BY-LAW NUMBER 2003/18

BY-LAW NO. 2003/18 is a by-law of the County of Wetaskiwin No. 10 in the Province of Alberta, to authorize the amendment to an Area Structure Plan; which was adopted by By-law 2001/38; for the purpose of providing a framework for subsequent subdivision and development of the area described as NE & SE 31-46-1-W5M (known as Willow Greens Estates) in accordance with Section 633 of the Municipal Government Act, Chapter M-26.1, Revised Statutes of Alberta 1994, and amendments thereto.

WHEREAS: Section 191 of the Municipal Government Act, 1994, Chapter M-26.1, allows for the amendments of by-laws.

AND WHEREAS: notification and procedural requirements outlined in Section 230 and 606 of the Municipal Government Act, 1994, Chapter M-26.1 have been met.

NOW THEREFORE: the County of Wetaskiwin No. 10, duly assembled, hereby enacts as follows:

1. The attached map showing NW 32-46-1-W5M be added to this By-law as "Appendix A", and becomes part of the *"Willow Greens Estates Structure Plan"*; subject to the following amendments:

   - Drainage will be designed by a professional engineer and storm detention pond(s) would be dedicated in appropriate location upon these plans.
   - The maps in the ASP are to be corrected by including the land between Block 4 Plan 992 6220 and Block 5 Plan 802 0538.
   - The land added is to be designated as municipal reserve on the maps.
   - Within both NE 31 and NW 32, land is to be dedicated as PUL to accommodate fire ponds at locations to be agreed between the fire chief and the developer. This requires a text amendment but not a change to the maps.
   - A 20 metre road right-of-way is to be dedicated from the south cul-de-sac to SW 32, on the understanding that the developer of NW 32 will not be responsible for construction.
   - The text is to be amended by including a statement that the expansion of lots in Plan 2639 NY is optional at the discretion of those lot owners.
   - The developer is to provide an amended version of the ASP including these changes.
   - Pursuant to Section 190 of the Municipal Government Act, the bylaw adopting the ASP comes into effect on the date on which the County receives an engineer's report which meets the requirements of Section 23 of the Water Act.

Amended by Bylaw 2005/17

2. This by-law comes into effect on the date of third reading.

READ: A First time this 10th day of March A.D., 2003.

READ: A Second time this 10th day of March, A.D., 2003.

READ: A Third time and finally passed this 10th day of February, A.D., 2004.

REEVE

SECRETARY-TREASURER

TABLE OF CONTENTS

APPENDICES

TABLE OF FIGURES

1. Applications and Property Location

The area structure plan (ASP) applies to the remainder of NE 31- 46-1-W5, the northeast portion of SE 31-46-1-W5 and the remainder of NW 32-46-1-W5. The subject properties are located near the southwest shore of Pigeon Lake in the County. An undeveloped government road allowance and an unnamed creek divide the subject properties into two separate blocks of land. The smaller east block abuts the Summer Village of Poplar Bay.

The ASP covers a total of 84.41 ha (208.57 acres) of private land, including 56.81 ha (140.38 acres) in NE 31-46-1-W5, 12.05 ha (29.77 acres) in SE 31-46-1-W5 and 15.55 ha (38.42 acres) in NW 32-46-1-W5.

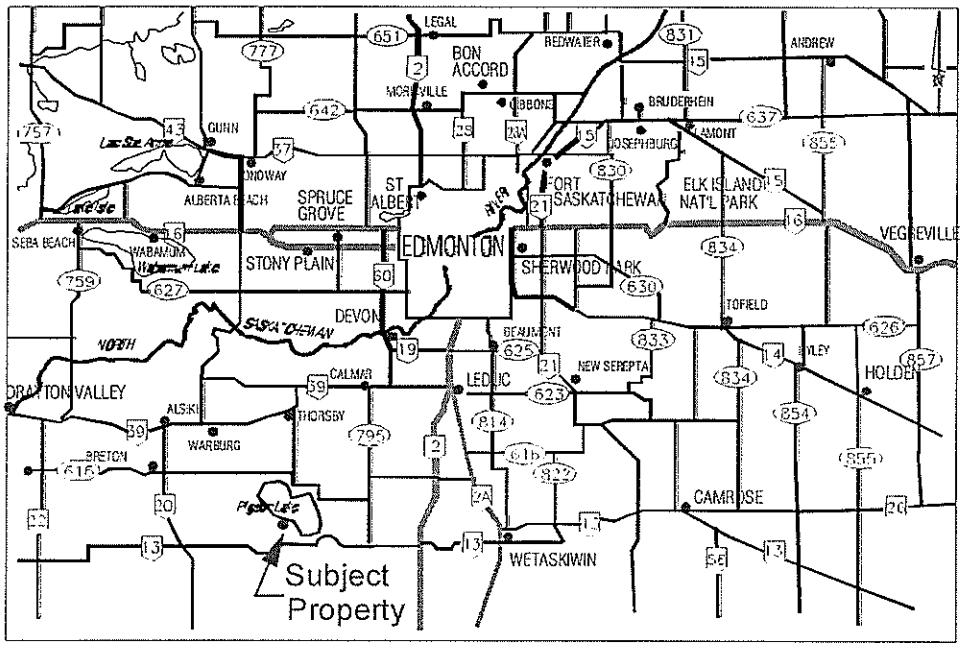


Figure 1 - Location

2. Purpose of Plan

The ASP will guide future development of the subject properties in an orderly and coordinated manner. The ASP contains provisions on environmental protection, land uses, roadways, utilities, development staging and intermunicipal cooperation. Future land use redistricting, subdivision and development decisions should be based on this plan.

3. Compliance with Relevant Legislation

The ASP is prepared in compliance with Section 633 of the Municipal Government Act, the County=s Municipal Development Plan and the Pigeon Lake Watershed Management Plan. The ASP also complies with West Central Planning Agency=s publication - ASubdivision and Development in the Pigeon Lake Drainage Basin: A Developer=s Guide@.

The present zoning on the subject properties is AG-Agricultural District. The proposed development as outlined in this ASP will require redistricting to CR-Country Residential District, RCR-Restricted Country Residential District, RC-Rural Commercial District and/or other suitable districts under the County=s Land Use Bylaw. The land use district regulations will provide more specific and detailed land use and site controls on the subject properties. Land subdivisions will comply with the provisions of this ASP, the Land Use Bylaw and other applicable governmental legislation, policies and standards.

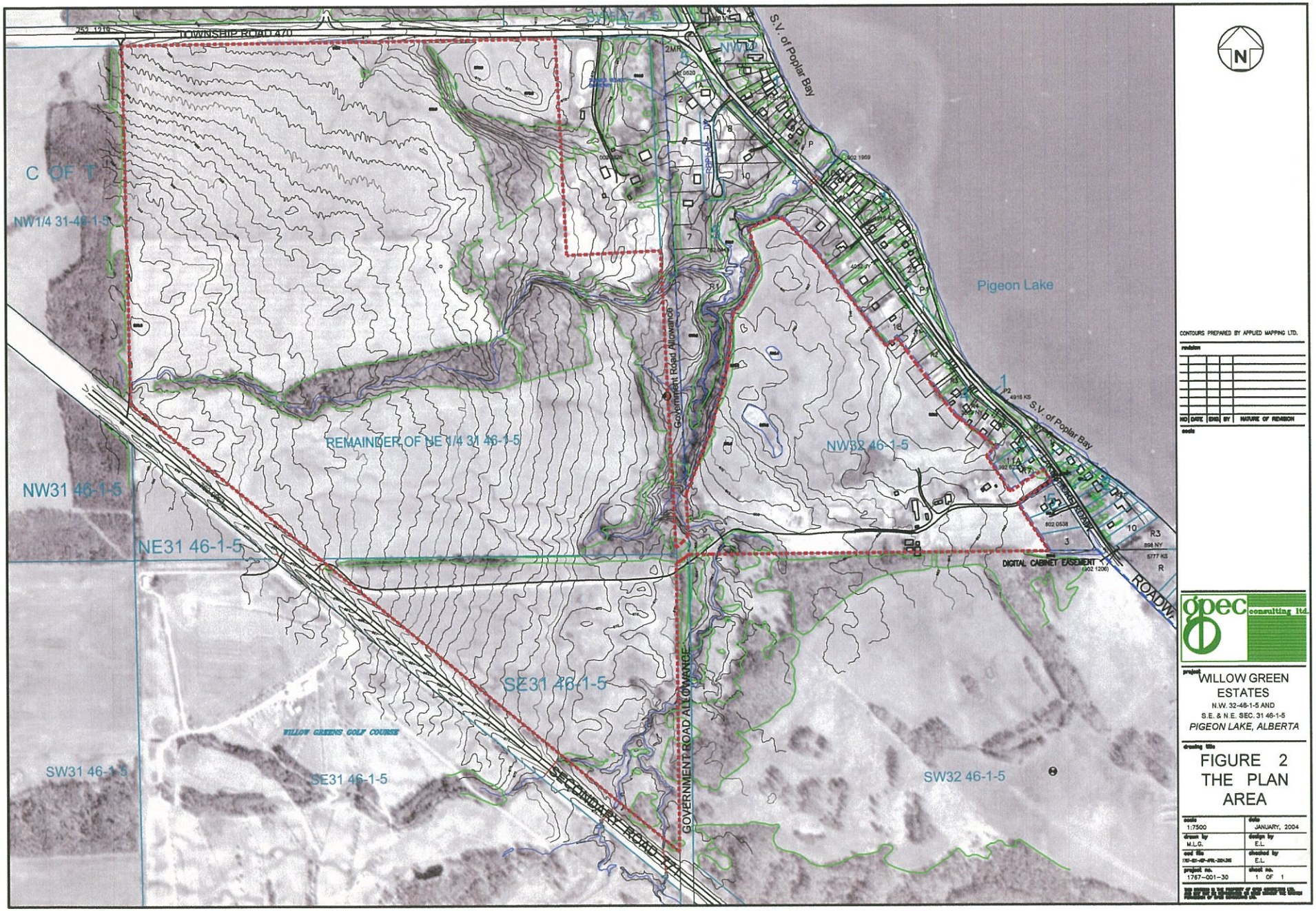
4. Physical and Environmental Features

4.1 Topography and View

The plan area has a gentle 5-9% sloping and hummocky topography in most places. The land slopes from higher elevations in the southwest toward lower elevations near the lakeshore in the northeast. The above sea level elevations of the subject properties range between 898 m (2,946 ft) at the highest point and 860.5 m (2,823 ft) at the lowest point.

Two unnamed creeks meander through the subject properties and a government road allowance. Steep slopes are present along portions of the larger creek. A geotechnical study has not found any slope stability concerns on the subject properties.

The higher grounds of the subject properties enjoy excellent and picturesque views of Pigeon Lake. The ASP is designed to capture this asset as much as possible.


TOWNSHIP ROAD 470
S.V. of Poplar Bay
Pigeon Lake
C OF T
NW1/4 31-46-1-5
REMAINDER OF NE 1/4 31 46-1-5
NW32 46-1-5
NW31 46-1-5
NE31 46-1-5
SE31 46-1-5
SW31 46-1-5
SW32 46-1-5
Government Road Allowance
DIGITAL CABINET EASEMENT
WILLOW GREENS GOLF COURSE
SECONDARY ROAD 771
ROADW
N
CONTOURS PREPARED BY APPLIED MAPPING LTD.
gpec consulting ltd.
project
WILLOW GREEN ESTATES
N.W. 32-46-1-5 AND
S.E. & N.E. SEC. 31 46-1-5
PIGEON LAKE, ALBERTA
drawing title
FIGURE 2
THE PLAN AREA
scale 1:7500
date JANUARY, 2004
drawn by M.L.G.
design by E.L.
checked by E.L.
project no. 1767-001-30
sheet no. 1 OF 1

4.2 Soils

Under the Canada Land Inventory rating system, the subject properties have Class 3 soils, which is medium quality for agricultural purposes.

According to Alberta Soil Survey Report No. 24 for the Buck Lake and Wabamum Lake Areas, the soils of Breton Series (70%) are present on level to gently sloping areas of the subject properties. Stones occur throughout the soil profile. The other soils of minor proportions include Tolman Series (20%), which are moderately drained with medium textured alluvial-lacustrine materials and stone free with undulating to rolling topography, and Modeste Series (10%), which are also well drained with level to hilly topography. The larger unnamed creek contains miscellaneous materials with undifferentiated origins.

4.3 Flood Plain

Alberta Environment has determined the 1:100 year flood elevation of Pigeon Lake at 851.2 m geodetic. The flood elevation is much lower than the subject properties, which are separated from the lake by cottage developments and land subdivisions in the Summer Village of Poplar Bay.

The drainage channels of the unnamed creeks are well defined. A geotechnical study has not found any flood plain concern along these creeks.

4.4 Tree Cover

The subject properties are mostly cleared. However, tree covers are found in the two unnamed creek channels and along creek banks. The predominant tree species are poplar, spruce and some willows.

Tree covers, where they exist, provide interesting landscape features and shelters for wildlife. They also protect the watercourses against erosion. Retention of tree covers would be desirable on the subject properties.

4.5 Fish and Wildlife

Generally, the Provincial Government has no jurisdiction on private lands in terms of protecting and managing wildlife habitats. However, the existing tree covers on the subject properties should be preserved where feasible. It is well known that deer, moose and other wildlife exist in the Pigeon Lake area. The two creeks and their banks could remain as habitats and corridors for wildlife, which moves to and from the Provincial Park to the north and other nearby lands.

The larger creek may also have some importance for fisheries. The ASP is intended to minimize and reduce unnecessary disturbances to the creeks.

4.6 Historical Resources

There are no historical resource concerns on the subject properties.

5. Existing Land Uses, Roadways and Utilities

5.1 Land Uses

At present, the cleared portions of the subject properties are used for agriculture. Pasture and hay production are the main uses in the larger west block. Cattle raising and pastures are present in the smaller east block. Two farm houses, one trailer, cattle corral, barns and sheds are also located on the smaller east block.

Well-established cottages and homes are located immediately east of the subject properties along the lakeshore in the Summer Village of Poplar Bay. A 10 acre parcel in the northeast corner of NE 31-46-1-W5 is used for cattle raising and a home site. The Pigeon Lake Provincial Park is located to the north across Township Road 470. This Park provides summer camping, picnic, playground, trails, concession, boat launch, swimming, shower and toilet facilities. The Willow Greens Golf Course is located to the southwest across Secondary Highway 771. This is a popular 18-hole par 70 golf course. Non-intensive agricultural operations are found in the remaining surrounding areas. There is no oil or gas development in the immediate vicinity of the subject properties.

5.2 Roadways

The subject properties are accessible from Secondary Highway 771, Township Road 470 and the Lake Road. The government road allowance between the east and west blocks most likely will not be developed.

5.3 Utilities

Residents in the general area depend on ground water wells for domestic water supply. For the purposes of the ASP, a geotechnical study completed in November 2003 by Hydrogeological Consultants Ltd. has found that there are ample ground water resources to support the proposed development in compliance with the requirements of Section 23 of the Water Act.

Sewage disposal generally depends on individual on-site systems, such as septic tanks and fields, treatment mounts and holding tanks.

Franchise utilities are available to the subject properties.

6. The Development Plan

6.1 The Planning Objective

The plan is to develop environmentally sensitive recreational/rural acreage subdivisions and convenience commercial services, which are compatible with and complementary to the surrounding land uses and communities.

6.2 Municipal Reserves and Environmental Protection

A reserve along the larger unnamed creek in NW 32-46-1-W5 has already been set aside for open space, nature conservation and environmental protection purposes. Following a detailed and extensive search of historical records, West Central Planning Agency has verified that no additional municipal reserve is due in NW 32-46-1-W5. However, the ASP will add an additional Environmental Reserve/PUL in the southwest corner of the east block.

Both Municipal and Environmental Reserves will be provided in the west block along tops-of-the banks of the unnamed creeks. The Municipal Reserve is provided to serve two purposes: (1) the provision of an adequate land area for a future public park, which will serve the local residents and also complement the operations of the Provincial Park, and (2) a connection with the Environmental Reserves on the two unnamed creeks and the Provincial Park to form a linear open space system and wildlife corridor.

The existing cattle operation in the east block will be discontinued. This will assist in reducing nutrient loading in Pigeon Lake. The existing farmhouses, corral, barns and sheds will also be removed.

6.3 Land Uses and Amenities

Approximately 91 recreational/rural acreage lots are included in the plan. These acreage lots vary in size, ranging between 0.4 ha (1 acre) and 1.57 ha (3.88 acres). Assuming an average household size at 3.2 persons per lot, the development may result in a population of 291 people. However, due to the nature of the proposed development, the actual population may fluctuate seasonally. The number of permanent residents should be less than the projected 291 people.

Two commercial lots are included in the ASP. One commercial lot is located at the entrance road opposite to the Willow Greens Golf Course access and the other lot is at the entrance road opposite the access road into the Provincial Park. These lots are intended to accommodate neighbourhood convenience commercial services to meet the needs of local residents and visitors to the area.

