BYLAW 199/2000

BEING A BYLAW OF THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31 TO ADOPT AN AREA STRUCTURE PLAN

WHEREAS the Council of the Municipal District of Foothills No. 31 (hereinafter called the "Council") is empowered by Section 633(1) of the Municipal Government Act, being Chapter M-26.1, to adopt an Area Structure Plan which provides a framework for subsequent subdivision and development of an area of land within the Municipality's boundaries; and

WHEREAS the Council did direct the preparation of an Area Structure Plan for the properties legally described as SE 28-21-28 W4 W4; and

WHEREAS the Area Structure Plan has been prepared under the direction of the Council;

NOW THEREFORE the Council of the Municipal District of Foothills No. 31 in the Province of Alberta, hereby enacts as follows:

1. This Bylaw may be cited as the "*Coulee View Estates Area Structure Plan*".

2. The Coulee View Estates Area Structure Plan being Schedule "A" attached hereto and forming part of this Bylaw.

3. That the Coulee View Estates Area Structure Plan may be amended by Bylaw from time to time in accordance with the Municipal Government Act, by the Municipal District of Foothills No. 31.

4. This Bylaw comes into full force and effect upon the third and final reading.

FIRST READING: December 7, 2000

Roy R. McLean
Reeve

Municipal Manager

SECOND READING: January 4, 2001

Roy R. McLean
Reeve

Municipal Manager

THIRD READING: January 4, 2001

Reeve
Roy R. McLean

Municipal Manager

PASSED IN OPEN COUNCIL assembled at the Town of High River in the Province of Alberta this 4 day of January 2001.

COULEE VIEW ESTATES
Area Structure Plan

Table of Contents

INTRODUCTION

1.1 PURPOSE

This Area Structure Plan (ASP) has been provided to the Municipal District of Foothills #31 as required by The Municipal Development Plan (MDP) adopted by By-law 139/98 dated October 1, 1998 and the Land Use Bylaw 1/99(LUB) adopted September 30,1999. It is intended to outline future development and subdivision in that portion of SE ¼ of Section 28 Township 21 Range 28 West of the 4th Meridian that lies to the south of Road Plan 5409EZ.

1.2BACKGROUND

The subject quarter section has had four previous subdivisions

1. The portion lying north of the Road Plan was separated from the quarter in 1979
2. There was a 10.5 acre parcel subdivided as an Agricultural parcel from the south-east corner of the quarter in 1990 (Descriptive Plan 901 1928) This parcel has since been rezoned under Land Use Bylaw 1/99 to Country Residential.
3. There was a 5-acre Country Residential subdivision done in 1996 from the northeast corner of the parcel lying south of the road plan.
4. There was a 5-acre Country Residential subdivision separating the original home site from the parcel lying north of the road plan in 1998.

1.3 APPROVAL PROCESS

An Area Structure Plan is identified in the Municipal Government Act

Definitions **616(dd) "statutory plan" means an intermunicipal development plan, a municipal development plan, an area structure plan and a area redevelopment plan adopted by a municipality under Division 4;**

As noted in Section 633 of the Municipal Government Act, the Council may by bylaw adopt an Area Structure Plan. The Municipal Government Act also states that Council in the process of adopting this plan must comply with provisions of Section 636, 637 and 638 which are quoted as follows:

Statutory plan Preparation **636 While preparing a statutory plan a municipality must**

(a) provide opportunities to any person who may be affected by it to make suggestions and representations,
(b) notify the public of the details of the plan preparation process and of the means to make suggestions and representations referred to in clause (a),

1. INTRODUCTION

APPROVAL PROCESS (cont.)

(c) notify the school authorities with jurisdiction in the area to which the plan preparations applies and provide opportunities to those authorities to make suggestions and representations,

(d) in the case of a municipal development plan, notify adjacent municipalities of the plan preparation and provide opportunities to those municipalities to make suggestions and representations, and

(e) in the case of an area structure plan, where the land that is the subject of the plan is adjacent to a another municipality, notify that municipality of the plan preparation and provide opportunities to that municipality to make suggestions and representations.

Effect of plans **637 The adoption by a council of a statutory plan does not require the municipality to undertake any of the project referred to in it.**

Plans consistent **638 All statutory plans adopted by a municipality must be consistent with each other.**

1995 c24 s95

1.4 LEGISLATED REQUIREMENTS

The Municipal Government Act (MGA) outlines the contents that are required to be present in an Area Structure Plan. Section 633 of the Municipal Government Act reads as follows:

Area structure plan **633(1) For the purpose of providing a framework for subsequent subdivision and development of an area of land, a council may, by bylaw, adopt an area structure plan.**

(2) An area structure plan

(a) must describe

(i) the sequence of development proposed for the area,

(ii) the land uses proposed for the area, either generally or with respect to specific parts of the area,

(iii) the density of population proposed for the area either generally or with respect to specific parts of the area, and

(iv) the general location of major transportation routes and public utilities,

1. INTRODUCTION

1.4 LEGISLATED REQUIREMENTS (cont.)

and
may contain other matters the council considers necessary.

1.5 MUNICIPAL REQUIREMENTS

The Municipal District of Foothills has outlined when an Area Structure Plan is required or may be required in Section 5.3.5 of the Municipal Development Plan, as outlined below:

5.3.5 An Area Structure Plan drafted in accordance with the guidelines adopted by the Municipality shall be required as part of a Country Residential proposal that would create 8 new lots or more and for proposals of less than 8 new lots an Area Structure Plan may be required if in the opinion of Council one is necessary, due to:

- **a) the impact the proposal may have on adjoining lands;**
- **b) the need to review, in greater detail, the infrastructure requirements of this proposal;**
- **c) the proposal being a continuation of an existing subdivision and leads to a density greater than 8 lots per quarter section;**
- **d) the proposal, in the opinion of Council being phase 1 of a development that will create 8 new lots or more.**

1.6 DEFINITIONS AND INTERPRETATIONS

In this plan:

I. "Act" means the Municipal Government Act 1995 and amendments thereto.
II. "Council" means the elected Council of the Municipal District of Foothills #31.
III. "Developer" means the landowner of the subject parcel(s) as listed on the title(s) or their duly appointed agent.
IV. "Land Use Bylaw" means Bylaw 1/99 passed by Council pursuant to the Municipal Government Act which regulates and controls land uses and development controls and approvals within the boundaries of the municipality.
V. "Municipal Development Plan" means the plan adopted by Bylaw 139/98 pursuant to the Municipal Government Act.

1. INTRODUCTION

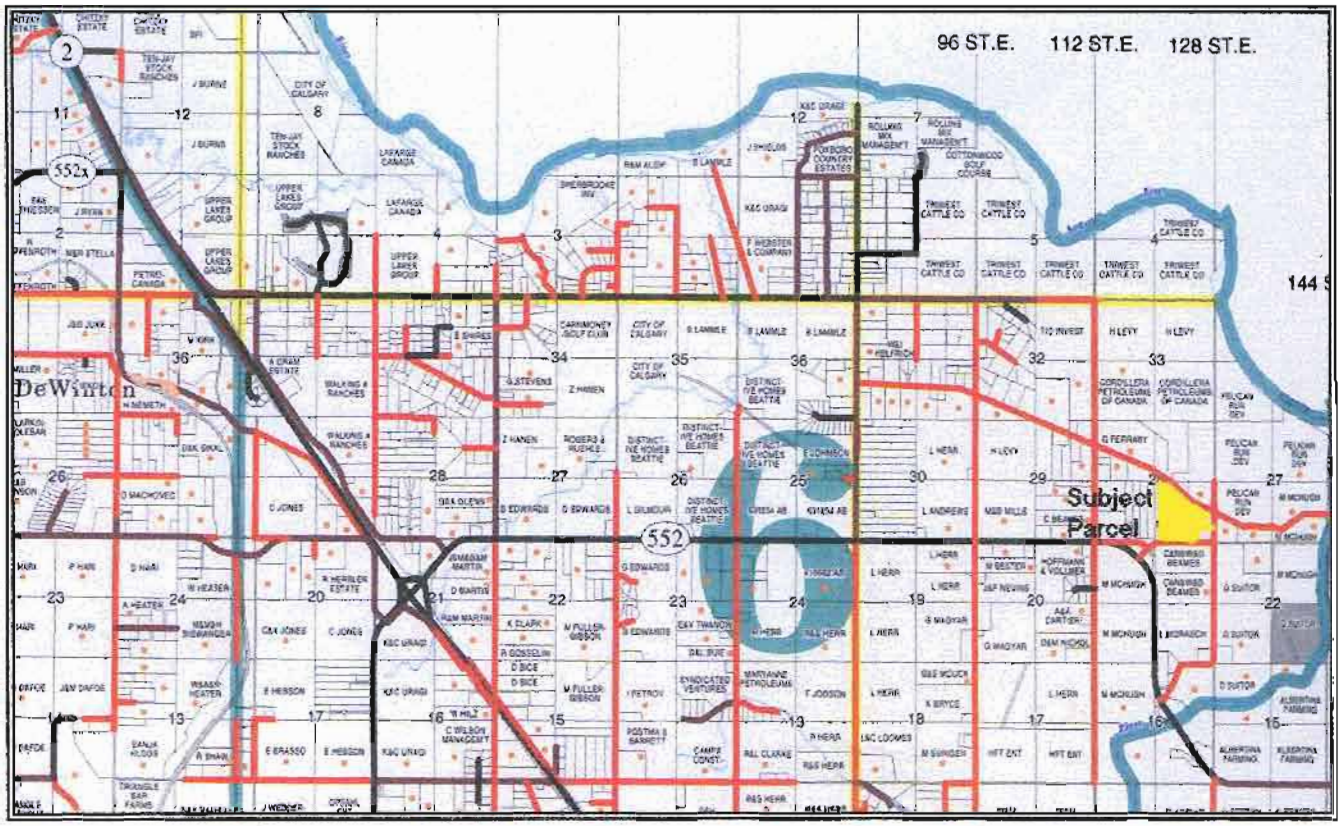
1.6 DEFINITIONS AND INTERPRETATIONS (cont.)

