
17.98 Brown Sandstone	from: 32.31 M to: 36.58		_	Total Drawdown: 12.8 M If water removal was less than 2 duration, reason why:		
20.12 Brownish Gray Shale	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x 0 0 CM x 0	OIII			
25.91 Brownish Gray Sandstone 28.65 Gray Silty Shale	Perforated by: Machine				•	
28.65 Gray Silty Shale 36.58 Brownish Gray Sandstone		Seal: Driven & Bentonite				
	from: 27.43 M Seal:	to: 31.7 N	v1	Recommended p	umping rate: 0	
	from: 0 M	to: 0 M		Liters/Min		
	Seal:	1. 644		Recommended pump intake: Type Pump Installed		
	from: 0 M Screen Type:	to: 0 M Screen II	2. 0 CM	Pump Type: SUB Pump Model: 10S05-9 H.P.: Any further pumptest informat		
	from: 0 M to: 0 M	Slot Size	: 0 CM			
	Screen Type:	Screen II	J: U CIVI			
	from: 0 M to: 0 M Screen Installation Meth	Slot Size	: U CM	any randrate puritip	COL HIIOHHAUUH	
	Fittings					
	Тор:	Bottom:	-			
	Pack: Grain Size:	Amount				
	Grain Size: Geophysical Log Taken:	Amount:				
	Retained on Files:					
	Additional Test and/or Pr Chemistries taken By Dr					
	Held: 0		nts Held: 1			
	Pitless Adapter Type:					
	Drop Pipe Type: Length: M	Diameter	- CM			
	Comments:	Diameter	, O(VI			
	DRILLER REPORT 18 G	SR HARD.				
	7 Contractor Cod	7 Contractor Contification				
	Driller's Name:	7. Contractor Certification Driller's Name: UNKNOWN DRILLER				
	Certification No.:	VA7724	*** DIVICEE!\			

Water	Well Drilling	Report		Well I.D.: Map Verified:	0362712 Not Verified	
The data contained in this report is supplied by the Driller. The province disclaims			Date Report Received:	1972/09/18		
Environment Tesponsionity for its accuracy.				Measurements: Metric		
1. Contractor & Well Owner Informat	ion			2. Well Locati		
Company Name: BROWN JIM		Drilling Company Approval No		1/4 or Sec Tw LSD	p Rge Westof M	
Mailing Address: City or Town:		Postal Code:		SW 34 03	9 02 5	
WellOwner's Name: Well Location Identifier:				Location in Quarte 0 M from	Boundary	
MCCOOK P.O. Box Number: Mailing Add	lress:	Postal Code:		0 M from Lot Block	Boundary Plan	
.O. Box Number: Mailing Address: 23 35 N.Y. SYLVAN LAKE NORT SIDE					How Obtain:	
City: Province:		Country:		944.88 M	Estimated	
3. Drilling Information				6. Well Yield Test Date	Start Time:	
Type of Work: New Well Proposed well use:				(yyyy/mm/dd):	otart rime.	
Reclaimed Well Date Reclaimed: Materi	als Used:	Domestic		1972/06/12 Test Method: Pum	11:00 AM	
Method of Drilling: Rotary	als Oscu.	Requirem	ents/day	Non pumping	21.34 M	
Flowing Well: No Rate:		0 Liters		static level:	EASE	
Gas Present: Oil Pro 4. Formation Log	5. Well Completio	n I		Rate of water removal:	54.55 Liters/Min	
Depth		Data Completed		Depth of	0 M	
from	Date Started(yyyy/mm/d	^(yyyy/mm/dd) :		pump intake: Water level at	0 M	
ground Lithology Description	Well Depth: 39.62 M	1972/06/12 Borehole Diamet	er 0 CM	end of	O IVI	
(meters)	Casing Type: Steel	Liner Type:	.cr. o Ciw	pumping:	-6.014	
15.24 Clay & Rocks	Size OD: 11.43 CM	Size OD: 0 CM		Distance from top casing to ground	of CM	
18.29 Shale	Wall Thickness: 0 CM	Wall Thickness:	0 CM	level:		
21.34 Blue Lost Circulation Shale 39.62 Lost Circulation Shale & Sandstone	Bottom at: 19.2 M	Top: 0 M Bo	ottom: 0 M	Depth To water	level (meters)	
2002 Look On Culation Ondie & Samustone			1165	Elapsed Drawdown Minute		
	Perforations from: 0 M to: 0 M	Perforations Size) :	Total Drawdown: (
	from: 0 M to: 0 M	0 CM X 0 CM	÷	If water removal w		
	from: 0 M to: 0 M	0 CM x 0 CM		duration, reason w	/hy:	
	Perforated by:					
	Seal: Driven	40.01				
	from: 0 M Seal:	to: 0 M		Recommended pu	ımping rate: 0	
	from: 0 M	to: 0 M		Liters/Min Recommended pu	ma intalia	
	Seal: from: 0 M	to: 0 M		Recommended pu 25.91 M	шћ шаке;	
	Screen Type:	Screen ID: 0 CM		Type Pump Install	ed	
	from: 0 M to: 0 M	Slot Size: 0 CM		Pump Type: SUB Pump Model:		
	Screen Type: from: 0 M to: 0 M	Screen ID: 0 CM Slot Size: 0 CM		H.P.:		
		Screen Installation Method:		Any further pumpto	est information?	
	Fittings					
	Top:	Bottom:				
	Pack: Grain Size:	Amount: 0				
	Geophysical Log Taken					
	Retained on Files: Additional Test and/or Pump Data					
	Chemistries taken By Driller: Yes					
	Held: 0 Pitless Adapter Type:	Documents Held	: 1			
	Drop Pipe Type:					
	Length: M	Diameter: CM				
	Comments: SOFT WATER.					
•						
	7. Contractor Certification					
	Driller's Name:	UNKNOWN DRII	LER			
Certification No.:						

å v	Vater '	Well Drilling I	₹ер	ort	Well I.D.: Map Verified: Date Report	0362711 Not Verified		
Alberta Environment	ained in this i	report is supplied by the Drill esponsibility for its accuracy	er. The	province disclaims	Received: Measurements:	1971/08/24 Metric		
1. Contractor & Well Owner	Informat	ion			2. Well Locat			
Company Name:			lling Co	ompany Approval No.:	1/4 or Sec T	wp Rge West		
NELSON DRILLING & PLUMBING Mailing Address:	O4 T	- · · · · · · · · · · · · · · · · · · ·	-4-1-0-	-l	LSD SW 34 0	M		
waijing Address:	City or Tow	n: Po	stal Co	ae:	SW 34 0 Location in Quart	39 02 5 ter		
WellOwner's Name:	Well Location	on Identifier:			0 M from	Bounda		
SHAPKE, B.					0 M from	Bounda		
P.O. Box Number:	Mailing Add	ress: Po	stal Co	de:	Lot Block	Plan		
City:	CALGARY Province:	Co	untry:		Well Elev:	How Obtain:		
					944.88 M	Estimated		
3. Drilling Information					6. Well Yield			
Type of Work: New Well				Proposed well use:	Test Date	Start Time:		
Reclaimed Well Date Reclaimed:	Matari	als Used:		Domestic Anticipated Water	(yyyy/mm/dd): 1971/07/01	11:00 AM		
Method of Drilling: Rotary	waten	aio USCU.	 .	Requirements/day	Test Method: Pur			
Flowing Well: No	Rate:	iters		0 Liters	Non pumping	0.91 M		
Gas Present:	Oil Pre			<u> </u>	static level:	45.40		
4. Formation Log		5. Well Completion			Rate of water removal:	45.46 Liters/Min		
Depth from		Date Started(yyyy/mm/dd):	Date (Completed	Depth of	0 M		
ground Lithology Descr	intion		(yyyy/ 1971/(mm/dd): 07/01	pump intake:			
level	, p. 1011	Well Depth: 36.58 M		ole Diameter: 0 CM	Water level at	0 M		
(meters)		Casing Type: Galvanized	Liner		end of pumping:			
3.05 Brown Clay & Sand 17.07 Blue Clay		Steel			Distance from tor	of CM		
22.86 Sandstone Stringers		Size OD: 5.08 CM Wall Thickness: 0 CM		D: 0 CM hickness: 0 CM	casing to ground			
27.43 Blue Soft Shale		Bottom at: 30.18 M			level: Depth To water level (meter			
32.92 Water Bearing Shale			Top: 0			r level (meters) ed Time		
36.58 Blue Shale		Perforations from: 0 M to: 0 M		ations Size: x 0 CM	Drawdown Minut	tes:Sec Recover		
		from: 0 M to: 0 M	0 CM:	x 0 CM	Total Drawdown:			
		from: 0 M to: 0 M	0 CM	x 0 CM	If water removal of duration, reason			
		Perforated by: Seal: Driven						
		from: 0 M	to: 0 N	1	1			
		Seal:			Recommended p	umping rate: 0		
		from: 0 M Seal:	to: 0 N	1	Liters/Min	umping rate. 0		
		from: 0 M	to: 0 N	1	Recommended p			
		Screen Type:	_	n ID: 0 CM	Type Pump Insta	lled		
		from: 0 M to: 0 M		ze: 0 CM	Pump Type: Pump Model:			
		Screen Type: from: 0 M to: 0 M		n ID: 0 CM ize: 0 CM	H.P.:			
		Screen Installation Method:			Any further pump	test information		
		Fittings			1			
		Top: Pack:	Botton	1:	1			
		Pack: Grain Size:	Amou	nt: 0				
		Geophysical Log Taken:			1			
		Retained on Files:			4			
•		Additional Test and/or Pum Chemistries taken By Driller		•				
		Held: 0		nents Held: 1				
		Pitless Adapter Type:			1			
		Drop Pipe Type:	Diam-	ton CM				
		Length: M Comments:	שוטום	ter: CM	1			
		MANOR INVESTMENTS N	ORTH	SIDE OF SYLVAN				
		LAKE. SOFT WATER.			İ			
					ĺ			
					ı			
		7. Contractor Certific						
		Driller's Name: Certification No.:	UNKN	OWN DRILLER	ĺ			
		Octunoanon No						

Alberta The data conta	iined in this i	Well Drilling Report report is supplied by the Driller. The province disclaims esponsibility for its accuracy.			Well I.D.: Map Verified: Date Report Received:	0362709 Not Verified 1971/10/25
Environment		-	·		Measurements	
 Contractor & Well Owner Company Name: 	Informat				2. Well Loc	
NELSON DRILLING & PLUMBING		Ur	illing Co	ompany Approval No.	: 1/4 or Sec LSD	Twp Rge West
Mailing Address:	City or Tow	n: Po	stal Co	de:	SW 34	039 02 5
VellOwner's Name:	Well Location	on Identifier:			Location in Qua 0 M from	Bounda
STEVENS, OLIVA P.O. Box Number:	Mailing Add	ress: Po	stal Co	de:	0 M from Lot Blo	Bounda ck Plan
	CALGARY Province:		ountry:		Well Elev:	How Obtain:
-	riovince.		Junity.		944.88 M	Estimated
3. Drilling Information					6. Well Yiel	
Type of Work: New Well Reclaimed Well				Proposed well use: Domestic	Test Date (yyyy/mm/dd):	Start Time:
Date Reclaimed:	Materi	als Used:		Anticipated Water	1971/08/01	11:00 AM
Method of Drilling: Rotary				Requirements/day	Test Method: F	
lowing Well: No	Rate:			0 Liters	Non pumping	3.66 M
Bas Present:	Oil Pre			<u>.</u>	static level:	45 46
l. Formation Log		5. Well Completion			Rate of water removal:	45.46 Liters/Min
Depth		Date Started(yyyy/mm/dd):	Date (Completed	Depth of	0 M
rom round Lithology Descri	intion	(j j j j / iii ii du).	(уууу/	mm/dd):	pump intake:	JW
evel Lithology Descri	puon	Well Depth: 36.58 M	1971/0 Boreh	ole Diameter: 0 CM	Water level at	0 M
neters)		Casing Type: Galvanized			end of	
.62 Brown Clay		Steel	Liner	ı ype:	pumping:	on of CN4
7.37 Blue Clay		Size OD: 5.08 CM		DD: 0 CM	 Distance from to casing to grour 	
3.22 Water Bearing Shale	•	Wall Thickness: 0 CM	Wall T	hickness: 0 CM	level:	
6.58 Blue Shale		Bottom at: 27.43 M	Top: 0	M Bottom: 0 M		iter level (meters)
		Perforations		ations Size:		sed Time
		from: 0 M to: 0 M		x 0 CM	Drawdown Mir Total Drawdow	tutes:Sec Recover
		from: 0 M to: 0 M		x 0 CM		n: 3.96 M al was less than 2
		from: 0 M to: 0 M Perforated by:	U CM	x 0 CM	duration, reaso	
		Seal: Driven			1	-
		from: 0 M Seal:	to: 0 N	1		
		from: 0 M	to: 0 N	1	Recommended Liters/Min	pumping rate: 0
		Seal: from: 0 M	to: 0 N	Л		pump intake: 0 M
		Screen Type:		n ID: 0 CM	Type Pump Ins	
		from: 0 M to: 0 M		ize: 0 CM	Pump Type:	
		Screen Type:	Scree	n ID: 0 CM	Pump Model: H.P.:	
		from: 0 M to: 0 M		ize: 0 CM		nptest information
		Screen Installation Method	:		- ,	
		Fittings Top:	Botton	ņ:]	
		Pack: Grain Size:	Amou	nt: O		
		Geophysical Log Taken:			1	
		Retained on Files: Additional Test and/or Pum	n Dete		1	
		Chemistries taken By Drille				
		Held: 0		nents Held: 1]	
		Pitless Adapter Type:				
		Drop Pipe Type:	Dia	tor CM		
		Length: M Comments:	Diame	ter: CM	1	
		COTTAGE @ MANOR INV OF SYLVAN LAKE. SOFT	ESTME WATER	NTS NORTH SIDE		
		7 Contractor Contist				
		7. Contractor Certific Driller's Name:		I OWN DRILLER	4	
		Certification No.:	OINNI	OVVIN DRILLER		
		This well was constructed in	n accor	dance with the Water		

A	Water	Well Drilling	Rep	ort	Well I.D.: Map Verified:	0362723 Map
Alberta The data of Environment	ontained in this	report is supplied by the D responsibility for its accura	riller. The	province disclaims	Date Report Received:	1979/10/09
	I	U			Measurements:	Imperial
1. Contractor & Well Ow Company Name:	nei inioima		Drilling Co	mpany Approval No.:	2. Well Location 1/4 or Sec Twp	
SYLVAN LAKE DRLG				. , ,,	LSD	M
Mailing Address:	City or Tow	n:	Postal Co	de:	NE 34 039 Location in Quarter	02 5
WellOwner's Name:	Well Locati	on Identifier:		0.40.00	0 FT from	Boundary
CARLSON, PETER P.O. Box Number:		: · 			0 FT from	Boundary
	Mailing Add BENTLEY	iress:	Postal Cod	ie:	Lot Block	Plan
451 City:	Province:	(Country:			ow Obtain: stimated
3. Drilling Information					6. Well Yield	sumated
3. Drilling Information Type of Work: New Well				Proposed well use:	Test Date	Start Time:
Reclaimed Well	Mater	iolo I lood:		Stock	(yyyy/mm/dd): 1979/08/29	11:00 AM
Reclaimed Well Date Reclaimed: Method of Drilling: Rotary	iviater	ials Used:		Anticipated Water Requirements/day	Test Method: Pump	
Flowing Well: No Gas Present:		Gallons		400 Gallons	Non pumping	150 FT
Gas Present: 4. Formation Log	Oil Pr	esent: 5. Well Completion	· · · · · · · · · · · · · · · · · · ·	<u> </u>	static level: Rate of water	7
Depth			Date C	Completed	removal:	Gallons/Min
Depth from		Date Started(yyyy/mm/do	^{גן:} (yyyy/r	nm/dd):	Depth of pump intake:	0 FT
ground Lithology De: level	scription	1979/08/28	1979/0 Boreho	08/29 ble Diameter: 0	Water level at	220 FT
(feet)		Well Depth: 255 FT	Inches	i	end of pumping:	
15 Clay & Rocks 255 Shale & Sandstone		Casing Type: Steel	Liner T		Distance from top o	f Inches
ZOO SHAIR & SAHUSIONE		Size OD: 4.5 Inches Wall Thickness: 0.141		D: 0 Inches	casing to ground	
		Inches		hickness: 0 Inches	level: Depth To water	level (feet)
		Bottom at: 229 FT	Top: 0	FT Bottom: 0	Elapsed 1	Time `
		Perforations		ations Size:	Drawdown Minutes Total Drawdown: 70	
		from: 0 FT to: 0 FT		es x 0 Inches	If water removal wa	s less than 2 hr
		from: 0 FT to: 0 FT from: 0 FT to: 0 FT		es x 0 Inches es x 0 Inches	duration, reason wh	ıy:
		Perforated by:				
		Seal: Driven from: 0 FT	to: 3 F	т .	Personmended	anina mta. A
		Seal:			Recommended pun Gallons/Min	iping rate: 0
	ů.	from: 0 FT Seal:	to: 0 F	1	Recommended pun	
		from: 0 FT	to: 0 F		Type Pump Installe Pump Type:	a
		Screen Type: from: 0 FT to: 0 FT		n ID: 0 Inches ze: 0 Inches	Pump Model:	
		Screen Type:		ze: 0 inches	H.P.: Any further pumptes	st information?
		from: 0 FT to: 0 FT	Slot Si	ze: 0 Inches	I and the pumple:	, anomidaoni
		Screen Installation Methor Fittings	oa:		1	
		Top:	Botton	ı:	l	
		Pack: Grain Size:	Amour	nt· O		
		Geophysical Log Taken:	AHIOUI	14. <i>G</i>	1	
		Retained on Files:	mn Dete		1	
		Additional Test and/or Pu Chemistries taken By Dri	imp Data ller: No			
		Held: 1		ents Held: 3	1	
		Pitless Adapter Type: Drop Pipe Type:				
		Length: FT	Diame	ter: Inches		
		Comments:				
		7 Contractor Conti	fication			
		7. Contractor Certing Driller's Name:		OWN DRILLER		
		Cartification No.	CHAN		1	