The Municipal and Environmental Reserves will also serve as recreational and open space amenities for the local residents.

In the east block, provisions are made in the ASP for 3-4 cottage lots in the Summer Village of Poplar Bay to expand their back yards. This is desirable to create larger home sites in the Summer Village and this type of planning will be a good example of inter-municipal cooperation. However, expansion of these lots in Plan 2639NY is optional at the discretion of these lot owners.

Development of the subject properties as planned will be mutually complementary with Willow Greens Golf Course, the Provincial Park and the Summer Village of Poplar Bay. The development of convenience commercial services and the Municipal Reserve will benefit the general area. The sizes of the proposed residential lots will also be compatible with neighbouring land uses.

6.4 Roadways

The internal roadway design is intended to discourage through traffic, yet still allows dual accesses to the larger west block to ensure traffic safety. The east block will have a single access, which is acceptable due to the smaller number of lots served. In addition, the use of cul-de-sacs will minimize traffic volumes and promote safety and privacy, thus a higher quality of life for the residents. A 20 m road right-of-way will be dedicated from the south cul-de-sac to SW 32-46-1-W5, on the understanding that the developer of NW 32-46-1-W5 will not be responsible for construction.

For the larger west block, the north entrance road from Township Road 470 is directly opposite to the Provincial Park access road. A four-way intersection at this location is preferred for better traffic safety and control. However, it may be desirable to add a left-turning lane on Township Road 470 just west of the Provincial Park entrance road to solve the occasional traffic tie-ups at the Park gate. The south entrance road from Secondary Highway 771 will be directly opposite to a new access to Willow Greens Golf Course. The new intersection on Secondary Highway 771 will be a safer design than the present property accesses to the subject properties, as the visibility of this intersection will be excellent on Secondary Highway 771 from the southeast and improved from the northwest. Three existing property accesses to Secondary Highway 771 will be closed.

The roadway design is intended to prevent through traffic between the Lake Road and Secondary Highway 771 to satisfy a major concern of Alberta Infrastructure. Only a walkway is provided from the east block to the Lake Road. In addition, no roadway connection to SW 32-46-1-W5 is provided as the landowner of this property has no plans to develop her land and is opposed to any roadway connection from NW 32-46-1-W5.

6.4.1 Internal Roadway Standards:

The internal roadways will be rural cross section (Appendix One), constructed to meet the standards and requirements of the County. In general, the roadways will have a minimum right-of-way of 20 m, a gravel road surface of 7.3 m in width, 3:1 side slopes, 3 m wide ditch bottom and 4:1 back slopes.

Each lot will be provided with an approach (Appendix One). The approaches will meet the Rural Standards for Private Approaches requirements of the County. In general, the approaches will have a gravelled 7 m top width, 6 m radius and at right angles to the roadway.

6.4.2 Traffic Generation:

Special design considerations will be required for the intersection of Secondary Highway 771 and the west block access road, located in SE 31- 46-1-W5. It is anticipated that the acreage lots to the south of the smaller creek, designated as Environmental Reserves, and the commercial lot at the south access road will utilize the proposed intersection. Lots to the north of the smaller creek will utilize Township Road 470. Daily Trip Generation is presented in the following table.

Land Use	Assumptions	Area	Lots	Number of Trips
Residential	10 trips per day	-	62	620
Commercial	250 trips per ha	0.93 ha	1	233
Total Daily Trips at Intersection	-	-	-	853

Turning Movement Summary Diagrams were obtained for the intersections of Highway 13 and SH 771, and SH 616 and SH 771, as well as Alberta Secondary Highway Traffic Volume History Report to gage the existing traffic loads on SH 771. This information is summarized below:

Location	AADT From North on 771	AADT From South on 771	Total AADT	Description
13 & 771 W of Westerose	520	320	840	This intersection is south of proposed development.
616 & 771 NW of Pigeon Lake	215	195	410	This intersection is north of proposed development.
E of 999 35-46-2-5			450	This location is north of proposed development
N of 999 35-46-2-5			380	This location is north of proposed development

Based on this information, Figure D 7.4 Traffic Volume Warrant Chart For At-Grade Intersection Treatment on Two-Lane Rural Highways indicates that a Type II intersection treatment will be required. It is assumed that the Willow Greens Golf Course access will be realigned to provide a four-way intersection. If AADT from the golf course access is less than 200 then a Type II b Standard At-Grade Intersection for Two-Lane Highways will be required. If the AADT is greater than 200 a Type II c intersection will be required.

This design is based on "ultimate" conditions, and although the development will be phased over a number of years the intersection should be constructed to the required standard when the internal road network that connects to SH 771 is constructed.

6.5 Utilities

Ground water supply will be used for domestic purposes. All wells will be developed in compliance with Alberta Environment standards. For this purpose, a geological study has been conducted to verify that there are sufficient local ground water sources for the proposed development. (See Appendix Two)

For sewage disposal, the geotechnical report recommended that soil percolation tests be conducted. This should be done as part of the subdivision process. The most suitable sewage disposal methods can be determined following the tests. For the purpose of the ASP, sanitary sewage will be managed by individual on-site systems, such as septic tanks and fields, treatment mounts or holding tanks, all of which must comply with applicable Provincial Private Sewage System Guidelines and the Alberta Plumbing Code Regulation.

Roadside ditches and the two unnamed creeks will facilitate storm water management in the west block. In the east block, roadside ditches and a previously installed culvert will provide storm water management functions. Due to the low-density large acreage development design, no additional storm water management facility is anticipated. However, at the time of subdivision, drainage will be designed by a professional engineer and storm detention pond(s) would be dedicated in appropriate location upon these plans.

Franchise utilities, i.e. power, gas, telephone, will be provided by the respective utility companies at the time of subdivision.

Within both NE 31-46-1-W5 and NW 32-46-1-W5, land is to be dedicated as PUL to accommodate fire ponds at locations to be agreed between the Fire Chief and the developer.

6.6 Development Staging

The three subject land parcels in the ASP belong to two landowners. Therefore, development staging is designed in recognition of this land ownership pattern, as follows:

6.6.1 NE 31-46-1-W5:

Stage One will include the entrance and internal roads, 1 commercial lot, 1 Municipal Reserve lot and 17 residential lots.

Stage Two will include internal road extensions, 14 residential lots and 2 Environmental Reserve lots.

Stage Three will include internal road extensions, 23 residential lots and 1 Environmental Reserve lot.

6.6.2 SE 31-46-1-W5:

This area consisting of 10 residential lots, 1 commercial lot and 1 Environmental Reserve lot will be developed in a single stage.

6.6.3 NW 32-46-1-W5:

Stage One will include the internal road, 15 residential lots and 2 Environmental Reserve lots.

Stage Two will include the remaining 12 lots and internal road extension.

6.7 Plan Statistics

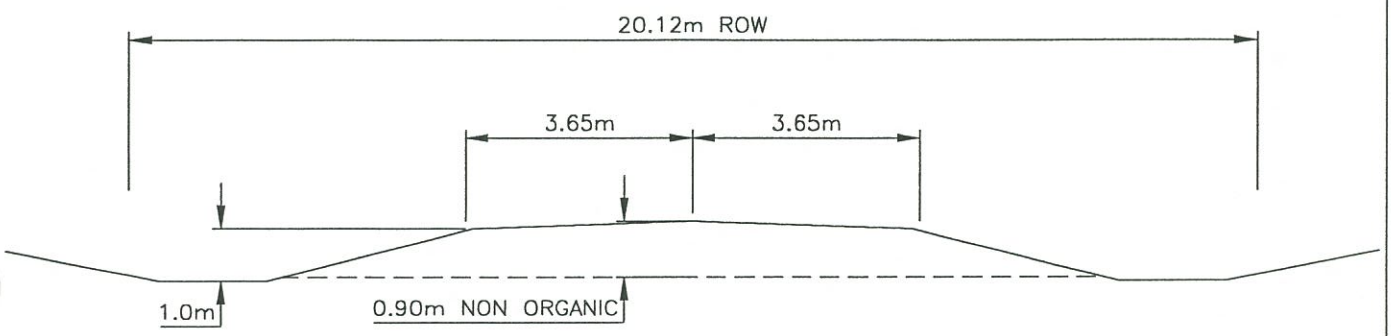
The following table shows a summary of the land use categories of the ASP:

Land Use Category	Area	% of Total
Residential	60.59 ha (149.72 acres)	71.8%
Commercial	2.47 ha (6.10 acres)	2.9%
Municipal Reserve	5.45 ha (13.47 acres)	6.5%
Environmental Reserve/PUL	8.24 ha (20.36 acres)	9.8%
Roads	7.66 ha (18.92 acres)	9.0%
Total	84.41 ha (208.57 acres)	100%

7. Plan Amendment

Future amendments to this ASP may be considered as deemed appropriate by the County.

Appendix One
Roadway Design Standards



RURAL ROAD TYPICAL SECTION

FUNCTION

ROADS CONSTRUCTED TO MEET STANDARD FOR COUNTY TRAFFIC.

RIGHT OF WAY REQUIREMENTS

RIGHT OF WAY 20.12 METRES WITH BACKSLOPING EASEMENT FOR CONSTRUCTION

CROSS SECTION ELEMENTS

FINISHED ROAD TOP 7.3 METRES
GRADE SLOPE 1 METRE VERTICAL @, 3:1
DITCH FLAT BOTTOM @ 3.0m WIDTH
BACKSLOPING MIN. 4:1

GEOMATIC REQUIREMENTS

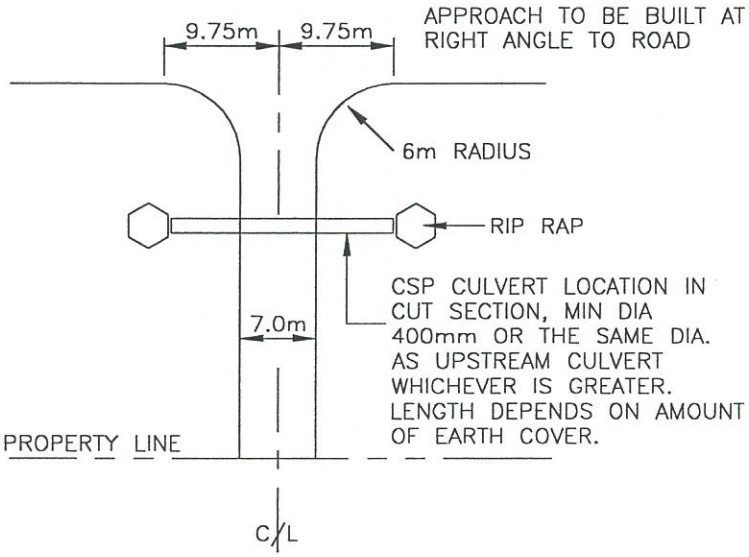
MAX. GRADIENT 6%
MIN CREST VERTICAL CURVATURE – K45
MIN. SAG VERTICAL CURVATURE – K30
MIN. HORZ. CURVATURE – 300 METRE RADIUS
MAX. SUPER ELEVATION 6%
CROWN RATE 3%

STRUCTURAL REQUIREMENTS FOR ROADWAYS AND APPROACHES

SURFACE AGGREGATE	DESIGNATION 4 CLASS 20 MATERIAL, 3/4 INCH CRUSH, AB. INFRASTRUCTURE SPEC., MIN. 100mm DEPTH
GRADE	0.90 METRE MIN. NON ORGANIC MATERIAL WITH 0.20 METRES OF CLAY CAP.
COMPACTION	UPPER 0.30 METRE 100% S.P.D. BELOW 0.30 METRE 98% S.P.D.
MOISTURE CONTENT	OPTIMUM MOISTURE CONTENT

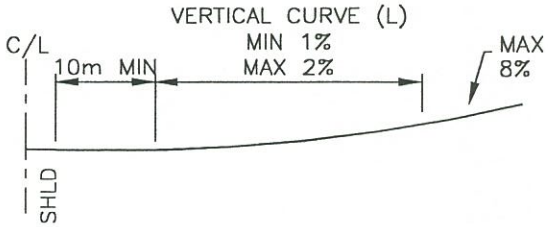
gpec consulting ltd.

COUNTY OF WETASKIWIN NO. 10
LOCAL ROADS - RURAL STANDARD
AVERAGE TO LIGHT TRAFFIC VOLUMES

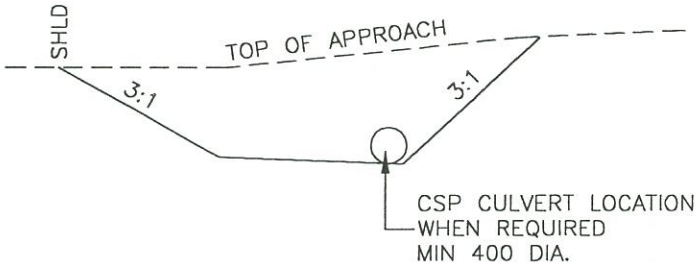


PLAN - PRIVATE APPROACH

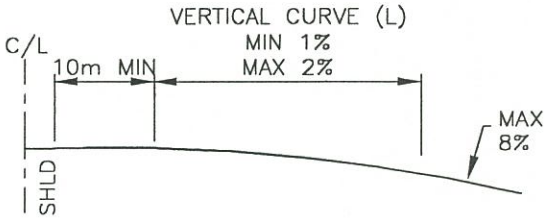
MIN. CURVE LENGTH OF VERTICAL CURVE		
ALGEBRAIC DIFFERENCE IN GRADIENT (%)	LENGTH L (METRES)	
	CREST	SAG
1	6	7.5
2	12	15
3	18	23
4	25	30
5	30	36
6	37	46
7		46
8		46
9		46



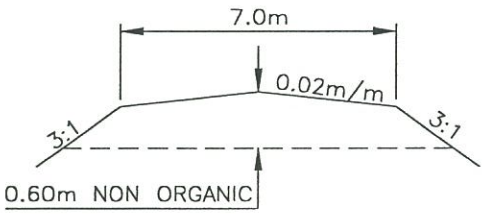
PROFILE - PRIVATE APPROACH IN CUT



DETAIL OF DITCH AND CULVERT LOCATION



PROFILE - PRIVATE APPROACH IN FILL



MIN. PRIVATE APPROACH CROSS SECTION

NOTES:
ALL ENTRANCES ARE TO BE FROM THE INTERNAL ROAD SYSTEM AND ARE TO PROVIDE REASONABLE ACCESS TO THE LOTS, EACH LOT IS TO HAVE A PRIVATE APPROACH.
GRAVEL MUST BE 3/4 INCH CRUSH, DESIGNATION 4, CLASS 20, AB. INFRASTRUCTURE SPEC. AND HAVE A MIN. DEPTH OF 4 INCHES (100mm) COMPACTION
UPPER 0.30m 100% S.P.D.
BELOW 0.30m 98% S.P.D.

COUNTY OF WETASKIWIN NO. 10
PRIVATE APPROACH RURAL STANDARD

gpec consulting ltd.

Appendix Two
Geotechnical Evaluation Report

THURBER ENVIRONMENTAL CONSULTANTS LTD.

Suite 200, 9636 - 51st Avenue
EDMONTON, Alberta T6E 6A5
Phone (780) 438-1684
Fax (780) 437-7125

THURBER

March 28, 2001 File: 19-865-20

GPEC Consulting Ltd.
#202, 9808 - 42 Avenue
Edmonton, Alberta
T6E 5V5

Attention: Mr. R. Dacyk, RET

STAGE 1: GENERAL EVALUATION
NE 31-46-1-W5, SE 31-46-1-5 AND NW 32-46-1-W5M
PIGEON LAKE AREA, ALBERTA

Dear Sir:

This letter report presents Thurber Environmental Consultants Ltd. (Thurber) desk top study (Stage 1: General Evaluation) related to hydrogeological and geotechnical parameters for the above noted proposed development area.

1. OBJECTIVE AND SCOPE OF WORK

It is understood that a new development is being proposed along the western shore of Pigeon Lake. The objective of this desk top study was to provide various geotechnical and hydrogeological parameters for the area structure plan. To meet this objective the program has been divided into three stages. The first stage, as outlined in Thurber's January 12, 2001 letter, comprises of the following assessment activities;

- Evaluate groundwater quantity in relation to the proposed development;
- Recharge/discharge areas;
- Soil percolation rates;
- Slope stability; and
- Potential flooding and erosion concerns.

The groundwater study included a review of groundwater data from Alberta Environment's (AENV) water well data base, review of hydrogeological reports and preparation of a cross-section.

2. GROUNDWATER EVALUATION

Based the review of groundwater data presented in this section, there should be adequate groundwater for the proposed new development area at depths of 25 to 40 metres in quantities ranging from 0.4 to 1.9 L/s and possibly more. Confirmation of these quantities can only be provided upon carrying out an aquifer test (Stage 2).

2.1 AENV Water Well Data Base

A search of AENV water well data base was conducted in an area covering approximately 5 km by 5 Km (3 x 3 miles) centred on section 31-46-1-W5M. There were 190 wells in AENV's data base within this area. In general, the wells have been installed to depths that range from 9.8 m to 305 m, however, the majority of the wells were installed at depths between 20 to 40 m and within the shallow bedrock.