VI. "Municipality" mean the Municipal District of Foothills #31
VII. "Plan Area" means the specifically outlined areas that are mentioned in Section 1.1 of this plan and shown in the attached Figure 1.
VIII. "Subdivision Approving Authority" means the Council of the Municipal District of Foothills #31.

All other definitions and interpretations shall have the meaning that is assigned to them in the Municipal Government Act, the Municipal Development Plan or the Land Use Bylaw.

2. PLAN AREA

2.1 LOCATER MAP



Extracted From Municipal District of Foothills Map – Dated August 15, 1999

Figure 1

2. PLAN AREA (cont.)

2.2 ZONING MAP

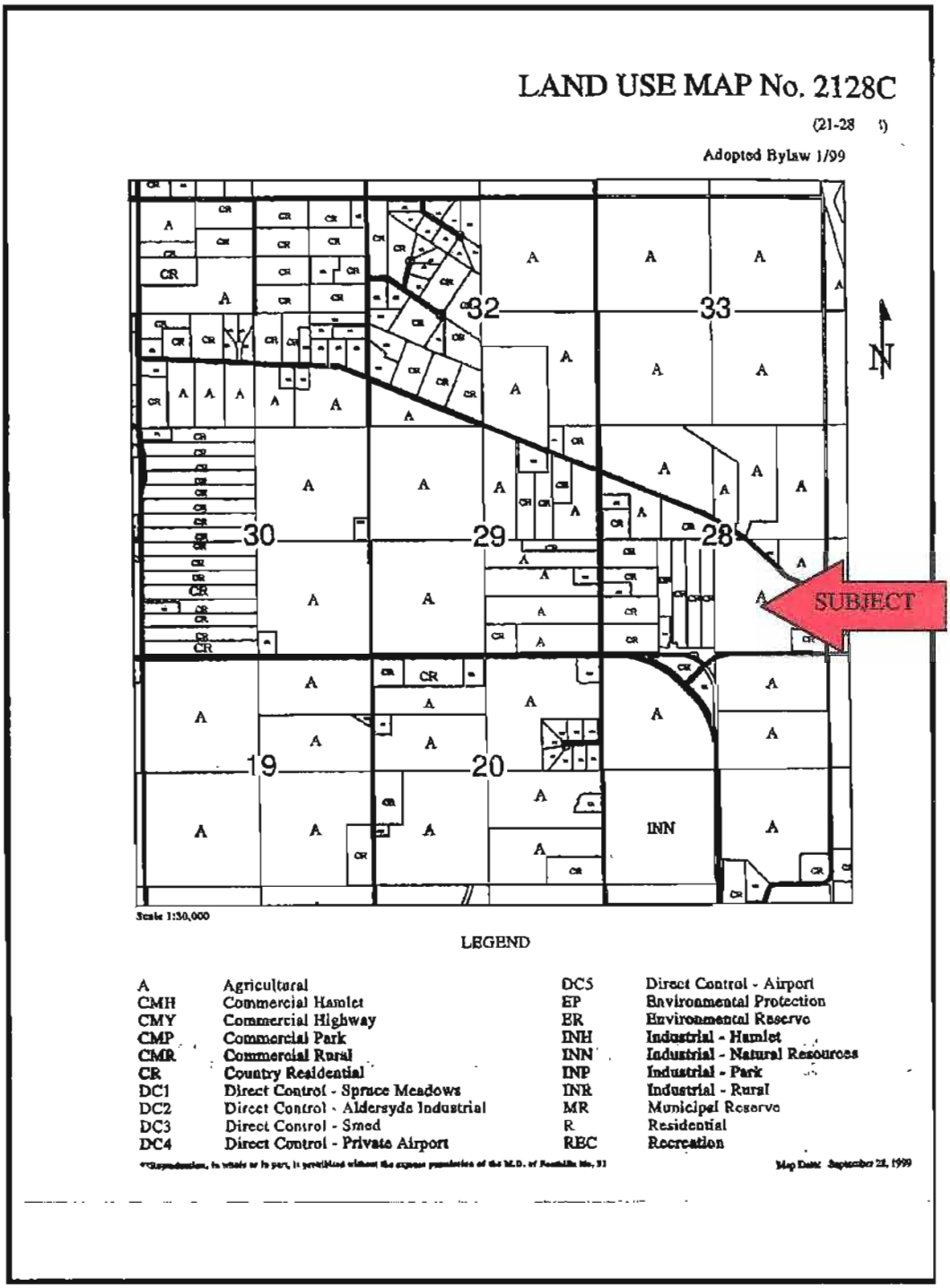
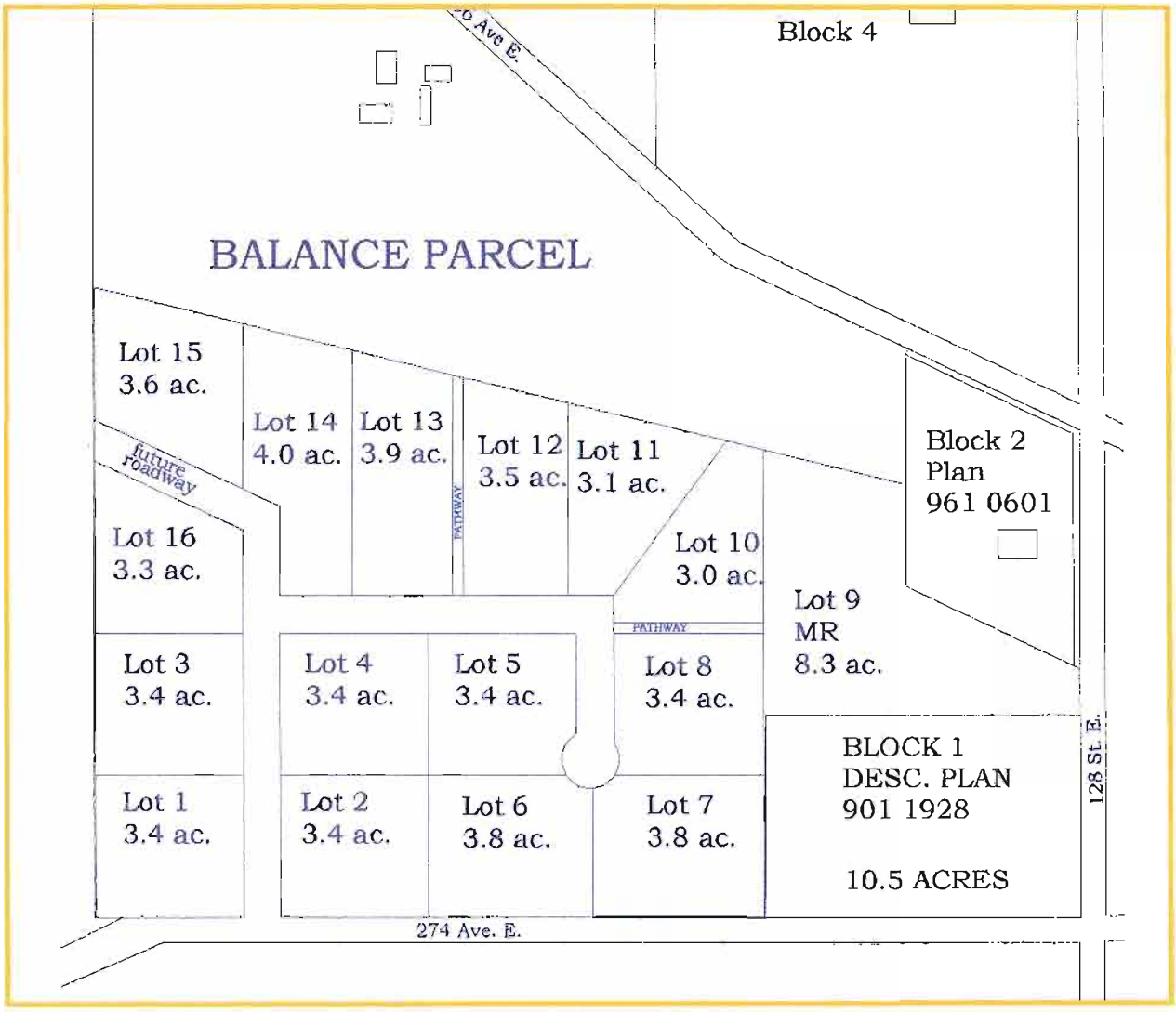


Figure 2

2. PLAN AREA (cont.)

2.3 Plan Area Map

Figure 3.