▲ Water	Well Drilling	Repo	ort	Well I.D.: Map Verified:	0362724 Map
The data contained in this	report is supplied by the Di	riller. The	orovince disclaims	Date Report	
Alberta Environment	responsibility for its accurac	cy.		Received: Measurements:	Metric
1. Contractor & Well Owner Informa	fion			2. Well Locat	
Company Name:		Orillina Cor	mpany Approval No.:		vp Rge Westof
ERICKSON ERNFRED		_		LSD	, M
Mailing Address: City or Tov	vn: F	Postal Cod	e:		39 02 5
WellOwner's Name: Well Locat	ion Identifier:			Location in Quart 0 M from	er Boundarv
CARLSON, H.				0 M from	Boundary
P.O. Box Number: Mailing Ad BENTLEY	dress: F	Postal Cod	e:	Lot Block	Plan
City: Province:		Country:		Well Elev:	How Obtain:
•				994.87 M	Estimated
3. Drilling Information Type of Work: Federal Well Survey				6. Well Yield	
Type of Work: Federal Well Survey			Proposed well use:	Test Date	Start Time:
Reclaimed Well Date Reclaimed: Mate Method of Drilling: Drilled Flowing Well: No Rate	nals Used:		Domestic & Stock Anticipated Water	(yyyy/mm/dd): 1934/01/01	11:00 AM
Method of Drilling: Drilled	1.0	Requirements/day			known
Flowing Well: No Rate Gas Present: Oil P	Liters		0 Liters	Non pumping static level:	21.34 M
4 Formation Log	5. Well Completion			Rate of water	0 Liters/Min
4. Formation Log Depth from		Date C	ompleted	removal:	
from	Date Started(yyyy/mm/dd	i): (yyyy/m		Depth of pump intake:	0 M
ground Lithology Description level	W # D # 05 04 14	1934/0		Water level at	0 M
(meters)	Well Depth: 65.84 M Casing Type: Unknown	Liner T	le Diameter: 0 CM	end of	
	Size OD: 5.08 CM		D: 0 CM	pumping:	
	Wall Thickness: 0 CM		ickness: 0 CM	Distance from tor casing to ground	OOLCIVI
	Bottom at: 0 M	Top: 0	M Bottom: 0 M	level:	
					r level (meters) d Time
	Perforations from: 0 M to: 0 M	Perfora 0 CM x	tions Size:		es:Sec Recovery
	from: 0 M to: 0 M	0 CM x		Total Drawdown:	
	from: 0 M to: 0 M	0 CM x	0 CM	If water removal viduration, reason	was less than 2 hr
·	Perforated by: Seal:			duration, reason	wily.
	from: 0 M	to: 0 M			
	Seal:	(- O N 1		Recommended p	umping rate: 0
	from: 0 M Seal:	to: 0 M		Liters/Min	
	from: 0 M	to: 0 M		Recommended p	
·	Screen Type:		ID: 0 CM	Type Pump Insta Pump Type: SP N	
	from: 0 M to: 0 M Screen Type:		:e: 0 CM ID: 0 CM	Pump Model:	
	from: 0 M to: 0 M	Slot Siz	e: 0 CM	H.P.: Any further pump	tost information?
	Screen Installation Metho	od:		rany surmer pump	rest innomitation) (
	Fittings Top:	Bottom	:	1	
	Pack:				
	Grain Size:	Amoun	t: 0		
	Geophysical Log Taken: Retained on Files:		•		
·	Additional Test and/or Pu				
·	Chemistries taken By Dril Held: 0		ents Held: 1		
	Pitless Adapter Type:	Docum	ento neia. I		
	Drop Pipe Type:	_	0.1	1	
	Length: M Comments:	Diamet	er: CM		
	PASKAPOO FORMATIO	N.			
•				1	
				1	
	7 Contractor Codil	Section .		1	
	7. Contractor Certif Driller's Name:		OWN DRILLER	1	
	Certification No.:			l	
	This well was constructed	in accord	ance with the Water	i	

≜ w	ater '	Well Drilling I	Rep	ort	Well I.D.: Map Verified:	0362715 Not Verified
The data contain	ed in this i	report is supplied by the Drill	er. The	province disclaims	Date Report	1970/11/05
Alberta Environment	r	esponsibility for its accuracy			Received:	
	£ ·	1			Measurements:	<u>Metric</u>
Contractor & Well Owner i Company Name:	ntormat			mananii Ammaa I bi	2. Well Locat	
Lompany Name: LAWSON, M.E. WATER WELLS		Dri	ming Co	empany Approval No.	: 1/4 or Sec Tv	p Rge West M
	ity or Tow	n: Po	stal Co	de:	NW 34 03	9 02 5
WellOwner's Name:	Vell Location	on identifier:			Location in Quarte 0 M from	er Bounda
RICHARSON, JACK					0 M from	Bounda
	lailing Add	ress: Po D SYLVAN LAKE, OLDS	stal Co	de:	Lot Block	Plan
	rovince:		untry:			How Obtain:
2 Drilling Information					960.12 M 6. Well Yield	Estimated
3. Drilling Information Type of Work: New Well				Proposed well use:	Test Date	Start Time:
Reclaimed Well				Domestic	(yyyy/mm/dd):	otait inne.
Date Reclaimed:	Materi	als Used:	Anticipated Water		1970/08/18	11:00 AM
Method of Drilling: Rotary				Requirements/day	Test Method: Pun	
Flowing Well: No Gas Present:	Rate: I			0 Liters	Non pumping static level:	5.79 M
4. Formation Log	Oil PT	5. Well Completion			Rate of water	90.92
Depth			Date (Completed	removal:	Liters/Min
from		Date Started(yyyy/mm/dd):		mm/dd):	Depth of	0 M
ground Lithology Descrip	tion		1970/0	08/18	pump intake: Water level at	0 M
evel		Well Depth: 18.29 M		ole Diameter: 0 CM	end of	G IVI
(meters) 5.18 Sandy Clay		Casing Type: Steel	Liner		pumping:	
5.16 Sandy Clay		Size OD: 12.7 CM Wall Thickness: 0 CM		DD: 0 CM hickness: 0 CM	Distance from top	of CM
15.24 Clay & Boulders		Was Trickness. U Civi	Wall	HICKHESS, U CIVI	casing to ground	
18.29 Sandstone		Bottom at: 15.54 M	Top: 0	M Bottom: 0 M	level: Depth To water	level (meters)
		Perforations	Porfor	ations Size:	Elapse	
		from: 0 M to: 0 M		alions size: x 0 CM	Drawdown Minute	es:Sec Recove
		from: 0 M to: 0 M		x 0 CM	Total Drawdown:	
		from: 0 M to: 0 M	0 CM	x 0 CM	If water removal v	
		Perforated by:			- Casoli V	******
		Seal: from: 0 M	to: 0 N	4		
		Seal:	.J. J N	•		
		from: 0 M	to: 0 M	1	Recommended po	umping rate: 0
		Seal: from: 0 M	to: 0 N	4	Recommended po	ump intake: 0 M
		Screen Type:		n ID: 0 CM	Type Pump Instal	
		from: 0 M to: 0 M	Slot Si	ize: 0 CM	Pump Type:	
		Screen Type:		n ID: 0 CM	Pump Model: H.P.:	
·		from: 0 M to: 0 M		ze: 0 CM	Any further pumpt	est information
		Screen Installation Method: Fittings			1	
		Top:	Botton	n:		
		Pack:			1	
		Grain Size:	Amou	nt: 0	1	
		Geophysical Log Taken:				
		Retained on Files: Additional Test and/or Pum	n Data		1	
		Chemistries taken By Drille				
		Held: 0		nents Held: 1		
		Pitless Adapter Type:		-		
		Drop Pipe Type: Length: M	Diame	ter: CM		
		Comments:	Pidilic	WALL COLD	1	
					1	
		[
					1	
		7 Contractor Contra				
		7. Contractor Certific			4	
		Driller's Name: Certification No.:	UNKN	OWN DRILLER		
		This well was constructed in	n accon	dance with the Water	.1	

Alberta Environment I. Contractor & Wo Company Name: RICHMOND WW DRLG Mailing Address: WellOwner's Name:	e data contained in this r	Well Drilling F report is supplied by the Drille responsibility for its accuracy.	er. The	orovince disclaims		/erified: Report		Not Ver	,,,,Cu
Environment I. Contractor & We Company Name: RICHMOND WW DRLG Mailing Address:	r	eport is supplied by the Drilli esponsibility for its accuracy.	ei. ine	movince disciziiiis				4070101	2/02
I. Contractor & We Company Name: RICHMOND WW DRLG Mailing Address:		responsibility for its accuracy.			Recei			1976/09	9/03
Company Name: RICHMOND WW DRLG Malling Address:						ıremen		<u>Metric</u>	
RICHMOND WW DRLG Mailing Address:	ell Owner Informat				2. We				Mari
Mailing Address:	·	Dri	lling Co	mpany Approval No.:	1/4 or LSD	Sec	Twp	Rge \	vvesto M
VellOwner's Name:	City or Tow	n: Po	stal Cod	de:	NW	34 on in Qu	039 uarter	02	5
VEINMAN, GARRY	Well Location	on Identifier:			0 M 0 M				undar undar
P.O. Box Number:	Mailing Add	ress: Po G RD SW, CALGARY	stal Cod	de:	Lot	ВІ	ock	Plan	
City:	Province:		untry:		Well E 975.36			w Obtain timated	n:
B. Drilling Informa	ion				6. We	ell Yie	ld		
ype of Work: New Well				Proposed well use:	Test D			Start Ti	me:
Reclaimed Well	1.2_43	oin Licody	Domestic	(yyyy/r 1976/0	nm/dd) 18/13	:	11:00 A	M	
Date Reclaimed: Method of Drilling: Rotar		als Used:		Anticipated Water Requirements/day		lethod:	Pump	11.00 A	MAI
vietnod of Drilling: Rotar Flowing Well: No	y Rate:	iters	***	0 Liters		umping		14.94 N	<u>л</u>
Gas Present:	Oil Pre			<u> </u>	static l	evel:			
1. Formation Log		5. Well Completion		······································		f water		227.3	4!
Depth			Date C	Completed	remov			Liters/N	
rom	_	Date Started(yyyy/mm/dd):	(yyyy/r	nm/dd):	Depth	or intake:		19.81 N	/1
	gy Description	1976/08/12	1976/0			level at	<u> </u>	19.81 N	<u>л</u>
evel meters)		Well Depth: 25.91 M	Boreho	ole Diameter: 0 CM	end of		_		-
neters) 3.53 Brown Shale		Casing Type: Galvanized Steel	Liner T	Гуре:	pumpi				
20.73 Brown Sands	one	Size OD: 11.43 CM	Size O	D: 0 CM		ce from		CM	
5.91 Gray Sandsto		Wall Thickness: 0.36 CM		hickness: 0 CM	-casing -level:	to grou	ına		
- W		Bottom at: 21.64 M	Top: 0			th To v	vater le	vel (met	ters)
		Perforations		ations Size:	┨▔▔		psed 7		
		from: 0 M to: 0 M	0 CM x					Sec Red	cove
		from: 0 M to: 0 M	0 CM >	x 0 CM		Drawdo			
	•	from: 0 M to: 0 M	0 CM >	x 0 CM		er remo		s less th	an 2
		Perforated by:			uu au	, i çat	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, .	
		Seal: Driven from: 0 M Seal:	to: 0 M	1					
		sear: from: 0 M Seal:	to: 0 M	1	Liters/	Min	•	iping rat	
		from: 0 M	to: 0 M	1				ıp intake	: 0 M
		Screen Type:		n ID: 0 CM	Type I	Pump Ir	nstalled	1	
•		from: 0 M to: 0 M		ize: 0 CM	Pump	Type: Model:			
		Screen Type:		n ID: 0 CM	H.P.:	·*iouel.			
		from: 0 M to: 0 M Screen Installation Method		ize: 0 CM		ırther pı	umptes	st informa	ation
		Fittings			1				
		Top:	Botton	n:	_[_				
		Pack:	_		1				
		Grain Size:	Amour	nt: 0	4				
		Geophysical Log Taken: Retained on Files:			1				
		Additional Test and/or Purn	p Data		1				
		Chemistries taken By Drille							
		Held: 0		nents Held: 1	1				
		Pitless Adapter Type:							
		Drop Pipe Type: Length: M	Diamo	eter: CM	1				
		Comments:	Dianie	agi, Givi	1				
		MEDIUM HARD WATER.						r	
*		7. Contractor Certific	cation	1	1				
		Driller's Name:		OWN DRILLER	1				
		Certification No.:		- · · · · · · · · ·	1				

≜ Water	Well Drilling	Rep	ort	Well I.D.: Map Verified:	0362717 Not Verified
The data contained in this	report is supplied by the Drill	er. The	province disclaims	Date Report	
Environment	esponsibility for its accuracy	•		Received: Measurements:	Metric
1. Contractor & Well Owner Informat	ion			2. Well Location	1 Marie and A and Control to London
Company Name: RICHMOND WW DRLG		illing Co	ompany Approval No.:	1/4 or Sec Tw	
				LSD	M
Mailing Address: City or Tow	n: Po	stal Co	ae:	NW 34 039 Location in Quarte	
	on Identifier:			0 M from	Boundary
PIERSON, GORDON P.O. Box Number: Mailing Ado	Irace: Do	stal Co	4e:	0 M from Lot Block	Boundary Plan
12 VAŘNA	PLACE NW, CALGARY T3		u ç.		T IGHT
City: Province:	Co	untry:			low Obtain:
2 Drilling Information				6. Well Yield	stimated
3. Drilling Information Type of Work: New Well			Proposed well use:	Test Date	Start Time:
Reclaimed Well			Domestic	(yyyy/mm/dd):	
Date Reclaimed: Mater Method of Drilling: Rotary	eclaimed: Materials Used: Anticipated Wat			1976/07/15 Test Method: Pum	11:00 AM
Method of Drilling: Rotary Flowing Well: No Rate:	Liters		Requirements/day 0 Liters	Non pumping	9.14 M
Gas Present: Oil Pre			<u> </u>	static level:	10.15
4. Formation Log	5. Well Completion			Rate of water removal:	18.18 Liters/Min
Depth from	Date Started(yyyy/mm/dd):		Completed mm/dd):	Depth of	18.29 M
ground Lithology Description	1976/07/14	1976/0		pump intake:	0.14
level	Well Depth: 38.1 M	Boreh	ole Diameter: 0 CM	Water level at end of	0 M
(meters) 10.67 Clay & Rocks	Casing Type: Galvanized Steel	Liner -	Гуре:	pumping:	
25.91 Brown Sandstone	Size OD: 11.43 CM	Size C	DD: 0 CM	Distance from top	of CM
38.1 Gray Shale & Sandstone	Wall Thickness: 0.36 CM		hickness: 0 CM	casing to ground level:	
	Bottom at: 31.09 M	Top: 0	M Bottom: 0 M	Depth To water	level (meters)
	Perforations	Perfor	ations Size:	Elapsed	
•	from: 0 M to: 0 M		x 0 CM	Drawdown Minute Total Drawdown: 0	* I
	from: 0 M to: 0 M from: 0 M to: 0 M		x 0 CM x 0 CM	If water removal w	
	Perforated by:	O OIVI	X O ONI	duration, reason w	hy:
	Seal: Driven				-
	from: 0 M Seal:	to: 31.	09 M		
	from: 0 M	to: 0 N	1	Recommended pu	mping rate: 0
	Seal:			Liters/Min Recommended pu	ma intake: 0 M
	from: 0 M Screen Type:	to: 0 N	n ID: 0 CM	Type Pump Install	
	from: 0 M to: 0 M		ize: 0 CM	Pump Type: HAND	
·	Screen Type:		n ID: 0 CM	Pump Model: H.P.:	
	from: 0 M to: 0 M		ize: 0 CM	Any further pumpte	est information?
	Screen Installation Method Fittings			1	
	Top:	Botton	n:	<u> </u>	
	Pack:	A	-t- 0		
·	Grain Size: Geophysical Log Taken:	Amou	חנ: ט	 	
•	Retained on Files:]	
	Additional Test and/or Pum				
	Chemistries taken By Drille Held: 0		nents Held: 1		
	Pitless Adapter Type:		i roier i	1	
	Drop Pipe Type:	D!	tom CN4		
	Length: M Comments:	שום	ter: CM	1	
	SOFT WATER.				
	7. Contractor Certific	nation	1	1	
	Driller's Name:		OWN DRILLER	1	
	Certification No.:				
	This well was constructed i	n accor	dance with the Water	I	

A	Water	Well Drilling	Rep	ort	Well I. Map V Date F	erified:		036271 Not Ve	-
Alberta Environment	he data contained in this	report is supplied by the Dri responsibility for its accuracy	iller. The y.	province disclaims	Receiv		:	1981/0 <u>Metric</u>	5/20
. Contractor & V	Vell Owner Informa					II Loca	atior		
Company Name:	ILLING LTD			mpany Approval No.	: 1/4 or LSD	Sec	Twp	Rge	Westo M
LBÉRTA EAGLE DRI Mailing Address:	City or Tov		17793 ostal Cod	le:	NW	34	039	02	1VI 5
OX 9036			4S 1S6			n in Qua	ırter		
VellOwner's Name:	Well Locat	ion Identifier:			O M	from from			unda: unda:
EID, WILF .O. Box Number:	Mailing Ad		ostal Co	de:	Lot	Bloc	ck	Plan	
ity:	Province:	CRES, RED DEER	ountry:	- 	Well E 969.26			w Obtai imated	n:
. Drilling Inform	ation					ell Yield		mateu	
ype of Work: New We				Proposed well use:	Test D		<u>и</u>	Start T	ime:
eclaimed Well		•		Domestic		nm/dd):			
ate Reclaimed:		ials Used:		Anticipated Water Requirements/day	1981/0	4/30 lethod: P	umn	11:00 A	4M
lethod of Drilling: Rota lowing Well: No		Liters		Requirements/day	Non pu			23.47	vI
las Present:		resent:			static l	evel:			
. Formation Log		5. Well Completion			. 10.00	f water		45.46	**-
epth		Date Started(yyyy/mm/dd)		ompleted	remova Depth			Liters/N 30.48 N	
om			(уууул	nm/dd):	pump i			30.401	VI.
round Lithol vel	ogy Description	1981/04/28 Well Depth: 45.72 M	1981/0	ole Diameter: 0 CM		level at		27.43 1	VI
neters)		Casing Type: Galvanized			end of				
.66 Clay		Steel	Liner 1		pumpir Distan	ce from t	on of	CM	
.14 Shale	I-1	Size OD: 11.43 CM		D: 0 CM		to groun		0,00	
3.53 Brown Sand 5.72 Shale & Sa	ndstone Ledges	Wall Thickness: 0.36 CM		hickness: 0 CM	_level:			. 17	
o.iz onale u oa	nastone Leages	Bottom at: 37.19 M	Top: 0		Dep	th To wa	iterie sed T		ters)
		Perforations from: 0 M to: 0 M		ations Size: c 0 CM	Drawo	lown Min			cove
		from: 0 M to: 0 M		CO CM		rawdow			
		from: 0 M to: 0 M		c 0 CM		r remova			an 2
		Perforated by:			durand	n, reaso	n wny	, ·	
		Seal: Driven from: 0 M	to: 37.	19 M					
		Seal: from: 0 M Seal:	to: 0 M	1		nmended Liters/Mir		ping rat	e:
		from: 0 M	to: 0 M	Ī		nmended	pum	p intake	e:
		Screen Type:	Scree	ı ID: 0 CM	30.48		الم		
		from: 0 M to: 0 M		ze: 0 CM	i ypê F Pumn	ump ins Type: St	talled JB		
		Screen Type: from: 0 M to: 0 M		n ID: 0 CM ze: 0 CM	Pump	Model:			
		Screen Installation Method		20.00	H.P.:	rther pun	4	. :_£	_4:
		Fittings			Atiy iu	rmer pun	npies	LIMOIM	auor
		Top: Pack:	Botton	1:	-				
		Fack: Grain Size:	Amou	nt: O					
		Geophysical Log Taken:			1				
•		Retained on Files:	5.		_				
		Additional Test and/or Pur Chemistries taken By Drill							
		Held: 0		nents Held: 1					
		Pitless Adapter Type:							
		Drop Pipe Type: Length: M	Diame	ter: CM					
		Comments: MEDIUM HARD WATER.							
		7. Contractor Certif	ication	<u> </u>					
		Driller's Name:		OWN DRILLER	7				

