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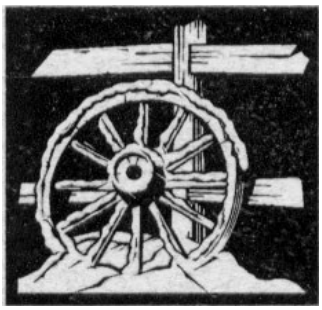
SPRING 2008

CO-14264

Lorne and Leanne Read
Sundance Trail Phase II
Area Structure Plan Amendment

Municipal District of Foothills No. 31



Lorne and Leanne Read

SUNDANCE TRAIL AREA STRUCTURE PLAN - AMENDMENT

APRIL 2008

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APPENDICES

1. INTRODUCTION

1.1 Plan Purpose

The Sundance Trail Area Structure Plan (ASP) was prepared pursuant to the provisions of Section 633 of the Municipal Government Act and amendments thereto. The purpose of the Area Structure Plan is to act as a guide to future subdivision and development within the NE ¼ Sec. 13-20-01-W5M. The location of the NE ¼ Sec. 13-20-01-W5M in relation to the MD of Foothills No. 31 is identified in Exhibit 1.0 Location Plan. The location of the subject quarter and the land uses in the area are identified in Exhibit 2.0 Existing Land Use.

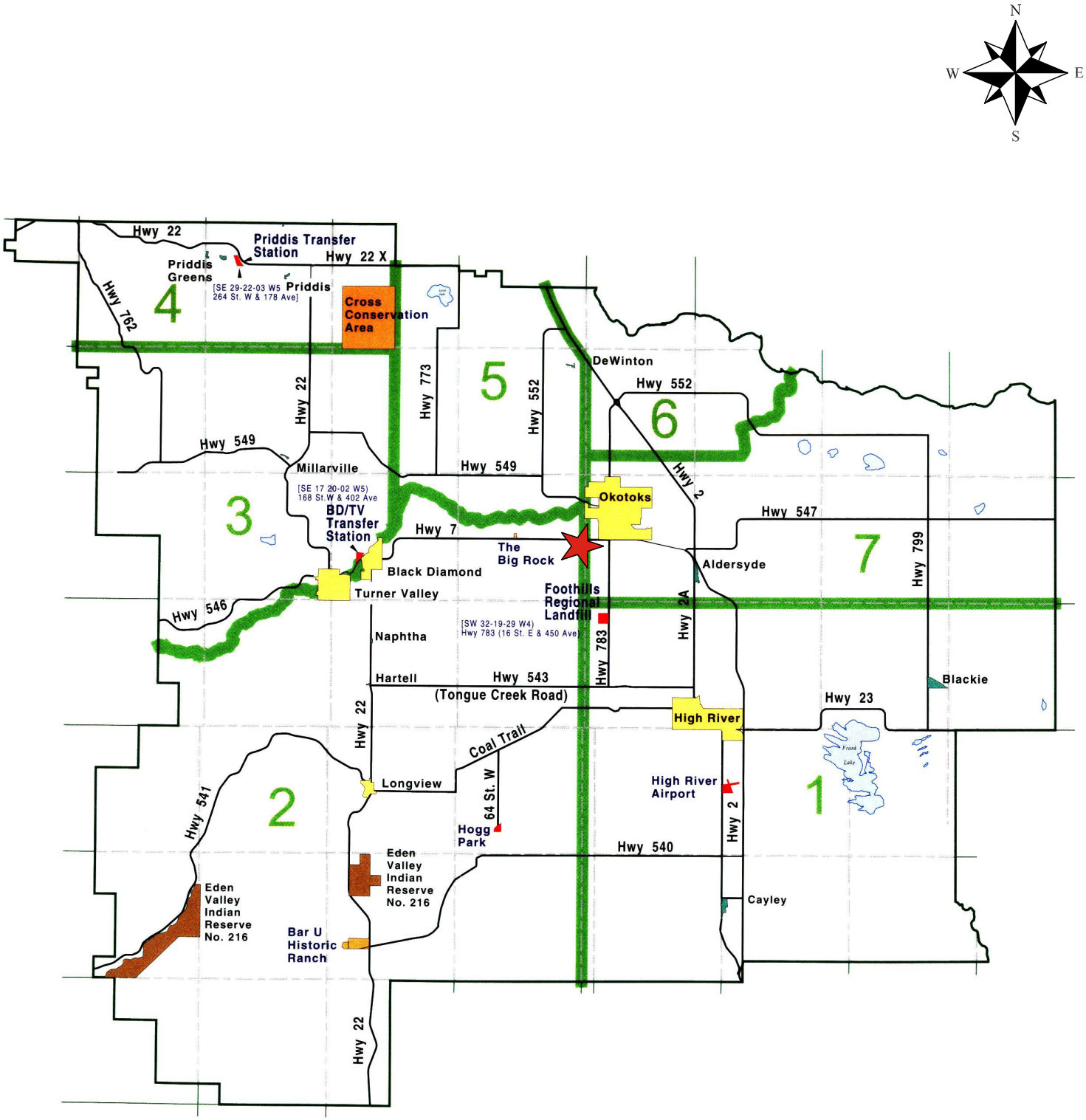
1.2 Background to the Sundance Trail Area Structure Plan