2. PLAN AREA (cont.)

2.4 LOCATION/OWNERSHIP

The subject parcel is located approximately 10.5 kilometers East of the overpass serving Highways 2 and 2A and Secondary Highway 552 and is approximately .3 kilometers north and east of Secondary Highway 552. The land is serviced by 256th Avenue on its North boundary, 274th Avenue on its South boundary and 128th Street on its eastern boundary.
The Certificate of Title is attached as Appendix "A" of this document.

2.5 DEVELOPMENT HISTORY

Subject Lands
In 1979 the quarter section was split into two parcels. That portion lying north of the road was separated from the portion lying south of the road (Subject Land).
In 1989 a 10.5-acre parcel was removed from the Southeast corner of the subject lands as an Agricultural parcel.
In 1996 a 5-acre parcel was removed from the Northeast corner of the subject lands and zoned Country Residential.

Adjacent Lands
The Northeast ¼ of 28-21-28W4 was subdivided in the late 30's or early 40's to accommodate a World War II air-training base north of the road plan. A three-acre parcel was severed from the remainder by the road plan

The Northwest ¼ of 28-21-28W4 was split into two parcels by the road early in the last century. The portion south of the road was subdivided in the late 80's and early 90's into 4 parcels of varying sizes.

The Southwest ¼ of 28-21-28W4 was split into 8-20 acre parcels in the 70's and two of those twenties were further subdivided in the 90's.
The remainder of the subject ¼ had a five-acre parcel removed that surrounds the original buildings in 1998.

2. PLAN AREA (cont.)

2.5 DEVELOPMENT HISTORY (cont.)

Adjacent Sections

The NW21-21-28W4 has had two Country Residential lots created by a road diversion.

The NE21-21-28W4 has been split into 2-80 acre parcels.

The SW21-21-28W4 is intact and is zoned for gravel extraction.

The SE21-21-28W4 has 3 country residential acreages and the balance.

Section 27 is relatively intact north of the road but has had approval for a golf course surrounded by Country Residential Lots. That portion south of the road is presently in 4 parcels.
1.
The majority of the land in this township is County Residential.

3. PLAN GOALS AND OBJECTIVES

1. To set out a plan of development for the subject lands
2. To create 15 new Country Residential lots and a Municipal Reserve lot that best utilizes the land base and natural topographic features of the site
3. To avoid development on environmentally sensitive lands
4. To ensure that the proposed development conforms to the goals and objectives of the Municipal District of Foothills Municipal Development Plan.
5. To provide a mechanism of amending the Municipal District of Foothills Land Use Bylaw so that all development conforms to the Bylaw.

4. PLAN POLICIES

4.1 PLAN CONCEPT

In order to meet the Plan's objective, this Plan incorporates a development that will be compatible with the general area and will facilitate the growing demand for Country Residential lots while still maintaining a large portion of land for an Agricultural pursuit in the foreseeable future. (Presently hay and pasture for equestrian operation.)

The Municipal Reserve lot is designed to maintain the separation distance between the two existing residences and provides extra land for recreational purposes. The internal lots on the development have access to the parcel by means of a walkway off the internal road system.

4.2 LAND USES

Zonings

a) Country Residential

The area designated for the residential development under this Plan is currently zoned Agricultural District under the Municipal District of Foothills Land Use Bylaw. Prior to proceeding to subdivision, the Plan Area will be redesignated to Country Residential to comply with the provisions of the Municipal District of Foothills Municipal Development Plan and the Municipal District of Foothills Land Use Bylaw. The maximum density allowed would be the fifteen lots outlined in this plan.

b) Municipal Reserve

The area designated for the municipal reserve under this Plan is currently zoned Agricultural District under the Municipal District of Foothills Land Use Bylaw. Prior to proceeding to subdivision, the Plan Area will be redesignated to Municipal Reserve to comply with the provisions of the Municipal District of Foothills Municipal Development Plan and the Municipal District of Foothills Land Use Bylaw. The 10-meter pathways will be part of the Municipal Reserve but are over dedication not to be included in MR calculations. The pathways are to provide ready access to the MR parcel for all residences of the quarter and will be maintained by adjoining landowners. All uses and final design of the MR will be to the satisfaction of Council.

c) Agricultural District

The balance of the Plan area is presently zoned Agricultural District and is to remain with this designation.

4. PLAN POLICIES

4.3 Environmental Considerations

There are no environmentally sensitive areas in the Plan Area therefore no Environmental Reserve Parcels are contemplated in the Plan.

4.4 Transportation/Phasing

The phasing of the project is tied directly to the Municipal District of Foothills guidelines as per road surfacing requirements. The first phase is meant to take the project to the maximum density for a gravel roadway. This would be from a newly constructed internal road engineered and built to Municipal Standards. All accesses will be developed utilizing the internal road system.

The second phase is to take the project to the maximum density with a surfaced internal road and a dust controlled main road built to Municipal Standards

The third and final phase will entail surfacing the internal road as well as 274 Avenue E. from the point of entry to the Plan area back to Secondary Highway 552. This road would be rebuilt to Municipal Standards and surfaced to the satisfaction of the Municipal Council.

As indicated in Figure 4, the area will be developed in three phases as outlined below:

Phase 1	Includes the development of Lots 1-4 and Municipal Reserve Lot 9. This depicts short-term (immediate) development of 4 residential lots and one-MR lot.
Phases 2	Includes the development of Lots 5-8 and Lot 16
Phase 3	Includes the development of Lots 10-15 inclusive. The intent of phases 2 and 3 will be to allow an existing agricultural activity to continue for a longer term with the eventual conversion to country residential development. Phases 2 and 3 lands can be considered as an agricultural transition area. Phase 2 is a medium term phase consisting of 5 lots. Phase 3 is a long term phase consisting of 6 lots. Council will consider Phases 2 and 3 on further applications as surrounding densities increase and water is proven to be available to support them.

The "Future Road" as shown on the plan is to be dedication only. It's sole purpose is to provide a more viable access to the parcels to the West should they wish to develop in the future and will dedicated at Phase 2.

4. PLAN POLICIES

4.5 Density

The Municipal District of Foothills Municipal Development Plan outlines the maximum density provision for Country Residential to be 32 lots per quarter section or 1 lot per five acres. The total number of developable acres within the plan area is 111.57 acres, which equates to 22.31 lots. This Area Structure Plan allows for 15 lots or 67.2% of maximum density.

There are no plans to develop the lower lands at this time as the road infrastructure is below Municipal standards. Possibly, it could be further developed for residential or recreational usage after the roads serving the parcel are improved. Any further development would require an Area Structure Plan Amendment and would be the subject of a Public Hearing before Council at the time of application.
The owner shall enter into a restrictive covenant on the balance lands restricting further subdivision unless approved by Municipal Council.

4.6 Neighborhood Impact

The land on three sides of the subject land is zoned Country Residential and has been developed over the years into a variety of sizes from 4 acres up to 20 acres. The quarter immediately south is divided into 2-80 acre parcels. Less than a mile to the west is 552 Estates plus an extension of 6 further lots. The entire area south of Calgary from Highway 2 east to this property has seen a multitude of developments from 1 or 2 parcels from the ¼ section to Residential development at Heritage Pointe. The natural topographic boundary to this point in time has been the Highwood River, approximately 2 kilometers south of the subject lands.

The two other Country Residential parcels on the quarter section maintain the same separation because of the placement of the Municipal Reserve parcel.

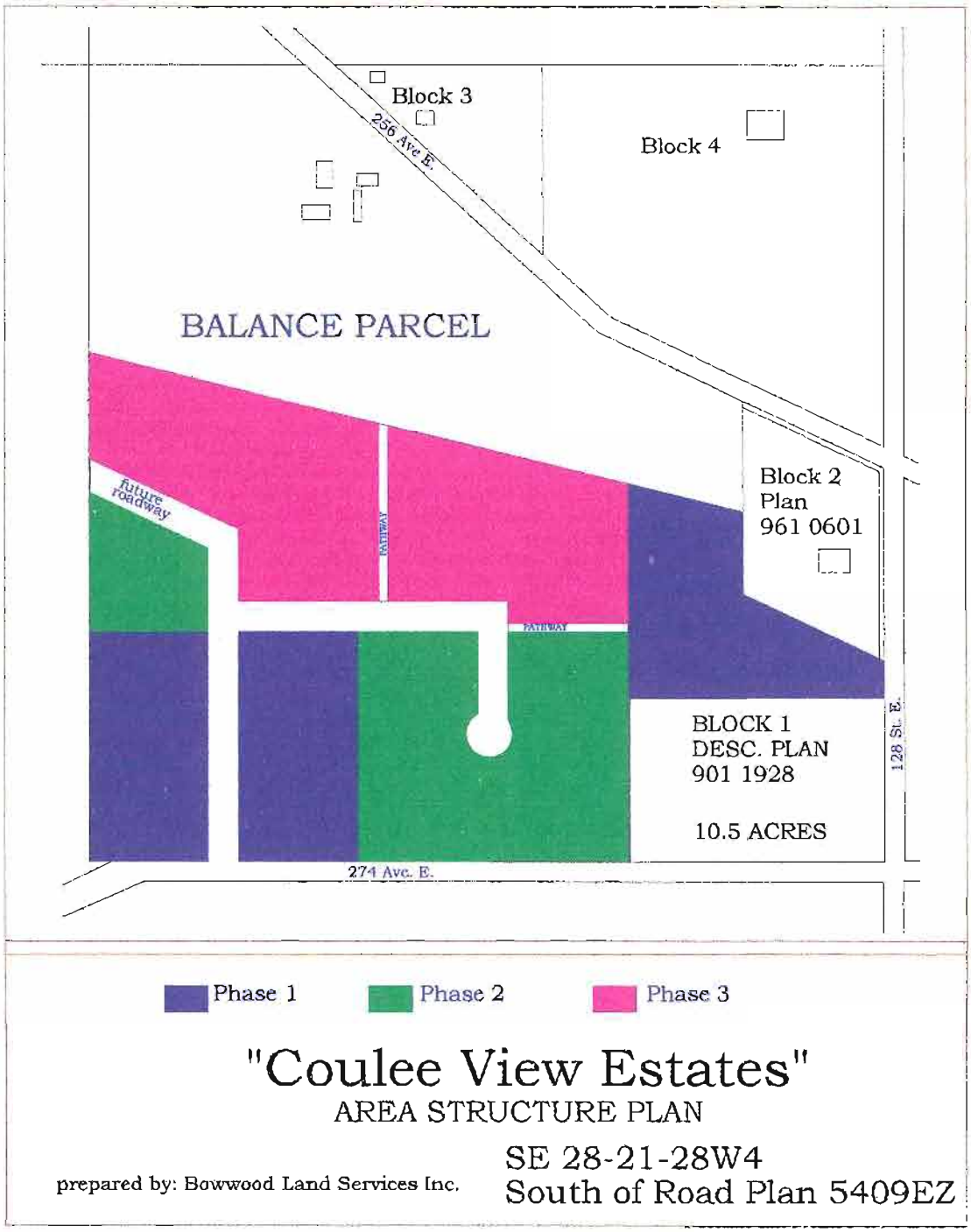
The Municipal Reserve besides allowing the separation mentioned above provides for a natural space for residents to develop a park in the future or any other community amenity that is approved by the Council of the Municipal District of Foothills.