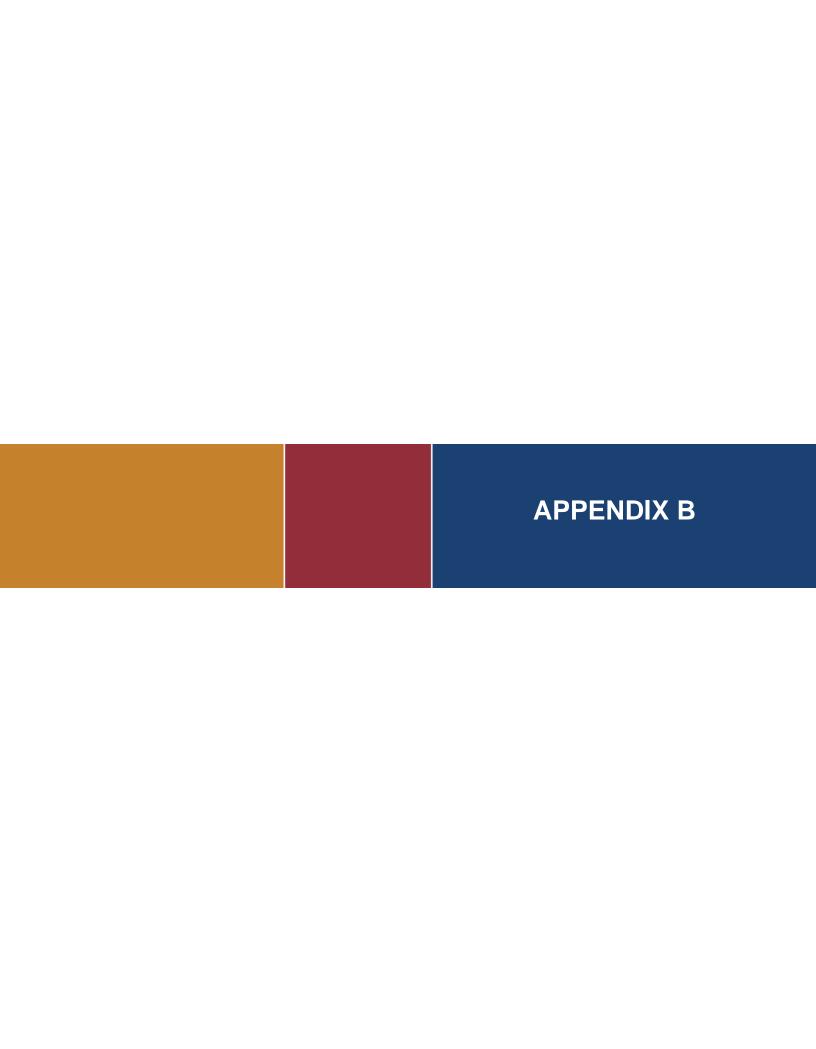
The data contained in this re	Well Drilling Report is supplied by the Drille isponsibility for its accuracy.			Well I.D.: Map Verified: Date Report Received: Measurements:	0362720 Not Verified Metric
Contractor & Well Owner Informati				2. Well Location	- A. J. A. Miller
Company Name:		ling Co	mpany Approval No.:		
ERICKSON & KANGAS	NO:	NÉ		LSD	M
Mailing Address: City or Towr UNKNOWN	r: Pos	tal Co	de:	NW 34 039 Location in Quarter	
WellOwner's Name: Well Locatio	n Identifier:			0 M from	Boundary
GOUTHEAU, DENNIS P.O. Box Number: Mailing Addi	rose: Pos	tal Co	ie.	0 M from Lot Block	Boundary Plan
SYLVÂN LA		stal Out			
City: Province:	Cou	untry:			low Obtain: stimated
3. Drilling Information				6. Well Yield	otimatod
Type of Work: New Well			Proposed well use:	Test Date	Start Time:
Reclaimed Well	No Upodi		Domestic Anticipated Water	(yyyy/mm/dd): 1963/06/27	11:00 AM
Date Reclaimed: Materia Method of Drilling: Cable Tool	als Used:		Requirements/day	Test Method: Unkr	iown
Flowing Well: No Rate: L			0 Liters	Non pumping static level:	10.67 M
Gas Present: Oil Pre		1		Rate of water	45.46
4. Formation Log Depth	5. Well Completion	Date C	Completed	removal:	Liters/Min
from		(уууу/і	mm/dd):	Depth of pump intake:	0 M
ground Lithology Description level	Well Depth: 24.38 M	1963/0 Boreh	06/27 ole Diameter: 0 CM	Water level at	0 M
(meters)		Liner		end of pumping:	
3.05 Clay 12.19 Sandstone	Size OD: 11.43 CM		D: 0 CM	Distance from top	of CM
12.19 Sandstone 21.95 Blue Shale	Wall Thickness: 0 CM	wall i	hickness: 0 CM	casing to ground level:	
24.38 Sandstone	Bottom at: 17.37 M	Тор: 0	M Bottom: 0 M	Depth To water	level (meters)
	Perforations	Perfor	ations Size:	Elapsed	
·	from: 0 M to: 0 M		x 0 CM	Drawdown Minute Total Drawdown: 0	
·	from: 0 M to: 0 M from: 0 M to: 0 M		x 0 CM x 0 CM	If water removal wa	as less than 2 hr
	Perforated by:			duration, reason w	hy:
	Seal: Loose from: 0 M	to: 0 N	1		
	Seal:			Recommended pu	mning rate: 0
	from: 0 M Seal:	to: 0 N	1.	Liters/Min	imping rate. o
	from: 0 M	to: 0 N	1	Recommended pu	mp intake:
	Screen Type: from: 0 M to: 0 M		n ID: 0 CM ize: 0 CM	13.41 M Type Pump Installe	ed
	Screen Type:		n ID: 0 CM	Pump Type: HAND	
	from: 0 M to: 0 M	Slot S	ze: 0 CM	Pump Model: H.P.:	
·	Screen Installation Method: Fittings			Any further pumpte	est information?
	Тор:	Botton	n:		
	Pack: Grain Size:	Amou	nt· Ω		
	Geophysical Log Taken:	Anou	16.0		
	Retained on Files:	- D-4-		4	
	Additional Test and/or Pum Chemistries taken By Driller			1	
	Held: 0		nents Held: 1	4	
	Pitless Adapter Type: Drop Pipe Type:				
·	Length: M	Diame	eter: CM	4	•
	Comments: SOFT WATER.				
•					
	7. Contractor Certific	ation	<u> </u>	1	
	Driller's Name:		OWN DRILLER	1	
	Certification No.: This well was constructed in		dance with the Motor		
	TITUS WEIL WAS CONSTRUCTED IT	iauuul	dance with the water	•	

The data contained in this	Well Drilling F	er. The i	ort province disclaims	Well I.E Map Ve Date Re Receive	erified: eport	0362728 Map 1975/01/03
Environment	responsibility for its accuracy.				rements:	Metric
1. Contractor & Well Owner Informa					II Locat	
Company Name:			mpany Approval No.:	1/4 or LSD	Sec Tv	vp Rge Weston M
FORRESTER WATER WELL DRILLING (1981 Mailing Address: City or Tox		stal Cod	le:	NW	35 03	
RR 1 RED DEE	R AB CA			4	n in Quart	
WellOwner's Name: Well Local BRATTBERG, ELMER	ion Identifier:			O M O M		Boundary Boundary
P.O. Box Number: Mailing Ac	dress: Po	stal Coc	le:	Lot	Block	Plan
300 BENTLEY				Well Ele	314	How Obtain:
City: Province:	Co	untry:		990.6 M		Estimated
3. Drilling Information					ll Yield	
Type of Work: New Well			Proposed well use:	Test Da		Start Time:
Reclaimed Well Date Reclaimed: Mate	rials Used:		Domestic & Stock Anticipated Water	(yyyy/m 1974/11		11:00 AM
Method of Drilling: Cable Tool	nais Oseu.		Requirements/day		ethod: Bail	er
Flowing Well: No Rate	: Liters		0 Liters	Non pu		38.1 M
	resent:		<u> </u>	static le Rate of		95.47
4. Formation Log	5. Well Completion	Deta 0	ompleted	remova	d:	Liters/Min
Depth from	Date Started(yyyy/mm/dd):		ompietea nm/dd):	Depth o		0 M
ground Lithology Description	1974/10/31	1974/1	1/05	pump in Water le		50,29 M
level (meters)	Well Depth: 64.01 M		le Diameter: 0 CM	end of		00:20 :::
12.19 Brown Sandy Clay	Casing Type: Steel Size OD: 17.78 CM		ype: Steel D: 14.12 CM	pumpin		- 6014
18.29 Gray Conglomerate	Wall Thickness: 0.59 CM		nickness: 0.79 CM		e from top to ground	O OT CIM
21.95 Brown Sandstone	Dettem et: 20.26 M	Top: 0	M Bottom:	level:		
24.38 Gray Sandstone 26.82 Gray Hard Sandstone	Bottom at: 29.26 M	64.01	M	Dept		r level (meters)
38.1 Gray Sandy Shale	Perforations		ations Size:	Drawdo		d Time es:Sec Recovery
41.76 Gray Hard Sandstone	from: 29.26 M to: 64.01 M	0.95 C	M x 15.24 CM : 0 CM	Total D	rawdown:	0 M
43.28 Dark Gray Water Bearing Shale & Sandstone Ledges	from: 0 M to: 0 M	0 CM >		1	removal v n, reason v	vas less than 2 h
48.46 Light Gray Bentonitic Shale	Perforated by: Torch			Guranoi	11, 1625011	wily.
53.95 Water Bearing Coal	Seal: Driven from: 0 M	to: 29.2	26 M	i		
64.01 Light Gray Bentonitic Shale	—Seal:			Recom	mended n	umping rate: 0
	from: 0 M Seal:	to: 0 M		Liters/N	/lin	
	from: 0 M	to: 0 M	l	Recom	mended p	ump intake: 0 M
	Screen Type:		ID: 0 CM	Pump 1	ump Insta	liea
	from: 0 M to: 0 M Screen Type:		ze: 0 CM n ID: 0 CM	Pump N	Model:	
	from: 0 M to: 0 M		ze: 0 CM	H.P.:	thor nume	test information?
	Screen Installation Method	:		- In the	arer pump	test information:
	Fittings Top:	Bottom	n:	1		
	Pack:			1		
,	Grain Size:	Amour	nt: 0	-		
	Geophysical Log Taken: Retained on Files:			1		
	Additional Test and/or Pum			1		
	Chemistries taken By Drille Held: 0		nents Held: 1			
	Pitless Adapter Type:	Docum	roma i ratti. 1	1		
	Drop Pipe Type:	D:-	OM			
	Length: M Comments:	Diame	ter: CM	1		
	SOFT WATER.					
				1		
	7. Contractor Certifi	cation		1		
	Driller's Name:		OWN DRILLER	1		
	Certification No.:					
1	This well was constructed i	in accor	dance with the Water	1		

ê	The data contained in this i	Well Drilling F	er. The	ort province disclaims	Well I.D.: Map Verifi Date Repo		0362729 Map 1980/09/03	
Envi	Alberta n ironment	esponsibility for its accuracy.			Measurements: Metric			
1. Contr	ractor & Well Owner Informat	ion			2. Well L	ocatio	on	
Company				mpany Approval No.:	1/4 or Se LSD	c Tw	Rge Westo M	
Mailing Ad	TER WATER WELL DRILLING (1981) Iddress: City or Tow		stal Co	ie:	NW 3	5 039		
RR 1	RED DEER	AB CA			Location in	-		
WellOwne	. •	on Identifier:			0 M fro		Boundary Boundary	
P.O. Box	RG, ELMER Number: Mailing Add	Iress: Pos	stal Co	de:	Lot	Block	Plan	
300	BENTLEY							
City:	Province:	Co	untry:		Well Elev: 1005.84 M	-	low Obtain: stimated	
2 Drilli	ng Information				6. Well		Sumatou	
	ng Information /ork: New Well			Proposed well use:	Test Date	iioiu	Start Time:	
Reclaimed				Stock	(yyyy/mm/		44.00 414	
Date Recl		Materials Used: Anticipated Water Requirements/day		1980/06/12 Test Metho		11:00 AM		
Method of Flowing W	f Drilling: Cable Tool Vell: No Rate:	Liters	·	0 Liters	Non pump	ing	42.67 M	
Gas Prese				<u> </u>	static level	:	00.00	
4. Form	ation Log	5. Well Completion			Rate of wa	iter	90.92 Liters/Min	
Depth		Date Started(yyyy/mm/dd):		completed	Depth of	•	57.91 M	
from around	Lithology Description	1980/06/09	(yyyy/i 1980/0	mm/dd): 16/12	pump intal		···	
level	Little 10 Description	Well Depth: 60.96 M	Boreh	ole Diameter: 0 CM	Water level	at	51.82 M	
(meters)		Casing Type: Steel	Liner	Type: Steel	pumping:		*	
0.3 1.52	Topsoil Yellow Sandy Clay	Size OD: 17.78 CM Wall Thickness: 0.59 CM		D: 14.12 CM hickness: 0.79 CM	Distance fi		of CM	
	Yellow Soft Sandstone	vali mickness. 0.59 CM	Top: 0		casing to glevel:	iround		
	Yellow Hard Sandstone	Bottom at: 32.31 M	60.96			o water	level (meters)	
	Gray Sandy Clay	Perforations	Perfor	ations Size:		Elapsed		
	Brownish Gray Sandstone Light Brown Coarse	from: 35.66 M to: 60.96 M	0.95 C	M x 15.24 CM	Total Draw		s:Sec Recovery	
	Grained Sandstone	from: 0 M to: 0 M from: 0 M to: 0 M	0 CM x 0 CM 0 CM x 0 CM				as less than 2 h	
	Gray Hard Sandstone	Perforated by: Torch	O OIVI	K O OIN	duration, r	eason w	hy:	
	Gray Fine Grained Sandstone Gray Hard Sandstone	Seal: Driven		0.4.1.4				
	Dark Gray Soft Sandstone	−from: 0 M –Seal:	to: 32.	31 M				
	Gray Sticky Shale	from: 0 M	to: 0 N	1	Recomme Liters/Min	nded pu	mping rate: 0	
	Blue Sandy Shale Gray Water Bearing Sandstone	Seal:	4 0 1	1		nded pu	mp intake: 0 M	
	Blue Gray Sandy Shale	from: 0 M Screen Type:	to: 0 N	n ID: 0 CM	Type Pum	p Installe		
	Blue Gray Coarse Grained Sandstone	from: 0 M to: 0 M		ze: 0 CM	Pump Typ Pump Mod	e:		
38.71	Gray Sticky Shale	Screen Type:		n ID: 0 CM	H.P.:	1 C 1.		
	Blue Sandy Shale Gray Carbonaceous Shale	from: 0 M to: 0 M Screen Installation Method:		ize: 0 CM		r pumpte	est information?	
	Blue Shale	Fittings	<u>. </u>		1			
	Gray Water Bearing Sandstone	Top:	Bottor	n:	4			
	Blue Gray Water Bearing Shale & Sandstone Ledges	Pack: Grain Size:	Amou	nt: 0				
	Blue Gray Water Bearing Sandstone	Geophysical Log Taken:						
60.96	Blue Sandy Shale & Sandstone	Retained on Files:	n Dete		-			
	Ledges	Additional Test and/or Pum Chemistries taken By Drille	r: No					
		Held: 1	Docur	nents Held: 2				
		Pitless Adapter Type:						
		Drop Pipe Type: Length: M	Diame	eter: CM				
		Comments:		·	1			
					_			
		7. Contractor Certific	cation	1	1			
		production octains						
		Driller's Name: Certification No.:		IOWN DRILLER	1			

A .				Well I.D.:	0362731
A Water \	Well Drilling F	de\$	ort	Map Verified:	Map
The data contained in this r	eport is supplied by the Drille	er. The	province disclaims	Date Report Received:	
Alberta re Environment	esponsibility for its accuracy.			Measurements:	Metric
1. Contractor & Well Owner Informati	on			2. Well Locati	
		ling Co	mpany Approval No.:		
Company Name: ERICKSON ERNFRED				LSD	M
Mailing Address: City or Town	n: Pos	stal Co	de:	NW 35 03 Location in Quarte	
WellOwner's Name: Well Location	n Identifier:			0 M from	Boundary
BRATTBERG, H.			<u> </u>	0 M from Lot Block	Boundary Plan
P.O. Box Number: Mailing Add BENTLEY	ress: Pos	stal Co	de:	Lot Block	Fiall
City: Province:	Co	untry:		4	How Obtain:
					Estimated
3. Drilling Information Type of Work: Federal Well Survey			D	6. Well Yield Test Date	Start Time:
Reclaimed Well			Proposed well use: Domestic & Stock	(yyyy/mm/dd):	Start Time.
Date Reclaimed: Materia	als Used:		Anticipated Water	1932/01/01	11:00 AM
Method of Drilling: Drilled	Hara		Requirements/day 0 Liters	Test Method: Unk Non pumping	50.29 M
Flowing Well: No Rate: I Gas Present: Oil Pre		4	Littero	static level:	
	5. Well Completion			Rate of water	0 Liters/Min
Depth	Date Started(yyyy/mm/dd):		Completed	removal: Depth of	0 M
from ground Lithology Description	Dato Startoa(yyyymmrady).	(yyyy/i 1932/0	mm/dd): 11/01	pump intake:	
level	Well Depth: 65.53 M		ole Diameter: 0 CM	Water level at end of	0 M
(meters)	Casing Type: Galvanized	Liner -	Fype:	pumping:	
	Steel Size OD: 5.08 CM		D: 0 CM	Distance from top	of CM
	Wall Thickness: 0 CM		hickness: 0 CM	casing to ground level:	
	Bottom at: 0 M	Top: 0	M Bottom: 0 M		r level (meters)
	Perforations	Perfor	ations Size:		d Time
	from: 0 M to: 0 M		× 0 CM	Total Drawdown:	es:Sec Recovery 0 M
	from: 0 M to: 0 M from: 0 M to: 0 M		x 0 CM x 0 CM	If water removal v	vas less than 2 hr
	Perforated by:			duration, reason	why:
	Seal: from: 0 M	to: 0 N	A		
	Seal:	10. U IV	•	Recommended p	in marine rote: 0
	from: 0 M	to: 0 N	1	Liters/Min	umping rate: 0
	Seal: from: 0 M	to: 0 N	1	Recommended p	
	Screen Type:		n ID: 0 CM	Type Pump Insta Pump Type: SP E	
	from: 0 M to: 0 M Screen Type:		ize: 0 CM n ID: 0 CM	Pump Model:	-
	from: 0 M to: 0 M		ize: 0 CM	H.P.:	toet information?
	Screen Installation Method:			Any further pump	test information?
	Fittings Top:	Botton	n·		
	Pack:	Dotto			
	Grain Size:	Amou	nt: 0		
	Geophysical Log Taken: Retained on Files:				
	Additional Test and/or Pum				
	Chemistries taken By Drille: Held: 0		nents Held: 1	İ	
	Pitless Adapter Type:	Docai	TORES FIGIG. 7	1	
	Drop Pipe Type:	D:			
	Length: M Comments:	Diame	eter: CM	1	
	PASKAPOO FORMATION.				
	7. Contractor Certific	ation	1	1	
	Driller's Name:		OWN DRILLER	1	
	Certification No.: This well was constructed in	n accor	dance with the Water		