In section 31-46-1-W5M there are 10 well records ranging in depth from 13 to 64 m with the average depth being 45 m. In section 32-46-1-W5M there are 89 well records ranging in depth from 13 m to 49 m with the majority of them being completed at depths ranging from 15 to 35 metres.

The AENV data base did not contain chemical analyses for wells located in section 31 and there were only 15 wells in section 32. Thurber was therefore not able to comment on groundwater chemistry in section 31. The review of groundwater chemical analyses in section 3.2 generally indicate the following:

- Overall the groundwater quality is good with Total Dissolved Solids (TDS) concentrations that are below the 1998, Health Canada, Canadian Drinking Water Quality Guidelines (CDWQ) for TDS of <500 mg/L;

- Iron concentrations range from <0.05 to 2.6 mg/L with an average concentration which is higher than the CDWQ guideline for iron of 0.3 mg/L. This indicates that a form of groundwater treatment may be required to lower iron concentrations in the water supply; and,

- Sodium concentrations range from 20 to 295 mg/L. However the majority of the analyses indicate that the sodium concentrations are below the CDWQ for sodium of 200 mg/L.

The Apparent Twenty Year Safe Yield (Q_{20}) reported on the water well reports in NW 1/4 of section 32 ranges from 7.4 to 1893.8 m^3/day (0.086 L/s to 22 L/s) within approximately 50 metres from the ground surface. This Q_{20} range are in majority for bedrock sediments either at shallow depths (within the first 20 metres) or within a 35 to 50 metre depth interval. There are no Q_{20} values available in AENV's data base for

the NE and SE 1/4 of Section 31. This data suggest a great variability in the amount of groundwater that is available in the area and that the average Q_{20} is in the order of 98 m^3/day (1.1 L/s).

2.2 Geology and Hydrogeology

Geological and hydrogeological reports (Ozoray,1972[1], Shetsen,1990[2], Tokarsky, 1971[3]) were reviewed for the Pigeon lake area. These reports indicate that the area is underlain by surficial sediments in the order of 10 to 15 m thick consisting of glacial till containing minor amounts of water-sorted material (gravel and sand). Below the surficial sediments is the bedrock Paskapoo Formation of Tertiary Age. In this area the Paskapoo Formation can be up to 360 m thick. The Paskapoo Formation is made up of often-soft medium-grained sandstone, shale and coal. The Paskapoo Formation is underlain by the Upper Cretaceous Horseshoe Canyon Formation which is made up of bentonitic shale and sandstone with some coal seams.

All these sediments' groundwater potential are discussed in the above mentioned reports and can be summarized as follows:

A hydrogeological cross section (A-A') was prepared (Drawings 19-865-20-1 and -2) using information from water wells located through and outside of the proposed development area. Drawing 19-325-20-1 shows selected water wells in the development area whose logs and completion details are located in Appendix A.

The Cross-Section depicts the geology and some of the hydrogeological characteristics of the development area. The main aquifers are indicated by the presence of a completed interval (slotted casing or screen). The cross-section exemplifies the fact that little groundwater is available in the surficial sediments above the bedrock and that groundwater bearing intervals are found in the shallow bedrock.

3. DRAINAGE

Stereo aerial photographs were reviewed to evaluate the existing surface water drainage network of the proposed development area. The development area is in a recharge area. The locations and directions of existing drainage ways have been

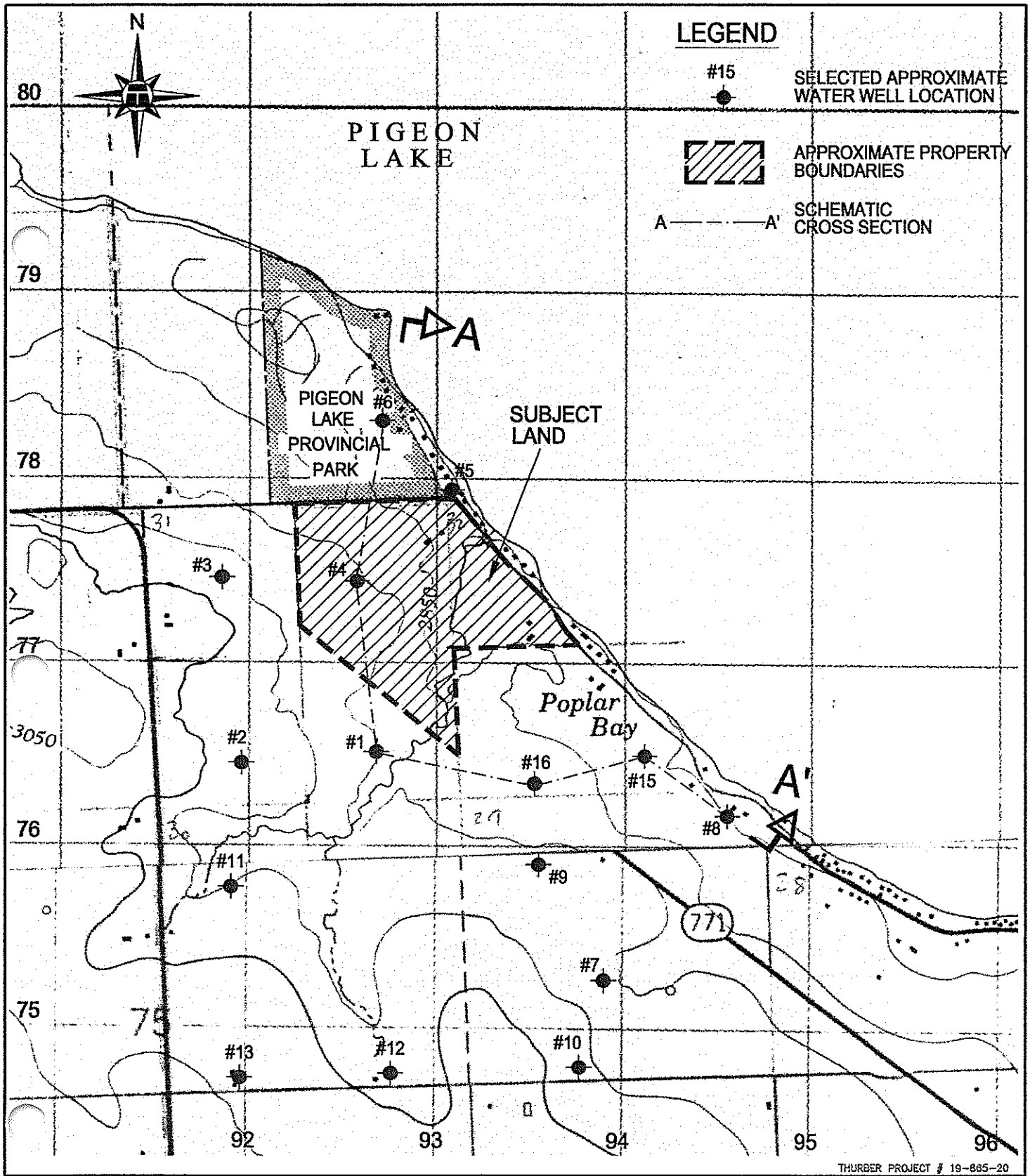
---

1 G. Ozoray, 1972, Hydrogeology of the Wabamun Lake Area, Alberta, Alberta Research Council Report 72-8.

2 I. Shetsen, 1990, Quaternary Geology, Central Alberta, Alberta Research Council, Natural Resources Department, Terrain Sciences Department.

3 O. Tokarsky, 1971, Hydrogeology of the Rocky Mountain House Area, Alberta. Alberta Research Council, Report 71-3.

Continued....

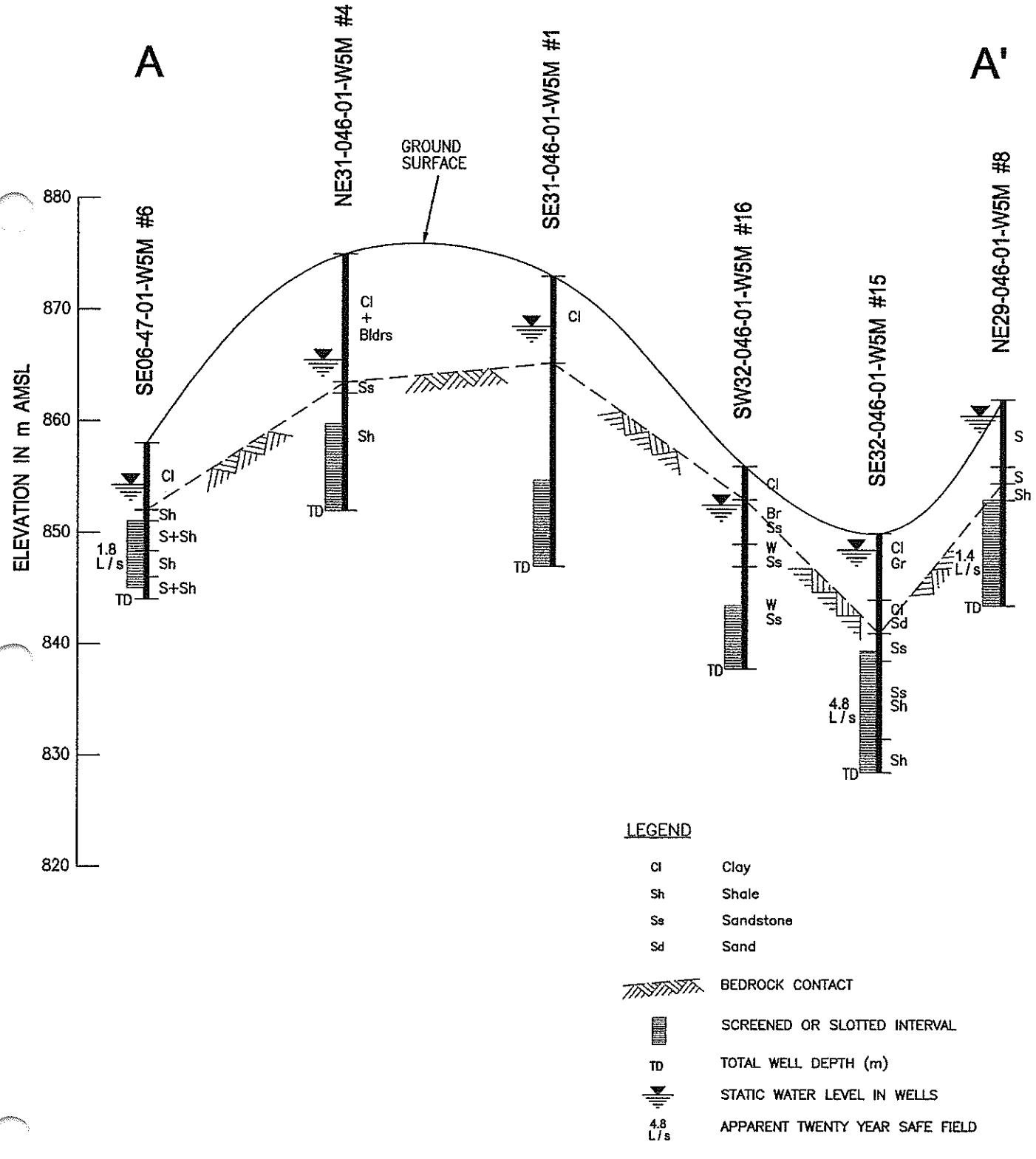


THURBER PROJECT # 19-865-20

ENGINEER	DMB	GPEC CONSULTING
DRAWN	MNG	
DATE	FEB. 2001	PROPERTY AND CROSS SECTION LOCATIONS
APPROVED		
SCALE	N.T.S.	GROUND WATER SUPPLY EVALUATION — PIGEON LAKE, AB

THURBER

DRAWING No. 19 - 865 - 20 - 1



THURBER PROJECT # 19-865-20

ENGINEER	DMB	GPEC CONSULTING	THURBER
DRAWN	MNG		
DATE	FEB. 2001	# SCHEMATIC CROSS SECTION A-A'	
APPROVED			DRAWING No.
SCALE	1:500	GROUND WATER SUPPLY EVALUATION — PIGEON LAKE, AB	19 - 865 - 20 - 2

indicated in "green" on Drawing 19-865-20-3. The main drainage way of the area is through Creek No. 1 which crosses the proposed development area from south to north nearly through the centre of the development and Creek No. 2 which provides drainage for the northwestern quarter of the development. Creek No. 2 joins Creek No. 1 outside of the development area south of the Summer Village.

4. FLOODING POTENTIAL & EROSION CONCERNS

Flooding potential was undertaken by Northwest Hydraulic Consultants[4] (Northwest). Their report is located in Appendix B. The water shed characteristics of the development area indicate that the small creek (Creek No. 1) and Pigeon Lake will have the most effect on flood potential. Based on the two largest rainfall events from a gauge near the mouth of Strawberry Creek (located to the north of the Pigeon Lake) area in 1967 and 1999 a runoff in the order of 50 mm is expected to occur over a four to five day period. The 100 year flood peak for Creek No. 1 that empties into Pigeon Lake would be in the order of 3.4 m^3 /s.

Northwest's report also indicates that information that could be obtained from locals in the area regarding high water marks, whether the road has ever been over topped and backwater conditions of Pigeon Lake would be of further use in assessing expected flows through the development area.

Erosion potential in the area would be strongest along the steeper slopes of Creek No.1. The erosion potential will be a function of slopes, vegetal cover and paved areas but also of the drainage system that will be built in the development area.

5. SLOPE STABILITY

Stereo aerial photographs at a scale of 1:30,000 of the proposed development area were reviewed and did not reveal the existence of slope instability over the development area.

6. SOIL PERCOLATION RATES

The development area is underlain by glacial till which is composed in majority of clay with some coarser fractions such as sand and some gravel. Based on a review of the Alberta Private Sewage Systems[5], 1999 this material corresponds to a clay loam to a sandy clay and as such the soils should be tested for percolation rates.

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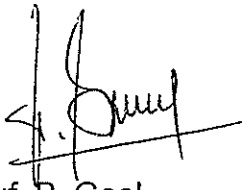
4 Northwest Hydraulic Consultants, March 26, 2001, Proposed Development Area at Pigeon Lake, AB, Hydrologic Overview .

5 Alberta Private Sewage Systems, Standard of Practice, 1999, Handbook, Alberta Municipal Affairs.

7. CLOSURE

We trust this information meets your present needs. If you have any questions please do not hesitate to call the undersigned.

Yours very truly,
Thurber Environmental Consultants Ltd.
N. Fernuik, P. Biol., P. Eng.
Review Principal



D. Borneuf, P. Geol.
Senior Hydrogeologist

STATEMENT OF GENERAL CONDITIONS

1. STANDARD OF CARE

This study and Report have been prepared in accordance with generally accepted engineering or environmental consulting practices in this area. No other warranty, expressed or implied, is made.

COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report which is of a summary nature and is not intended to stand alone without reference to the instructions given to us by the Client, communications between us and the Client, and to any other reports, writings, proposals or documents prepared by us for the Client relative to the specific site described herein, all of which constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. WE CANNOT BE RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purpose that were described to us by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the document are only valid to the extent that there has been no material alteration to or variation from any of the said descriptions provided to us unless we are specifically requested by the Client to review and revise the Report in light of such alteration or variation.

USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT OUR WRITTEN CONSENT. WE WILL CONSENT TO ANY REASONABLE REQUEST BY THE CLIENT TO APPROVE THE USE OF THIS REPORT BY OTHER PARTIES AS "APPROVED USERS". The contents of the Report remain our copyright property and we authorize only the Client and Approved Users to make copies of the Report only in such quantities as are reasonably necessary for the use of the Report by those parties. The Client and Approved Users may not give, lend, sell, or otherwise make the Report, or any portion thereof, available to any party without our written permission. Any use which a third party makes of the Report, or any portion of the Report, are the sole responsibility of such third parties. We accept no responsibility for damages suffered by any third party resulting from unauthorized use of the Report.

5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgemental in nature and even comprehensive sampling and testing programs, implemented with the appropriate equipment by experienced personnel, may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and all persons making use of such documents or records should be aware of, and accept, this risk. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. Where special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

(see over...)

APPENDIX A

Water Well Data

#1

SE 31-046-01 W5M

Owner: *Porter, B*
11607 37th Avenue, Edmonton, Alberta T6S 0J1
Contractor: *Rondal WW Drilling*

Easting (m): *58,492*** 70/80
Northing (m): *5,870,838***
Elevation (m): *873****

M36234.927455

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*

Date Started: *18 Aug 1981*
Date Completed: *18 Aug 1981*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462985*

General Details

Drilled Depth (m): *25.9* Top of Bedrock: *17.7 m **
Completed Depth (m): *25.9* Completion Interval: *19.2 m - 25.9 m **

Seal Details: *Driven — (0.0 m to 19.2 m)*

Casing /Liner Details

Type: *Steel — 114.3 mm (O.D.)* Bottom (m): *19.2*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
7.9	865.0	Clay
9.8	863.1	Blue Shale
11.3	861.6	Clay
11.9	861.0	Green Shale
17.7	855.2	Clay
20.1	852.8	Green Shale
25.9	847.0	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	18 Aug 81	11:00	Bailer			22.7	4.27	1.2	5.5						‡

‡ test data available at additional cost.
** denotes a MOW-TECH LTD. calculated or determined value.*
*** '70' - MT Calculated — (10TM NAD27)*
**** '80' - MT DEM — (Ground ; AMSL)*
¤ - more than one approval on file.