In 1989, 12.95 ± acres was removed from the subject quarter for road widening under Road Plan 891 2019. In July of 1998, the Developer purchased the balance of the NE ¼ Sec. 13-20-01-W5M, and has been residing on the property since that time. In 1998 a subdivision was completed creating one 5.0 ± acre lot from the NE ¼ Sec. 13-20-01-W5M under Plan 981 2423. The Sundance Trail Area Structure Plan made provisions to incorporate this 5.0± acre parcel (Block 1, Plan 981 2423) into the Plan area, altering the boundaries of the lot, and allowing for a continuous 40-metre strip and 30-metre Service Road to be developed along the northern boundary of the Plan Area. On October 26, 2000, the Sundance Trail Area Structure Plan was granted first reading by the Council of the Municipal District of Foothills No. 31. On July 12, 2001, Council granted second and third readings to the Sundance Trail Area Structure Plan. A copy of the Bylaw adopting the Sundance Trail Area Structure Plan is attached as Appendix A. Exhibit 3.0 identifies the Sundance Trail Area Structure Plan subdivision as adopted on July 12, 2001.

The Sundance Trail Area Structure Plan originally proposed the creation of nineteen new Country Residential lots. As a condition of approval, Council reduced the development to only eleven (11) new Country Residential lots. On July 21, 2005, Council refused an application to amend the Sundance Trail Area Structure Plan to allow for the development of Phase II, including the addition of twelve (12) new Country Residential parcels. Council felt that the application was premature and the density was too high for the area at the time of the hearing. This amendment application has now been submitted as the area has undergone additional development and the application includes an overall reduced density. Furthermore, this amendment has reduced the proposed number of lots to be developed from twelve (12) parcels to only five (5) new Country Residential parcels.

1.2.1 GROWTH IN THE REGION

The Town of Okotoks, recently deemed one of Canada's fastest growing communities by Statistics Canada has seen growth resulting from development pressures in Calgary region. Statistics Canada reported that from 2001-2005 the population in the Town of Okotoks has grown from 11,689 to 17,145 people; a population change of 46.7%. Furthermore, Statistics Canada reported that the Municipal District of Foothills No. 31 has increased in population by 18.9% from 2001 to 2006 with an additional 3,134 people now residing in the Municipality. To accommodate this growth, the Town of Okotoks has welcomed a new Wal-Mart, Sobey's, and various other commercial, retail, and business components have located in the Town of Okotoks and the M.D. of Foothills No. 31. This new commercial centre and increased population has changed the area,



Sundance Trail
Area Structure Plan
NE ¼ Sec. 13 - 20 - 01 - W5M

Location Plan

Exhibit 1.0

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Source: MD of Foothills No. 31