A	Water	Well Drilling I	Rep	ort	Well I. Map V Date F	erified:		03627 Map	
	Alberta r ironment	province discialins	Received: 1980/09 Measurements: Metric						
	ractor & Well Owner Informat	ion			2. We	ell Loc	catio		
Company		Dr	_	mpany Approval No.		Sec	Twp	Rge	Westo
	TER WATER WELL DRILLING (1981)		318	· · · · · · · · · · · · · · · · · · ·	LSD NW	35	039	02	M 5
/lailing Ad	ddress: City or Tow RED DEER		stal Co	de:	1	on in Q		ŲZ.	
RR 1		on Identifier:			ОМ	-			oundar
	ERG, ELMER				0 M				oundar
	Number: Mailing Add	iress: Po	ostal Co	de:	Lot	Bi	ock	Plar	1.
ity:	BENTLEY Province:	Co	ountry:		Well E			w Obta	
					1005.8			timated	1
	ng Information			Proposed well use:	Test D		iu .	Start	Time:
ype of w Reclaime	/ork: New Well d Well			Domestic & Stock	(yyyy/r		:		
Date Recl		ials Used:		Anticipated Water	1980/0			11:00	AM
Method of	f Drilling: Cable Tool			Requirements/day	Test M			50.29	NA.
lowing V	Vell: No Rate:			0 Liters	Non pu			5U.29	IVI
Sas Pres		esent:		<u> </u>		f water		90.92	
	ation Log	5. Well Completion	5	>	remov			Liters	/Min
Depth		Date Started(yyyy/mm/dd)		Completed mm/dd):	Depth			68.58	М
rom round	Lithology Description	1980/05/21	1980/			intake:		FC 00	
evel	Elitiology Description	Well Depth: 71.63 M		ole Diameter: 0 CM	Water end of	level a	τ	56.39	M
meters)		Casing Type: Steel	Liner	Type: Steel	pumpi				
	Dark Brown Sandy Clay	Size OD: 17.78 CM		DD: 14,12 CM	Distan	ce fron	1 top o	f CM	
	Light Brown Sandy Clay	Wall Thickness: 0.59 CM	Wall 1	hickness: 0.79 CM		to gro	und		
	Dark Gray Sticky Clay Brownish Gray Clay & Shale	Bottom at: 36.88 M	Top: (level:	4- T			-4\
3.53	See Comments Clay & Sitt	Bottom di coloc iii	71.63		Dep	oth To v	vater is apsed		eters)
	Yellow Sticky Clay	Perforations		ations Size:	Drawe	down N			ecover
13.72	Brown Clay & Shale	from: 46.02 M to: 71.63 M from: 0 M to: 0 M		CM x 15.24 CM x 0 CM		Drawdo			
15.24	Blue Gray Shale	from: 0 M to: 0 M		x 0 CM		er remo			han 2 l
16.46	Blue Shale	Perforated by: Torch			duratio	on, reas	son wh	ıy:	
19.2	Clay & Shale	Seal: Driven							
21.03 21.34	Brown Soft Sandstone Gray Hard Sandstone	from: 0 M	to: 36	.88 M					
22.25	Gray Sandy Shale	Seal: _from: 0 M	to: 0 I	M		nmend	ed pun	nping ra	ate: 0
23.77	Gray Hard Sandstone	Seal:	(0. 0 1	••	Liters/				
27.74	Gray Sandy Shale & Sandstone	from: 0 M	to: 0			nmend Pump I			(e: U M
29.57	Gray Sticky Shale	Screen Type:	= : : : = =	n ID: 0 CM		Type:	IIStalie	u	
32	Blue Shale	from: 0 M to: 0 M		n ID: 0 CM	Pump	Model	:		
39.32	Gray Sandy Shale Gray Sandstone	Screen Type: from: 0 M to: 0 M		Size: 0 CM	H.P.:	~		-4 !- "	
47.24 55.17	Gray Shale & Sandstone Ledges	Screen Installation Method			Any fu	ırther p	umpte	st intori	mation
58.52	Dark Gray Sandstone	Fittings			1				
61.87	Gray Hard Sandstone	Top:	Botto	m:	-				
64.31	Black Silty Shale	Pack: Grain Size:	Amou	int: 0					
67.36	Gray Sticky Shale	Geophysical Log Taken:	7 31100		1				
68.88 69.19	Carbonaceous Shale Blue Gray Sandy Shale	Retained on Files:			_				
71.63	Gray Hard Sandstone	Additional Test and/or Pur							
		Chemistries taken By Drill		ments Held: 2					
		Held: 0 Pitless Adapter Type:	DOCU	mente rieid. Z	-1				
		Drop Pipe Type:							
		Length: M	Diam	eter: CM	4				
		Comments: 28'- GRAVEL & COAL CO	ONG. SC	OFT WATER.					
			ns _						
		7. Contractor Certif			-				
		Driller's Name: Certification No.: This well was constructed		NOWN DRILLER	er				



Project Name Palms Cove Project No. 113929190
Date200 , Time
Owner's Name Nicole Janner Phone 403-748-4180
Owner's Address RRI Site 1 Box 1x Bentley TOC OJO
Location, Legal: Lsd_NE_S_34_Twp_39_R_3_W.5_
Location, GPS: 11UD690800 WM 5809844 Elev
Well location: Pit, Inside building, Near Dugout, Near barn
Other
Total depth Casing Diam. So Casing Material Steel Height above gnd
Casing wall thickness Completion zone to
Depth to water, measured Reported
Keported
DrillerYear drilled
DrillerYear drilled
Driller Year drilled Pump depth . Pump make . HP
Driller Year drilled Pump depth Pump make , HP Intake depth of pump Height csg. above ground
Driller
Driller
Pump depth
Driller

Project Name talms Cove Project No. 113929190
Date200 , Time
Owner's Name Doug/Andrea Hunt, Rea Morse Phone 748-419-6661 (Doug
Owner's Address Site 1 RRI Box 30 Bentley TOC. 030
Location, Legal: Lsd NE S 34 Twp 39 R a W. 5
Location, GPS: 11U0690770 UTm 5809859 Elev.
Well location: Pit, Inside building, Near Dugout, Near barn
Other located on Janner Property
Total depthCasing Diam 555 Casing Material Steel Height above gnd 6
Casing wall thickness Completion zone to
Depth to water, measuredReported
Driller Arcan Basin Year drilled
Pump depth, HP
Intake depth of pump Height csg. above ground
Water quality: Hard, Med, Soft, Rusty, Black,Smell, Smell, Elect. ConductivitypHTemperature0 C. Water treated?
Taste: Supply Appearance Clear Gas present? Supply
Use of well: Domestic \checkmark , Livestock (how many) 30, Industrial (type) Dairy, Poultry, Commercial Other
Seasonal use? YesNo Increase in use in last 5 years?
Other (specify) Estimated annual production
Any dugouts or springs on property? No

Project Name Palms Cove Project No. 113929190
Date200 , Time
Owner's Name Brian Russell Phone 748-2013
Owner's Address Box 305 Eckville
Location, Legal: Lsd SH S 4 Twp 40 R 3 W. 5
Location, GPS: 1140688289 41775810055 Elev
Well location: Pit, Inside building, Near Dugout, Near barn
Other East of house
Total depth 2001 Casing Diam. Casing Material Steel Height above gnd Ø
Casing wall thickness Completion zone to
Depth to water, measured Reported
Driller Alken Bosin Year drilled 1980
Pump depth ~40'-100'. Pump make submersible, HP
Pump depth ~40'-100' . Pump make submersible HP
Pump depth <u>"40'-100'</u> . Pump make <u>submersible</u> , HP
Pump depth Nuo'-100' Pump makeSubmersible, HP
Pump depth Nuo'-100' Pump makesubmersible, HP
Pump depth
Pump depth "40'-100' . Pump makeSUDMETSIDL, HP
Pump depth

- and Well SH of house
- Livestock
- Casing 4' above and -early 1970 30-40' to water

Project Name Palms Cove Project No. 113939190
Date200 , Time
Owner's Name Brian Russell Phone 748-2013
Owner's Address Box 305 Eckville
Location, Legal: Lsd SE S 4 Twp 40 R 3 W. 5
Location, GPS: 1140688881 utm 5809990 Elev.
Well location: Pit, Inside building, Near Dugout, Near barn
Other
Total depth Casing Diam. Casing Material Steel Height above gnd
Casing wall thickness Completion zone to
Depth to water, measured Reported
DrillerYear drilled_ ~ 1940
Driller Year drilled ~ 1940 Pump depth . Pump make , HP
DrillerYear drilled_ ~ 1940
Driller Year drilled ~ 1940 Pump depth . Pump make , HP
Driller Year drilled ~ 1940 Pump depth Pump make , HP Intake depth of pump Height csg. above ground
Pump depth Pump make, HP
Driller Year drilled ~ 1940 Pump depth Pump make , HP Intake depth of pump Height csg. above ground Water quality: Hard , Med. , Soft ✓, Rusty , Black , Smell Other Elect. Conductivity pH Temperature Oc. Water treated? Taste: Good Appearance clear Gas present? Supply Use of well: Domestic ✓, Livestock (how many) , Industrial (type) Dairy , Poultry , Commercial Other
Pump depth Pump make, HP
Driller Year drilled ~ 1940 Pump depth Pump make , HP Intake depth of pump Height csg. above ground Water quality: Hard , Med. , Soft ✓, Rusty , Black , Smell Other Elect. Conductivity pH Temperature Oc. Water treated? Taste: Good Appearance clear Gas present? Supply Use of well: Domestic ✓, Livestock (how many) , Industrial (type) Dairy , Poultry , Commercial Other

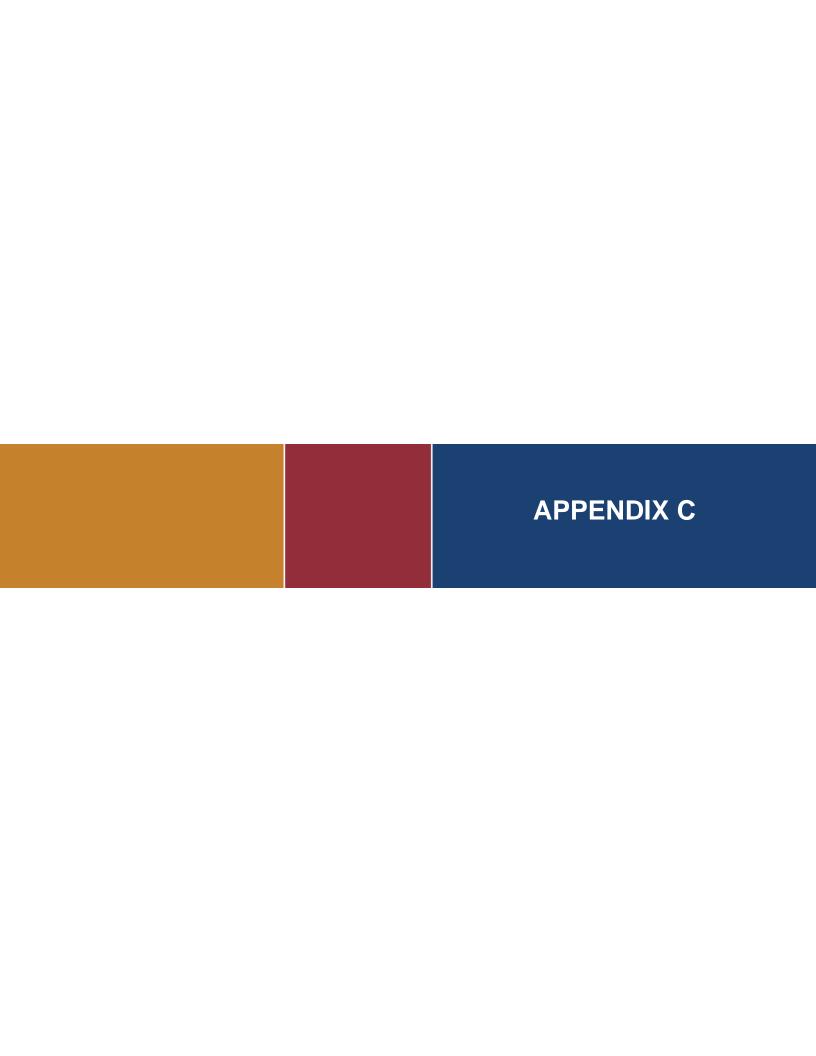
Well a

⁻ located behind shed

⁻ livestock

Project Name Talms Cove Project No. 113929190
Date200 , Time
Owner's Name Ralph Noves Phone 748-222
Owner's Address Rox 1 Site 1 RRI Bentley
Location, Legal: Lsd SN S 3 Twp 40 R 2 W. 5
Location, GPS: 11U0689351 UTM 5810009 Elev.
Well location: Pit, Inside building, Near Dugout, Near barn
Other N of house.
Total depth Casing Diam. 4.5" Casing Material Steel Height above gnd 8"
Casing wall thickness Completion zone to
Depth to water, measured Reported 130'
Driller Cliff Richmond Year drilled 1983
Pump depth, Pump make, HP
Intake depth of pumpHeight csg. above ground
Water quality: Hard, Med/_, Soft, Rusty, Black,Smell,Other
Elect. Conductivity pH Temperature 0 C. Water treated?
Taste: Good Appearance Clear Gas present? Supply
Use of well: Domestic, Livestock (how many), Industrial (type), Dairy, Poultry, Commercial Other
Seasonal use? YesNo_✓. Increase in use in last 5 years?
Other (specify) Estimated annual production
Any dugouts or springs on property? No

Project Name Ralms Cove Project No. 113929190
Date200 , Time
Owner's Name Randy Scerpnek Phone 748-3491
Owner's Address RRI Box 177 Bentley Tocoto
Location, Legal: Lsd SE S 3 Twp 40 R 3. W. 5
Location, GPS: 11U 01/90599 UTM 5810144 Elev
Well location: Pit, Inside building, Near Dugout, Near barn
Other NW of house
Total depth 280 Casing Diam. 65" Casing Material Steel Height above gnd 39'
Casing wall thickness Completion zone to
Depth to water, measuredReportedReported
Driller Alken Bosin Year drilled
Pump depth, HP
ntake depth of pumpHeight csg. above ground
Water quality: Hard, Med, Soft, Rusty, Black,Smell,Other
Elect. Conductivity pH Temperature OC. Water treated?
Faste: Good Appearance Clear Gas present? Supply
Jse of well: Domestic , Livestock (how many) , Industrial (type) , Pairy , Poultry , Commercial Other
easonal use? YesNo_\(\overline{\lambda}\). Increase in use in last 5 years?
Other (specify) Estimated annual production
any dugouts or springs on property? No