The Municipal Reserve has the ability to be accessed from 128 Street East or by means of the pathway connecting the proposed internal road to the Reserve parcel.

4. PLAN POLICIES

4.7 PHASING SCHEDULE

Figure 4.



5. SERVICING CONSIDERATIONS

5.1 Stormwater Drainage

The existing parcel slopes gently to the north and there is no evidence of any defined water courses on the portion of the Plan Area that is to be developed. There are two small depressions near the south boundary that hold small amounts of water after spring thaws. The majority of stormwater would appear to be absorbed into the ground or use the ditches of the existing municipal roads. When the internal roads are engineered, the stormwater drainage plan will have to be incorporated and will follow best management practices whereby post-development flows are no greater than predevelopment flows.

The remainder of the property that is not being developed slopes to the north at a greater rate and the run-off is accommodated by the seasonal creek that transverses the property at the north end of the Plan Area.

5.2 Domestic Water

There are a number of moderate to high producing wells on the quarter section as outlined in the initial water survey done by Groundwater Exploration (Attachment 2). The lots will be supplied by individual wells that are certified by a registered engineer to meet or exceed the requirements of the Water Act.

5.3 Domestic Sewage

The domestic sewage disposal will be by means of septic tank and conventional field system. All installations will require permitting and must meet the requirements of Alberta Safety Codes and Building Codes.
While no high water areas have been identified to date, percolation tests will be performed on any lots that the Municipality determines necessary.

5.4 Shallow Utilities

Electrical service to the plan area is from Utilicorp and no cost easements will be provided and placed on each title prior to registration.

Natural gas service to the plan area is from Atco Gas and no cost easements will be provided and placed on each title prior to registration.

Telephone service to the plan area is from Telus and no cost easements will be provided and placed on each title prior to registration.

5. SERVICING CONSIDERATIONS

5.5 Solid Waste Removal

Will be the responsibility of the individual landowner who has a number of private contractors that can be utilized or they may haul the waste themselves to the Foothill's Regional Landfill south of Okotoks.

5.6 Police Service

The plan area is policed primarily by the RCMP detachment from Okotoks for all purposes and secondarily by the Special Constables from the M.D. of Foothills for traffic matters.

5.7 Fire Protection

The plan area is within the fire protection area of Okotoks Volunteer Fire Department and backup protection is also provided from the City of Calgary, High River and Blackie Fire Departments.

5.8 Emergency Medical and Ambulance

The Foothills Regional Emergency Services Commission services this are from its Okotoks station with back up service provided from High River, Turner Valley or the City of Calgary.

5.9 911 Service

911 emergency calling is provided throughout the area and is for all emergency calls including fire, ambulance and police as well as disaster services. This service is manned 24 hours a day/seven days a week by the Foothills Regional Emergency Services Commission.

6. BUILDING RESTRICTIONS AND COVENANTS

The developer will be registering a Developer's Agreement registered on title as a restrictive covenant for each lot which outlines the building envelope allowed so that a minimal impact on neighbors is achieved without lose of view.

The Agreement will also outline size and style of house permitted as well as location of outbuildings.

All houses will be required to install oversize pressure tanks, low volume toilets and water saving shower heads to minimize the impact on the groundwater supply by conserving and managing water usage.

The Agricultural Lands will have a Restrictive Covenant placed upon then that restricts "Intensive Agricultural Uses" to the satisfaction of the Municipality.

A. L. T. A.

SOUTH ALBERTA LAND REGISTRATION DISTRICT

REMOTE LAND TITLE SEARCH

SEARCH DATE: 08/08/2000

S LINC	SHORT LEGAL	TITLE NUMBER
0026 678 466	4;28;21;28;SE	961 063 526 +1

LEGAL DESCRIPTION

THAT PORTION OF THE SOUTH EAST QUARTER, OF SECTION TWENTY EIGHT (28) IN TOWNSHIP TWENTY ONE (21) RANGE TWENTY EIGHT (28) WEST OF THE FOURTH MERIDIAN THAT LIES TO THE SOUTH WEST OF A ROADWAY REGISTERED AS PLAN 5409EZ CONTAINING FIFTY ONE AND ONE HALF HECTARES (51 1/2) (127 1/2 ACRES) MORE OR LESS
EXCEPTING THEREOUT:

PLAN	NUMBER	HECTARES	ACRES
DESCRIPTIVE	9011928	4.25	10.5
ROAD	9210798	0.017	0.042
SUBDIVISION	9610601	2.182	5.39

EXCEPTING THEREOUT ALL MINES AND MINERALS

ESTATE: FEE SIMPLE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 921 101 238 +1

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
		REGISTERED OWNER(S)		
961 063 526	26/03/1996	SUBDIVISION PLAN		

OWNERS

THERESA MAY BERGLUND
OF R.R. 1
DEWINTON
ALBERTA T0L 0X0

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
741 038 380	26/04/1974	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.
811 093 640	22/05/1981	CAVEAT CAVEATOR - THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31.
921 066 360	26/03/1992	MORTGAGE MORTGAGEE - PIONEER CREDIT UNION, LIMITED. 319 CENTRE ST SW, BOX 5460 HIGH RIVER ALBERTA T1V1M6 ORIGINAL PRINCIPAL AMOUNT: $135,000 (DATA UPDATED BY: TRANSFER OF MORTGAGE 941131596) (DATA UPDATED BY: CHANGE OF ADDRESS 981009879)

TOTAL INSTRUMENTS: 003 *END OF SEARCH * SR# - J232041 /AR1030
YOUR FILE #: REM500

#0057

Groundwater Supply Feasibility- Phase 1
Berglund property: Area Structure Plan
SE-28-21-28-W4M

Submitted to:

Bowwood Land Services Inc

Prepared by:

Groundwater Exploration & Research Ltd
June 2000

Groundwater Exploration & Research LTD

Box 15
Balzac, AB. CANADA T0M 0E0
Phone (403) 226-0330: Fax (403) 226-6593: Email: nowakb@cadvision.com

June 7, 2000
File No: 0057

Bowwood Land Services Inc
RR1
DeWinton, AB.
T0L 0X0

Attention: Wayne Berglund

RE: Berglund property: SE-28-21-28-W4M
Area Structure Plan - Groundwater Feasibility Assessment

Enclosed find our report which addresses the groundwater feasibility in the immediate area of the Berglund property at SE-28-21-28-W4M in the Municipal District of Foothills.

Background Information

A 15 lot subdivision is being proposed for a 44.52 hectare [110 acre] parcel in the SE-28 quarter section. Five parcels currently exist on the quarter section. The proposed property is located east of the Highway 2 and Okotoks Overpass on Secondary Road 552 and 128 Street East. The proposed lot size for each of the 15 lots is approximately 1.21 hectares [3 acres], leaving a 39.52 hectare [97.65 acre] residual parcel.

In accordance with the Municipal District of Foothills regulations, there is a requirement to prepare an Area Structure Plan for subdivisions with 8 or more parcels. This report addresses the feasibility of finding sufficient volumes of groundwater to sustain an additional 15 lots in SE-28-21-28-W4M

In accordance with the Water Act, a household is allowed to withdraw up to 1250 m^3/year without requiring a license to divert water. Based on the maximum allocation of 1250 m^3/year or 3.42 m^3/day, the total water requirement is 51.3 m^3/day [7.8 Cgpm] for individual wells per lot. For a licenced communal well, the water requirement is 1.82 m^3/day [400 gpd/lot] or a total of 27.3 m^3/day [4.2 Cgpm].