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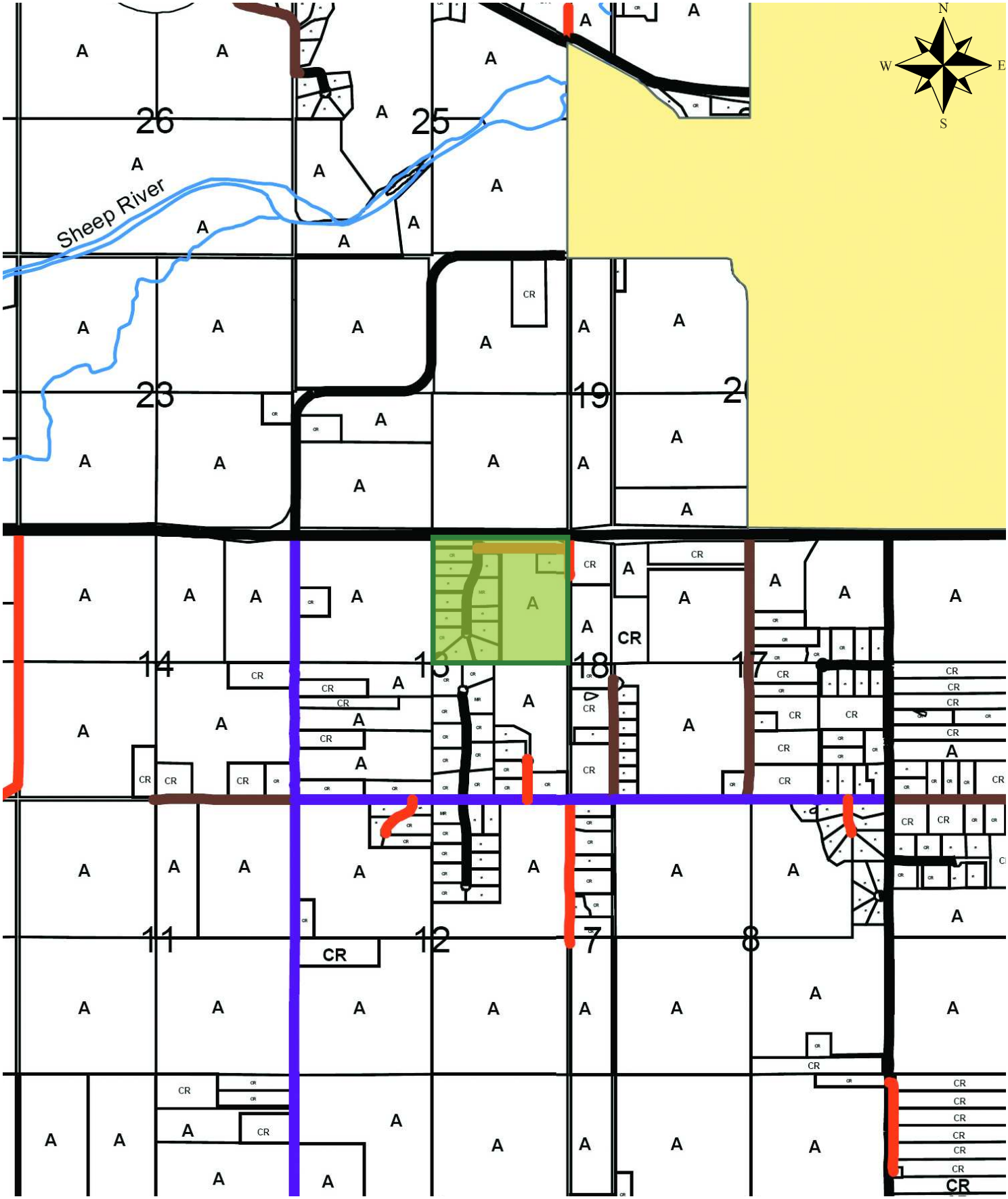

Subject Lands A - Agricultural CR - Country Residential MR - Municipal Reserve

Sundance Trail
Area Structure Plan
NE ¼ Sec. 13 - 20 - 01 - W5M

Existing Land Use

Exhibit 2.0

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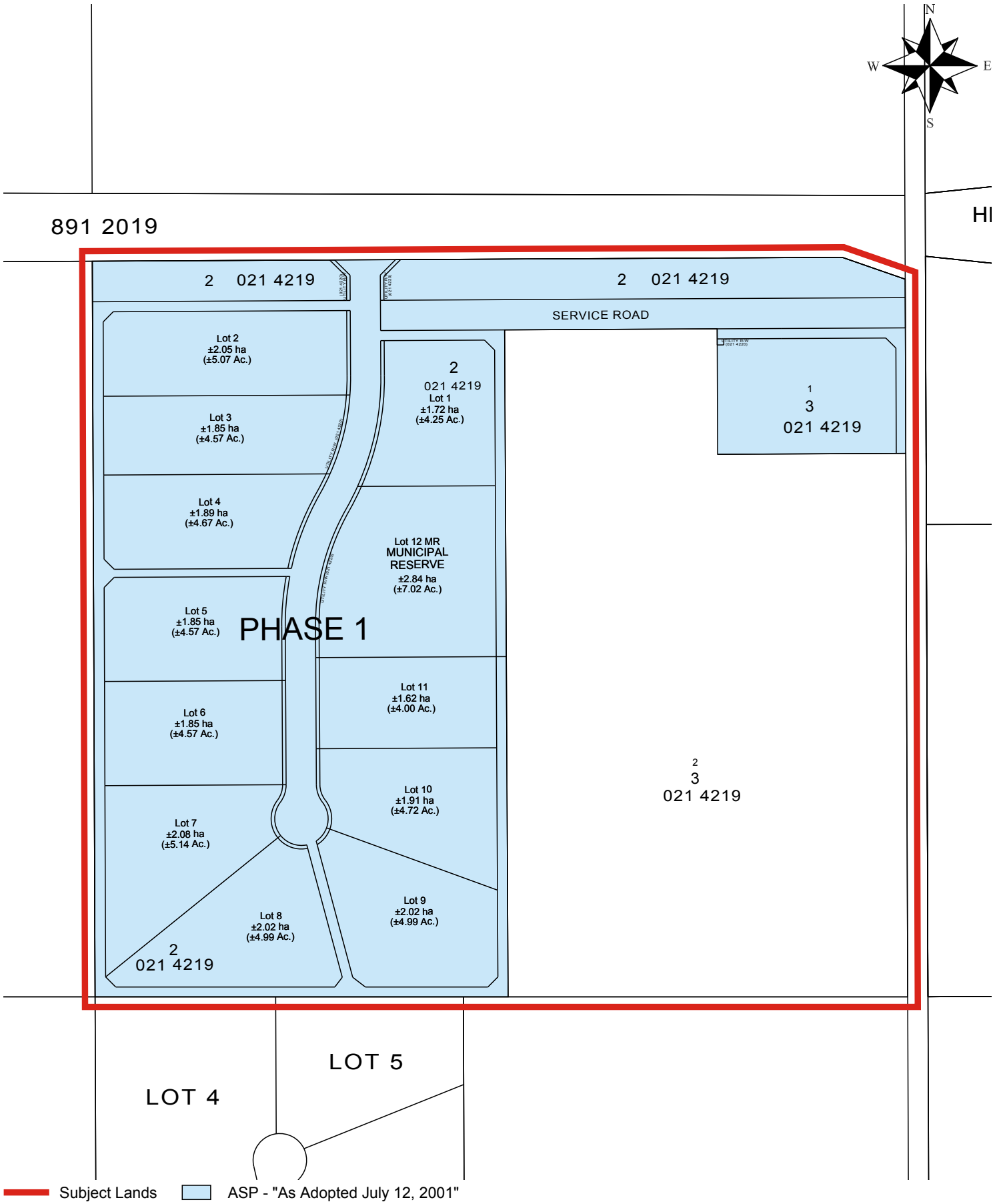