Cocker COD-1 Cocker Tourner Country Co. Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Country Cocker Cocker Country Cocker Cocker Country		rica	vvater vv		g Kep	ort		GIG Well		No.	·	
March Marc	ENVIRO	NMENT	The driller supplies the far its accuracy. The	data contained in this re- information on this rea	port. The Pro-	rince disclaims respo ained in a public d	onsibility alabaso.					
Costs Charles Costs Cost			Location									
Season Value Baco NEW Note State Common Bureathy at 1 and 10 state 1 and 10 stat	Owner Name:		1 0	Address:			Town:				_	4.7
Secretarion Control	للعدي	eo Ya	In Cove			1 100-100			4 - 4 - 411		O_{i}	ויכ
Internation Load Control Lat Control Lat Control Lat Control Lat	Location 1/4 or SA				1.01:	Biocks	Plan:				. 1	1
The filter Indian		7155 -		2 0		-}					<u>ي</u>	11921-A
Total Tota	Measured fron	n Baundary o	Cuarter D	Lat	GPS	Coordinates in De	cimal Degree	es (NAD-83)				0.0
Totalling Internation Total Producting Total Production Total		m#tfrom [ו ל ו פרוער	i m/it tram □ □	Latite	_{ide:} <u>\$2,4061</u>	Long	Hude: 114.20	91	Elevation		
Internal coloring:					<u>п. Пн</u>	and Held Auto 20-3	Om 🔼	Diff. Corr. Hand Ha	ld 5-	10m. 🗆	Surve	yed GPS<1m
August A			Turks of Itherity	<u></u>				Dropped Well I	len:			
Bedenoticus Description		iing:		!					J&U:			
Canal Cana		.g			od de e	* 1 (1.14)			3/уг	with residenc	е ол р	roperty)
Billions (etc.) Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Week Well Dispersed Well Compile	.)∕Boring	-					nent	☐ Other (Specif	y):			
Retary financial Desponsed Well De]										
Presentation Pres		a) (t	Amount Used:			1	i					
Permation Log Reconstruction than Permation Company Co			☐ Deenanad Wall					(Note: All wells, I	елсер	t household w	elis, m	ust be licenced by
Formation log					plicable):		1	Alberta Environm	ent t	o divert and us	ie grou	ndwaler)
Unifold Vest Comment C	9 Formation	Log			. ☑ Imperial	@ Well Com	oletion	Mei	85UT	ments in: [Metri	ic (Imperial
Total state Second Secon	D					Total Depth	, Fi	nished Well	Т	Start Date		End Date
Description Description] Lith	iology Description		Drilled: /6	2 0 D	epth: (60		10 OL /1	2	10/02/12
1.31 55 Strocom			4.			Borehole:	. 41.		^			
Surface Certifier, If applicable Well Calling Clark Surface Certifier, If applicable Well Calling Clark Surface Certifier, If applicable Surface	<u>0-1ヱ</u>		(bu i	STOWN				:F10111;	_			113
Surface Cealings (II applicable) Siete Gallangs (Inter- Gallan Strate Gallangs (Inter- Gallangs Gallangs Gallangs (Inter- Gallangs G	n -31					Diameter	: 5*	From:	h	3	To:	160'
State Shade Stock Stock State Stat	٠٠٠					Surface Cas	ing: (if appl	icable) Well	Cas	ing/Liner:		
	1-86	<u> </u>	Drale T	5000		PLSigni	7	-		_	yanize	d Steef
Color Colo	y . un		< C			☐ Galvaniz	ed Steal	📑	PVC	□ Fibe		
Color Colo	10 70	 	JJ SA	. '								
Color Colo	10-65		Shale 6	jely		□ ribergia:	22	Siz	a OD	.41/2 W	di Thir	kness: 257
Stra OD SS Statush Stra OD Statush Stra OD Statush Stra OD Statush	T-T8		Em lo	Porton		☐ Other						
10 - 77	000			enous:		Size OD: S	1b."	1			,	
1	5.70		65 Kn	2/Jn						_	_	
1	0.77		challe a	Las C. Her)	Wall Thickne	es: <u>25</u> 4"		_	112		145
Performed by: Intention Daw 24 Department Daw 25 Depar	0.77		JOH D	May Cilly	<u></u>	Bellom at:	112'	Fro			_To:	
Annular Seab: Definitive Sturry Genericities Chips Cament	7-97	7 GPM		فم `		Bottipin Bat	*16.7	Siz	e:	<i>3/</i> 8"	_x	12"
Annutiar Seal: pérunite Siury fleentorite Chips Cement Sp - LeD She Le Gold Part	21-111-		Shelo					"Pei	riorat	ed by: DM	schine	☐ Saw -211
Piaced From:			Jijace	Gray			,			_ O	her.	
Angount Option Shoo, as:	116-150	/	। <i>5</i> 5 ५।	iery 1		Annular Sea	ıl: 🔲 ⊯entoni	te Sturry 🗆 Bento	onite	Chips 🔲 Ce	ment	
Angount Option Shoo, as:	50 11.0		Sha Do	2.		Diagod Con	. <i>D</i>	-		To Mi	T	
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Screen Type: Stainbeas Steel PVC Sta OD: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: To: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Stot Size: Interval From: Interval From: Stot Size: Interval From: Interval Fro		ļ								-	:	
Stra OD Interval From: To: Sict Size: Interval From: To: Sict Size: Sict Size: Interval From: To: Sict Size: Sict Size: Interval From: To: Sict Size: Sict Size: Interval From: To: Sict Size: Sict Size: Interval From: To: Sict Size: Sict Size: Interval From: To: Sict Size: Interval From: Sict Size: Interval From: Sict Size: Interval From: Sict Size: Interval From: Sict Size: Interval From:			-						_I.O!	ner, at:		
Interval From:		<u> </u>				Screen Type	: 🗋 Stainles	is Steel 🔲 PVC	;			
Interval From:	•		1			Size OD:						
Talescoped Attached to Casing Packtr Coupler Bottom Filtings: Wash-down Ball Packtr Packtr Coupler Bottom Filtings: Wash-down Ball Packtr Packtr Coupler Bottom Filtings: Wash-down Ball Packtr Packtr Coupler Bottom Filtings: Wash-down Ball Packtr Packtr Coupler Bottom Filtings: Wash-down Ball Packtr Packtr Coupler Bottom Filtings: Wash-down Ball Packtr Pac			1			Interval From	n:	To:		Slot 8	Size:_	
Top Fittings: Packtr Coupler Bottom Fittings: Wash-down Ball Facktr Packtr Pa						Interval From	n:	To:		Slot \$	Sì28;_	
Pack: Pack		;	1			☐ Telescop	ed 🔲 Attach					
Artificial/Mechanical Phatural Grain Size: Amount: More State Phatural Grain Size: Amount: More State Phatural Grain Size: Amount: More State Phatural Taken From: More Grain Ground Leve Phatural			 		***************************************	Top Fittings:	Decker 🗅	Coupler Botto	m Fil	ttings: 🔲 Wa	sh-dov	yn 🔲 Ball 🛄 P
Metal Test Massuramonts in: Metal Metal Indication Indicat						Pack:						
Metal Test Massuramonts in: Metal Metal Indication Indicat						☐ Artificial/Me	chardcal 🗩	Natural Grain S	Size:		. Amo	unt:
Depth to water level label in the control in the second in	O Yield Test				Mea	surements in: 🔲 !	vietric 🔁 imp	erial Taken Fr	om:	iop of Ca	sing	Ground Level
Arroslan Flow Lexibor control installed Describe. Describe	Test	_ 1	Start .	Distance From T		Sta	tic Water			Depth-t	o wate	er level
Artesian Flow		05 13	- Ima: 2:30	am/am	vo.Level:		al:	ind mo		Ela		
Rate: Umin or Ignm Pailer	Artesian Flo	w		Yes, flow control in	stalled						`i I	_
Palier Pumping Rate: 43			2 fragles sid larence	Describe:				ŀ			-	
Pump Bailer Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Water Removal Rate: Umin / Igam Igam		I_1	1	•		· 					_	-
Water Removal Rate: 43		ater Remov		las.		يهر ا			_j	27.6	2	16.4
Pump installed Yes Depth Air Testad From: 126.3 5 103.0 126.9 6 107.5 126.9 6 107.5 126.9 6 107.5 127.5 7 107.1 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 8 106.6 128.4 128.4 8 106.6 128.4 128.4 8 106.6 128.4 128.	⊒ Yump ⊒ Yumpine Bata:	43	Umin Mania 10/242	Barronal Bata	,	Air Males Barrer	J. Barra 43	المصادرين	1:	24. ા ૈ	3	IU A
126.3 5 10 1.0	CHAPTE GITTE	rant: 120					From: 1/-				4	
126.9 6 107.5 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 7 107.1 127.5 127.5 7 107.1 127.5 127.	ייי טפסמוניין הוספט				***	1	, , ,		-		-	
Pump installed Yes Depth: 127.5 7 107.1 Decommended Pump Intake Depth (From TOC): 30 moD Type: Model: H.P.: 128.4 8 106.6 Did you Encounter: Saline Water (>4000 ppm TDS) Depth: m/lt		i nodad	- Luncia, expedit wily:	1.							1	-
Secommended Pump Intake Depth (From TOC): 130 mo Type: Model: H.R.: 128.4 8 106.6 Did you Encounter: Saline Water (>4000 ppm:TDS) Depth: mr/lt Well Disinfected Upon Completion 130.0 10 1/5.4 Gas		i period was •									6	107.5
Secommended Pump Intake Depth (From TOC): 130 mo Type: Model: H.P.: 128.4 8 106.6		ti period was •			ì					7.5	17	107.1
Saline Water (> 4000 ppm TDS) Depth: m/ft Geophysical Log Taken: 130.0 10 1/5.4 Geophysical Log Taken: Geophysical Log Taken: 130.0 12 1/65.1 Geophysical Log Taken: Geophysical Log Taken: 130.0 12 1/65.1 Geophysical Log Taken: 130.0 12 1/65.1 Geophysical Log Taken: 130.0 14 1/04.5 Other (Specify): 130.0 14 1/04.5 Additional Comments on Wall: Sample Collected for Potability: 16 1/04.5 Yes (Result Attached) No 20 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.2 Owater Diverted for Drilling 25 1/04.3 Owater Diverted for Drill	waler remova	•	10	L/min or @pp	Pump insta	illed 🖸 Yes	Depth;_		12	***	, ,	
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Geophysical Log Taken: 130.0 10 15.4 Geophysical Log Taken: 130.0 12 105.1 Idditional Comments on Well: 150.0 14 104.5 Idditional Comments on Well: 16 104.5 Idditiona	waler remova	i Pump Rate:_		. •			•		12	8.4	8	
Certific district Certification No: Certification No: Certification No: Certific district Certification No: Cert	waler remova lecommended	i Pump Rate:_ i Pump Intake	Depth (From TOC):	130	Type:	Model:		н.е:	12 12	8.4 9.1	8 9	106.00
Cother (Specify): 130.0 14 101.9 Additional Comments on Well: 16 104.6 Sample Collected for Potability: 18 104.3 No 20 104.7 Water Diverted for Drilling 25 Water Diverted for Drilling 25 Water Source: Show Taken: 12.00 10 0.2 17 7:00 10 Contractor Certification -0.5 Contractor Certification -0.5 Contractor Certification -0.5 Company Name: 40 You have the sum of the proposition of the Water Act All Information in this record is true and describes by works and hydroydologic conditions at the time of well completion only. 105 57 Contractor Certification -0.5 Company Name: -0.5 Com	waler remova lecommended	i Pump Rate:_ i Pump Inteke unter: 🔲 Salin	Depth (From TOC):	130m0	Type:	Model:	d Upon Comp	н.е:	12 12	8.4 9.1	8 9 10	106.0 105.4
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Yes (Result Attached) 18 174.3 20 104.7 20 20 20 20 20 20 20 2	water remova ecommended ecommended olid your Encounteredial Action	i Pump Rate:_ i Pump Intake inter:	Depth (From TOC)	130m0	Type:	Model: Well Disinfecte Geophysical Log T	d Upon Comp aken: samma	н.е:	12 13 13	8.4 9.1 0.0 0.0	8 9 10 12 14	105.4 105.1 104.9
Water Diverted for Drilling Water Diverted for Drilling Water Diverted for Drilling Amount Taken: 1200 Diversion Date: Time: 30 Contractor Certification 7:00 mpm 40 Contractor Certification 40 Company I Drilling Report Given to Owner 40 Name of downeyman responsible for drilling/construction of well: Certification No: 50 All Contractor Certification 7:00 mpm 40 Company Name: 40	water remova ecommended ecommended old you Excou ternedial Actio	i Pump Rate:_ i Pump Intake inter:	Depth (From TOC)	130m0	Type:	Model: Well Disinfecte Geophysical Log 1 Electric G	d Upon Comp aken: samma /):	н.е:	12 13 13	8.4 9.1 0.0 0.0	8 9 10 12 14 16	106-10 105.1 104.8 104.6
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Taken: 1200 10 012 17 7:00 @pm 90 90 90 90 90 90 90 90 90 90 90 90 90	water remova ecommended ecommended ild you Encou temedial Actio	d Pump Rate:_d Pump Intake unter: Cl Salin	Depth (From TOC): e Water (>4000 ppm 1	130m0	Type:	Model: Well Disinfecte Geophysical Log T Electric G Other (Specify Sample Collected t Yes (G Resu	d Upon Comp aken: samma /): for Potability:	н.е:	12 13 13	8.4 9.1 0.0 0.0	8 9 10 12 14 16 18 20	106.09 105.4 105.1 104.9 104.6 104.3
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Company Name: A Left by that this well was constructed in according with the Water (MiniSterial) Regulation of the Water Act. All Information in this necord is true any describes by wins and hydroydologic conditions at the time of well completion only.	ecommended ecommended ecommended lid you Encou lemedial Actio additional Com Water Dive	i Pump Rate:_ i Pump Intake unter:	Depth (From TOC):e Water (>4000 ppm 1	130 miD Depth: Depth:	Type:	Model: Well Disinfecte Geophysical Log T Geophysical Cog T Geophysical Cog T Geophysical Cog T No Model: Geophysical Cog T Geophysical	d Upon Compaken: samma (): (): (): (): (): (): (): (): (): ()	H.P:	12 13 13	8.4 9.1 0.0 0.0	8 9 10 12 14 16 18 20 25 30 -25	106.4 105.4 105.1 104.9 104.6
Company Name: A LC n To the line of the Water Act. All Information in this record is true and describes by wints and hydrogologic conditions at the time of veil completion only. 105	water remova tecommended tecom	i Pump Rate:_ i Pump Intake unter: Li Salin Li Gas on Taken: unterts on Wa erted for Dri or Certificati ling Report Gi	Depth (From TOC):e Water (>4000 ppm 1] I: I: Illing Amour Taken: On	130 miD Depth: Depth:	Type:m/t	Model: Well Disinfecte Geophysical Log T Electric G Other (Specify Sample Collected t Resul No Diversion Date:	d Upon Compaken: samma (): (): (): (): (): (): (): (): (): ()	H.P:	12 13 13	8.4 9.1 0.0 0.0	8 9 10 12 14 16 18 20 25 30 -25 40	106.4 105.4 105.1 104.9 104.6
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	Lecommended Lecomm	I Pump Rate:_ I Pump Intake Inter: Li Salin	Depth (From TOC): e Water (>4000 ppm·1 i: liting Amount Taken: on ven to Owner sponelble for drilling	Depth:	Type:	Model: Well Disinfecte Geophysical Log T Geophy	d Upon Compaken: samma //: for Potability: tt Attached)	H.P:	12 13 13 13	8.4 3.1 0.0 0.0	8 9 10 12 14 16 18 20 25 30 -25 40 50 60 75	10.4 105.4 105.1 104.8 104.6 104.2

Aberro	Water Well Drilling Rep		ell T.D. /ell Tag No.
ENVIRONMENT	The driller supplies the data contained in this report. The Provint for its accuracy. The information on this report will be retain	ne disclaims responsibility ed in a public databasa. Date R	eport Received
Well Identification and	Location Address:	Town:	Postal
Owner Name: Pal	A	idwi);	Code:
Location 1/4 or LSD: SEC:	TWP: ROE: Worker: Lot:	Brock: Plan:	Additional Description:
NW 36	39 2 3		I FW-1
Measured from Boundary o	f: Quarter Lot GPS C	ordinates in Decimal Degrees (NAD 83) 52.406 Longitude; 114.	20 137 Equation: 91704
		Held Auto 20-30m Diff. Corr. Hand	Held 5-10m Surveyed GPS<1m
			III I I I I I I I I I I I I I I I I I
Method of Drilling:	Type of Work:	Proposed We	•
☐ Auger ☐ Backhoe/Oug	New Well (Producing) Test Hole or New Well (Dry) Plugged: *** ***	(up to 1250	m3/yr with residence on property)
☐ Boring ☐ Cable Tool	Plugged with: Bentonite Sturry Bentonite Ci		ooliy):
🗗 Rotary (air)	Other (Specify): Amount Used:	ļ	-
☐ Rotary (mud)		(Note: All wet	is, except household wells, must be licenced by
	Despensed Well - Well ID (if applicable)		Inment to divert and use groundwater)
Formation Log	Measurements in: Metric Imperial	Well Completion Total Depth Finished Well	Weapurements in: ☐ Metric ☑ Imperial Start Date End Date
Depth from Indicate if	Lithology Description	Drilled: //O Depth: 160	_ 1 1 1 1 1 1 1 1 1
ground level Water Bearing	01 0	Borehole: , 2/, II	- 431
0-12	Clay Brown	Diameter: 674 From: Diameter: 677 From:	117' To: //er?'
12-22	Shale Brasn (silty)/		ell Casing/Liner:
22-34	SS Brown	Steel	☐ Steel ☐ Galvanized Steel
24-40	She la Grean 1655	☐ Galvanized Steel	PVC Piberglass
40. 42	Carculate	L ☐ Fiberglass	Other: Size OD: 41/2 Wall Thickness: 257"
10" 4 / -	33 Grad	. ☐ Cement	Size OD: 472 Wall Thickness: 257 Top at: 100 Bottom at: 160
47-67	Shelle Gray Vati	- CE/L	
62-68	SS Brown	*	Perforations: From: 120 To: 145
68-72	Strale Gray	1 1-01	From: To:
72-7/2	55 Gree Roman	Bottomat: ///	Size: 3/8" x 18"
2 02	66.1 C.	Ţ	Perforated by: Machine DSaw Confi
10-05	STATI GREAT	1	Other:
83-105 76PM	55 Grey Brown	Annular Seal: Bentonite Sturry De	To 117'
105-121	Shale Grey	Placed From: O	To
121-147	55 Gruy	Amount: 10	_ □ Weided Ring, at:
197-11.0	Shala Gray	☐ Shale Trap, at:	Other, at:
100		Screen Type: Staintess Steel	
		Size OD:	
		Interval From:To:	
		Interval From:To:To:To:	Slot Size:
			ottom Fittings: 🔲 Wash-down 🔲 Bail 🔲 Plug
		Pack:	
		☐ Artificial/Mechanical ☐ Natural Gre	ain Size: Amount:
① Yield Test			n From: CLUOp of Casing Ground Level
Tast Date: 10 02 11	Start Distance From Top of Casing to Ground Level:	Static Water Level:	Depth to water level Elapsed Time
[-11 -1	Casing to Ground Level: Casing to Ground Level: 3:30 - am/r60 Casing to Ground Level:	m [/(Olan	Pumping Minutes Recovery
Artesian Flow	Describe:		112-8 1 109.9
Mexico of Water Remo			117-8 2 111.1
Pump	_ 🖸 Beiler	ElAir MARO	
Pumping Rate: 40	Umin (opp) Water Removal Rete:Umin / igpr mitZ Depth Balled From: m/l		113.0 4 11.0
Depth Pumped From: /2.		Depth Air Tested From: 160 R	113.1 5 110.9
ii vietos retritovai perion was			113-1 6
Becommended D	10 L/min or opport Pump instal	ed Dyes Depth:	- 113.1 7
Recommended Pump Rate			- 1/3.7 8 I
Recommended Pump intak		Model: H.P.:	113.2 9
Did you Encounter: 🖾 Sali	ne Water (>4000 ppm TDS) Depth:m/tt	Well Disinfected Upon Completion	113.2 10
□Gas		leophysical Log Taken:	113.2 12
Remedial Action Taken:		☐ Electric ☐ Gamma	113.2 14
		Other (Specify):	113.3 16
Additional Comments on W	eji:	ample Collected for Potability.	ルタ・3 18
		☐ Yes (☐ Result Attached) ☐ No	113,01 20
Water Diverted for D	rilling		115.4 25
Major	Amount	iversion Date: Time:	1)3.4 30
Source: Shop	Taken: 1200 16	102 11 7:00	pm 113.4 35
			115.4 40
		ation No:	113.4 50
1	orders la	6 [A	113.5 60
Company Name			113.5 75
1 Alkan The	in Delling LTD 9	lole	133.5 90
Certify that this well was t	onstructed in accordance with the Water (Ministerial) Regulation of d is true and describes the fronts and hydrogeologic conditions at t	he Water Act. he time of well completion only.	(13.5 105
	Signature:		113.4 120
	Juliatui Company	July 10 0	**

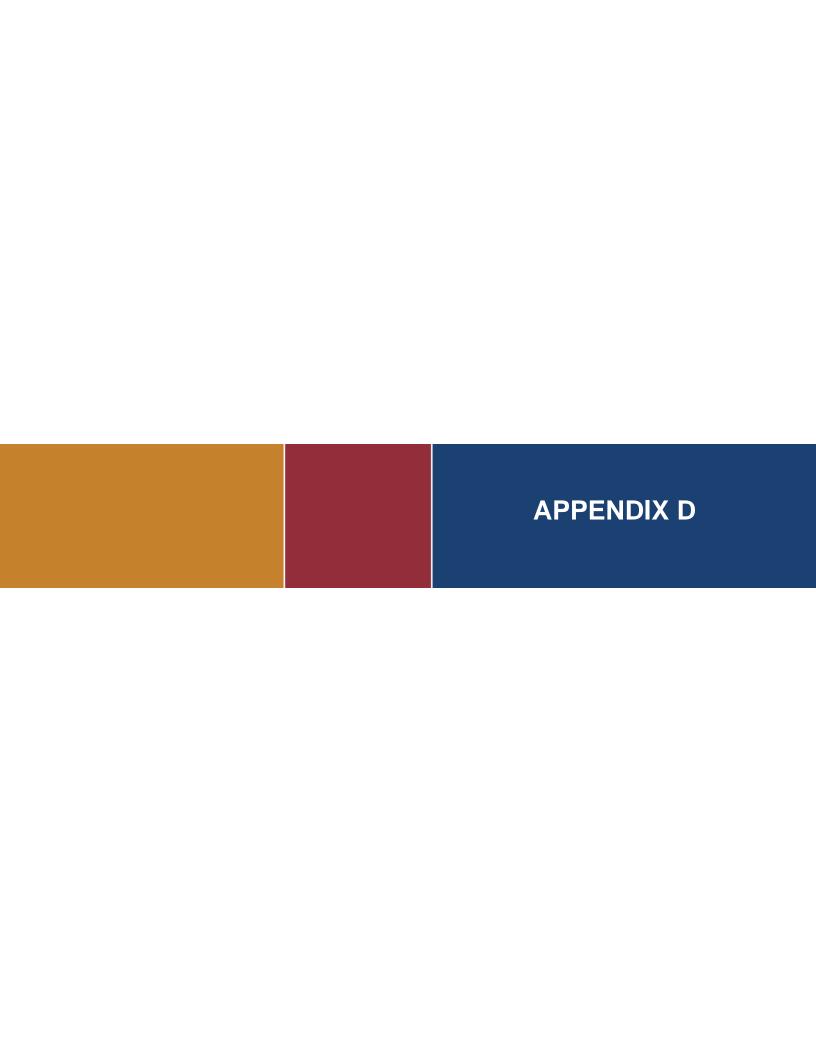
	ONMENT	The driller so	ipplies the d	ita containe	a in this rep	ort. The Pro	ince disclain	ıs responsibility ublic database.		A Well Tag No.:	9	
O Well Iden	lification and	Location	acy. main	1981 (M. 1987)	\$3.5%。\$P\$G#\$P\$G#	-y15 4 1 3 A 5-	1. 10 st 10 55 5 5 5 5 5	Checker of the South of the South		e Report Received:		100
Owner Name:	de0 (21	M Cou	ر م ا	Address:	300 CP & 8	7 <mark>5 80</mark> 8018	- 95 SI	′ Ti	bwn: Edmento	Postal Code:	tich	J 0BQ
Location 1/4 o	rLSD: SEC:	TWP:	RGE		W of MER;	Lot:	Block:	Plan:		Additional Description:		
	m Boundary o	<u> </u>	arter □ Lo			GPS	Coordinate	s in Decimal F	Degrees (NAD 83)	<u>'</u>		
15.		·			C. 5.		1 Page 1	Will al	Longitude: 1 i	4. 20 73 Elev	ation:	9704
O Drilling Int	m/ft from (NUS	 	Į M∕RL 11	om U E (o 20-30m	Diff. Con. Ha	nd Hald 5-10m		veyed GPS<1m
Method of Dri		Type of W		3 3 3 3 3 3		12 * 50003030	er met we prostage	roser , socjadoses resoc	Proposed	Well Use:		ent der kole in de State State fan
☐ Auger ☐ Backhoe/Du	ug		ell (Producio de or 🔲 Ne		v) Pluode	d: YY W	M DD		Househ (up to 1)	old 250 m3/yr with resid:	ence on	property)
Boring Cable Tool			d with: 🔲 B		шту 🗆) Bentonite		Cement	Other (S	ipecity):		
☐ Rotary (air) ☐ Rotary (mus		Amour	nt Used:	mer (Shec	ny):							
		🗆 Dеере		- Well	ID (if appli	icable\:				vells, except househol ironment to divert and		
⊙ Formation	Log		structed We	216		☑ Imperial:	Ø Well	Completion		Measurements in	-	
Depth from	Indicate if			ogy Desc			Total Dep	oth .	Finished Well	Start Da	ate	End Date
ground level	Water Bearing) 4					Boreho	<i>}(₀</i> 0 le:	Depin. j (O NO MAR	lub	reo from ()
11-17		المراضو	<u>ن بري </u>	(x)34"		,	Dia	meter:	From		To: . To:	<u> </u>
11-22	ļ	215	180 B	(<u>ij</u> .or	(51/1	5)		Casing: (if		Well Casing/Line		160
37 34		15	Br.	100			_ ⊡ Ste	el	аррисавіс)	Stéel 🗆 G		ed Steef
31-90		50	28 GA	Z,		0.5	Ga	ivanized Steel C			ibergia	
40 45		55	(71.534			/ - In	☐ Fib	erglass		Size OD:	Wall Th	ickness:_#57
47-67		Siz	A. C.	A		√28 αμ. [19:11 (1:54.)		ier —al	, [Top at: 100		
62-68	-	55	Rich	. العالم		30	Size O		:	Perforations:		•
68.72		Sh	ele G	-46.4				icknese:	2 B	From: /20	To:_ To:	14/5
70-76		55	me.	Reals	۸.		Bottom	at: ////		Size: 3/2	N	18
26-83		4.5	16 Pa (0 31.24			1			Perforated by:	Machine Other:	a □Saw ᡚ
83-105	7 GAM	15	Grei	1 Br.	mon		Annula	Seal: 🗆 Bei	ntonite Slurry 🔲 E	Bentonite Chips 🔲 (
105-121		Sh	mle B	1 1000			Placed		0	To	17'	·····
121-147		54,	Chara					nount: 15				
147-1100	Į Į	SYm	On Gr	جانب				e Shoe, at: <u> </u>	1 3	□ Welded Ring,	at:	
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							,):	· · · · · · · · · · · · · · · · · · ·	•		
							1	From:	To:		t Size:_ t Size:_	
					•		l		ached to Casing	-#- · 5W · · · D · ·		D- :: D
							Pack:	mys. — Packe	r ☐ Coupler B	ottom Fittings: W	asn-do	WI CI Ball CI
									☐ Natural Gr			ount:
O Yield Test Test	Asiation and a position	Start	1 2 20 20 20 20 20 20 20 20 20 20 20 20 2	Distanc	e From Top o	of	rements in:	Metric Static Water	Imperal Take	n From: Lizep of C		Ground Lever level
	1012 11p	Time:	30 am/p	(Casing	io Gradina D	aver:	m/tj 🔿	Level:	111 m	Pumping	lapsed 1 Minute	
Artesian Flow Rate:	v			Yes, flow of Describe:	control instal	led				710.9	0	1136
Method of Wa	ater Remova		or igpm		-		<i>y</i> -1			117 8	1.	144.9
2 Pump	1 100		☐ Bailer				Air		12 80 .	117.8	3	111.1
Pumping Rate: _ Depth Pumped Fro		_L/mln /¿gpm² _m/(i*_	Water Ren Depth Bailed			_L/min / igpm m/fi	Water Ren Depth Air Te	novat Rate:	#12 80 100 min/igg	113.0	4	THE U
If water removal	period was <2	2 hours, expla	in why:	-					.,	113.1	5	प्रविभ
		y, û								113.1	6	
Recommended I		19		_L/min qṛi	<i>-</i> " _	ump Installe		,	h:	113.7	7	
Recommended I	Pump Intake D	epth (From T	OC):		m/ft T	ype:		del:	H.P.:	113.2	8	
Did you Encoun		Water (>4000	ppm TDS)			'''/'L {		ected Upon Co	mpletion	113.1	10	
Remedial Action	□Gas n Taken:	·w.		Depth:			ophysical L Delectric (-		113.7	12	
							Other (Sp			113.2	14	
Additional Comm	ments on Welt:					Sa	nple Collect	ed for Potabilit	y:	113.3	16	
							⊒ Yes (□Re ⊒No	esuit Attached)	· *	1/3.41	18	
Water Diver	rted for Drilli	ng	12.035 7 050	<u> 1848</u>		7,10,200 g 18				115.4	25	
Water Source:	7.300 		Amount Taken:	200		Div	ersion Date: ຜູ້ນາໄ	7 7 Time		132 1	30	
@ Contractor		M2 (2000) Y	N. 100 17 18	E KIN	MSTER.	עין ו			ン afii/p.	113.11	35	
Copy of Drillin Name of Journ			drilling/con	struction	of well-	Certificati	on No			115.4	40	
Z 2/ (2)	$\mathcal{E} = \mathcal{L}^*$	onsible for e ≪av∆		uction	O Well.	Z Z	3			113.4	50	
Company Name:		SUL	: 1		-	(1.5.7				113.5	75	<u> </u>
H Ken Tiperlik that this	s well was const	nucted in acces	Harris I	e Water (Mir	ieloriali G	Valence of the	Votes Ast			113.5	90	
I certily that this All information	in this record is	irue and descin	bes the works	and hydrog	eologic con !			· .	1 1	1135	105	
Approval H	lolder Sig	nature;	The state of					Date:	10 / 10 12 / OF	1136	120	· · · · · · · · · · · · · · · · · · ·