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#2

SW 31-046-01 W5M

Owner: *Murphy, Craig*
Westerose, Alberta T0C 2V0
Contractor: *Fraser, Ron - (3432)*

Easting (m): *57,678* ** 70/80
Northing (m): *5,870,830* **
Elevation (m): *897* ***

M36234.928263

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Perforated Casing/Liner*
Proposed Use: *Domestic*
Date Started: *07 Jun 1997*
Date Completed: *07 Jun 1997*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *467608*

General Details

Drilled Depth (m): *64.0*
Completed Depth (m): *64.0*
Top of Bedrock: *3.0 m* ¤
Completion Interval: *54.9 m - 64.0 m* ¤

Preforation Method: *Saw*
Seal Details: *Shale Trap & Bentonite — (0.0 m to 51.8 m)*

Casing /Liner Details

Perforation Details

Type: *Plastic — 127.0 mm (O.D.) 6.60 mm (thick)*
Interval from (m): *54.9* to (m): *64.0* Size (mm): *6.35 x 152.40*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.1	894.4	Clay
18.9	878.6	Sandstone
25.9	871.5	Grey Shale
29.6	867.9	Sandstone
30.2	867.3	Hard Sandstone
32.9	864.5	Sandy Shale
40.2	857.2	Shale
40.5	856.9	Sandy Shale
44.8	852.7	Shale
45.1	852.3	Sandstone
50.3	847.2	Sandy Shale
60.0	837.4	Shale
60.7	836.8	Hard Sandstone
64.0	833.5	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Driller reports distance from Top of Casing (TOC) to ground level: 20".

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	07 Jun 97	11:00	Bailer & Pump	120.0	120.0	22.7	46.94	9.8	56.7	61.0	11.5		4		‡

5 lpm.

0.1134/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

#13

NW 31-046-01 W5M

Owner: *Patterson R.B.*
RR 1, Westerose, Alberta T0C 2V0
Contractor: *Johnson, Glen*

Easting (m): *57,671*** *70/80*
Northing (m): *5,871,615***
Elevation (m): *897****

M35379.059372

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Open Hole*
Proposed Use: *Domestic*
Date Completed: *25 Jul 1964*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *357799*

General Details

Drilled Depth (m): *67.1* Top of Bedrock: *2.4 m* *
Completed Depth (m): *67.1* Completion Interval: *38.4 m - 67.1 m* *
Completion Aquifer: *Lower Lacombe* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
2.4	894.1	Clay
36.6	860.0	Sandstone
67.1	829.5	Shale

Casing /Liner Details

Type: *<unknown> — 114.3 mm (O.D.)* Bottom (m): *38.4*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	25 Jul 64	11:00	Bailer			18.2	48.77	2.4	51.2				13		‡

‡ *test data available at additional cost.*
* *denotes a MOW-TECH LTD. calculated or determined value.*
** *'70' - MT Calculated — (10TM NAD27)*
*** *'80' - MT DEM — (Ground ; AMSL)*
□ *- more than one approval on file.*

www.mowtech.com — 1.800.661.6061

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

#4

NE 31-046-01 W5M

Owner: *Johnson, O*
Pigeon Lake, Alberta
Contractor: *Hostyn Drilling Co. Ltd.*

Easting (m): *58,481* ** 70/80
Northing (m): *5,871,627* **
Elevation (m): *875* ***

M36234.927456

Type of Work: *New Well*
Drilling Method: *Drilled*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *14 Sep 1967*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462986*

General Details

Drilled Depth (m): *22.9*
Completed Depth (m): *22.9*
Top of Bedrock: *10.7 m* *
Completion Interval: *15.2 m - 22.9 m* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
10.7	863.9	Sandy Clay & Boulders
11.6	862.9	Water Bearing Sand & Sandstone
18.3	856.2	Shale
22.9	851.7	Shale

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *15.2*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective	
1	14 Sep 67	11:00	Bailer			13.6	9.75	5.5	15.2							‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
□ - more than one approval on file.

Q20 5.9 m³/d
573 L/s

#5

SW 05-047-01 W5M

M35379.047890

Owner: *Rasch, Fred*
RR 1, Thorsby, Alberta
Contractor: *Bob's Drilling & Backhoe Service - (3448AD)*

Easting (m): *59,212*** 70/80
Northing (m): *5,872,448***
Elevation (m): *848****

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Stock*
Date Started: *06 May 1986*
Date Completed: *06 May 1986*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *448591*

General Details

Drilled Depth (m): *61.0* Top of Bedrock: *9.1 m* *
Completed Depth (m): *61.0* Completion Interval: *19.2 m - 61.0 m* *
Completion Aquifer: *Bedrock* *
Sand & Gravel Thickness: *0.6 m (total) — 0.6 m (below 15 m)* *

Casing /Liner Details

Type: *Steel — 114.3 mm (O.D.) x 3.580 mm (thick)* Bottom (m): *19.2*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
4.6	843.4	Brown Clay
9.1	838.9	Blue Clay
19.8	828.2	Shale
26.2	821.8	Soft Sandstone
26.8	821.2	Coal
38.4	809.6	Shale
44.2	803.8	Soft Sandstone
53.6	794.4	Shale
54.3	793.8	Sand & Sandstone
56.1	791.9	Shale
56.7	791.3	Coal
61.0	787.0	Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	06 May 86	11:00	Bailer			18.2	9.14	1.2		11.6	108.0		28		‡

1.25 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

#6

SE 06-047-01 W5M

Owner: *Hooper, G*
Alberta
Contractor: *Fraser, Ron*

Easting (m): *58,394* ** *70/80*
Northing (m): *5,872,433* **
Elevation (m): *858* ***

M35379.047899

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *01 May 1970*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *448600*

General Details

Drilled Depth (m): *13.7* Top of Bedrock: *6.1 m* °
Completed Depth (m): *13.7* Completion Interval: *7.0 m - 13.7 m* °
Completion Aquifer: *Lower Lacombe* °

Casing/Liner Details

Type: *Galvanized Steel — 107.9 mm (O.D.)* Bottom (m): *7.0*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
6.1	851.4	Clay
7.3	850.2	Shale
9.8	847.8	Water Bearing <see comments> Sand & Shale
11.6	845.9	Grey Shale
13.7	843.8	Water Bearing <see comments> Sand & Shale

Chemistry Details (mg/L) - Summary

General Comments

Driller Reports Med Hard Water. Od's Are Id's. 24'-32', 3 Gpm. 38'-45', 12 Gpm. ///

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	01 May 70	11:00	Pump	120.0	3.0	54.5	4.27	0.6			156.3		151		‡

1.8 L/1

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — {10TM NAD27}
*** '80' - MT DEM — {Ground ; AMSL}
o - more than one approval on file.

#7

06-29-046-01 W5M

Owner: *Suncor Energy Inc.*
Alberta
Contractor: *Aiken Basin Drilling Ltd*
Well Name: *Standby Well No. 1*

Easting (m): *59,525*** 70/80
Northing (m): *5,869,439***
Elevation (m): *888****

M36234.927432

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Industrial*

Date Started: *03 Sep 1984*
Date Completed: *03 Sep 1984*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462962*

General Details

Drilled Depth (m): *24.4*
Completed Depth (m): *24.4*
Top of Bedrock: *7.6 m* *
Completion Interval: *12.2 m - 24.4 m* *

Seal Details: *Driven & Formation Packer — (0.0 m to 12.2 m)*

Casing /Liner Details

Type: *Steel — 114.3 mm (O.D.) x 3.580 mm (thick)* Bottom (m): *12.2*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
4.6	883.9	Clay & Sand
7.6	880.9	Clay
12.2	876.3	Shale
24.4	864.1	Water Bearing Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	03 Sep 84	11:00	Pump			136.4	6.10								‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
D - more than one approval on file.

#8

NE 29-046-01 W5M

Owner: *Boer, John W.*
10612 30 St, Edmonton, Alberta
Contractor: *Vino's Water Well Drilling - (7989)*

Easting (m): *60,125*** 70/80
Northing (m): *5,870,056***
Elevation (m): *862****

M35379.061390

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Open Hole*
Proposed Use: *Domestic*
Date Started: *06 Aug 1991*
Date Completed: *07 Aug 1991*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *359851*
Lot: *6*
Block: *2*
Plan: *3883MC*

General Details

Drilled Depth (m): *18.3* Top of Bedrock: *Surficial Water Well ¤*
Completed Depth (m): *18.3* Completion Interval: *9.1 m - 18.3 m **
Completion Aquifer: *Lower Lacombe ¤*

Casing /Liner Details

Type: *Plastic — 127.0 mm (O.D.) x 12.700 mm (thick)* Bottom (m): *9.1*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
6.1	855.7	Fine Grained Sand
7.6	854.1	Coarse Grained Sand
9.1	852.6	Blue Shale
18.3	843.5	Water Bearing Sand

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	07 Aug 91	11:00	Bailer			68.2	1.83	3.0	4.9	7.6	119.3		43		‡

1.4 L/s

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‡ test data available at additional cost.
** denotes a MOW-TECH LTD. calculated or determined value.*
*** '70' - MT Calculated — (10TM NAD27)*
**** '80' - MT DEM — (Ground ; AMSL)*
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

#9

NW 29-046-01 W5M

Owner: *Primus, C.*
Edmonton, Alberta
Contractor: *Fraser, Ron*

Easting (m): *59,314* ** 70/80
Northing (m): *5,870,047* **
Elevation (m): *887* ***

M36234.927434

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *01 Aug 1971*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462964*

General Details

Drilled Depth (m): *25.9*
Completed Depth (m): *25.9*
Top of Bedrock: *10.7 m* *
Completion Interval: *11.6 m - 25.9 m* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
10.7	876.4	Clay
23.8	863.3	Shale
24.4	862.6	Sandstone
25.9	861.1	Water Bearing Sand & Shale

Casing / Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *11.6*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

Alberta Environment (AENV) (ID: 4840)

Sample: Date: *01 Jun 1974*
Analysis: Date: *25 Jun 1974*

Temperature (°C):	Calcium: *66*	Iron: *0.4*
Conductivity (µS/cm): *700*	Magnesium: *33*	Manganese:
TDS: *329*	Sodium: *20*	Nitrite:
pH (pH Unit): *8.3*	Potassium: *2.3*	Nitrate:
Total Hardness: *301*	Carbonate:	Aluminum
T-Alkalinity: *319*	Bicarbonate: *390*	Silica [SiO2]:
P-Alkalinity:	Sulfate: *11*	Phosphate:
Nitrate & Nitrite as N: *< 0.099*	Chloride: *< 1*	Lead:
Total Coliforms:	Fluoride: *0.15*	Cadmium:
Fecal Coliforms:	Hydroxide:	Oil & Grease:
Ion Balance: *105*		

Comments:

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m²/day)* Apparent	Q20 (m²/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	01 Aug 71	11:00	Pump			45.5	15.85		15.9						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

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#10

SW 29-046-01 W5M

Owner: *Bailey, D*
Westerose, Alberta
Contractor: *Double H Drilling*

Easting (m): *59,325*** 70/80
Northing (m): *5,869,233***
Elevation (m): *899****

M36234.927430

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Stock*

Date Started: *29 Mar 1977*
Date Completed: *29 Mar 1977*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462960*

General Details

Drilled Depth (m): *24.4*
Completed Depth (m): *24.4*
Top of Bedrock: *3.7 m* *
Completion Interval: *22.9 m - 24.4 m* *

Seal Details: *<unknown> — (0.0 m to 22.9 m)*

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *22.9*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.7	895.1	Clay
20.7	878.1	Sandstone
21.9	876.8	Shale
24.4	874.4	Sandy Shale

Chemistry Details (mg/L) - Summary

Alberta Environment (AENV) (ID: 10330)

Sample: Date: *20 Sep 1977*
Analysis: Date: *05 Oct 1977*

Temperature (°C):	Calcium: *55*	Iron: *0.18*
Conductivity (µS/cm): *720*	Magnesium: *45*	Manganese:
TDS: *401*	Sodium: *45*	Nitrite:
pH (pH Unit): *8.1*	Potassium: *2.2*	Nitrate:
Total Hardness: *323*	Carbonate:	Aluminum
T-Alkalinity: *388*	Bicarbonate: *473*	Silica [SiO2]: *12.6*
P-Alkalinity:	Sulfate: *20*	Phosphate:
Nitrate & Nitrite as N: *< 0.099*	Chloride: *< 1*	Lead:
Total Coliforms:	Fluoride: *0.13*	Cadmium:
Fecal Coliforms:	Hydroxide:	Oil & Grease:
Ion Balance: *103*		

Comments:

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	29 Mar 77	11:00	Bailer			27.3	17.68	1.2	18.9						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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#11

NW 30-046-01 W5M

Owner: *Moure, W*
Falun, Alberta
Contractor: *Warnke Drilling Ltd.*

Easting (m): *57,689*** *70/80*
Northing (m): *5,870,029***
Elevation (m): *894****

M36234.927452

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Stock*
Date Started: *10 Sep 1981*
Date Completed: *12 Sep 1981*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462982*

General Details

Drilled Depth (m): *36.6*
Completed Depth (m): *36.6*
Top of Bedrock: *10.7 m* ‡
Completion Interval: *27.7 m - 36.6 m* ‡

Casing /Liner Details

Type: *Steel — 141.2 mm (O.D.)*
Bottom (m): *27.7*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
10.7	883.0	Clay
19.8	873.8	Grey Shale
20.7	872.9	Sandy Shale
22.6	871.1	Brown Sandstone
26.8	866.8	Sandy Shale
28.0	865.6	Grey Shale
35.1	858.6	Sandy Shale
36.6	857.1	Grey Shale

Chemistry Details (mg/L) - Summary

Alberta Environment (AENV) (ID: 2077)

Sample: Date: *18 Feb 1985*
Analysis: Date: *14 Mar 1985*

Temperature (°C):	Calcium: *26*	Iron: *0.24*
Conductivity (µS/cm): *668*	Magnesium: *15*	Manganese:
TDS: *380*	Sodium: *103*	Nitrite:
pH (pH Unit): *8.2*	Potassium: *1.9*	Nitrate:
Total Hardness: *127*	Carbonate:	Aluminum
T-Alkalinity: *352*	Bicarbonate: *429*	Silica [SiO2]: *11.8*
P-Alkalinity:	Sulfate: *22*	Phosphate:
Nitrate & Nitrite as N: *< 0.05*	Chloride: *< 1*	Lead:
Total Coliforms:	Fluoride: *0.07*	Cadmium:
Fecal Coliforms:	Hydroxide:	Oil & Grease:
Ion Balance: *0.94*		

Comments:

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	12 Sep 81	11:00	Pump			22.7	23.16	1.2	24.4						‡

‡ *test data available at additional cost.*
* *denotes a MOW-TECH LTD. calculated or determined value.*
** *'70' - MT Calculated — (10TM NAD27)*
*** *'80' - MT DEM — (Ground ; AMSL)*
¤ *- more than one approval on file.*

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#12

SE 30-046-01 W5M

Owner: *Beath, G*
Westerose, Alberta
Contractor: *Johnson, Glen*

Easting (m): *58,513* ** 70/80
Northing (m): *5,869,224* **
Elevation (m): *904* ***

M36234.927447

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic & Stock*
Date Completed: *16 May 1966*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462977*

General Details

Drilled Depth (m): *94.5*
Completed Depth (m): *94.5*
Top of Bedrock: *23.8 m* *
Completion Interval: *36.6 m - 94.5 m* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
23.8	880.3	Clay
85.3	818.8	Shale
94.5	809.6	Water Bearing Shale

Casing /Liner Details

Type: *<unknown> — 114.3 mm (O.D.)*
Bottom (m): *36.6*

Perforation Details

Type: *<unknown> — 88.9 mm (O.D.)*

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	16 May 66	11:00	Bailer			22.7	27.43		27.4						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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#13

SW 30-046-01 W5M

Owner: *Norstrom, M*
Westerose, Alberta
Contractor: *Double H Drilling*

Easting (m): *57,696*** 70/80
Northing (m): *5,869,216***
Elevation (m): *923****

M36234.927449

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Started: *28 Jul 1976*
Date Completed: *03 Aug 1976*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462979*

General Details

Drilled Depth (m): *18.9*
Completed Depth (m): *18.9*
Top of Bedrock: *8.5 m ¤*
Completion Interval: *12.8 m - 18.9 m ¤*

Seal Details: *Driven — (0.0 m to 12.8 m)*

Casing/Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *12.8*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
8.5	914.7	Clay
15.2	908.0	Shale
16.8	906.5	Sandy Shale
17.7	905.5	Shale
18.9	904.3	Sand & Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m^3/day)* Apparent	Q20 (m^3/day)* Effective	Transmissivity (m^2/day)* Apparent	Transmissivity (m^2/day)* Aquifer	Transmissivity (m^2/day)* Effective
1	03 Aug 76	11:00	Bailer			22.7	9.75	4.0	13.7						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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#14

NW 32-046-01 W5M

Owner: *Congdon, Don*
18404 61 Ave, Edmonton, Alberta T6M 2B5
Contractor: *Bar-K Drilling Ltd - (VA2732)*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.106920

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Perforated Liner*
Proposed Use: *Domestic*
Date Started: *20 Jul 1995*
Date Completed: *21 Jul 1995*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *380508*

General Details

Drilled Depth (m): *48.8* Top of Bedrock: *12.8 m ¤*
Completed Depth (m): *48.8* Completion Interval: *42.7 m - 48.8 m ¤*
Completion Aquifer: *Bedrock ¤*

Preforation Method: *Machine*
Seal Details: *Driven & Shale Trap — (14.9 m to 15.5 m)*

Casing /Liner Details

Type: *Plastic — 152.4 mm (O.D.) x 10.970 mm (thick)* Bottom (m): *15.5*
Liner: *14.9 m - 48.8 m*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 6.02 mm (thick)*
Interval from (m): *42.7* to (m): *48.8* Size (mm): *0.51 x 50.80*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
4.6	846.1	Brown Clay & Rocks
5.5	845.2	Sandy Green Clay
9.8	841.0	Soft Grey Sandstone
12.8	837.9	Clay & Rocks
14.0	836.7	Soft Shale
17.4	833.3	Shale
18.9	831.8	Siltstone & Sandstone
21.9	828.8	Shale
23.2	827.5	Siltstone
25.9	824.8	Shale
26.5	824.2	Siltstone
27.1	823.6	Shale
34.1	816.6	Hard Shale & Sandstone
48.8	801.9	Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	21 Jul 95	11:40	Air	120.0	16.0	50.0	5.79	5.5	11.3	30.5	225.5		16		‡

11.01 igpm.