Area Structure Plan

"As Adopted July 12, 2001"

Sundance Trail

Area Structure Plan
NE ¼ Sec. 13 - 20 - 01 - W5M

Exhibit 3.0

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April 2008

14264-SUB-01.dwg

Source:

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added to the demand for lots in the area, and ultimately makes the Plan Area a prime location for added country residential development.

1.3 Approval Process

Following the submission of the Area Structure Plan amendment application to the M.D. of Foothills No. 31, a public hearing will be scheduled, allowing the Area Structure Plan to be formally presented to Council. Should Council be in the opinion that the Area Structure Plan is in compliance with the provisions of the Municipal Government Act, the M.D. of Foothills No. 31 Municipal Development Plan, and their Land Use Bylaw; the document will receive first reading. Upon meeting any conditions, second and third reading will be granted by Council thereby adopting the Area Structure Plan amendment. A concurrent land use redesignation to allow for the future subdivision of the subject lands will be applied for concurrently with the Area Structure Plan amendment. Upon third reading of the land use amendment the developer will apply for subdivision.

1.3.1 PLAN IMPLEMENTATION, REVIEW, AND AMENDMENT

This Area Structure Plan is in keeping with Country Residential Subdivision Standards within the M.D. of Foothills No. 31 and is a Statutory Plan of the M.D. of Foothills No. 31. A copy of the adopting Bylaw is attached as Appendix A.

The Sundance Trail Area Structure Plan is designed to establish long-term planning strategies and guidelines for the Plan Area. The long-term nature of this document and changing considerations such as environmental, social or economic factors may require periodic review and occasional amendment of the Plan. Council through monitoring of subdivision and development approvals may initiate amendment of this Area Structure Plan in accordance with Part 17 of the Municipal Government Act. In addition, the landowner or his agents may request by application, amendment of the Area Structure Plan in accordance with the requirements and procedures of the same Section.

1.4 Public Participation

The Developer managed the public participation component of Phase I of this Area Structure Plan by directly contacting the adjacent landowners on an individual basis. By doing this, the Developer was able to identify and address the adjacent landowner's concerns where possible.

The public will have the opportunity to comment on the amendments to the Sundance Trail Area Structure Plan when the M.D. of Foothills No. 31 Council holds the public hearing for the amendment to this Area Structure Plan.

1.5 Legislative Framework

1.5.1 THE MUNICIPAL GOVERNMENT ACT

An Area Structure Plan is identified in the Municipal Government Act as a Statutory Plan. Section 633 of the Act reads as follows:

Area Structure Plans

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, and

b) may contain any other matters the council consider necessary.

In the process of preparing and adopting this Plan the Council must comply with the provisions of Section 636, 637 and 638 of the Municipal Government Act, which are quoted as follows for easy reference.

636 While preparing a statutory plan a Municipality must:

a) provide a means for any person who may be affected by it to make suggestions and representations,

b) notify the public of the plan preparation process and of the means to make suggestions and representations referred to in clause (a),

c) notify the school authorities with jurisdiction in the area to which the plan preparation 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 another municipality, notify that Municipality of the plan preparation and provide opportunities to the municipality to make suggestions and representations.