Geomorphic/Geologic Setting

The land in the area of SE-28 is gently rolling with a regional slope toward the northeast. The elevation change across the SE-28 quarter section is up to 23 meters [Dalemead 82 I/13; 1:50,000 topographic map sheet] primarily because of a drainage channel that exists in the northeast corner of the quarter section. The elevation change across the block of nine quarter sections is also up to 23 meters, once again being influenced by the presence of the drainage channel. Discounting the influence of the drainage channel, the elevation change is about 7.5 meters.

The bedrock in the area [Hamilton, Price & Langenberg, 1999: Geologic Map of Alberta; 1:1,000,000] is mapped as the Porcupine Hills Formation of continental origin. The Porcupine Hills Formation consists of greenish-grey, thick bedded, chloritic and feldspathic sandstone and blocky grey mudstone; with some tuff and thin coal beds. Water bearing units in the Porcupine Hills Formation are generally lenticular in geometry and of limited lateral extent.

Ozoray & Lytviak [1974: Hydrogeology of the Gleichen area, Alberta; Alberta Research Council, Report 74-9] map the area as having a groundwater potential of 33 to 164 m^3/day [5-25 Cgpm]. The regional groundwater flow is northeast toward the Bow River drainage basin.

Pertinent Regulations

Country residential subdivision and groundwater supply is regulated by Section 23(3) of the Water Act and stated as follows:

"If, after this Act comes into force, a subdivision of land of a type or class of subdivision specified in the regulations is approved under the Municipal Government Act, a person residing within that subdivision on a parcel of land that adjoins or is above a source of water described in section 21 has the right to commence and continue the diversion of water under section 21 only if

(a) a report certified by a professional engineer, professional geologist or professional geophysicist, as defined in the Engineering, Geological and Geophysical Professions Act, was submitted to the subdivision authority as part of the application for the subdivision under the Municipal Government Act, and the report states that the diversion of 1250 cubic

meters of water per year for household purposes under section 21 for each of the households within the subdivision will not interfere with any household users, licensees or traditional agriculture users who exist when the subdivision is approved, and

(b) the diversion of water for each of the households within the subdivision under section 21 is not inconsistent with an applicable approved water management plan.

Water Regulation [AR 205/98]

9(1) Subject to subsection (2), a type of subdivision of land for the purposes of section 23(3) of the Act is a subdivision that results in 6 or more parcels in a quarter section or in a river lot.

In essence, Section 23(3) of the Water Act asks two basic questions:

[a] Is there sufficient water to satisfy the maximum requirement of 1250 m^3/year for each lot in the proposed subdivision?

[b] Will the allocated volume of water per lot result in a significant adverse effect on neighbouring wells and licensed users existing at the time of subdivision application?

Groundwater Well Data

A survey of groundwater well data in SE-28 and the surrounding 8 quarter sections of land was undertaken utilizing available information from Alberta Environmental Protection's groundwater database file. A total of 32 well records were available for review, including 4 well records from the SE-28 quarter section. A summary of available water well information is summarized in Table 1, appended to this report.

[1] Well depths vary significantly from 18.3 to 103.7 meters over the nine quarter sections. Within the SE-28 quarter, the well depths vary from 18.3 to 67.1 meters. The variability in well depth exceeds the topographic relief across the site, indicating that the water bearing zones are not continuous across the immediate area. The geometric mean well depth is 53.1 meters which gives an indication of the anticipated well depth for future well drilling on the proposed lots.

[2] Completion intervals vary from shallow depths of 10.7 to 18.3 meters [Berglund: SE-28, May 81], to deeper completions at 91.5 to 103.7 meters [Aesie: SW-28] also suggesting that the water bearing zones are not continuous across the nine quarter block section or even within the immediate area of SE-28.

[3] Preliminary flow estimates vary from 11.5 to 183.3 m^3/day over the regional nine block section; and 39.3 to 183.3 m^3/day over the SE-28 quarter section. The variability in flow rates can be attributed to differences in bed geometry, texture, and cementation characteristics; in addition to well depth completion interval. The geometric mean flow, based on available well records is 39.5 m^3/day. This volume of water is sufficient to accommodate up to 11 lots based on the maximum allowable of 3.42 m^3/day per lot for a scheme involving individual wells per lot. This estimated number of lots is less than the proposed 15 lot subdivision. based on regional considerations.

Within the SE-28 quarter section, the geometric mean estimated flow rate is 68.7 m^3/day which is sufficient to service up to 20 lots. One of the highest recorded producing wells is the Berglund well completed May 81 at 28 Cgpm. Both the local and regional flow estimates exceed the groundwater requirement [1.82 m^3/day or 400 gpd/lot] based on a licensed communal well.

[4] At least two of the wells are completed with extensive open areas [Delbello, May 79 and Sep 80]. Nine of the water wells are completed with multi-layer watering bearing zones. Domestic wells with extensive open areas and or multi-layer completion zones generally signify the presence of low yield, water bearing zones.

[5] The non-pumping water level data displays a significant variability in depth from 2.7 to 51.5 meters. The variability in non-pumping water level mirrors the variability in well depth supporting the argument for a lack of continuity of water bearing units.

[6] The available drawdown in the wells is highly variable. A number of well records indicate limited available drawdown, or non-pumping water levels within the perforated zone. This observation is of concern unless future wells are completed within a single water-bearing zone.

[7] There is some evidence to suggest that the regional water table has not dropped significantly over a 30 year period. Wells completed within the 30 to 45 meter depth have similar non-pumping water levels for wells completed in the 1990's as those completed in the 1970's.

Licensed Users

There are no licensed users within the nine quarter block .

Existing Q_{20} Flow Tests:

Groundwater Exploration & Research has undertaken the analysis of eight Q20 flow tests both within the 9-block of quarter sections and outside of and adjacent to the block of 9 quarter sections. Pertinent data are tabulated as follows:

Location	Owner	Transmissive Capacity (m^2/day)	Recommmended Q20 (m^3/day)
NW-28	Cullimore	1.6	11.5
SE-33	Sanopsky	5.6	45.2
SE-29	MacNeil	18.0	21.0
NE-20	Vervena	1.4	15.0
NE-20	Vervena	11.2	10.4
NE-20	Vervena	2.6	3.5
NE-20	Vervena	34.4	39.3
NE-20	Vervena	17.9	39.3

Existing near-by well flow tests indicate a significant variability in transmissve capacity from 1.4 to 34.4 m^2/day. The recommended Q_{20} flow rates are often restricted by the pump test rate, rather than the aquifer capability. About 62% of the well tests indicate a transmissive capacity exceeding a desirable 3.5 m^2/day.

Well Interference

With respect to the potential for well interference as indicated in Section 23(3) of the Water Act, a calculation for well interference, neglecting recharge, at any given distance from the pumping well can be determined from:

$$u = r^2S/4Tt \text{ and}$$

$$s = QW(u)/4*pi*T$$

where:	u and W(u)	=	well function parameters
	T	=	transmissive capacity in m^2/day calculated from actual pump test data
	S	=	coefficient of storage, dimensionless
	t	=	20 years of continuous pumping, in days
	r	=	distance between pump well and neighbouring well
	s	=	projected drawdown at the neighbouring well and assumed to be 1 meter or less
	Q	=	pumping rate of 1250 m^3/year or 3.42 m^3/day

The calculation for well interference is based on the general assumption that a maximum projected drawdown of 1 meter, after 20 years of continuous pumping and neglecting recharge, is an acceptable drawdown that would not unduly interfere with a neighbouring wells' performance.

With the above defined criteria, critical values for well separation distance and transmissive capacity [TC] value can be determined. Acceptable combinations of transmissive capacity and well separation distance are tabulated as follows:

Well Separation Distance (m)	Transmissivity (m^2/day)
25	3.5
50	3.0
75	2.5
100	2.5

For a maximum drawdown of one meter, the critical transmissive capacity is 3.5 m^2/day and a well separation distance of 25 meters; This means, that if one assumes the addition of a single well will be completed in the same water bearing zone, then as long as the well separation distance is greater than 25 meters and the transmissive capacity exceeds 3.5 m^2/day, then any well interference can be deemed to be acceptable.

The transmissive capacity value can only be determined from a pump test conducted on a well drilled on each of the proposed parcels. Given that the proposed lot sizes are 1.21 [3 acres], hectares, a minimum separation distance of 25 meters, on balance, should be readily achievable.

Summary of Findings

Based on a feasibility assessment of existing water well information and geologic information, the following conclusions have been drawn:

[1] Geometric mean, preliminary water well flow data, indicates a sufficient amount of groundwater to support 11 to 20 lots based on regional [block of nine quarter sections] and local [SE-28 quarter section only]. The proposed subdivision is for 15 lots plus 5 existing lots. Based on a concept of individual wells per lot [1250 m^3/year or 753 gpd/lot], there is enough water to satisfy the existing and proposed parcels.

[2] For a licensed communal well [1.82 m^3/day or 400 gpd/lot] option, there is sufficient groundwater to support between 21 and 37 lots.

[3] To minimize a concern for well interference, the critical parameters are a minimum transmissive capacity of 3.5 m^2/day and a well separation distance of at least 25 meter. The well separation distance parameter is generally feasible given the proposed lot size. Recent flow test data suggests that finding a transmissive capacity above 3.5 m^2/day is probable.