2.6 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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#15

SE 32-046-01 W5M

Owner: *Schwentke, Hugo*
9516 74 Ave, Edmonton, Alberta
Contractor: *Vino's Water Well Drilling - (VC7989)*

Easting (m): *60,115*** *70/80*
Northing (m): *5,870,857***
Elevation (m): *850****

M35379.061391

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Open Hole*
Proposed Use: *Domestic*

Date Started: *20 Jun 1991*
Date Completed: *20 Jun 1991*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *359852*

General Details

Drilled Depth (m): *21.3* Top of Bedrock: *9.1 m* *
Completed Depth (m): *21.3* Completion Interval: *10.7 m - 21.3 m* *
Completion Aquifer: *Lower Lacombe* *
Sand & Gravel Thickness: *6.7 m (total) — 3.3 m (below 15 m)* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
6.1	844.4	Sandy Clay & Gravel
9.1	841.3	Blue Clay & Sand
11.6	838.9	Sandstone
18.3	832.2	Water Bearing Sand & Shale
21.3	829.1	Blue Sand & Shale

Casing/Liner Details

Type: *Plastic — 127.0 mm (O.D.) x 12.700 mm (thick)* Bottom (m): *10.7*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

6' Steel Protector. ///

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	20 Jun 91	11:00	Bailer			90.9	1.52	1.5	3.0	9.1	421.2		122		‡

20 i/m.

4.87 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

#16

SW 32-046-01 W5M

Owner: *Boles, B*
BECKETTE RD, Drayton Valley, Alberta
Contractor: *Panky's Consolidated Ltd. - (8653)*

Easting (m): *59,303*** 70/80
Northing (m): *5,870,849***
Elevation (m): *856****

M36234.927482

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Started: *26 Apr 1988*
Date Completed: *26 Apr 1988*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463012*
Lot: *8*
Block: *4*
Plan: *4816HW*

General Details

Drilled Depth (m): *18.3* Top of Bedrock: *3.0 m ¤*
Completed Depth (m): *18.3* Completion Interval: *12.8 m - 18.3 m ¤*

Seal Details: *Driven — (0.0 m to 12.8 m)*

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.) x 3.910 mm (thick)* Bottom (m): *12.8*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.1	853.0	Sandy Clay
7.0	849.1	Brown Sandstone
9.1	846.9	White Sandstone
11.0	845.1	Blue Shale
12.5	843.6	Grey Shale
14.9	841.2	White Sandstone
18.3	837.8	Mixed Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m²/day)* Apparent	Q20 (m²/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	26 Apr 88	11:00	Air			68.2	3.66	5.5	9.1						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NE 31-046-01 W5M

Owner: *ALF ELLS SVC*
RR 1, Westerose, Alberta
Contractor: *Fraser, Ron*

Easting (m): *58,481*** *70/80*
Northing (m): *5,871,627***
Elevation (m): *875****

M36234.927457

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *01 Jun 1978*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462987*

General Details

Drilled Depth (m): *13.1*
Completed Depth (m): *13.1*
Top of Bedrock: *4.6 m ¤*
Completion Interval: *7.6 m - 13.1 m ¤*

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *7.6*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
4.6	870.0	Clay
7.3	867.2	Shale
9.1	865.4	Hard Shale
13.1	861.4	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	01 Jun 78	11:00	Pump			22.7	3.35								‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 Feb 2001)

NW 31-046-01 W5M

M35379.060363

Owner: *Patterson, Blake*
Battle Lake, Alberta T0C 2V0
Contractor: *Fraser, Ron - (3432)*

Easting (m): *57,671* ** *70/80*
Northing (m): *5,871,615* **
Elevation (m): *897* ***

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Perforated Casing/Liner*
Proposed Use: *Domestic & Stock*
Date Started: *15 May 1991*
Date Completed: *16 May 1991*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *358808*

General Details

Drilled Depth (m): *67.1* Top of Bedrock: *3.7 m* *
Completed Depth (m): *67.1* Completion Interval: *54.9 m - 67.1 m* *
Completion Aquifer: *Lower Lacombe* *

Preforation Method: *Torch*

Casing /Liner Details

Perforation Details

Type: *Galvanized Steel — 114.3 mm (O.D.) 3.96 mm (thick)*
Interval from (m): *54.9* to (m): *67.1* Size (mm): *12.70 x 38.10*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.7	892.9	Clay
34.1	862.4	Sandstone
34.8	861.8	Hard Sandstone
40.8	855.7	Sandstone
41.2	855.4	Shale
41.5	855.1	Hard Sandstone
54.0	842.6	Shale
54.9	841.7	Hard Sandstone
57.9	838.6	Sandy Shale
67.1	829.5	Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	16 May 91	11:00	Bailer			27.3	44.50	1.2	45.7	51.2	175.6		45		‡

0.455 L/s
6 igpm

2.03 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

*Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

SE 31-046-01 W5M

Owner: *Tougas, D*
10507 75 Street, Edmonton, Alberta
Contractor: *Fraser, Ron*

Easting (m): *58,492* ** 70/80
Northing (m): *5,870,838* **
Elevation (m): *873* ***

M36234.927454

Type of Work: *New Well*
Drilling Method: *Rotary .*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Started: *05 Oct 1978*
Date Completed: *05 Oct 1978*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462984*

General Details

Drilled Depth (m): *25.9*
Completed Depth (m): *25.9*
Top of Bedrock: *15.2 m* *
Completion Interval: *18.3 m - 25.9 m* *

Seal Details: *<unknown> — (0.0 m to 18.3 m)*

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *18.3*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
7.0	865.9	Clay
15.2	857.7	Sandy Clay
21.3	851.6	Shale
25.9	847.0	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	05 Oct 78	11:00	Bailer			27.3									‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

13-32-046-01 W5M

Owner: *Wallace, Jim*
13 PINE RIDGE CR, St. Albert, Alberta
Contractor: *Inglis Water Well Drilling - (3441AD)*

Easting (m): *59,087* ** *70/80*
Northing (m): *5,871,831* **
Elevation (m): *852* ***

M36056.965013

Type of Work: *New Well*
Drilling Method: *Cable Tool*
Completion Type: *Casing/Perforated Liner*
Proposed Use: *Domestic*
Date Started: *28 Jun 1996*
Date Completed: *02 Jul 1996*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *466498*
Lot: *10*
Block: *5*
Plan: *7620449*

General Details

Drilled Depth (m): *19.8*
Completed Depth (m): *19.8*
Top of Bedrock: *7.3 m* *
Completion Interval: *12.2 m - 19.8 m* *

Preforation Method: *Saw*

Casing /Liner Details

Type: *Steel — 139.7 mm (O.D.) x 6.200 mm (thick)*
Bottom (m): *11.3*
Liner: *9.1 m - 19.8 m*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 6.02 mm (thick)*
Interval from (m): *12.2* to (m): *19.8* Size (mm): *3.17 x 304.80*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
4.0	848.1	Sandy Clay
7.3	844.7	Clay
11.3	840.7	Shale
19.8	832.2	Water Bearing Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Driller reports distance from top of casing to ground level: 1

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lgm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	02 Jul 96	11:00	Bailer	120.0	120.0	45.5	6.10	6.4	12.5		28.9		13		‡

10 igpm

0.3345 L/s

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‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Clegg, R.J.*
(Poplar Bay) 11412-53 Ave, Edmonton, Alberta
Contractor: *<unknown contractor>*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.042783

Type of Work: *Chemistry*
Drilling Method: *Drilled*
Completion Type: *<unknown>*
Proposed Use: *Domestic*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *443535*
Lot: *15*

General Details

Drilled Depth (m): *25.9*
Completed Depth (m): *25.9*
Completion Aquifer: *Lower Lacombe ¤*

Casing /Liner Details

Perforation Details

Water Well Screen Details

Lithology Information

Chemistry Details (mg/L) - Summary

Alberta Environment (AENV) (ID: 6515)

Sample: Date: *22 Jul 1973*
Analysis: Date: *27 Jul 1973*

Temperature (°C):	Calcium: *24*	Iron: *0.6*
Conductivity (µS/cm): *720*	Magnesium: *14*	Manganese:
TDS: *675*	Sodium: *141*	Nitrite: *< 0.05*
pH (pH Unit): *7.8*	Potassium: *2.4*	Nitrate: *0.899*
Total Hardness: *117*	Carbonate:	Aluminum
T-Alkalinity: *378*	Bicarbonate: *459*	Silica [SiO2]:
P-Alkalinity:	Sulfate: *33*	Phosphate:
Nitrate & Nitrite as N:	Chloride: *1*	Lead:
Total Coliforms:	Fluoride:	Cadmium:
Fecal Coliforms:	Hydroxide:	Oil & Grease:
Ion Balance:		

Comments:

General Comments

Originally In NW-32-46-1-5 ///

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	22 Jul 73	00:00	<unknown>				3.05								‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *COFFIN*
79 Avenue (Box 1146), Edmonton, Alberta
Contractor: *Fiveland, N.*

Easting (m): *59,293* ** *70/80*
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M36234-927501

Type of Work: *New Well*
Drilling Method: *Drilled*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *11 Jul 1964*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463031*
Lot: *14*
Block: *CAL*
Plan: *BEACH*

General Details

Drilled Depth (m): *40.8* Top of Bedrock: *14.6 m* *
Completed Depth (m): *40.8* Completion Interval: *24.4 m - 40.8 m* *

Sand & Gravel Thickness: *16.8 m (total) — 5.4 m (below 15 m)* *

Casing /Liner Details

Type: *<unknown> — 50.8 mm (O.D.)* Bottom (m): *24.4*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
0.9	849.8	Clay
3.7	847.0	Clay & Sand
6.1	844.6	Firm Yellow Sand
14.6	836.1	Firm Grey Sand
20.4	830.3	Water Bearing Grey Sand & Sandstone
21.9	828.8	Grey Shale
23.2	827.5	Green Shale
27.4	823.3	Hard Shale
31.1	819.6	Crumbly Shale
36.0	814.7	Firm Black Shale
40.2	810.5	Sandstone
40.8	809.9	Loose Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	11 Jul 64	11:00	Pump			27.3	3.66			18.3					‡
2	11 Jul 64	13:00	Pump			15.9	4.57			40.8					‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Falvo, R*
9993 29A Avenue, Edmonton, Alberta T6N 1A9
Contractor: *Mid-West Drilling Ltd.*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M36234.927504

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*

Date Started: *26 Oct 1981*
Date Completed: *26 Oct 1981*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463034*

General Details

Drilled Depth (m): *36.6*
Completed Depth (m): *36.6*
Top of Bedrock: *11.0 m* *
Completion Interval: *31.7 m - 36.6 m* *

Casing /Liner Details

Type: *Steel — 139.7 mm (O.D.) x 6.200 mm (thick)*
Bottom (m): *31.7*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
6.7	844.0	Brown Clay & Rocks
10.7	840.0	Grey Shale
11.0	839.7	Water Bearing Sand
11.6	839.1	Grey Shale
13.7	837.0	Green Shale
17.4	833.3	Grey Shale
18.3	832.4	Grey Sandstone
20.7	830.0	Grey Shale
23.8	826.9	Green Shale
24.7	826.0	Grey Sandstone
32.0	818.7	Grey Shale
33.5	817.2	Grey Sandstone
36.6	814.1	Grey Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective	
1	26 Oct 81	11:00	Air			31.8										‡

‡ *test data available at additional cost.*
* *denotes a MOW-TECH LTD. calculated or determined value.*
** *'70' - MT Calculated — (10TM NAD27)*
*** *'80' - MT DEM — (Ground ; AMSL)*
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Finnemore, R*
4908 114B Street, Edmonton, Alberta
Contractor: *Hostyn Drilling Co. Ltd.*

Easting (m): *59,293* ** 70/80
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M36234.927506

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Started: *21 Apr 1981*
Date Completed: *22 Apr 1981*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463036*
Lot: *10*
Block: *4*
Plan: *2639NY*

General Details

Drilled Depth (m): *44.2* Top of Bedrock: *18.3 m* *
Completed Depth (m): *44.2* Completion Interval: *15.9 m - 44.2 m* *

Sand & Gravel Thickness: *8.5 m (total) — 8.5 m (below 15 m)* *

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.) x 4.600 mm (thick)* Bottom (m): *15.9*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
13.7	837.0	Interbedded Clay & Sand
15.2	835.5	Blue Shale
18.3	832.4	Water Bearing Sand
21.3	829.4	Blue Shale
37.2	813.5	Sandstone
42.7	808.0	Water Bearing Sand
44.2	806.5	Brown Shale

Chemistry Details (mg/L) - Summary

Alberta Environment (AENV) [ID: 2164]

Sample: Date: *13 Feb 1985*
Analysis: Date: *21 Mar 1985*

Temperature (°C):	Calcium: *4*	Iron: *0.05*
Conductivity (µS/cm): *1149*	Magnesium: *3*	Manganese:
TDS: *713*	Sodium: *295*	Nitrite:
pH (pH Unit): *8.8*	Potassium: *0.7*	Nitrate:
Total Hardness: *22*	Carbonate: *30*	Aluminum
T-Alkalinity: *574*	Bicarbonate: *639*	Silica [SiO2]: *7.4*
P-Alkalinity:	Sulfate: *64*	Phosphate:
Nitrate & Nitrite as N: *< 0.05*	Chloride: *2*	Lead:
Total Coliforms:	Fluoride: *1.25*	Cadmium:
Fecal Coliforms:	Hydroxide:	Oil & Grease:
Ion Balance: *103*		

Comments:

General Comments

CHEM FILE WITH IC#49 (ORIGINALLY) WAS ADDED TO THIS FILE.