637 The adoption by Council of a Statutory Plan does not require the Municipality to undertake any of the projects referred to in it.

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

1.5.2 THE MUNICIPAL DEVELOPMENT PLAN

An Area Structure Plan is defined in the Municipal Development Plan as, “a statutory plan, adopted by Bylaw, which provides a land use strategy for subsequent redesignation, subdivision and development of a specific area of land in the Municipality.” Municipal legislative support for an Area Structure Plan is found in Section 5.3.5 of the Municipal Development Plan, which reads as follows:

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 except where the applicant does not intend to phase their proposal and the balance parcel can not be further Subdivided. 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 eight (8) lots per quarter section;

d) the proposal, in the opinion of Council, being phase 1 of a development that will create eight (8) new lots of more.

1.6 Interpretation

In this Plan:

a) "Act" means the Municipal Government Act 1995 and amendments thereto.

b) "Council" means the Council of the Municipal District of Foothills No. 31.

c) "Developer" means the landowners, Lorne Read and Leanne Read as listed on the Certificate of Title.

d) "Land Use Bylaw" means a Bylaw of the M.D. of Foothills No. 31 passed by Council pursuant to the provisions of the Municipal Government Act and intended to prohibit, regulate and control the use and development of land and buildings within the M.D. of Foothills No. 31.

e) "Municipal Development Plan" means the M.D. of Foothills No. 31's Municipal Development Plan.

f) "Municipality" means the area bounded and incorporated by the M.D. of Foothills No. 31.

g) "Plan Area" refers specifically to the lands within the NE ¼ Sec. 13-20-01-W5M as shown in Exhibit 4.0 Plan Area.

h) "Subdivision Approving Authority" means the Council of the M.D. of Foothills No. 31.

All other words and expressions have the meanings respectively assigned to them in the Municipal Development Plan, Land Use Bylaw or the Municipal Government Act.