[4] The transmissive capacity will need to be calculated on an individual well basis. A minimum well test duration of 12 hours pumping and 12 hours of recovery is sufficient to generate the required data. For a licensed communal well, a minimum flow test of 36 hours pumping and 36 hours recovery should be undertaken.

[5] If additional supporting information is required, it may be prudent to drill and test a new well or flow test an existing well on the property to confirm a minimum of 68.4 m^3/day [10.5 Cgpm] for existing and proposed lots based on individual lot requirements of 3.42 m^3/day [753 gpd/lot]. Alternatively, consideration can be given to the use of a licensed communal well with a requirement of 27.3 m^3/day [4.2 Cgpm]

Closure

If you have any questions or comments regarding the assumptions and conclusions drawn in this groundwater feasibility assessment, contact the undersigned at your convenience.

It should be noted that the assessment of potential groundwater availability is not a guarantee, but rather an indication of the probability of securing a sustainable groundwater supply. Site-specific well testing is required to confirm an adequate groundwater supply.

Thanking your for the opportunity to have been of service, we remain,

Respectfully yours,
Groundwater Exploration & Research Ltd

Bob Nowak

Bob Nowak; Ph.D., P.Geol.
Groundwater Geologist

Appendix

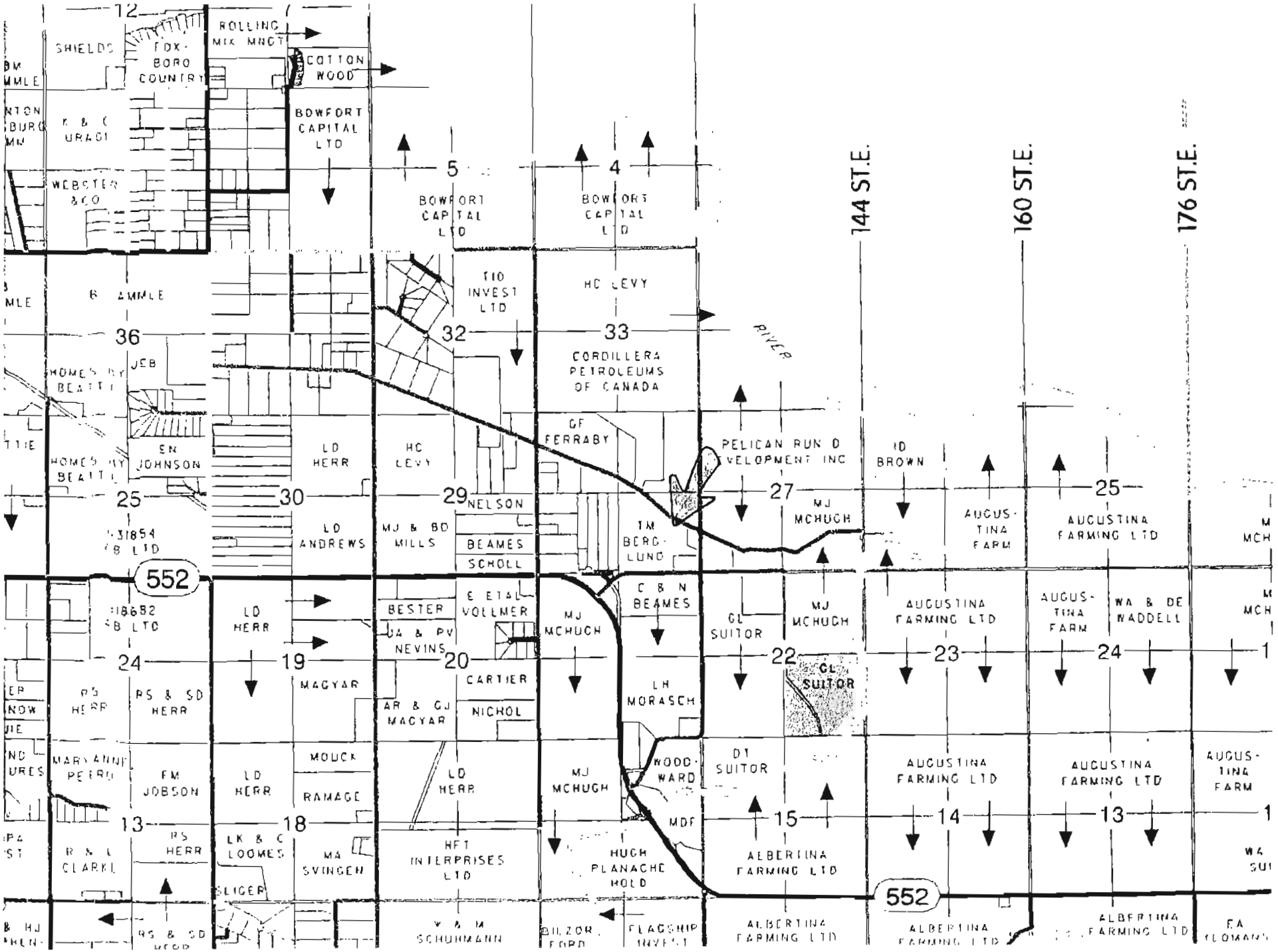

144 ST.E.
160 ST.E.
176 ST.E.
552
SHIELDS
FOX-BORO COUNTRY
ROLLING MIX MNGT
COTTON WOOD
BOWFORT CAPITAL LTD
WEBSTER & CO
TIO INVEST LTD
HC LEVY
CORDILLERA PETROLEUMS OF CANADA
PELICAN RUN DEVELOPMENT INC
GF FERRABY
HOMES BY BEATTIE
EN JOHNSON
LD HERR
HC LEVY
LD ANDREWS
MJ & BD MILLS
NELSON
BEAMES
SCHOLL
TM BERGLUND
MJ MCHUGH
RD BROWN
AUGUSTINA FARM
AUGUSTINA FARMING LTD
C & N BEAMES
GL SUITOR
WA & DE WADDELL
BESTER
E ETAL VOELMER
DA & PV NEVINS
CARTIER
NICHOL
AR & GJ MACYAR
MACYAR
RS HERR
RS & SD HERR
LH MORASCH
MARYANNE PEERO
FM JOBSON
MOUCK
RAMAGE
WOOD-WARD
DT SUITOR
MDF
R & L CLARKE
LK & C LOOMES
MA SVINGEN
HFT INTERPRISES LTD
HUGH PLANACHE HOLD
ALBERTINA FARMING LTD
SLIGER
W & M SCHUMANN
BILZOR FORD
FLAGSHIP INVEST

Table 1
Summary of Groundwater Well Data

Location	Landowner	Date Drilled	Td/Npwl (ft)	Flow Estimate	Completion Interval (ft)
TP21, R28					
SE-28	High Bow Homes Inc.	Jan 95	125/109.2	6 Cgpm/4 hrs	85 - 125
SE-28	Berglund	Jun 98	122/79.3	6 Cgpm/2 hrs	102 - 122
SE-28	Berglund	Mar 90	220/153	12 Cgpm/2 hrs	160 - 220
SE-28	Berglund	May 81	60/19	28 Cgpm/2 hrs	35 - 60
NE-28	Colomore	Nov 91	300/24	4 Cgpm/2.3 hrs	20 - 60 & 250 - 260
NE-28	Berglund	Apr 86	60/9	16 Cgpm/1 hr	30 - 55
NE-28	Jeffery	Mar 86	80/20	9 Cgpm/1 hr	28 - 75
NW-28	Cullimore	Jul 95	140/15.5	1.75 Cgpm/12 hrs	100 - 140
NW-28	Ferraby	Aug 95	155/60	13 Cgpm/2 hrs	80 - 105 & 125 - 150
SW-28	Chornawka	Aug 89	120/na	na	40 - 60 & 100 - 120
SW-28	Moore	Feb 93	310/73	6 Cgpm/4 hrs	110 - 120 & 270 - 310
SW-28	Voller	Apr 91	100/37.2	5 Cgpm/12 hrs	55 - 60 & 75 - 92
SW-28	Beemans Custom Homes	Jan 76	195/80	2.5 Cgpm/2 hrs	140 - 165
SW-28	Inverarity	Apr 72	158/45	6 Cgpm/5.06 hrs	open hole
SW-28	Funtmann	Jul 73	250/52	3 Cgpm/1 hr	80 - 100 & 200 - 240
SW-28	Beeman Custom Homes	Feb 76	105/71	6 Cgpm/2 hrs	85 - 105
SW-28	Fuetmann	Mar 73	105/45	4 cgpm/6 hrs	na
SW-28	Jeffery	Mar 73	268/60	4 Cgpm/4 hrs	80 - 85 & 190 - 210 & 250 - 260
SW-28	Scully	Jun 86	320/165	9 Cgpm/2.3 hrs	150 - 170 & 300 - 320
SW-28	Fuentmann	Mar 90	140/58	3.5 Cgpm/2 hrs	90 - 140
SW-28	Aesie	Aug 91	340/140	10 Cgpm/4 hrs	120 - 140 & 220 - 240 & 300 - 340
SW-28	Nevins	Jun 85	310/115	15 Cgpm/2 hrs	270 - 310