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	22 Apr 81	11:00	Bailer			45.5	3.66	4.0	7.6						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — [10TM NAD27]
*** '80' - MT DEM — [Ground ; AMSL]
D - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Graham, S A*
5516 ADA BLVD, Edmonton, Alberta
Contractor: *Fiveland, N.*

Easting (m): *59,293*** 70/80
Northing (m): *5,871,636***
Elevation (m): *851****

M36234.927496

Type of Work: *New Well*
Drilling Method: *Drilled*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *08 Apr 1964*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463026*
Lot: *2*
Block: *1*
Plan: *5715HW*

General Details

Drilled Depth (m): *18.0*
Completed Depth (m): *18.0*
Top of Bedrock: *5.2 m ‡*
Completion Interval: *6.7 m - 18.0 m ‡*

Casing /Liner Details

Type: *<unknown> — 50.8 mm (O.D.)*
Bottom (m): *6.7*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
1.8	848.9	Clay
5.2	845.5	Clay & Sand
7.0	843.7	Shale
13.4	837.3	Sandy Shale
14.0	836.7	Sandstone
14.6	836.1	Water Bearing Dark Shale
16.5	834.2	Grey Shale
18.0	832.7	Water Bearing Sand & Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	08 Apr 64	11:00	Pump			9.1	3.66								‡
2	08 Apr 64	13:00	Pump			27.3	3.66	14.3	18.0						‡
3	08 Apr 64	14:00	Pump			36.4	3.66								‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Heboer, Denis*
Popular Bay Pigeon Lake, Alberta
Contractor: *Midwest Water Well Ltd. - (VC6689)*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.052694

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Perforated Casing/Liner*
Proposed Use: *Domestic*
Date Started: *02 Jan 1990*
Date Completed: *02 Jan 1990*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *350968*

General Details

Drilled Depth (m): *38.1* Top of Bedrock: *9.1 m* *
Completed Depth (m): *38.1* Completion Interval: *30.5 m - 38.1 m* *
Completion Aquifer: *Lower Lacombe* *

Preforation Method: *Hand Drill*

Casing /Liner Details

Type: *Steel — 141.2 mm (O.D.) x 4.780 mm (thick)* Bottom (m): *18.3*
Liner: *15.2 m - 38.1 m*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 3.96 mm (thick)*
Interval from (m): *30.5* to (m): *38.1* Size (mm): *0.187*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.4	847.4	Sandy Clay
6.4	844.3	Brown Clay
9.1	841.6	Grey Clay
9.5	841.3	Sandstone
11.9	838.8	Soft Shale
14.3	836.4	Sandstone
18.6	832.1	Grey Shale
19.2	831.5	Sandstone
20.4	830.3	Sandstone
30.8	819.9	Shale
35.1	815.7	Sandstone
36.0	814.7	Shale
38.1	812.6	Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	02 Jan 90	00:00	Air			136.4	7.62	30.5	38.1		66.0		8		‡

30 igpm

0.764 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Howey, Lindsey*
Westerose, Alberta
Contractor: *Vino's Water Well Drilling - (VC7989)*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.059435

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Open Hole*
Proposed Use: *Domestic*
Date Started: *06 May 1991*
Date Completed: *07 May 1991*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *357862*

General Details

Drilled Depth (m): *21.3*
Completed Depth (m): *21.3*
Completion Aquifer: *Lower Lacombe **
Top of Bedrock: *12.2 m **
Completion Interval: *15.2 m - 21.3 m **

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
6.1	844.6	Coarse Grained Sand & Clay Stringers
12.2	838.5	Blue Grey Sand
15.2	835.5	Blue Shale
15.9	834.9	Shale
21.3	829.4	Water Bearing Sand

Casing/Liner Details

Type: *Plastic — 127.0 mm (O.D.) x 12.700 mm (thick)*
Bottom (m): *15.2*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	07 May 91	11:00	Bailer			13.6	5.49	6.7	12.2	14.6	12.3		3		‡

0.142 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Jones, J*
Poplar Bay, Alberta
Contractor: *Boyd's Water Well Drilling - (6024)*

Easting (m): *59,293* ** *70/80*
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M36234.927515

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Perforated Casing/Liner*
Proposed Use: *Domestic*

Date Started: *22 Aug 1988*
Date Completed: *22 Aug 1988*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463045*

General Details

Drilled Depth (m): *22.9* Top of Bedrock: *9.8 m* ⁴
Completed Depth (m): *19.5* Completion Interval: *12.8 m - 19.5 m* ⁴

Preforation Method: *Torch*
Seal Details: *Driven — (0.0 m to 12.8 m)*

Casing /Liner Details

Perforation Details

Type: *Steel — 114.3 mm (O.D.)*
Interval from (m): *12.8* to (m): *19.5* Size (mm): *1.65 x 254.0*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
9.8	841.0	Clay & Rocks
17.7	833.0	Shale
18.3	832.4	Hard Shale & Sandstone
20.1	830.6	Interbedded Grey Shale & Sandstone
21.0	829.7	Shale
21.9	828.8	Dark Shale & Coal
22.9	827.8	Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	22 Aug 88	11:00	<unknown>			13.6	4.57	11.0	15.5	18.3					‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — [10TM NAD27]
*** '80' - MT DEM — [Ground ; AMSL]
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Kelglen, Viego*
Popular Bay Pigeon Lake, Alberta
Contractor: *Midwest Water Well Ltd. - (VC6689)*

Easting (m): *59,293*** 70/80
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.053772

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Perforated Casing/Liner*
Proposed Use: *Domestic*
Date Started: *05 Sep 1990*
Date Completed: *05 Sep 1990*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *352103*
Lot: *014*

General Details

Drilled Depth (m): *44.2*
Completed Depth (m): *44.2*
Completion Aquifer: *Bedrock **
Top of Bedrock: *3.0 m **
Completion Interval: *39.6 m - 44.2 m **

Preforation Method: *Hand Drill*

Casing/Liner Details

Type: *Steel — 127.0 mm (O.D.) x 6.200 mm (thick)*
Bottom (m): *18.3*
Liner: *15.2 m - 44.2 m*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 3.96 mm (thick)*
Interval from (m): *39.6* to (m): *44.2* Size (mm): *0.312*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.1	847.7	Clay
6.7	844.0	Shale
15.2	835.5	Soft Sandstone
20.7	830.0	Grey Shale
29.3	821.4	Grey Shale
32.0	818.7	Sandstone
41.5	809.3	Shale
44.2	806.5	Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	05 Sep 90	11:00	Air			227.3	6.10	38.1	44.2		133.7		11		‡

50 igpm 1.55 L/s -

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Lieberman, Murry*
Grandview, Alberta
Contractor: *Vino's Water Well Drilling - (VC7989)*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.061714

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Open Hole*
Proposed Use: *Domestic*

Date Started: *25 Apr 1991*
Date Completed: *28 Apr 1991*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *360188*
Lot: *4*
Block: *4*
Plan: *872015*

General Details

Drilled Depth (m): *24.4* Top of Bedrock: *Surficial Water Well ¤*
Completed Depth (m): *24.4* Completion Interval: *12.8 m - 24.4 m ¤*
Completion Aquifer: *Lower Lacombe ¤*

Casing /Liner Details

Type: *Steel — 141.2 mm (O.D.)* Bottom (m): *12.8*

Perforation Details

Type: *Plastic — 127.0 mm (O.D.) 2.84 mm (thick)*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
6.1	844.6	Clay & Gravel
10.7	840.0	Black Sand
12.2	838.5	Blue Shale
12.8	837.9	Blue Rocks
14.3	836.4	Grey Shale
24.4	826.3	Water Bearing Sand

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	28 Apr 91	11:00	Bailer			13.6	1.22	7.9	9.1	11.6	12.0		3		‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Mcfadden, Pat*
Westerose, Alberta T0C 2V0
Contractor: *Fraser, Ron - (3432)*

Easting (m): *59,293* ** 70/80
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M35379.097971

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Perforated Casing/Liner*
Proposed Use: *Domestic*

Date Started: *17 Oct 1994*
Date Completed: *17 Oct 1994*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *396662*

General Details

Drilled Depth (m): *24.4* Top of Bedrock: *8.5 m* ¤
Completed Depth (m): *24.4* Completion Interval: *18.3 m - 24.4 m* ¤
Completion Aquifer: *Lower Lacombe* ¤

Preforation Method: *Saw*

Casing /Liner Details

Perforation Details

Type: *Plastic — 127.0 mm (O.D.) 6.60 mm (thick)*
Interval from (m): *18.3* to (m): *24.4* Size (mm): *6.35 x 152.40*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
8.5	842.2	Clay
9.1	841.6	Sandstone
14.0	836.7	Blue Shale
14.6	836.1	Sandy Shale
21.3	829.4	Blue Shale
24.4	826.3	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	17 Oct 94	11:00	Bailer & Pump	120.0	120.0	18.2	3.22	18.7	21.9	22.9	8.6		2		‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

NW 32-046-01 W5M

Owner: *Newman, Ed*
6508 87th Avenue, Edmonton, Alberta
Contractor: *Midwest Water Well Ltd.*

Easting (m): *59,293* ** 70/80
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M36234.927507

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Perforated Liner*
Proposed Use: *Domestic*
Date Started: *10 Aug 1983*
Date Completed: *10 Aug 1983*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463037*
Lot: *16*
Block: *5*
Plan: *7620449*

General Details

Drilled Depth (m): *45.7*
Completed Depth (m): *45.7*
Top of Bedrock: *11.6 m* *
Completion Interval: *39.6 m - 45.7 m* *

Preforation Method: *Machine*
Seal Details: *Driven — (0.0 m to 15.2 m)*

Casing /Liner Details

Type: *Steel — 141.2 mm (O.D.) x 4.780 mm (thick)*
Bottom (m): *15.2*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 6.35 mm (thick)*
Interval from (m): *39.6* to (m): *45.7* Size (mm): *9.53 x 9.53*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
4.6	846.1	Clay
11.6	839.1	Clay & Sandstone
14.0	836.7	Water Bearing Sandstone
21.3	829.4	Shale
24.4	826.3	Green Sandstone
31.4	819.3	Blue Sandstone
36.6	814.1	Shale
38.1	812.6	Sandstone & Coal
41.2	809.6	Shale
45.7	805.0	Water Bearing Blue Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	10 Aug 83	11:00	Air			90.9	4.57								‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
□ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

M36234.927497

Owner: *Otteson, H*
Alberta
Contractor: *Double H Drilling*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*

Date Started: *26 Jul 1976*
Date Completed: *26 Jul 1976*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463027*

General Details

Drilled Depth (m): *21.3*
Completed Depth (m): *21.3*
Top of Bedrock: *9.1 m* *
Completion Interval: *12.8 m - 21.3 m* *

Seal Details: *<unknown> — (0.0 m to 12.8 m)*

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *12.8*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.7	847.0	Clay
9.1	841.6	Sandy Clay
17.4	833.3	Shale
21.3	829.4	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	26 Jul 76	11:00	Bailer & Pump			90.9	2.29	0.8	3.0						‡

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‡ test data available at additional cost.
** denotes a MOW-TECH LTD. calculated or determined value.*
*** '70' - MT Calculated — (10TM NAD27)*
**** '80' - MT DEM — (Ground ; AMSL)*
□ - more than one approval on file.

NW 32-046-01 W5M

Owner: *Rachuck, Ken*
Popular Bay Pigion Lake, Alberta
Contractor: *Midwest Water Well Ltd. - (VC6689)*

Easting (m): *59,293* ** *70/80*
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M35379.053771

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Perforated Casing/Liner*
Proposed Use: *Domestic*
Date Started: *04 Sep 1990*
Date Completed: *04 Sep 1990*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *352102*
Lot: *017*

General Details

Drilled Depth (m): *42.7*
Completed Depth (m): *42.7*
Completion Aquifer: *Bedrock* *
Top of Bedrock: *5.2 m* *
Completion Interval: *30.5 m - 42.7 m* *

Preforation Method: *Hand Drill*

Casing /Liner Details

Type: *Steel — 139.7 mm (O.D.) x 6.200 mm (thick)* Bottom (m): *18.9*
Liner: *15.2 m - 42.7 m*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 3.96 mm (thick)*
Interval from (m): *30.5* to (m): *42.7* Size (mm): *0.312*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
5.2	845.5	Clay
8.8	841.9	Soft Sandstone
10.7	840.0	Shale
11.9	838.8	Sandstone
17.7	833.0	Shale
29.0	821.8	Green Shale
31.4	819.3	Sandstone
32.3	818.4	Sandstone
33.5	817.2	Shale
34.8	816.0	Bentonite
36.9	813.8	Shale
42.7	808.0	Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	04 Sep 90	11:00	Air			90.9	6.10	36.6	42.7		37.5		4		‡

20 igpm 0.434 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Redl, P.*
RR 2 (Box 29), Sherwood Park, Alberta T8A 3K2
Contractor: *Rondal WW Drilling*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M36234.927505

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*

Date Started: *17 Aug 1981*
Date Completed: *17 Aug 1981*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463035*

General Details

Drilled Depth (m): *22.9*
Completed Depth (m): *22.9*
Top of Bedrock: *6.7 m **
Completion Interval: *18.9 m - 22.9 m **

Seal Details: *Driven — (0.0 m to 18.9 m)*

Casing /Liner Details

Type: *Steel — 114.3 mm (O.D.)*
Bottom (m): *18.9*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
6.7	844.0	Clay
14.0	836.7	Soft Sand & Shale
19.8	830.9	Greenish Grey Shale
22.9	827.8	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	17 Aug 81	11:00	Bailer			27.3	3.66	4.9	8.5						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Reid, B.S.*
10246 WADHURST RD, Edmonton, Alberta
Contractor: *Fiveland, N.*

Easting (m): *59,293* ** 70/80
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M36234.927488

Type of Work: *New Well*
Drilling Method: *Drilled*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *02 Apr 1964*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463018*
Lot: *3*
Block: *1*
Plan: *5715HW*

General Details

Drilled Depth (m): *13.1*
Completed Depth (m): *13.1*
Top of Bedrock: *6.4 m* *
Completion Interval: *6.4 m - 13.1 m* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
2.1	848.6	Clay
5.8	844.9	Clay & Sand
6.4	844.3	Blue Clay
12.2	838.5	Sandy Shale & Sandstone
13.1	837.6	Water Bearing Shale & Sandstone

Casing/Liner Details

Type: *<unknown> — 50.8 mm (O.D.)*
Bottom (m): *6.4*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective	
1	02 Apr 64	11:00	Pump			27.3	3.35									‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — {10TM NAD27}
*** '80' - MT DEM — {Ground ; AMSL}
□ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Remich, G.*
Westerose, Alberta T0C 2V0
Contractor: *Fraser, Ron - (3432)*

Easting (m): *59,293* ** 70/80
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M36234.928264

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Perforated Liner*
Proposed Use: *Domestic*
Date Started: *04 Jun 1997*
Date Completed: *04 Jun 1997*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *467609*

General Details

Drilled Depth (m): *25.9*
Completed Depth (m): *25.9*
Top of Bedrock: *8.5 m* *
Completion Interval: *21.3 m - 25.9 m* *

Preforation Method: *Saw*
Seal Details: *Bentonite Chips/Tablets — (0.0 m to 18.3 m)*

Casing /Liner Details

Perforation Details

Type: *Plastic — 127.0 mm (O.D.) 6.60 mm (thick)*
Interval from (m): *21.3* to (m): *25.9* Size (mm): *6.35 x 152.40*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
8.5	842.2	Clay
9.8	841.0	Sandstone
13.4	837.3	Blue Shale
15.9	834.9	Sandy Shale
21.6	829.1	Blue Shale
25.9	824.8	Sandy Shale

Chemistry Details (mg/L) - Summary

General Comments

Driller reports distance from Top of Casing (TOC) to ground level: 20".

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Effective	Transmissivity (m²/day)* Apparent	Aquifer	Effective
1	04 Jun 97	11:00	Bailer & Pump	120.0	120.0	13.6	2.22	20.0	22.3	22.9	7.4		1		‡

26.43 l/m

0.086 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
□ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Tkachuk, Bill*
Poplar Bay, Alberta
Contractor: *Inglis Water Well Drilling - (3441AD)*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.097973

Type of Work: *New Well*
Drilling Method: *Cable Tool*
Completion Type: *Casing/Perforated Liner*
Proposed Use: *Domestic*
Date Started: *19 Jul 1994*
Date Completed: *20 Jul 1994*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *396664*
Lot: *8*
Block: *5*
Plan: *7620449*

General Details

Drilled Depth (m): *19.8* Top of Bedrock: *7.0 m* *
Completed Depth (m): *19.8* Completion Interval: *12.2 m - 19.8 m* *
Completion Aquifer: *Lower Lacombe* *

Preforation Method: *Saw*

Casing /Liner Details

Type: *Steel — 139.7 mm (O.D.) x 6.200 mm (thick)* Bottom (m): *11.6*
Liner: *7.6 m - 19.8 m*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 6.02 mm (thick)*
Interval from (m): *12.2* to (m): *19.8* Size (mm): *3.17 x 304.80*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
2.4	848.3	Clay
4.6	846.1	Sandy Clay
6.1	844.6	Sand
7.0	843.7	Clay
12.2	838.5	Shale
18.3	832.4	Water Bearing Sandstone
19.8	830.9	Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	20 Jul 94	11:00	Bailer	120.0	120.0	90.9	6.74	13.1	19.8		25.3		12		‡

26.4 igpm

0.293 L/s

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Trybuch, Luke*
10535 154 Ave, Edmonton, Alberta T5X 5C6
Contractor: *Bar-K Drilling Ltd - (VA2732)*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.068319

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Perforated Liner*
Proposed Use: *Domestic*
Date Started: *17 Jul 1992*
Date Completed: *18 Jul 1992*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *366857*

General Details

Drilled Depth (m): *39.6* Top of Bedrock: *9.8 m ¤*
Completed Depth (m): *39.6* Completion Interval: *33.5 m - 39.6 m ¤*
Completion Aquifer: *Lower Lacombe ¤*

Preforation Method: *Machine*

Casing /Liner Details

Type: *Plastic — 152.4 mm (O.D.) x 10.970 mm (thick)* Bottom (m): *15.9*
Liner: *14.6 m - 39.6 m*