2. PLAN AREA

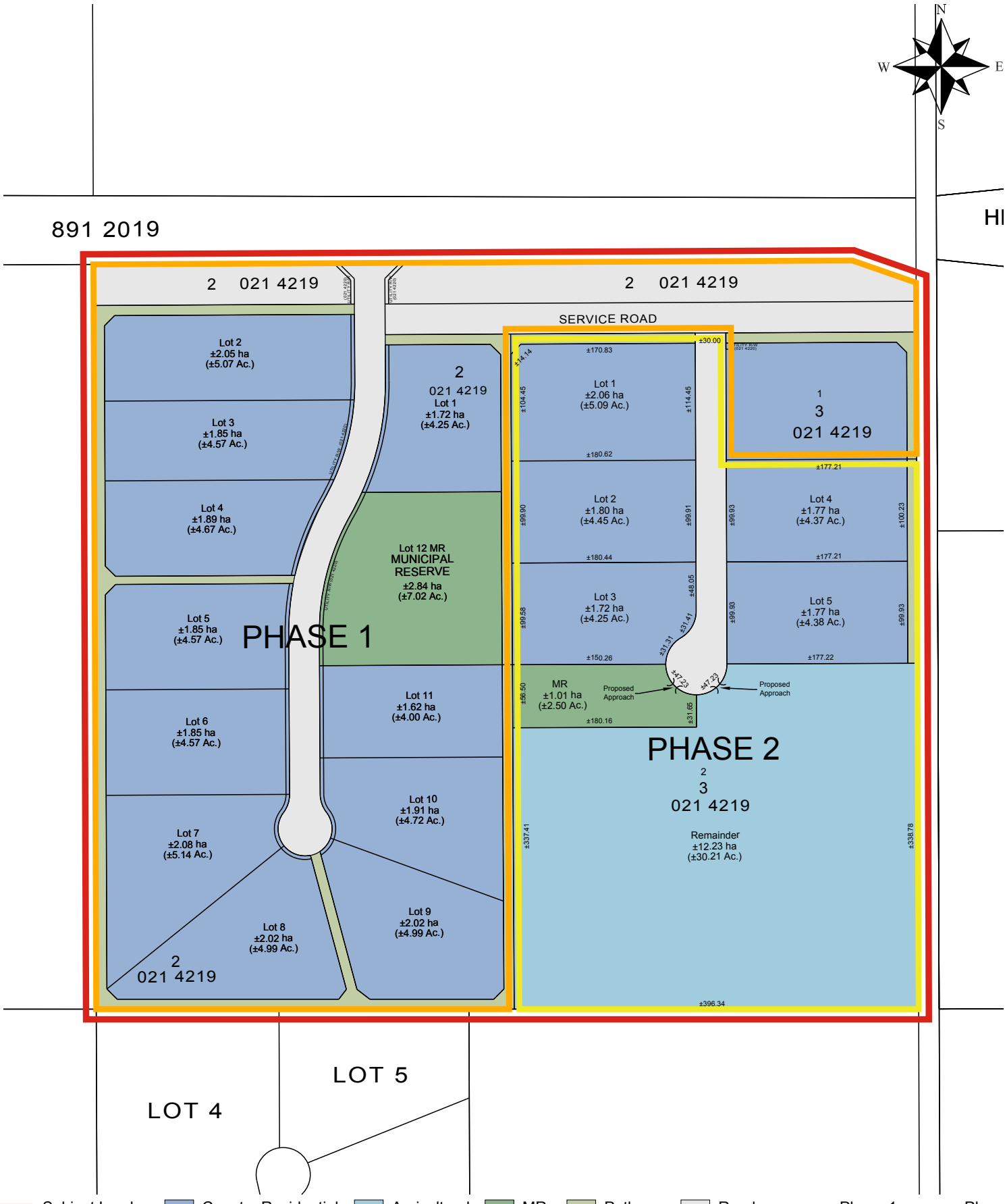
2.1 Location / Ownership

The Plan Area is located on the south side of Highway 7, approximately 1.6 kilometers west of the Highway 7 and Highway 783 junction, south of Okotoks. The Plan Area is more specifically identified as the NE ¼ Sec. 13-20-01-W5M. The Certificate of Title identifies the Phase II lands as Lot 2, Block 3, Plan 021 4219. A copy of the Certificate of Title for the lands owned by Lorne and Leanne Read is attached as Appendix B.

2.2 Definition of the Plan Area

2.2.1 BOUNDARIES OF THE PLAN

The Plan Area is bound by Meridian Road to the east, and the quarter section line of the NW ¼ Sec. 13-20-01-W5M to the west. To the south the Plan Area is bound by the northerly quarter section line of the SE ¼ Sec. 13-20-01-W5M, and Highway 7 bounds the Plan Area to the north. These boundaries are shown in Exhibit 4.0 Plan Area.



Sundance Trail
Area Structure Plan
NE ¼ Sec. 13 - 20 - 01 - W5M

Plan Area

Exhibit 4.0

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April 2008
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2.2.2 GENERAL PHYSICAL DESCRIPTION

The Plan Area gently slopes downward from the west side of the quarter section, and the land concentrates from all sides to the southeast corner of the quarter section. As per the Agrologist report (attached as Appendix C) the north half of the Plan area is comprised of 2-5% slopes and the south half of the quarter section is comprised of 6-9% slopes. The Agrologist report also indicated that all of these slopes converge towards the southeast corner of the quarter section where the lowest point in the quarter section has been identified.

Within the undeveloped lands, vegetation is comprised of grassland in the southern portion of the quarter section. A portion of the Plan Area has been cultivated with little success. The Developer no longer wishes to farm this land, as it is a very expensive process due to excessive stoniness, with little chance of success. The Agrologist report completed for the Sundance Trail confirms the low agricultural capability of the subject lands with soil ratings ranging from Class 4 to Class 6. The vegetation types and general use of the Phase II lands can be seen in Exhibit 5.0 Plan Area with Aerial Photography

3. PLAN GOALS AND OBJECTIVES

3.1 Goals and Objectives

The primary objective for the Sundance Trail Area Structure Plan is to provide a planning framework for the development of the NE ¼ Sec. 13-20-01-W5M. The overall objectives of the Sundance Trail Area Structure Plan are as follows:

a. To create an attractive multi-lot development comprised of twelve (12) Country Residential lots and a Municipal Reserve and walkway system within Phase I, and five (5) Country Residential lots, a Municipal Reserve parcel and an agricultural balance within Phase II.

b. To provide an open space walkway system that will enhance pedestrian movement and provide linkages to the Municipal Reserves.

c. To register a restrictive covenant on all Country Residential lots within the Plan Area, to ensure that the lots are developed responsibly with continuity.

d. To ensure that the development conforms to the goals and objectives of the M.D. of Foothills No. 31 Municipal Development Plan and Land Use Bylaw.