Table 1 (continued)
Summary of Groundwater Well Data

Location	Landowner	Date Drilled	Td/Npwl (ft)	Flow Estimate	Completion Interval (ft)
SW-28	Dellbello	Sep 80	270/100	4 Cgpm/2 hrs	150 - 270
SW-28	Dellbello	May 79	230/95	3 Cgpm/2 hrs	20 - 230
SW-28	Irving	Jan 85	115/15	8 Cgpm/4 hrs	50 - 115
SW-28	Webb	Apr 72	150/45	5 Cgpm/6.05 hrs	open hole
NE-21	Morasho	Mar 94	236/126	12 Cgpm/4 hrs	186 - 234
NE-21	Beams	Sep 93	265/169	5 Cgpm/2 hrs	145 - 165
NW-21	Perzinger	Aug 94	160/105	2 Cgpm/2 hrs	100 - 160
NW-21	Pearson	Mar 93	250/110	5 Cgpm/4 hrs	210 - 250
NW-22	Buckland	Aug 93	245/139	9 Cgpm/2 hrs	165 - 225
SW-27	Berglord	Mar 71	138/123	8 Cgpm/1.3 hrs	127 - 138

na = not available

ALBERTA ENVIRONMENTAL PROTECTION

COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 160002

THIS DATA MAY NOT BE FULLY CHECKED; THE PROVINCE DISCLAIMS ALL RESPONSIBILITY FOR ITS ACCURACY:

CONTRACTOR:

ME: AARON/INTERPROVINCIAL WATERWELL DRILLING

ADDRESS: Box 28, Site 9, R.R.1 DeWinton, Alberta T0L-0X0

LICENCE NO.: 0670 JOURNEYMAN NO.: VA4996

WELL OWNER:

NAME: BERGLUND WAYNE

ADDRESS: R R 1 DEWINTON, ALBAERTA

POSTAL CODE: T0L 0X0

WELL LOCATION: IC#:

~ OR LSD	SEC	TWP	RGE	W. MER
SE	28	021	28	W4

LOCATION VERIFICATION METHOD: NOT VERIFIED
LOCATION IN QUARTER:

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain: NOT OBTAIN

FORMATION LOG DESCRIPTION:

Depth (Feet):	Lithology:
Ground to:	
12	Sandstone
19	Yellow Clay
29	Brown Hard Clay
34	Limestone
37	Sandstone
44	Blue Clay
46	Water Bearing Sandstone
49	Green Shale
52	Gray Shale
55	Coal
60	Gray Shale

DRILLING METHOD: CABLE TOOL

TYPE OF WORK: NEW WELL

FLOWING WELL: No **RATE:**
GAS PRESENT: OIL PRESENT:
DATE OF ABANDONMENT:
MATERIAL USED:
PROPOSED USE: DOMESTIC

WELL COMPLETION DATA:

WELL FINISH: CASING/PERFORATED LINER
TOTAL HOLE DEPTH: 60 Feet

CASING TYPE: STEEL
SIZE OD: 5.25 Inch WALL THICKNESS: 0.188 Inch
BOTTOM AT: 17 Feet

PERFORATED CASING/LINER:
TYPE: STEEL
SIZE OD: 4.25 Inch ID: Inch
WALL THICKNESS: 0.188 Inch
TOP AT: Feet BOTTOM AT: 60 Feet
PERFORATED FROM: 35 Feet TO: 60 Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: 0.250 Inch X 12.000 Inch
HOW PERFORATED: TORCH
SEAL TYPE: DRIVEN
INTERVAL TOP: 10 Feet TO: 17 Feet
GEOPHYSICAL LOG TAKEN:
RETAINED ON FILE:

SCREEN:
MATERIAL:
SIZE ID (CLEAR): Inch SLOT SIZE: Inch
INTERVAL TOP: Feet TO: Feet
Feet TO: Feet

INSTALLATION METHOD:
TOP FITTINGS:
BOTTOM FITTINGS:
PACK TYPE:
GRAIN SIZE: AMOUNT:

PITLESS ADAPTER TYPE:
DROP PIPE TYPE: LENGTH: Feet
DIAMETER: Inch
ADDITIONAL PUMP INFORMATION:

PRODUCTION TEST:

TEST DATE: May 14, 1981 START TIME: 3:00

Elapsed Time in Min:Sec	Depth to Water Level During Pumping	Depth to Water Level During Recovery

WATER REMOVAL RATE DURING TES: 28.0 Gal/Min
TEST DURATION: 2 Hours 0 Minutes
TESTING METHOD: BAILER
DEPTH OF PUMP/DRILL STEM: 35 Feet
WATER LEVEL AT END OF TEST: Feet
NON-PUMPING(STATIC) WATER LEVEL: 19.0 FEET
TOTAL DRAWDOWN: 16 Feet

RECOMMENDED PUMPING RATE: 15 Gal/Min
RECOMMENDED PUMP INTAKE AT: 50 Feet
TYPE OF PUMP INSTALLED:
MODEL: H.P.:

DATE WORK STARTED: May 14, 1981

DATE WORK COMPLETED: May 14, 1981

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN: N HELD: DOCUMENTS HELD: 1

WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY:

COMMENTS:

(Maximum of 9 lines printed)

DATE FORM PRINTED: May 24, 2000 13:59:50 DATE DATA KEYED: March 17, 1993 WINDOWS\GIC4 BM

ALBERTA ENVIRONMENTAL PROTECTION
COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 256595

THIS DATA MAY NOT BE FULLY CHECKED; THE PROVINCE DISCLAIMS ALL RESPONSIBILITY FOR ITS ACCURACY:

CONTRACTOR:

NAME: *BLACKWOOD DRILLING LTD.*

ADDRESS: *Box 53*
Dewinton, Alberta T0L 0X0

LICENCE NO.: JOURNEYMAN NO. *14020Q*

WELL OWNER:

NAME: *HIGH BOW HOMES INC*

ADDRESS: *RR1, DEWINTON*

POSTAL CODE: *T0L 0X0*

WELL LOCATION: IC#:

~ OR LSD	SEC	TWP	RGE	W. MER
08	28	021	28	W4

LOCATION VERIFICATION METHOD: *NOT VERIFIED*
LOCATION IN QUARTER:
500 feet from NORTH boundary
100 feet from EAST boundary

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain: *NOT OBTAIN*

FORMATION LOG DESCRIPTION:

Depth (Feet):	Lithology:
Ground to:	
2	*Loam*
5	*Sand*
116	*Clay & Sand*
122	*Gravel*
125	*Unknown*

DRILLING METHOD: *ROTARY*

TYPE OF WORK: *NEW WELL*

FLOWING WELL: *No* **RATE:**
GAS PRESENT: *No* **OIL PRESENT:** *No*
DATE OF ABANDONMENT:
MATERIAL USED:
PROPOSED USE: *DOMESTIC*

WELL COMPLETION DATA:

WELL FINISH: *CASING/PERFORATED LINER*
TOTAL HOLE DEPTH: *125* Feet

CASING TYPE: *STEEL*
SIZE OD: *6.62* Inch WALL THICKNESS: *0.188* Inch
BOTTOM AT: *103* Feet

PERFORATED CASING/LINER:
TYPE: *PLASTIC*
SIZE OD: *5.00* Inch ID: Inch
WALL THICKNESS: *0.250* Inch
TOP AT: *85* Feet BOTTOM AT: *125* Feet
PERFORATED FROM: *85* Feet TO: *125* Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: *0.093* Inch X *6.000* Inch
HOW PERFORATED: *SAW*
SEAL TYPE: *DRIVEN*
INTERVAL TOP: Feet TO: *103* Feet

GEOPHYSICAL LOG TAKEN:
RETAINED ON FILE:

SCREEN:
MATERIAL:
SIZE ID (CLEAR): Inch SLOT SIZE: Inch
INTERVAL TOP: Feet TO: Feet
Feet TO: Feet

INSTALLATION METHOD:
TOP FITTINGS:
BOTTOM FITTINGS:
PACK TYPE:
GRAIN SIZE: AMOUNT:

PITLESS ADAPTER TYPE:
DROP PIPE TYPE: LENGTH: Feet
DIAMETER: Inch
ADDITIONAL PUMP INFORMATION:

PRODUCTION TEST:

TEST DATE: *January 21, 1995* START TIME: *11:00*

Elapsed Time in Min:Sec	Depth to Water Level During Pumping (Feet)	Depth to Water Level During Recovery (Feet)
0:00	(Static) 109.17	
1:00	110.42	110.
2:00	110.58	109.58
3:00	110.67	109.42
4:00	110.67	109.33
5:00	110.67	109.33
6:00	110.75	109.33
7:00	110.75	109.25
8:00	110.75	109.25
9:00	110.75	109.17
10:00	110.75	109.17
12:00	111.	109.17
14:00	111.	
16:00	111.	
20:00	111.17	
25:00	111.17	
30:00	111.17	
35:00	111.17	
40:00	111.17	
50:00	111.17	
60:00	111.17	
75:00	111.17	
90:00	111.17	
105:00	111.25	
120:00	111.25	

WATER REMOVAL RATE DURING TEST: *6* Gal/Min
TEST DURATION: *4* Hours *0* Minutes
TESTING METHOD: *PUMP*
DEPTH OF PUMP/DRILL STEM: *124* Feet
WATER LEVEL AT END OF TEST: *111* Feet
NON-PUMPING (STATIC) WATER LEVEL: *109.2* FEET
TOTAL DRAWDOWN: *2* Feet

RECOMMENDED PUMPING RATE: *6* Gal/Min
RECOMMENDED PUMP INTAKE AT: *124* Feet
TYPE OF PUMP INSTALLED:
MODEL: H.P.:

DATE WORK STARTED: *December 15, 1994*

DATE WORK COMPLETED: *January 22, 1995*

COMMENTS:
(Maximum of 9 lines printed)

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN: *N* HELD: DOCUMENTS HELD: *1*

WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY: *500 Gallons*

DATE FORM PRINTED: *May 24, 2000* *13:59:49* **DATE DATA KEYED:** *November 20, 1995* *WINDOWS\GIC4* *UM*

ALBERTA ENVIRONMENTAL PROTECTION
COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 289576

THIS DATA MAY NOT BE FULLY CHECKED; THE PROVINCE DISCLAIMS ALL RESPONSIBILITY FOR ITS ACCURACY:

CONTRACTOR:

NAME: KRIEGER DRILLING LTD.