Perforation Details

Type: *Plastic — 114.3 mm (O.D.) 6.02 mm (thick)*
Interval from (m): *33.5* to (m): *39.6* Size (mm): *0.51 x 304.80*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
7.9	842.8	Clay
9.8	841.0	Sand & Rocks
14.0	836.7	Soft Clay & Shale
15.5	835.2	Shale
35.1	815.7	Shale & Siltstone
39.6	811.1	Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	18 Jul 92	11:00	Pump			18.2	4.57	26.2	30.8	33.5	11.3		1		‡

high

0.13 L/S.

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

NW 32-046-01 W5M

M36234.927490

Owner: *Wallace, J*
9 RIVERSIDE Cresent, Edmonton, Alberta
Contractor: *Unity Services*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Started: *05 Jul 1975*
Date Completed: *07 Jul 1975*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463020*
Lot: *7&8*
Block: *2*
Plan: *898NY*

General Details

Drilled Depth (m): *18.3*
Completed Depth (m): *18.3*
Top of Bedrock: *3.7 m* *
Completion Interval: *9.8 m - 18.3 m* *

Casing /Liner Details

Type: *Concrete — 114.3 mm (O.D.) x 4.780 mm (thick)* Bottom (m): *9.8*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.7	847.0	Clay
4.6	846.1	Sandstone
9.1	841.6	Shale
9.8	841.0	Sandstone
10.1	840.6	Coal
11.6	839.1	Water Bearing Sand & Shale
15.2	835.5	Shale
16.5	834.2	Sandstone
18.3	832.4	Water Bearing Sand & Shale

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	07 Jul 75	11:00	Pump			22.7	1.83	4.0	5.8						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
□ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

Owner: *Armstrong, D*
10828 38A Avenue, Edmonton, Alberta
Contractor: *Double H Drilling*

···32-046-01 W5M

Easting (m): *59,704*** *70/80*
Northing (m): *5,871,249***
Elevation (m): *852****

M36234.927519

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Started: *21 Oct 1977*
Date Completed: *26 Oct 1977*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463049*
Lot: *26*
Block: *3*
Plan: *6430RS*

General Details

Drilled Depth (m): *17.1*
Completed Depth (m): *17.1*
Top of Bedrock: *10.7 m* *
Completion Interval: *12.5 m - 17.1 m* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
3.4	848.3	Clay
10.7	841.0	Sandy Clay
12.8	838.8	Shale
13.7	837.9	Sandy Shale
14.6	837.0	Shale
17.1	834.6	Sandy Shale

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *12.5*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	26 Oct 77	11:00	Bailer			27.3			9.1						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NE 32-046-01 W5M

Owner: *Holmes, D.*
Westerose, Alberta
Contractor: *Johnson, Glen*

Easting (m): *60,104* ** 70/80
Northing (m): *5,871,648* **
Elevation (m): *851* ***

M36234.927518

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *27 Sep 1967*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463048*

General Details

Drilled Depth (m): *24.4*
Completed Depth (m): *24.4*
Top of Bedrock: *10.4 m* ¤
Completion Interval: *12.5 m - 24.4 m* ¤

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
10.4	840.6	Clay
19.8	831.2	Shale
24.4	826.6	Water Bearing Shale

Casing /Liner Details

Type: *<unknown> — 114.3 mm (O.D.) x 4.780 mm (thick)* Bottom (m): *12.5*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	27 Sep 67	11:00	<unknown>			36.4	2.13								‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NE 32-046-01 W5M

Owner: *Noel, G*
Poplar Bay, Alberta
Contractor: *Bob's Drilling & Backhoe Service*

Easting (m): *60,104*** 70/80
Northing (m): *5,871,648***
Elevation (m): *851****

M36234.927517

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *18 Jul 1973*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463047*

General Details

Drilled Depth (m): *14.0*
Completed Depth (m): *14.0*
Top of Bedrock: *10.4 m* *
Completion Interval: *12.2 m - 14.0 m* *

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
10.4	840.6	Blue Clay
12.8	838.2	Shale
13.1	837.9	Soft Sandstone
14.0	837.0	Shale

Casing / Liner Details

Type: *Plastic*
Bottom (m): *12.2*

Perforation Details

Water Well Screen Details

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m²/day)* Apparent	Q20 (m²/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	18 Jul 73	11:00	<unknown>				2.44		2.4						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Beke, L.P.*
(Poplar Bay)16141-109A Ave, Edmonton, Alberta
Contractor: *<unknown contractor>*

Easting (m): *59,293*** *70/80*
Northing (m): *5,871,636***
Elevation (m): *851****

M35379.042781

Type of Work: *Chemistry*
Drilling Method: *<unknown>*
Completion Type: *<unknown>*
Proposed Use: *Domestic*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *443533*

General Details

Drilled Depth (m): *15.2*
Completed Depth (m): *15.2*
Completion Aquifer: *Lower Lacombe **

Casing /Liner Details

Perforation Details

Water Well Screen Details

Lithology Information

Chemistry Details (mg/L) - Summary

U of A Hospital - Trace Elements/Environmental Toxicology Laboratory (ID: 10829)

Sample: Date: *02 Sep 1967*
Analysis: Date: *11 Sep 1967*

Temperature (°C):	Calcium:	Iron: *0.05*
Conductivity (µS/cm):	Magnesium:	Manganese:
TDS: *556*	Sodium:	Nitrite: *0*
pH (pH Unit):	Potassium:	Nitrate: *0*
Total Hardness: *19*	Carbonate:	Aluminum
T-Alkalinity: *450*	Bicarbonate:	Silica [SiO2]:
P-Alkalinity:	Sulfate: *12*	Phosphate:
Nitrate & Nitrite as N:	Chloride: *8*	Lead:
Total Coliforms:	Fluoride:	Cadmium:
Fecal Coliforms:	Hydroxide:	Oil & Grease:
Ion Balance:		

Comments:
Soda 31.9 Grains/Gallon.

General Comments

Originally In NW-28-41-1-5 ///

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	02 Sep 67	00:00	<unknown>				12.19								‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

NW 32-046-01 W5M

Owner: *Chevlny, F*
301 11825 102 Street, Edmonton, Alberta
Contractor: *Hostyn Drilling Co. Ltd.*

Easting (m): *59,293* ** *70/80*
Northing (m): *5,871,636* **
Elevation (m): *851* ***

M36234.927499

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Open Hole*
Proposed Use: *Domestic*
Date Completed: *26 Sep 1974*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *463029*

General Details

Drilled Depth (m): *45.7*
Completed Depth (m): *45.7*
Top of Bedrock: *13.7 m* *
Completion Interval: *14.9 m - 45.7 m* *

Casing /Liner Details

Type: *Galvanized Steel — 114.3 mm (O.D.)*
Bottom (m): *14.9*

Perforation Details

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
9.1	841.6	Clay
12.2	838.5	Sand
13.7	837.0	Clay
14.9	835.8	Blue Shale
22.9	827.8	Sandstone
27.4	823.3	Blue Shale
30.5	820.2	Sandstone
45.7	805.0	Water Bearing Sand & Sandstone

Chemistry Details (mg/L) - Summary

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	26 Sep 74	11:00	Pump			45.5	2.44	5.8	8.2						‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
¤ - more than one approval on file.

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Generated on: 01 Feb 2001 (last modified: 01 feb 2001)

SE 32-046-01 W5M

Owner: *Burnett, D.*
3508 111B Street, Edmonton, Alberta
Contractor: *Big Quill Drilling Ltd.*

Easting (m): *60,115*** 70/80
Northing (m): *5,870,857***
Elevation (m): *850****

M36234.927463

Type of Work: *New Well*
Drilling Method: *Rotary*
Completion Type: *Casing/Perforated Liner*
Proposed Use: *Domestic*
Date Started: *08 Aug 1983*
Date Completed: *08 Aug 1983*
AENV License ID:

Electric Log: *No* Flowing Well: *No*
Gamma Log: *No*
Gas Present: *No*
Oil Present: *No*

Other: *462993*

General Details

Drilled Depth (m): *36.6*
Completed Depth (m): *36.6*
Top of Bedrock: *10.1 m °*
Completion Interval: *27.4 m - 36.6 m °*

Preforation Method: *Torch*

Casing /Liner Details

Type: *Steel — 141.2 mm (O.D.) x 4.780 mm (thick)* Bottom (m): *24.1*
Liner: *23.8 m - 36.6 m*

Perforation Details

Type: *Steel — 114.3 mm (O.D.) 4.78 mm (thick)*
Interval from (m): *27.4* to (m): *36.6* Size (mm): *3.18 x 203.20*

Water Well Screen Details

Lithology Information

Depth (BGL)	Elevation (AMSL)	Lithologic Description
5.2	845.3	Brown Clay & Rocks
10.1	840.4	Grey Clay & Rocks
12.5	838.0	Light Blue Shale
19.5	831.0	Grey Shale
19.8	830.7	Fine Grained Grey Sandstone & Coal
21.3	829.1	Light Blue Shale
21.9	828.5	Hard Sandstone
26.5	824.0	Grey Shale
27.1	823.3	Grey Sandstone
29.9	820.6	Light Blue Shale
36.6	813.9	Coarse Grained Grey Sandstone

Chemistry Details (mg/L) - Summary

Alberta Environment (AENV) (ID: 10597)

Sample: Date: *08 Aug 1983*
Analysis: Date: *08 Sep 1983*

Temperature (°C):	Calcium: *< 1*	Iron: *1.2*
Conductivity (µS/cm): *934*	Magnesium: *< 1*	Manganese:
TDS: *475*	Sodium: *200*	Nitrite:
pH (pH Unit): *9.1*	Potassium: *0.5*	Nitrate:
Total Hardness: *7*	Carbonate: *39*	Aluminum
T-Alkalinity: *435*	Bicarbonate: *452*	Silica [SiO2]: *7.1*
P-Alkalinity:	Sulfate: *< 5*	Phosphate:
Nitrate & Nitrite as N: *< 0.05*	Chloride: *6*	Lead:
Total Coliforms:	Fluoride: *2.7*	Cadmium:
Fecal Coliforms:	Hydroxide:	Oil & Grease:
Ion Balance: *0.97*		

Comments:

General Comments

Aquifer Test(s)

No.	Date	Time	Testing Method	Duration (min) Pumping	Duration (min) Recovery	Avg. Rate (lpm)	NPWL (metre)	Drawdown (metre)	Level-End (metre)	Pump (metre)	Q20 (m³/day)* Apparent	Q20 (m³/day)* Effective	Transmissivity (m²/day)* Apparent	Transmissivity (m²/day)* Aquifer	Transmissivity (m²/day)* Effective
1	08 Aug 83	11:00	Air			104.6	6.46			36.6					‡

‡ test data available at additional cost.
* denotes a MOW-TECH LTD. calculated or determined value.
** '70' - MT Calculated — (10TM NAD27)
*** '80' - MT DEM — (Ground ; AMSL)
o - more than one approval on file.

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APPENDIX B

Northwest Hydraulic Consultants
Hydrologic Overview

Leaders in
water resource
technology

nhc

Ref. No. 6171/3961

March 26, 2001

Thurber Environmental Consultants Ltd.
Suite 200, 9636 – 51 Avenue
Edmonton, AB
T6E 6A5

Attention: Dominique Borneuf, Ph.D., P.Geol.
Senior Hydrogeologist

Re: Proposed Development Area at Pigeon Lake, AB
Hydrologic Overview

1.0 Introduction

This letter report provides a brief hydrologic overview of a proposed development area located west and adjacent to the summer village of Poplar Bay at Pigeon Lake and approximately 2 km southeast of Pigeon Lake Provincial Park (see Figure 1).

2.0 Watershed Characteristics of Pigeon Lake

Pigeon Lake is located 60 km southwest of Edmonton within a shallow depression that is fed by many small, often intermittent streams. The watershed covers a drainage area of 284 km^2, of which 97 km^2 (34%) is lake area. Lake levels are regulated by a control structure – two bay weir with stop logs and a Denil II fish ladder[1] – that is located at the outlet of Pigeon Lake at Ma-Me-O Beach. Under the supervision of Alberta Environment, the weir is usually operated with one stop log in place to maintain the lake level at a geodetic elevation of 849.95 m. The sill elevation is set at 849.8 m. Discharge over the weir enters Pigeon Creek at the mouth and flows for 15 km before entering the Battle River.

Table 1 provides a summary of the annual maximum, minimum and range in lake levels for the period 1965 to 1999. Annual maximum and annual minimum lake levels are also presented by Figures 2 and 3, respectively. Data between 1965 and

[1] Atlas of Alberta Lakes, 1990.

northwest
hydraulic
consultants

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1971, inclusive, were obtained from a previous report by NHC[2]. Data from 1972 onward were obtained from Water Survey of Canada (WSC) gauge no. 05FA013, *Pigeon Lake at Grandview*. Note that all reported levels are instantaneous readings and due to possible wind setup are not necessarily mean lake levels.

The extreme maximum lake level of El. 850.63 m occurred in 1981; an extreme minimum of El. 849.33 occurred in 1968. The difference between these two extreme values is 1.30 m. On an annual basis, the maximum range in lake level was 0.58 m (1990), which is a typical fluctuation for many lakes in central Alberta. Furthermore, historic information alluded to in the previously mentioned report prepared by NHC indicated that the extreme maximum water level of El. 850.71 m occurred in 1948. In this case, the difference between extreme values is 1.38 m.

Table 2 lists lake levels for various return periods based on a normal frequency distribution of maximum lake levels (1965-99); Figure 4 represents the plotted data. Lake levels of the 100- and 200- year return period are estimated to reach El. 850.63 and 850.70 m, respectively.

3.0 Watershed Characteristics of the Proposed Development Area

As shown by Figure 1, a small creek flows north through the proposed area and discharges into Pigeon Lake. The creek drains a small portion of the watershed located to the southwest of Pigeon Lake and has a drainage area of approximately 9.0 km^2. Based on the two largest events from nearby WSC gauge no. 05DF004 (Strawberry Creek near the Mouth, 1967-99), both of which resulted from heavy rainfall, an event runoff in the order of 50 mm is expected to occur over a four- to five-day period. The 100-year flood peak for the creek which empties into Pigeon Lake would be in the order of 3.4 m^3/s.

Any historical information that can be obtained regarding this creek may also prove beneficial in determining expected flows through the proposed development area. In particular, culvert or bridge capacities for the road crossing near the shoreline, highwater marks, communication with local residents and whether this road has ever

[2] Northwest Hydraulic Consultants Ltd., November 1981. Pigeon Lake Regulation Study, submitted to Alberta Environment Planning Division.

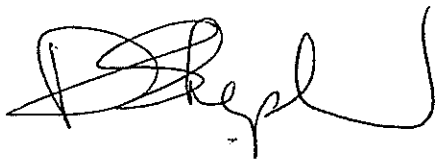
been overtopped. However, lake levels will play the primary role in the occurrence of high water within the proposed development area (*i.e.*, backwater conditions). Information should be sought as to whether historically high lake levels resulted in inundation of this area.

According to topographic mapping, the relief of the proposed development area is fairly low and, for the most part, sloped toward the creek ravine. Moderately well-drained soils developed on glacial till are present throughout the drainage basin[3], therefore, similar geology is expected in the area of interest. Forest cover is mainly restricted to areas surrounding the creek ravine. Although some forest cover exists to the west of the creek, a majority of the land in this area is being used for agricultural purposes.

Please feel free to contact the undersigned at (780) 436-5868 should you have any questions or concerns.

Yours truly,

NORTHWEST HYDRAULIC CONSULTANTS LTD.



Darren Shepherd, M.Sc., P.Eng.

Attachments

northwest hydraulic consultants

Reviewed by:

E.K. Yaremko, P.Eng.
Principal

[3] Lindsay, J.D., W. Odynsky, J.W. Peters and W.E. Browser. 1968. Soil Survey of the Buck Lake (NE83B) and Wabamun Lake (E1/2 83G) areas. Alta. Soil Surv. Rep. No. 24, Univ. Alta. Bull. No. SS-7, Alta. Res. Counc. Rep. No. 87 Univ. Alta., Edmonton.