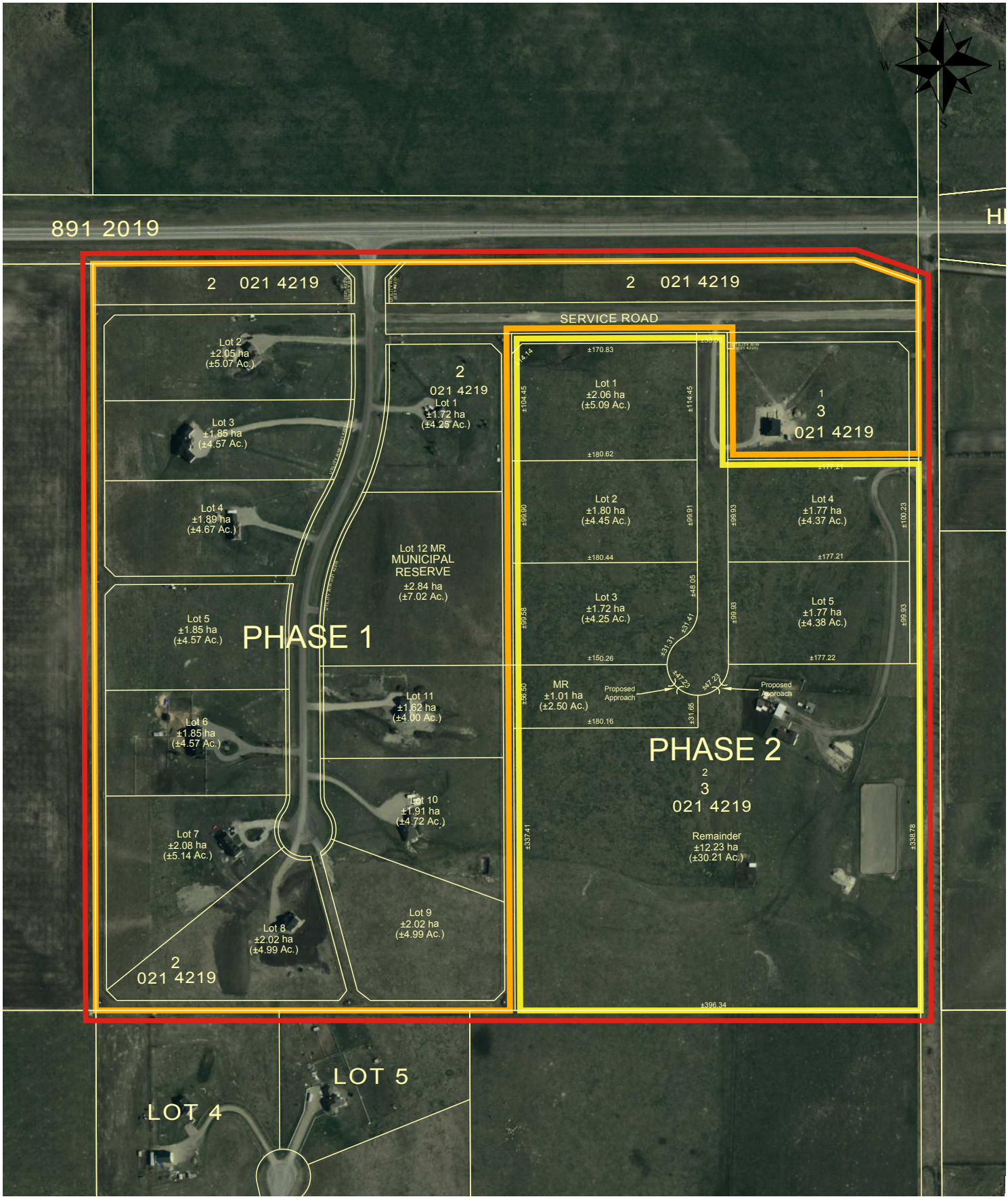
e. To create an affordable family environment geared towards community and safety.

3.2 Principles of Development

3.2.1 COMMUNITY ASSOCIATION

The Developer has created a self-governing community association, comprised of the newly created lot owners of the Plan Area. Membership in this community association is predetermined, as each new lot owner within Phase II will be bound to this association by way of a restrictive covenant, which will be placed on the title of each new lot.

The community association will be responsible for the maintenance and liability of the walkway system. Additionally, the Developer on behalf of the community association has approached the M.D. of Foothills No. 31 and has been granted the right to lease the Phase I Municipal Reserve parcel for the community. The community association has undertaken the liability and financial responsibility for the care of the Municipal Reserve within Phase I. The Developer may apply to



Subject Lands Phase 1 Phase 2

Sundance Trail
Area Structure Plan
NE ¼ Sec. 13 - 20 - 01 - W5M

Aerial Photo

Exhibit 5.0

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lease the Municipal Reserve parcel within Phase II, however approval to lease the Phase II Municipal Reserve parcel will be at the discretion of Council.

3.2.2 RESTRICTIVE COVENANT

A restrictive covenant will be placed on the title of each new Country Residential lot. This restrictive covenant will require each new landowner to build their dwelling according to Architectural Guidelines. The Architectural Guidelines, to be administered by IBI Group, include details such as:

- Building Envelopes
- Site Requirements
- Housing Forms
- Building Materials
- Fencing
- Landscaping
- Construction Requirements, and
- Use of Land (such as garbage disposal, storage, restricted burning, permitted animals and the landowner's responsibility regarding animals).

In addition, the restrictive covenant will require that each new landowner participate in, and contribute to a community association, comprised of all landowners of the Plan Area.