PW1

SCIID	riá /	yvalt	ı vvei	ااالزاحا	ոն և	έμδιτ			Well Tag No.		
***	NMENT	for its accurac	y. The inform	nation on this i	report will be	Province diselaln retained in a p	is responsibility ublic database.	Date	Report Receiv	5336 1349	
Owner Name:		Location	, A			, 1,3×P. I.	С Т	oyn:	and a sold to be desired.	ostel	· • • • • • • • • • • • • • • • • • • •
October 1/4 or	LSD: SEC:	TWP:	RGE:	Z Z		공·3· '약공 <u>;</u> - Block:		Edmontos	Additional	ide: T% h	1 OB X
(NW 3	4 30	_	2.			1.5			تاديا لموغ	Hervell
Measured from	n Boundary o	f: ☐ Quar	ter 🔲 Lot		G	PS Coordinate	s in Decimal D	egrees (NAD 83) Longitúde: 111			
 	m/ft from [лов <u>—</u>	_	m/ft from 🔲	E (hittude: <u>\</u>	o 20-30m	Longitúde: 1111. Diff. Corr. Han			reyed GPS<1m
O Drilling Inf Method of Dril		Type of Wo		395.797 (4.65)	A Particular		65年985月季生	Proposed V		\$151.255A	工程1000000000000000000000000000000000000
☐ Auger	- 1	☐ New Well						Househo			
Backhoe/Du	ng		or 🔲 New 1 with: 🔲 Bent	Well (Dry) Plu onite Slumv	gged: 📉 🔲 Bentor		Cernent	Other (S	-	estaence on	property
Cable Tool	_		Other	r (Specify):	C Dunion		_				
Rotary (muc	"	Amount Deepens	od IMAII					(Note: All w	elis, except hous	sehold wells, i	must be licenced by
		☐ Reconst	ructed Well	- Well ID (If a		ennare Fr ancis Ar SIII S			ronment to dive		
6 Formation Depth from	Indicate if	- 1141-42-42 A 11 69		s in: 🔲 Metric		Totel De	pth ,	Finished Well	Stz	art Date	End Date
ground level	Water Bearing			y Descriptio	·n 	Drilled:	/60	Depth: /(2	0 101	வய் ச்சு	NO (84 /45
0-12		Cha	1 Extra	Jn			meter: (a	孙 From		To: _	113
12-31		55	Brown	₹ 7		ļ	meter: 5	Fron	n:	To:	160
31-36		5)7 ₉₄	<u> 4 3 .</u>	ica e-		Surface	e Casing: (if	appacanie) '	•	Linter: ☐ Gelvaniza	ed Steel
36.40	}	55	Great				Ivanized Steel			Fiberglas	
40-55		5h-	le Gri	1			nerglass			 Walt Thi	ickness: 257
55-58		She	le Bri	ousn			her		Top at: <u>\$0</u>		1
58.70	_	55	Backs	1*>		I	0: 5 1 12		Perforations:		
70 - 77		4)24	& Gree	7 11)	Walf Ti	hickness: 0		From: 115		1-17
77-97	7684	<<	Grain	1 '3 1	_,(Botton	n at:		From: Size: 3/8		12"
97-116		-sha	le Co	امداع			•		Perforated by		e □Saw ②D
116.150		35	Gren			Annule	r Seal∗ ⊡ Bá	ntonite Slurry 🔲 E	entonite Chine	Other:	
150 160		4ho	le E	***			From:)	To	****	
							mount: 10				
						,	e Shoe, at:	113		_	
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			•		•		D;	miless oleei 🔲	•		
·						1	l From:	To:		_ Slot Size: _ _ Slot Size: _	
							l From: escoped ☐ At	To: tached to Casing		_ SICT 5/20:_	
						Top Fit	tings: 🔲 Packe	er 🗌 Coupler 🛚 🖰	ottom Fittings:	☐ Wash-do	wn 🗋 Bail 🗋 Plu
							iał/Mechanical	☐ Natural Gr	ain Size:	Amc	ount:
O Yield Test		488.7612	jak (m. j.).			easurements In	Static Water	Imperial Take		p of Casing Depth to wat	
Test Date: Y10	क्षा । इन्ह	Start Time:	ろい am/pffj.	Distance From Casing to Grou	and Level:	3, m/t	Level:	104 m	Pumpin	Elapsed 1	Time .
Artesian Flov	v	_ _		Yes, flow control Describe:	installed	· · · · · · ·	1		704 3	- 1	130.0
Rate:			or igpm						<u> </u>	.,	120.1
Method of Wa ☐ Pump			□ Bailer		·	. □ Air		12	177.1		115 4
Pumping Rate: ,	43	L/min /sgpm	Water Remov Depth Bailed F		L/min /	igpm Water Re	moval Rate: Tested From:	<u>// 3 </u>		7 4	108.6
If water removal						are Leoper vol		, (, , , , , , , , , , , , , , , , , , ,	126		108.0
· —			-	No.	· i · · · · ·				126.9		1075
Recommended	Pump Rate:	70	·L	/min or ស្ត្រីប៉ូរ៉ា	Pump ins	stallad □ Yès	Dep	th:	1275	7	107.1
Recommended	Pump Intake E	Depth (From TO	ic): 136)m#(5	Type:	м	odet:	H.R:	1784	8	1066
Did you Encour	nter: 🗆 Saline	Water (>4000	oprn TDS) D	epth:	m/ft	☐ Well Disint	lected Upon C	ompletion	1300	10	105.4
•	□Gas			epth:		Geophysical I	_		130.0	10	125.1
Remedial Action	n Takeo:	•				☐ Electric ☐ Other (S)			130.0	14	104.9
Additional Com	ments on Well-			•	:	1	cted for Potabil	·		16	1046
						☐ Yes (☐)	sted for Potabil Result Atlached			18	104.3
Own and discount		re ascent	San and the san and	and the second	11 N F 2 TO VICE TO	□No	and second distance	Data de Composito de la Compositorio de	Sw -	20	101.7
B Water Dive _{Vater}		1	Amount		0.2019.(bb) 	Diversion Date		9:	1.5.	25 30	
Source: <)			faken:	1100	1/A	o/us/	<u> </u>	7.00 afi/ p	m -	30 85	
Contractor Copy of Drilling			enegas (mentra)	11.48 F3 B (115)	[1] 《新文學》	Dark (Market (Mark))	5544×45864555	not represent	1	40	
Name of Jour	- •		rilling/cons	truction of we	ell: Certi	fication No:				50	
الأنهر		80-150m				83061				60	
Company Name	e Garcia		100	`1 <u>(</u>)		966	Č.			75	
I certify that the All information	is well was cons	tructed in accord	ance with the		l) Regulation of				4	90	
All Information Approval F			es uppworκs a. √1 →			it the time of well (m) fore for	<u>, </u>	105 120	<u> </u>
• PPI 0 701 I	018		78 67	1		sllow copy: We		nk copy: Contracto		1, 1,50	aw

Pink copy: Contractor

Yellow copy: Well Owner





Pumping Test - Water Level Data

Page 1 of 3

Project: Palms Cove Aquifer test

Number: 113929190

Client: Qualico Developments

Location: W1/2-34-39-2-W.5

Pumping Test: Pumping Test 1

Pumping well: PW-1

Test conducted by: Alken Basin Drilling Ltd.

Test date: 2/12/2010

Discharge: variable, average rate 454.89 [m³/d]

Radial distance to PW [m]: -

Time [min] Water Level [m] Drawdown [m] 1 2 0.946 1.046 2 4 1.132 1.232 3 6 1.169 1.269 4 8 1.198 1.298 5 10 1.211 1.311 6 12 1.223 1.323 7 14 1.231 1.331 8 16 1.246 1.346 9 18 1.246 1.346 10 20 1.263 1.363 11 24 1.269 1.369 12 30 1.273 1.373 13 34 1.279 1.379 14 40 1.284 1.384 15 44 1.277 1.377 16 50 1.281 1.381 17 60 1.286 1.386 18 70 1.298 1.398 19 80	Observa	ation well: PW-1	Static water level [m]: -0.10			
2 4 1.132 1.232 3 6 1.169 1.269 4 8 1.198 1.298 5 10 1.211 1.311 6 12 1.223 1.323 7 14 1.231 1.331 8 16 1.246 1.346 9 18 1.246 1.346 9 18 1.246 1.346 10 20 1.263 1.363 11 24 1.269 1.369 12 30 1.273 1.373 13 34 1.279 1.379 14 40 1.284 1.384 15 44 1.277 1.377 16 50 1.281 1.381 17 60 1.286 1.386 18 70 1.288 1.398 19 80 1.298 1.398 19 80		· ·				
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Pumping Test - Water Level Data

Project: Palms Cove Aquifer test

Page 2 of 3

Number: 113929190

Client: Qualico Developments

Stantec

	Time	Water Level	Drawdown
47	[min] 2160	[m]	[m]
47		1.364	1.464
48	2400	1.367	1.467
49	2640	1.363	1.463
50	2880	1.364	1.464
51	3120	1.363	1.463
52	3360	1.379	1.479
53	3600	1.373	1.473
54	3820	1.377	1.477
55	4060	1.388	1.488
56	4300	1.383	1.483
57	4302	0.258	0.358
58	4304	0.185	0.285
59	4306	0.154	0.254
60	4308	0.135	0.235
61	4310	0.123	0.223
62	4312	0.114	0.214
63	4314	0.104	0.204
64	4316	0.098	0.204
65	4318	0.098	0.198
66			
67	4320	0.089	0.189
	4324	0.085	0.185
68	4330	0.079	0.179
69	4334	0.073	0.173
70	4340	0.068	0.168
71	4350	0.066	0.166
72	4360	0.057	0.157
73	4370	0.053	0.153
74	4380	0.051	0.151
75	4390	0.055	0.155
76	4410	0.047	0.147
77	4430	0.047	0.147
78	4450	0.041	0.141
79	4470	0.037	0.137
80	4500	0.037	0.137
81	4530	0.035	0.135
82	4560	0.033	0.133
83	4590	0.037	0.137
84	4620	0.031	0.131
85	4680	0.031	0.131
86	4740	0.035	0.135
87	4800	0.029	
88	- · · · · · · · · · · · · · · · · · · ·		0.129
	4860	0.03	0.13
89	4920	0.023	0.123
90	5040	0.021	0.121
91	5160	0.019	0.119
92	5280	0.021	0.121
93	5400	0.022	0.122
94	5520	0.026	0.126
95	5760	0.009	0.109
96	6000	0.009	0.109
97	6240	0.007	0.107



Pumping Test - Water Level Data

Page 3 of 3

Project: Palms Cove Aquifer test

Number: 113929190

Client: Qualico Developments

	Time [min]	Water Level [m]	Drawdown [m]
98	6480	0.005	0.105
99	6700	-0.003	0.097
100	6940	-0.007	0.093
101	7180	-0.011	0.089
102	7420	0.007	0.107
103	7680	0.02	0.12
104	7920	0.014	0.114
105	8202	0.007	0.107



Pumping Test - Water Level Data

Page 1 of 3

Project: Palms Cove Aquifer test

Number: 113929190

Client: Qualico Developments

Location: W1/2-34-39-2-W.5

Pumping Test: Pumping Test 1

Pumping well: PW-1

Test conducted by: Alken Basin Drilling Ltd.

Test date: 2/12/2010

Discharge: variable, average rate 454.89 [m³/d]

Radial distance to PW [m]: 55.04

Observation well: OB-1		Sta	atic water level [m]: -0.03
	Time [min]	Water Level [m]	Drawdown [m]
1	2	0.075	0.105
2	4	0.127	0.157
3	6	0.153	0.183
4	8	0.179	0.209
5	10	0.179	0.209
6	12	0.205	0.235
7	14	0.218	0.248
8	16	0.205	0.235
9	18	0.218	0.248
10	20	0.218	0.248
11	24	0.231	0.261
12	30	0.231	0.261
13	34	0.231	0.261
14	40	0.268	0.298
15	44	0.244	0.274
16	50	0.244	0.274
17	60	0.255	0.285
18	70	0.268	0.298
19	80	0.257	0.287
20	90	0.255	0.285
21	100	0.27	0.30
22	120	0.27	0.30
23	140	0.28	0.31
24	160	0.27	0.30
25	180	0.27	0.30
26	210	0.27	0.30
27	240	0.293	0.323
28	270	0.283	0.313
29	300	0.28	0.31
30	330	0.293	0.323
31	360	0.283	0.313
32	420	0.283	0.313
33	480	0.293	0.323
34	540	0.283	0.313
35	600	0.283	0.313
36	660	0.306	0.336
37	720	0.296	0.326
38	780	0.296	0.326
39	840	0.309	0.339
40	900	0.296	0.326
41	960	0.296	0.326
42	1020	0.309	0.339
43	1140	0.319	0.349
44	1260	0.306	0.336
45	1381	0.296	0.326
46	1442	0.319	0.349
-			



Pumping Test - Water Level Data

Page 2 of 3

Project: Palms Cove Aquifer test

Number: 113929190

Client: Qualico Developments

Sta	ntec
JW	

				Cilei
	Time [min]	Water Level [m]	Drawdown [m]	
47	1560	0.293	0.323	
48	1680	0.306	0.336	
49	1800	0.296	0.326	
50	1920	0.306	0.336	
51	2140	0.293	0.323	
52	2380	0.306	0.336	
53	2620	0.306	0.336	
54	2860	0.293	0.323	
55	3098	0.293	0.323	
56	3240	0.293	0.323	
57	3480	0.306	0.336	
58	3720	0.293	0.323	
59	3960	0.293	0.323	
60	4086	0.306	0.336	
61	4300	0.293	0.323	
62	4302	0.203	0.233	
63	4304	0.151	0.233	
64	4306	0.131		
65	7899		0.142	
66	4308 4310	0.099	0.129	
		0.099	0.129	
67	4312	0.073	0.103	
68	4314	0.073	0.103	
69	4316	0.073	0.103	
70	4318	0.06	0.09	
71	4320	0.06	0.09	
72	4324	0.047	0.077	
73	4330	0.047	0.077	
74	4334	0.036	0.066	
75	4340	0.036	0.066	
76	4350	0.01	0.04	
77	4360	0.023	0.053	
78	4372	0.023	0.053	
79	4390	0.013	0.043	
80	4414	0.013	0.043	
81	4442	0.013	0.043	
82	4472	0.013	0.043	
83	4580	0.013	0.043	
84	4636	-0.013	0.017	-
85	4730	-0.013	0.017	
86	4796	-0.013	0.017	一
87	4908	-0.013	0.017	\dashv
88	5140	-0.013	0.017	
89	5492	-0.013	0.017	
90	5504	-0.016	0.014	
91	5854	-0.016	0.014	-
92	6084	-0.016	0.014	\dashv
93	6382	-0.019	0.001	
94	6510	-0.025	0.014	
95	6876	-0.016		-
96	7036		0.001	\dashv
97	7352	-0.029	0.001	
31	1002	-0.029	0.001	