Table 1
WATER LEVEL STATISTICS
Proposed Development Area at Pigeon Lake, AB - Hydrologic Overview

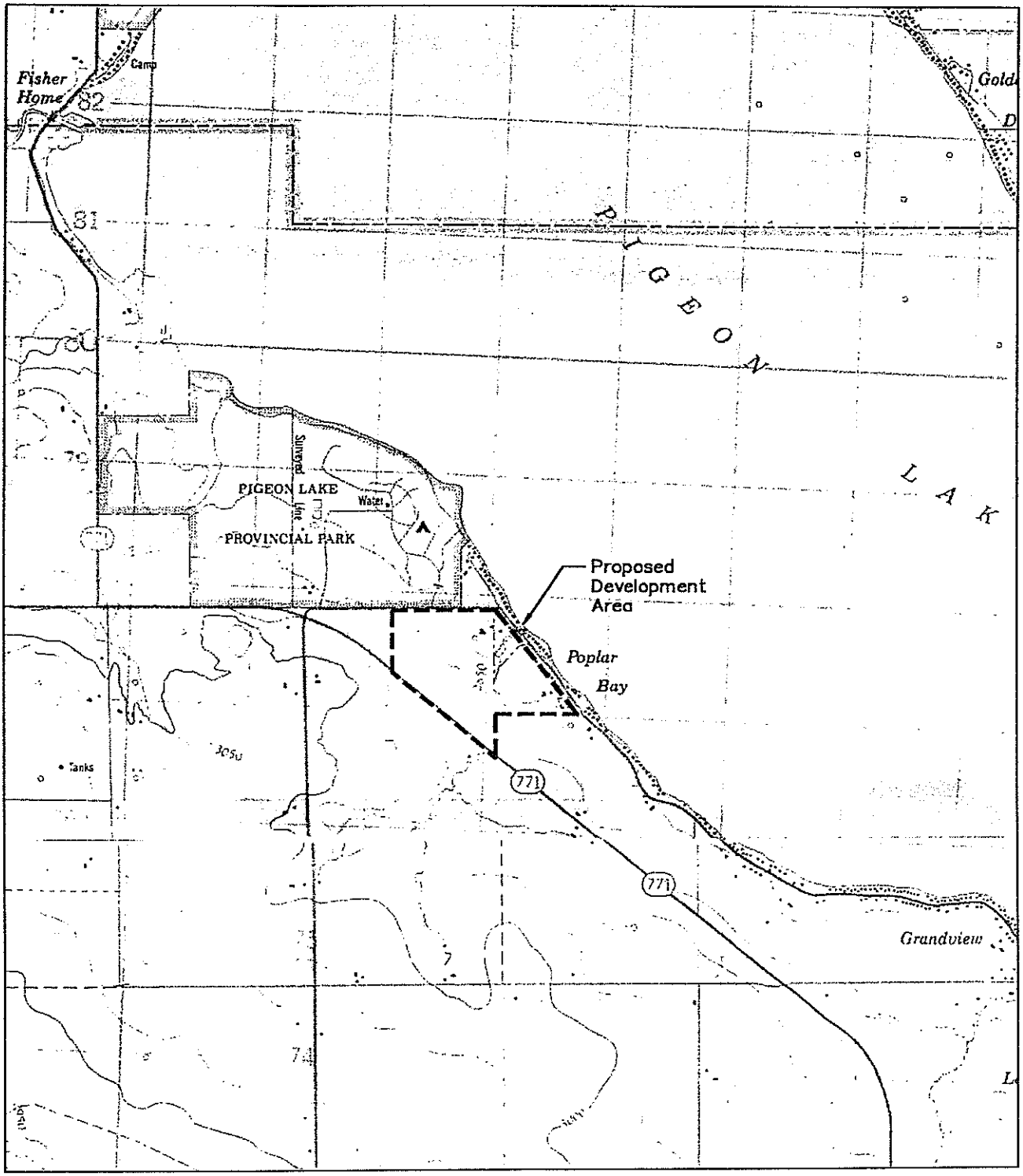
Year	Lake Level - Geodetic (m)		Annual Range (m)
	Maximum	Minimum	
1965	849.93	849.50	0.43
1966	849.90	849.68	0.22
1967	849.78	849.58	0.20
1968	849.64	**849.33**	0.31
1969	849.61	849.44	0.17
1970	849.58	849.39	0.19
1971	849.74	849.61	0.13
1972	849.79	849.59	0.19
1973	850.00	849.73	0.27
1974	850.45	850.13	0.32
1975	850.28	849.96	0.32
1976	850.05	849.85	0.20
1977	850.10	849.80	0.31
1978	849.99	849.85	0.14
1979	850.19	849.98	0.20
1980	850.36	850.02	0.34
1981	**850.63**	850.19	0.44
1982	850.39	849.99	0.39
1983	850.11	849.77	0.33
1984	849.92	849.66	0.27
1985	850.04	849.82	0.23
1986	850.22	849.89	0.34
1987	850.18	849.86	0.32
1988	849.88	849.70	0.18
1989	849.99	849.73	0.26
1990	850.54	849.95	**0.58**
1991	850.27	849.94	0.33
1992	850.07	849.71	0.36
1993	849.86	849.66	0.20
1994	849.81	849.63	0.18
1995	849.71	849.52	0.18
1996	849.89	849.58	0.30
1997	850.07	849.80	0.27
1998	850.03	849.78	0.25
1999	850.13	849.88	0.25
Mean	850.03	849.76	0.27

NOTES:

- Data between 1965 and 1971, inclusive, was obtained from *Pigeon Lake Regulation Study* prepared by NHC for Alberta Environment Planning Division, November 1981.
- Data between 1972 and 1999 was obtained from Water Survey of Canada (WSC) Gauge No. 05FA013 (Pigeon Lake at Grandview).

Table 2
FREQUENCY ESTIMATES OF MAXIMUM LAKE LEVELS
Proposed Development Area at Pigeon Lake, AB - Hydrologic Overview

Return Period (years)	Lake Level - Geodetic (m)
2	850.03
5	850.25
10	850.36
20	850.46
50	850.56
100	850.63
200	850.70



NOTES:

- Map shown is not to scale.
- Based on NTS map nos. 83-G/1 and 83-B/16 (1:50,000 scale).

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Pigeon Lake Proposed Development Area

LOCATION PLAN

Dwg. 6171-100	26-Mar-2001	**Figure 1**

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Figure 2

ANNUAL MAXIMUM LAKE LEVELS

WSC 05FA013 - Pigeon Lake at Grandview (1965-99)

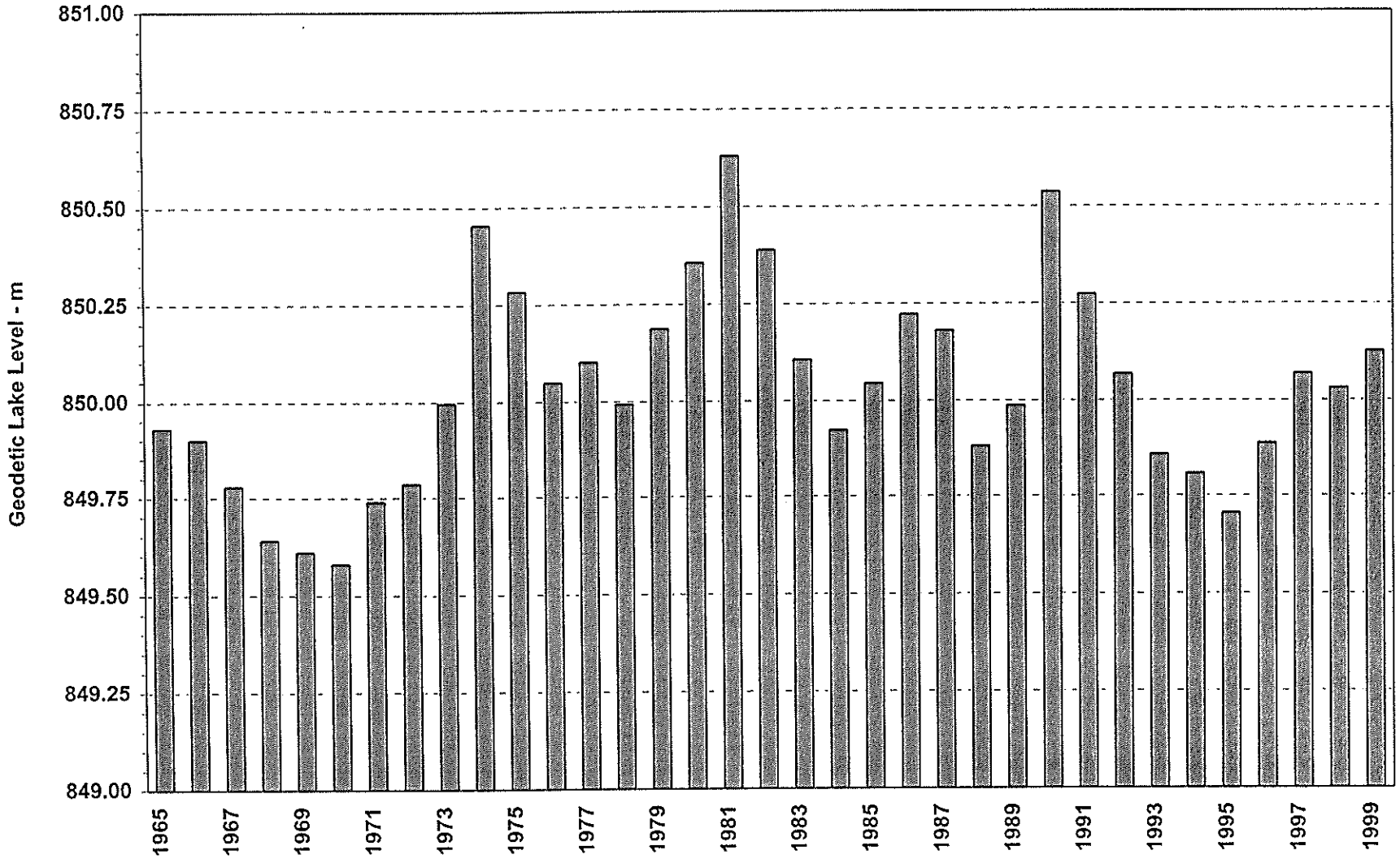
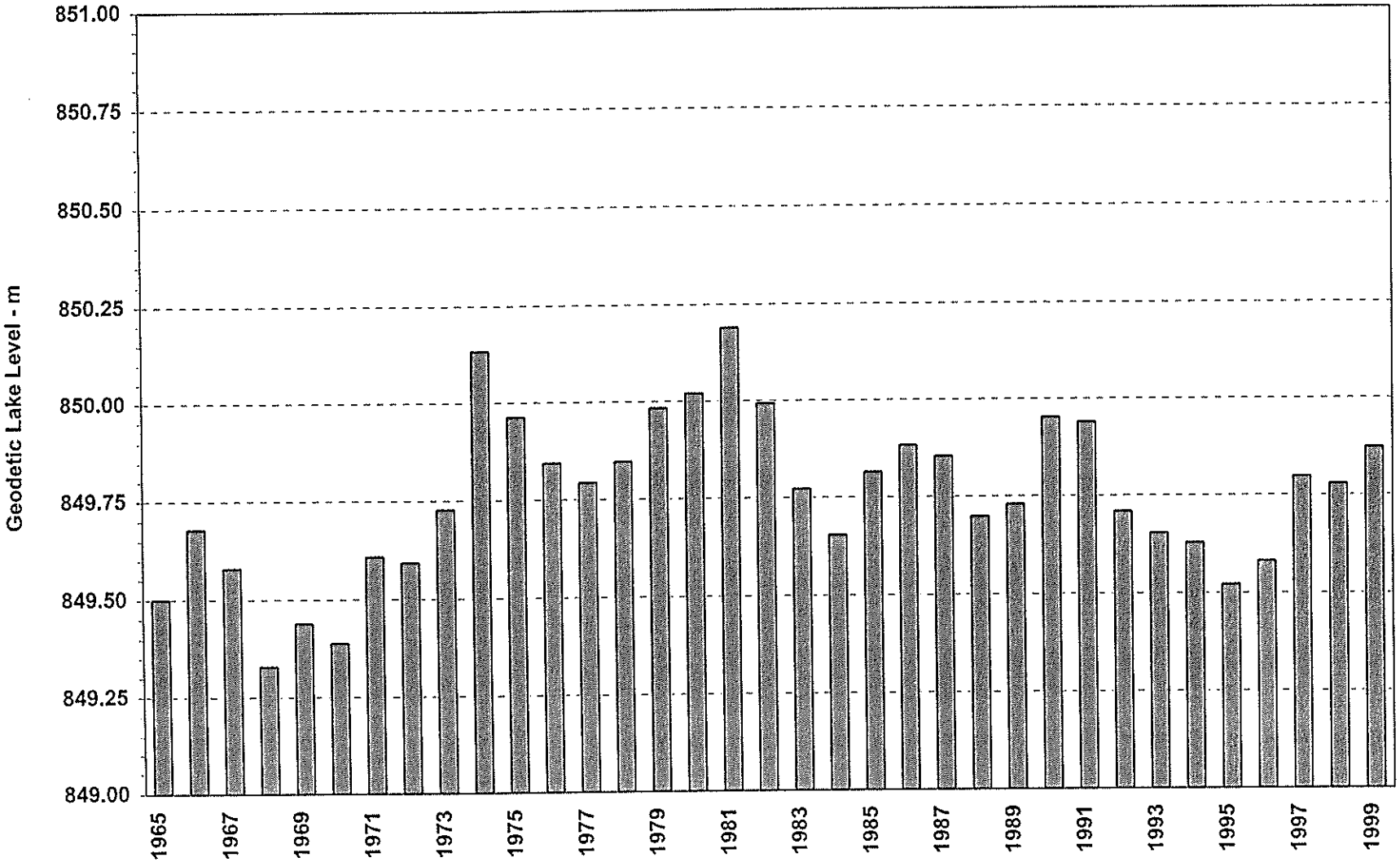


Figure 3
ANNUAL MINIMUM LAKE LEVELS
WSC 05FA013 - Pigeon Lake at Grandview (1965-99)



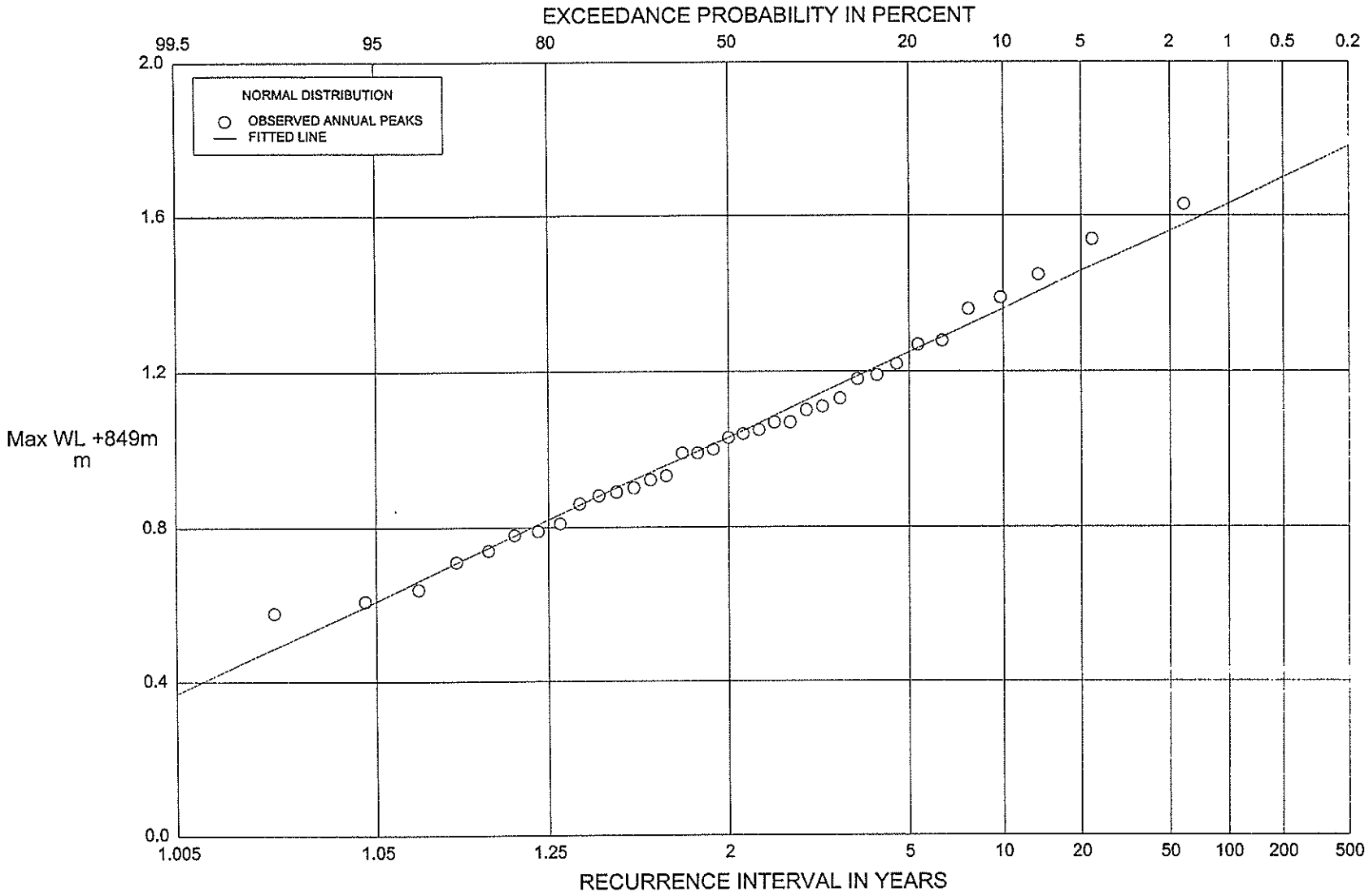


FIGURE 4 - Frequency Plot of Max. Lake Levels