ADDRESS: R.R.6
Calgary, Alberta T2M-4L5

LICENCE NO.: 0651 JOURNEYMAN NO. VB4372

WELL OWNER:

NAME: BERGLUND, JACKIE C/O HIGH BOW

ADDRESS: RR1, DEWINTON

POSTAL CODE: T0L 0X0

WELL LOCATION: IC#:

~ OR LSD	SEC	TWP	RGE	W. MER
SE	28	021	28	W4

LOCATION VERIFICATION METHOD: MAP
LOCATION IN QUARTER:

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain: NOT OBTAIN

FORMATION LOG DESCRIPTION:

Depth (Feet):	Lithology:
Ground to:	
1	Topsoil
5	Brown Clay
18	Brownish Gray Sand
65	Brown Sandy Clay
85	Clay & Rocks
88	Gravel
92	Gray Sandy Clay
97	Gray Shale
122	Gray Wet Sandstone

DRILLING METHOD: ROTARY

TYPE OF WORK: NEW WELL

FLOWING WELL: No **RATE:**
GAS PRESENT: No **OIL PRESENT:** No
DATE OF ABANDONMENT:
MATERIAL USED:
PROPOSED USE: DOMESTIC

WELL COMPLETION DATA:

WELL FINISH: CASING/PERFORATED LINER
TOTAL HOLE DEPTH: 122 Feet

CASING TYPE: STEEL
SIZE OD: 6.62 Inch WALL THICKNESS: 0.188 Inch
BOTTOM AT: 95 Feet

PERFORATED CASING/LINER:
TYPE: PLASTIC
SIZE OD: 4.50 Inch ID: Inch
WALL THICKNESS: 0.237 Inch
TOP AT: 82 Feet BOTTOM AT: 122 Feet
PERFORATED FROM: 102 Feet TO: 122 Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: 0.375 Inch X 0.375 Inch
HOW PERFORATED: HAND DRILL
SEAL TYPE: DRIVEN
INTERVAL TOP: Feet TO: 95 Feet

GEOPHYSICAL LOG TAKEN:
RETAINED ON FILE:

SCREEN:
MATERIAL:
SIZE ID (CLEAR): Inch SLOT SIZE: Inch
INTERVAL TOP: Feet TO: Feet
Feet TO: Feet

INSTALLATION METHOD:
TOP FITTINGS:
BOTTOM FITTINGS:
PACK TYPE:
GRAIN SIZE: AMOUNT:

PITLESS ADAPTER TYPE:
DROP PIPE TYPE: LENGTH: Feet
DIAMETER: Inch
ADDITIONAL PUMP INFORMATION:

PRODUCTION TEST:
TEST DATE: July 2, 1998 START TIME: 1:00

Elapsed Time in Min:Sec	Depth to Water Level During Pumping (Feet)	Depth to Water Level During Recovery (Feet)
0:00	(Static) 79.35	
1:00	84.46	82.98
2:00	81.55	82.88
4:00	81.69	82.69
6:00	81.83	82.59
10:00	82.02	82.44
14:00	82.18	82.29
20:00	82.38	82.11
30:00	82.65	81.90
60:00	83.24	81.67
90:00	83.62	81.50
120:00	83.99	81.36

WATER REMOVAL RATE DURING TEST: 6 Gal/Min
TEST DURATION: 2 Hours 0 Minutes
TESTING METHOD: PUMP
DEPTH OF PUMP/DRILL STEM: 100 Feet
WATER LEVEL AT END OF TEST: 83 Feet
NON-PUMPING (STATIC) WATER LEVEL: 79.3 FEET
TOTAL DRAWDOWN: 4 Feet

RECOMMENDED PUMPING RATE: 7 Gal/Min
RECOMMENDED PUMP INTAKE AT: 100 Feet
TYPE OF PUMP INSTALLED: SUB
MODEL: H.P.:

DATE WORK STARTED: June 30, 1998

COMMENTS: DRILLER REPORTS DISTANCE FROM TOP OF CASING TO GROUND LEVEL: 1.5'.
(Maximum of 9 lines printed)

DATE WORK COMPLETED: June 30, 1998

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN: N HELD: DOCUMENTS HELD: 1

WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY: 250 Gallons

DATE FORM PRINTED: May 24, 2000 13:59:49 **DATE DATA KEYED:** October 2, 1998 WINDOWS\GIC4 UM

ALBERTA ENVIRONMENTAL PROTECTION

COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 156311

THIS DATA MAY NOT BE FULLY CHECKED; THE PROVINCE DISCLAIMS ALL RESPONSIBILITY FOR ITS ACCURACY:

CONTRACTOR:

AME: *BIG ROCK WATER WELL DRILLING*

ADDRESS:

LICENCE NO.: JOURNEYMAN NO.*VA2103*

WELL OWNER:

NAME: *BURGLUND, WAYNE*

ADDRESS: *DEWINTON*

POSTAL CODE:

WELL LOCATION: IC#:

– OR LSD	SEC	TWP	RGE	W. MER
SE	28	021	28	W4

LOCATION VERIFICATION METHOD*MAP*
LOCATION IN QUARTER:

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain: *NOT OBTAIN*

FORMATION LOG DESCRIPTION:

Depth (Feet):	Lithology:
Ground to:	
120	*Fine Grained Clay & Gravel*
125	*Sand*
170	*Gravel*
180	*Sand*
195	*Gray Shale*
210	*Brownish Gray Sandstone*
220	*Shale*

DRILLING METHOD: *ROTARY*

TYPE OF WORK: *NEW WELL*

FLOWING WELL*No* **RATE:**
GAS PRESENT: *No* OIL PRESENT: *No*
DATE OF ABANDONMENT:
MATERIAL USED:
PROPOSED USE: *DOMESTIC*

WELL COMPLETION DATA:

WELL FINISH: *PERFORATED CASING/LINER*
TOTAL HOLE DEPTH: *220* Feet

CASING TYPE:
SIZE OD: Inch WALL THICKNESS: Inch
BOTTOM AT: Feet

PERFORATED CASING/LINER:
TYPE: *PLASTIC*
SIZE OD: *4.50* Inch ID: Inch
WALL THICKNESS: *0.237* Inch
TOP AT: Feet BOTTOM AT: *220* Feet
PERFORATED FROM: *160* Feet TO: *220* Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: *0.125* Inch X *12.000* Inch
HOW PERFORATED: *OTHER*
SEAL TYPE: *SHALE TRAP*
INTERVAL TOP: Feet TO: *120* Feet
GEOPHYSICAL LOG TAKEN:*GAMMA*
RETAINED ON FILE: *yes GAMMA*
SCREEN:
MATERIAL:
SIZE ID (CLEAR): Inch SLOT SIZE: Inch
INTERVAL TOP: Feet TO: Feet
Feet TO: Feet
INSTALLATION METHOD:
TOP FITTINGS:
BOTTOM FITTINGS:
PACK TYPE:
GRAIN SIZE: AMOUNT:

PITLESS ADAPTER TYPE:
DROP PIPE TYPE: LENGTH: Feet
DIAMETER: Inch
ADDITIONAL PUMP INFORMATION:

PRODUCTION TEST:

TEST DATE:*March 27, 1990* START TIME*1:00*

Elapsed Time in Min:Sec	Depth to Water Level During Pumping	Depth to Water Level During Recovery

WATER REMOVAL RATE DURING TEST*12.0* Gal/Min
TEST DURATION: *2* Hours *0* Minutes
TESTING METHOD: *AIR*
DEPTH OF PUMP/DRILL STEM: *210* Feet
WATER LEVEL AT END OF TEST: Feet
NON-PUMPING(STATIC) WATER LEVEL:*153.0* FEET
TOTAL DRAWDOWN: Feet

RECOMMENDED PUMPING RATE: *8* Gal/Min
RECOMMENDED PUMP INTAKE AT: Feet
TYPE OF PUMP INSTALLED:
MODEL: H.P.:

DATE WORK STARTED: *March 26, 1990*

COMMENTS:
(Maximum of 9 lines printed)

DATE WORK COMPLETED:*March 27, 1990*

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN*N* HELD: DOCUMENTS HELD: *2*

~~WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY:~~

DATE FORM PRINTED:*May 24, 2000* *13:59:50* **DATE DATA KEYED:***July 31, 1995* *WINDOWS\GIC4* *UM*