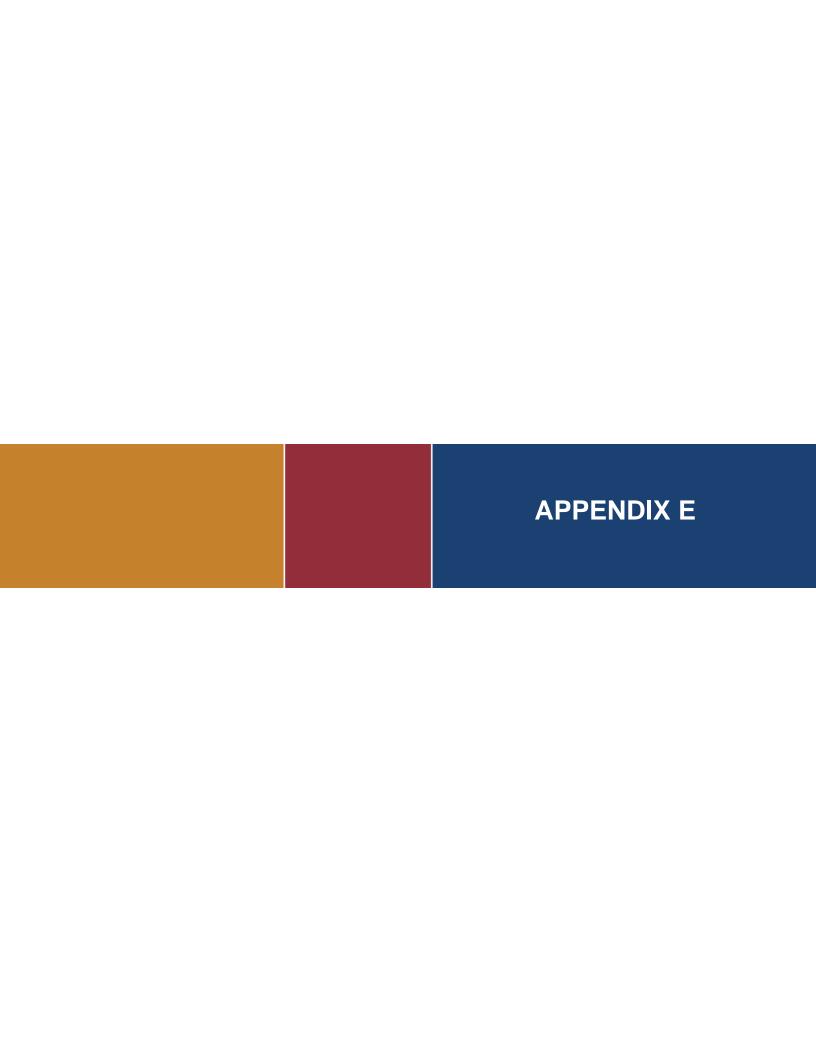
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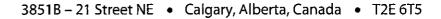
Pumping Test - Water Level Data Page 3 o		
Project: Palms Cove Aquifer test		
Number: 113929190		

Qualico Developments

Stantec

	Time (min)	Water Level [m]	Drawdown [m]
98	7456	-0.016	0.014
99	7640	-0.016	0.014
100	8204	-0.016	0.014





WSH Labs (1992) Ltd.

Phone: (403) 250-9164 • Fax: (403) 291-4597 • www.wshlabs.com

Alken Basin Drilling

Phone:

(403) 748-4340

Lab Number:

64911

Box 47

Bentley, AB T0C 0J0

Fax:

Email:

(403) 748-2880

PO Number:

Sulfates

Total Coliform

Escherichia Coliform

Sample Info: Qualco Palm Cove

New Well

NW-34-39-2-W5

Sampled By:

Wade Balon

Date Sampled: Date Received:

500

Zero / Absent

Zero / Absent

2/18/2010

Date Reported:

2/19/2010 3/1/2010

Analyte	Units	Result	Canadian Drinking Water Guideline Maximum
Calcium	mg/L	12.5	No Guideline
Iron	mg/L	0.04	0.3
Magnesium	mg/L	4.7	No Guideline
Manganese	mg/L	0.02	0.05
Potassium	mg/L	1.2	No Guideline
Sodium	mg/L	175	200
Bicarbonates	mg/L	432	No Guideline
Bromides	mg/L	< 0.1	No Guideline
Carbonates	mg/L	12	No Guideline
Chlorides	mg/L	8.0	250
Fluorides	mg/L	0.50	1.5
Nitrates as N	mg/L	< 0.02	10
Nitrites as N	mg/L	< 0.02	1
NO ₃ + NO ₂ as N	mg/L	< 0.02	No Guideline

61

Parameter	Units Result	Result	Canadian Drinking Water Guideline Maximum	
Electrical Conductivity	μS/cm	744	No Guideline	
pH ·	pН	8.42	6.5 - 8.5	
Hardness (as CaCO ₃)	mg/L	51	No Guideline	
Total Alkalinity (as CaCO ₃)	mg/L	378	No Guideline	
P-Alkalinity (as CaCO ₃)	mg/L	6	No Guideline	
Hydroxide (as CaCO ₃)	mg/L	0	No Guideline	
Total Dissolved Solids (calculated)	mg/L	483	500	
Sulfides as S	mg/L	< 0.03	0.05	
Turbidity	NŤU	0.3	1	
Color	TCU	< 5	15	
Total Kjeldahl Nitrogen	mg/L	< 0.9	No Guideline	
Ammonia Nitrogen	mg/L	< 0.9	No Guideline	
Total Phosphorus as P	mg/L	< 0.4	No Guideline	
Phenol	mg/L	0.1	No Guideline	
Microbiology	Units	Result	Canadian Drinking Water Guideline Maximum	

0

0

Sum of Cations	8.65	TDS / EC Ratio	0.65
Sum of Anions	8.79	Sodium Adsorption Ratio	10.71
ion Balance	0.98	Saturation Index	0.60

CFU/100 mL

CFU/100 mL

mg/L



3851B – 21 Street NE • Calgary, Alberta, Canada • T2E 6T5

Phone: (403) 250-9164 • Fax: (403) 291-4597 • www.wshlabs.com

Alken Basin Drilling

Sample Info: Qualco Palm Cove

New Well

NW-34-39-2-W5

Box 47

Bentley, AB T0C 0J0

Phone:

(403) 748-4340

Lab Number:

64911

Fax: Email: (403) 748-2880

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PO Number:

Sampled By: Date Sampled:

Wade Balon 2/18/2010

Date Received:

2/19/2010

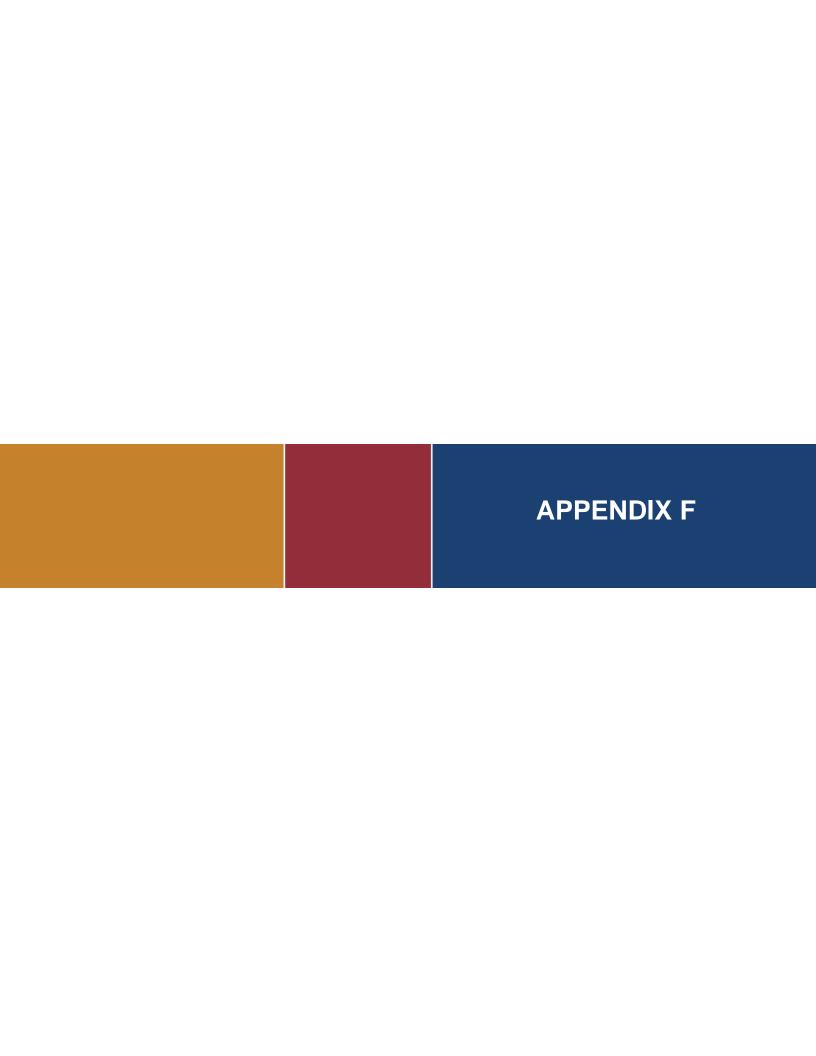
Date Reported:

3/1/2010

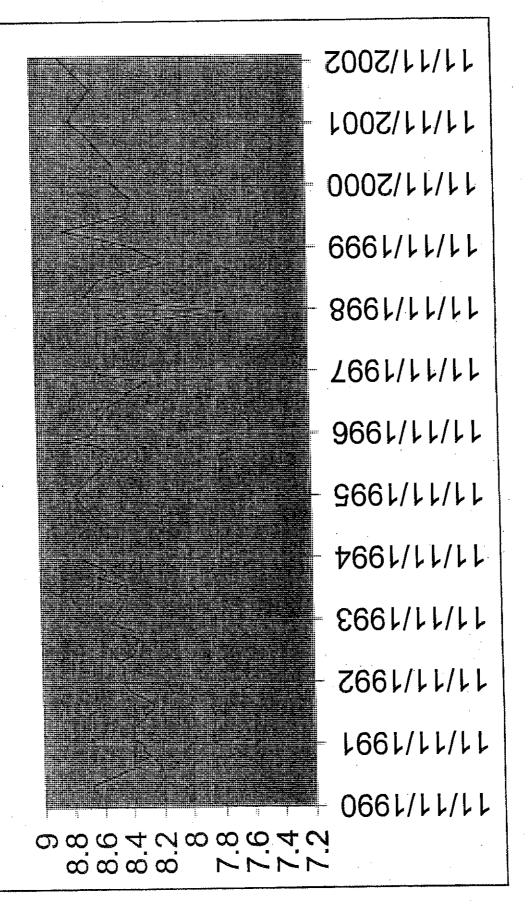
Trace Metals	Units	Result	Canadian Drinking Water Guideline Maximum
Boron	μg/L	222	5000
Aluminum	μg/L	20.2	100
Chromium	μg/L	< 0.1	50
Copper	μg/L	< 0.08	1000
Zinc	μg/L	60.2	5000
Arsenic	μg/L	0.88	10
Selenium	μg/L	0.06	10
Cadmium	μg/L	< 0.05	5
Antimony	μg/L	0.3	6
Barium	μg/L	31.6	1000
Mercury	μg/L	< 0.05	1
Lead	μg/L	< 0.1	10
Uranium	μg/L	< 0.04	20

Certified By:	

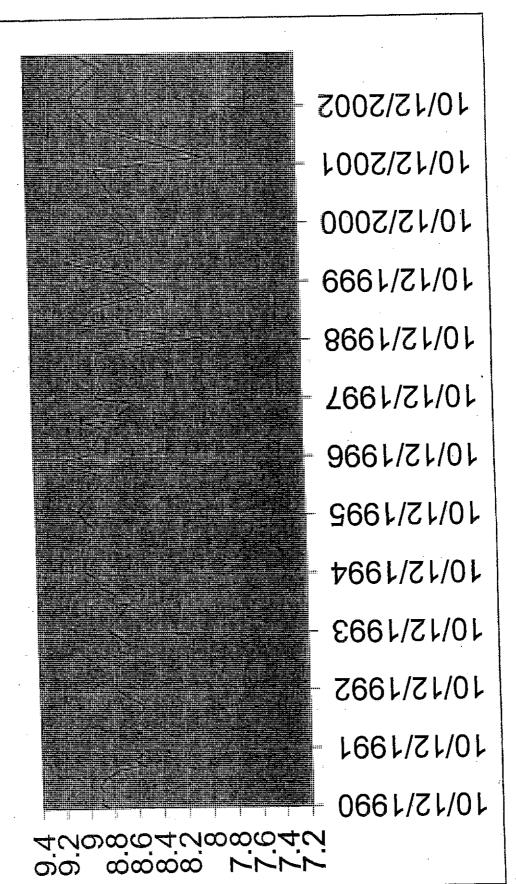
< denotes less than detection limit. TNTC = Too Numerous To Count (>200 colonies).

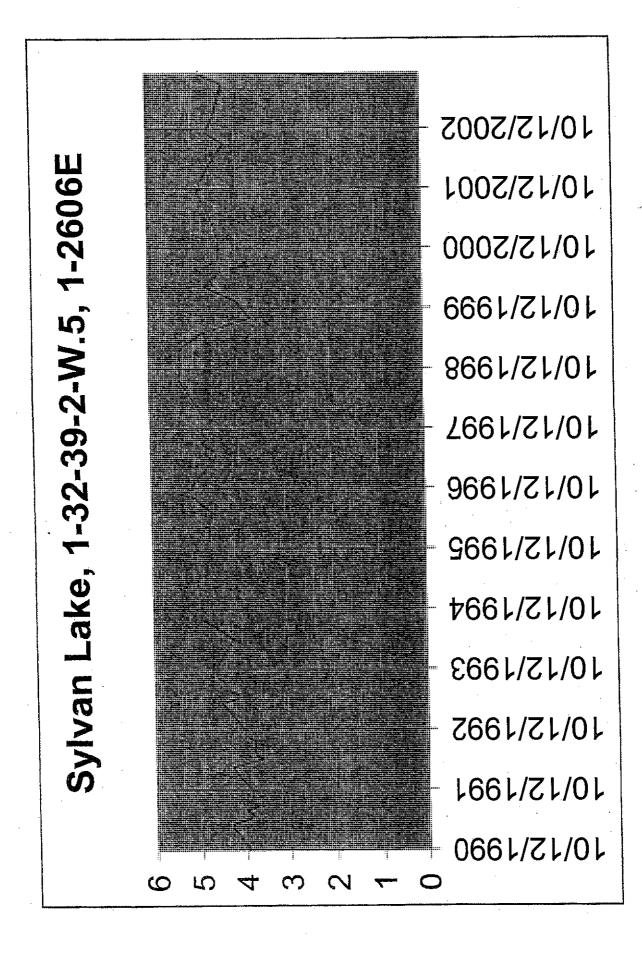


Sylvan Lake, 1-32-39-2-W.5, 1-2604E

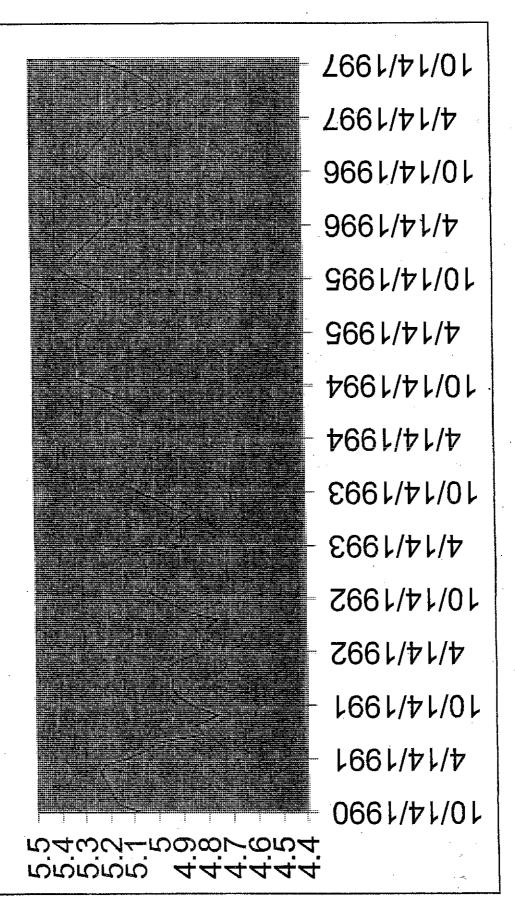


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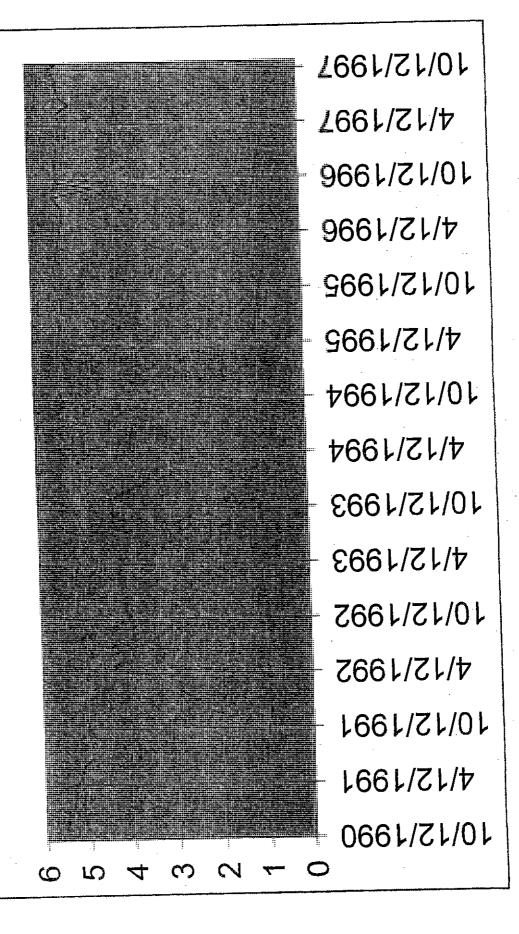




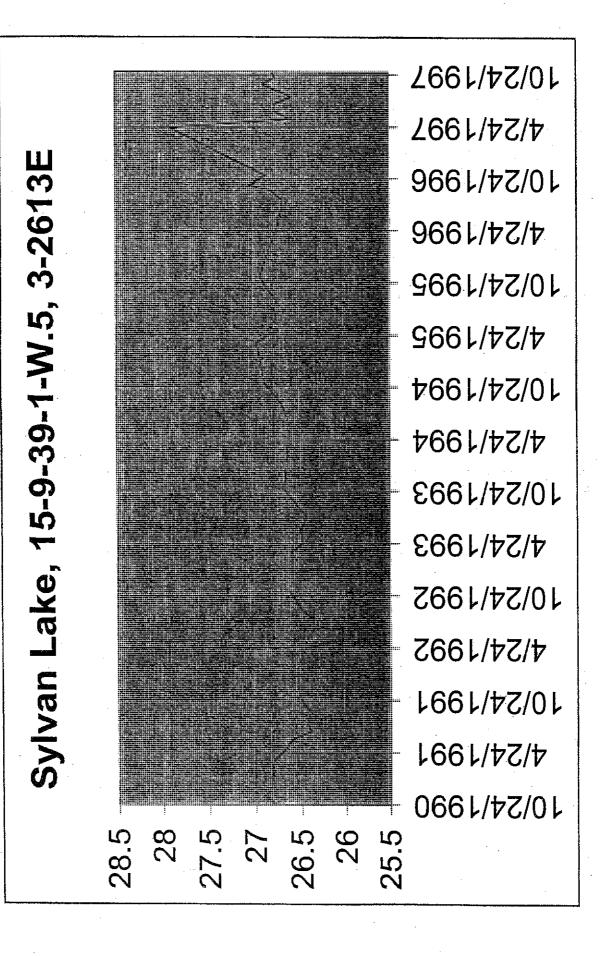
2-2609E 1-19-39-1-W.5 Sylvan



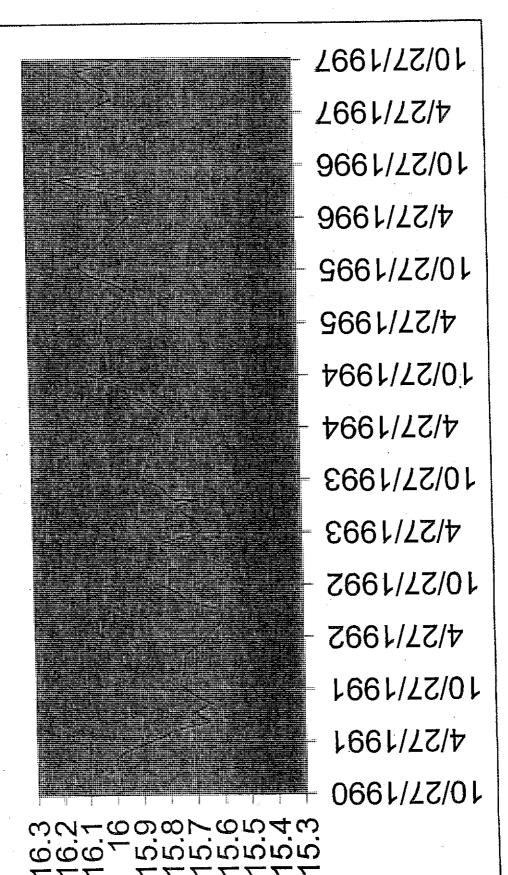
2-2610E Sylvan



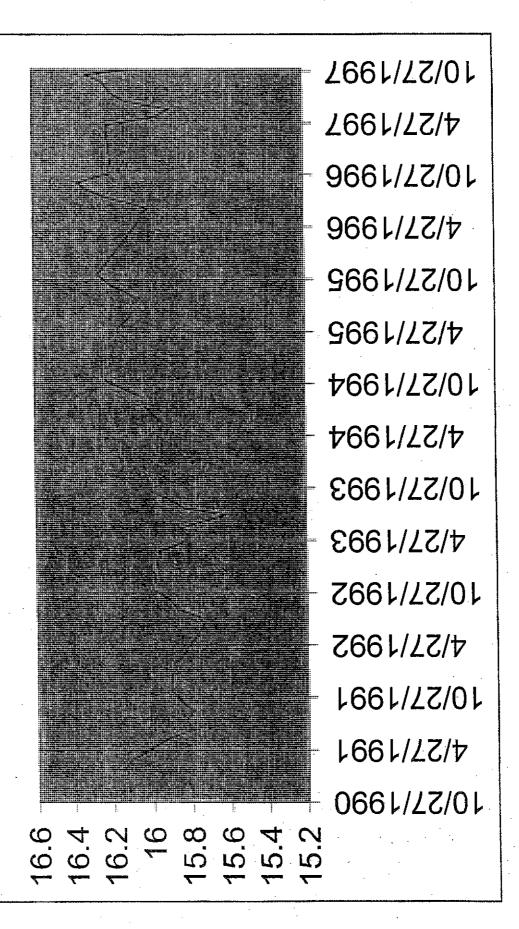
1661/71/01 1661/71/7 9661/71/01 2-261 9661/71/7 9661/71/01 9661/71/7 1-19-39-1-W 7661/71/01 **7661/71/7** 10/14/1993 4/14/1993 Sylvan Lake, 10/14/1992 74/1665 1661/71/01 1661/71/7 0661/71/01

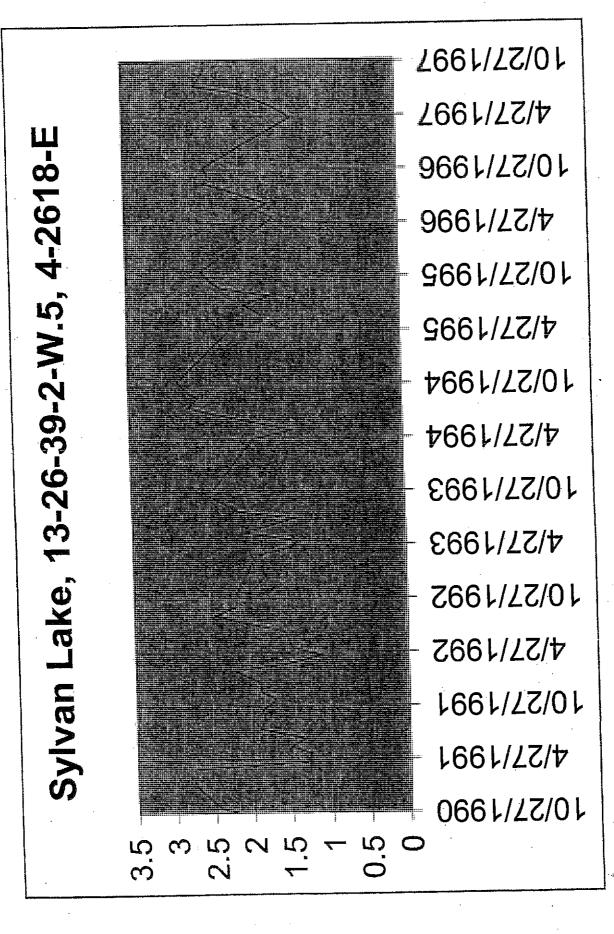


Lake, 13-26-39-2-W.5, 4-2616-E Sylvan

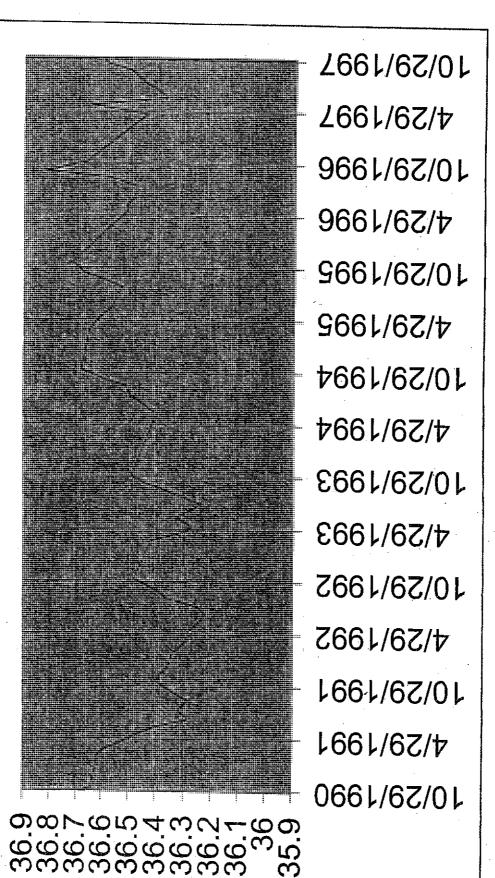


4-2617E 13-26-39-2-W.5, Sylvan Lake,

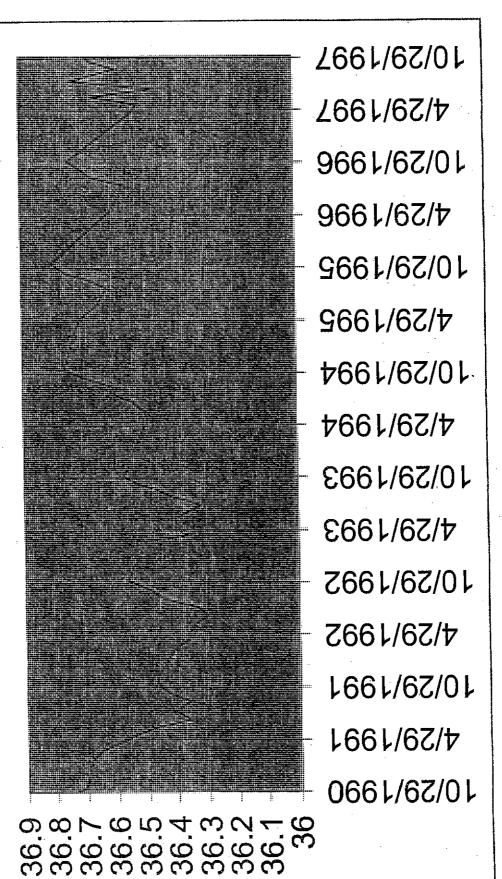




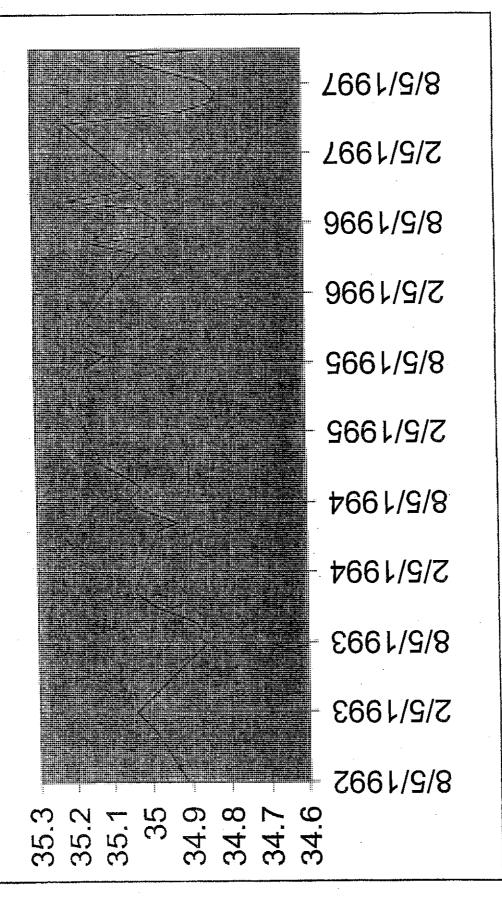
1-25-39-2-W.5, 5-2619-E Sylvan Lake,



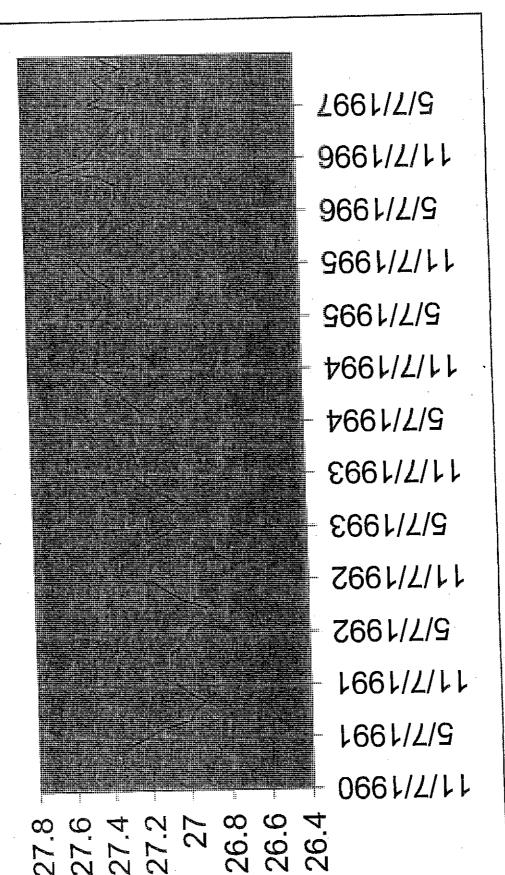
.25-39-2-W.5, 5-2620-E Lake Sylvan



Sylvan Lake, 1-25-39-2-W.5, 5-2621-E

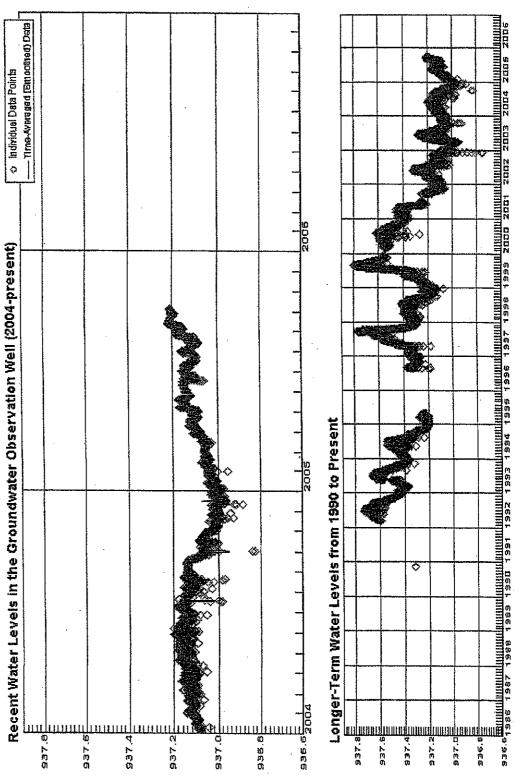


3-2622-E Sylvan Lake, 15-9-39-1-W.5,



Sylvan Lake 2623E (Obs.Well #391) Lat 52' 23' 38.8" N Long: 114' 14' 37.5" W Formation: Bedrock Aquifer: Paskapoo Depth Class: Intermediate

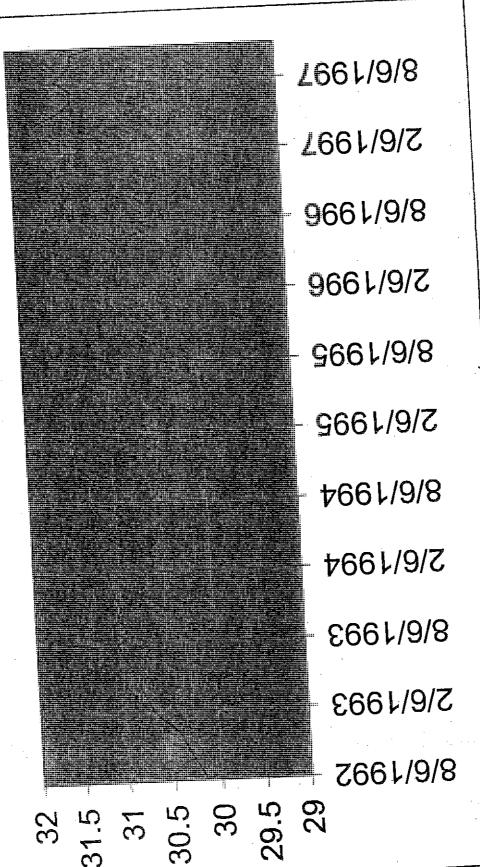




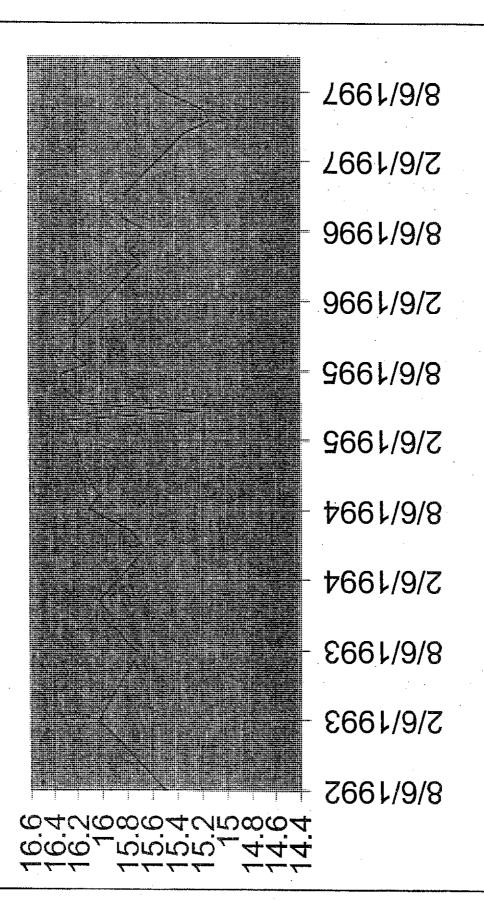
Water Level Elevation in Observation Well (m)

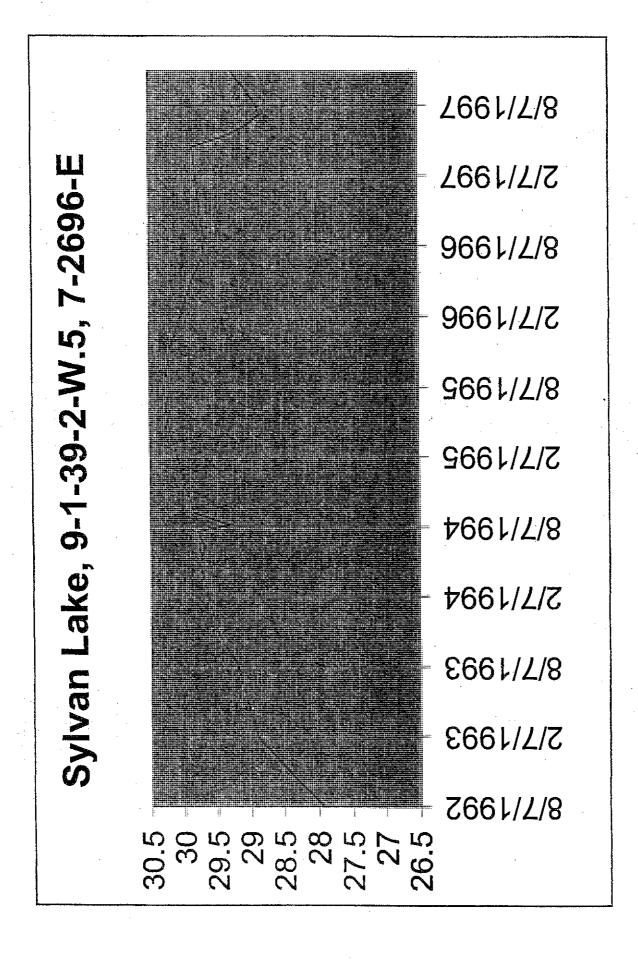
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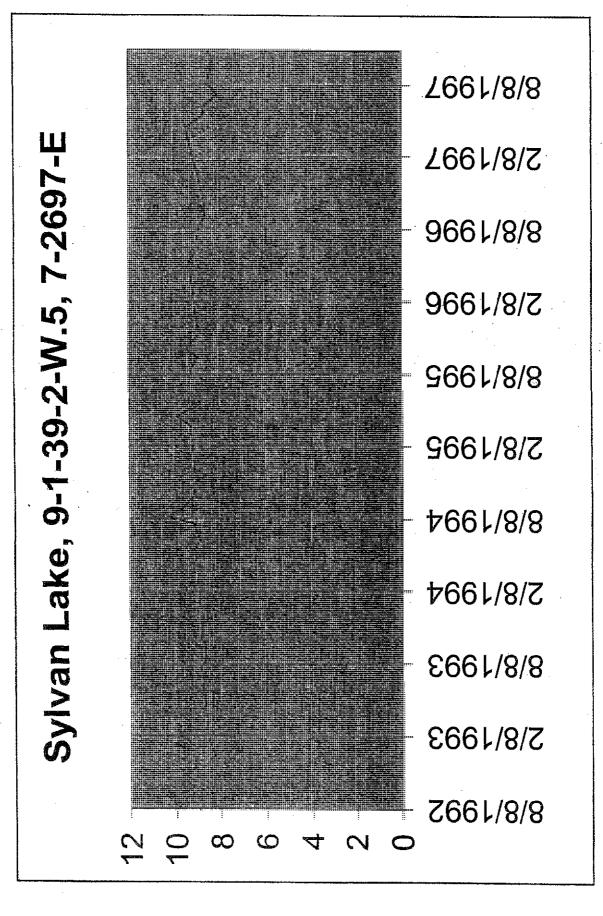
Sylvan Lake, 8-10-39-2-W.5, 6-2693-E



Sylvan Lake, 8-10-39-2-W.5, 6-2694-E







Sylvan Lake, 9-1-39-2-W.5, 7-2698-E