4. DEVELOPMENT PROPOSAL

4.1 The Plan Concept

With an amendment to the Sundance Trail Area Structure Plan, the Developer will add to the project initiated in 2000. The existing service road, built by the Developer as a condition of approval for Phase I, provides safe access to Phase II. The ongoing development of services within the Town of Okotoks, and the proximity of the Plan Area to the Town make this area suitable for further development.

As noted in the objectives, this amended Plan proposes to add to the existing twelve (12) lot development. Phases I and II will be controlled by Architectural Guidelines, which will be registered on the title of each new lot as a restrictive covenant. Country Residential lots in Phase I range from 4.00 ± acres to 5.10 ± acres. The Country Residential lots in Phase II will range from 4.25 ± acres to 5.09 ± acres, leaving an Agricultural balance of 30.21 ± acres. The Municipal Reserves will be joined to all lots of the Plan Area by a ten meter (10 m) walkway system. Sundance Trail will be a development that will create an affordable family environment geared towards community and safety within the M.D. of Foothills No. 31.

4.2 Land Use Components

Phase I was completed in 2002, creating eleven new country residential lots, a Municipal Reserve, a walkway system, and incorporated an existing country residential lot. The Phase II Country Residential lots, Municipal Reserve and walkway system will be developed and incorporated into Phase I.

4.2.1 COUNTRY RESIDENTIAL DISTRICT

This Area Structure Plan is compatible and consistent with the provisions of the Municipal Development Plan and the Land Use Bylaw. Currently the Phase II lands carry an Agricultural District (A) designation in the M.D. of Foothills No. 31 Land Use Bylaw. In order to proceed with the subdivision of Phase II, the land will first need to be redesignated to Country Residential District (CR). The Country Residential policies are as follows:

a) The minimum lot size shall not be less than 3.00 acres;

b) A Restrictive Covenant outlining architectural controls shall apply to all Country Residential lots within Phase II.

4.2.2 AGRICULTURAL DISTRICT

Phase II will result in a remainder of 30.21 ± acres with an Agricultural District designation. The agricultural parcel within Phase II must meet the requirements of the municipal legislation for the M.D. of Foothills No. 31.

4.2.3 MUNICIPAL RESERVE

Under Section 666(1) of the Municipal Government Act, Council may require the owner of a parcel of land that is subject to a subdivision to provide land for Municipal Reserve or provide money in place of land. Phase I created a 7.01-acre Municipal Reserve as required by legislation. The Municipal Reserve has been located in the centre of the Plan Area to provide access to the landowners of the Plan Area and to act as a main focal area within the development. As indicated in Section 3.2.1 of this plan, the Sundance Trail Community Association has applied to lease the Municipal Reserve, from the M.D. of Foothills No. 31. The Community Association maintains and cares for the Municipal Reserve based on their recreational pursuits. Phase II will create an additional Municipal Reserve parcel consisting of approximately 2.5± acres.

The following policies apply to the Municipal Reserve:

a. Lands indicated in Exhibit 4.0 Plan Area as Municipal Reserve are to be dedicated to the Municipal District of Foothills No. 31 for use as outlined in the Municipal Government Act;

b. The Municipal Reserve requirements for the balance lands of Phase II will be deferred via caveat to the balance parcel.

c. At the discretion of Council, the Sundance Trail Community Association could lease the Municipal Reserve from the Municipality for agricultural pursuits or development such as but not limited to a park, playground, or community facility.

4.2.4 WALKWAY SYSTEM

The walkway system in Phase II will be a continuation of the existing walkway system created in Phase I. The walkway system will be ten meters (10 m) wide to allow for a range of recreational pursuits, such as horseback riding.

The walkway system has been designed to allow all lots to the access to the Municipal Reserves via the walkway system. This walkway system will be landscaped by the Developer to ensure both visual and recreational variation to the users by placing shrubs, trees, and other features along the walkway system. Additionally, the Developer will fence the walkways, establishing the boundary of the walkway system from the lots within the Plan Area, and providing a buffer to Highway 7.

To ensure that the walkway system is cared for in the future, a community association has been created, involving all landowners of the Plan Area. This community association collects funds for the care and continuous maintenance of the walkway system. The policies that apply to the walkway system are as follows:

a. The walkway system will be constructed by the Developer, and shall be maintained by the Sundance Trail Community Association;

b. The walkway system is in addition to the lands provided for municipal reserve and does not form any part of the required 10% municipal reserve dedication;

c. With the exception of maintenance or emergency vehicles, no motorized vehicles will be permitted within the walkway system;

d. Public liability for the walkway system will be the responsibility of the Sundance Trail Community Association.

4.3 Phasing

This development will be competed in two phases. Phase I included the development and servicing of Lots 1-12, Block 2, Plan 0214219, including the Municipal Reserve, the internal road providing access to these twelve (12) lots, and the Phase I walkway system. Additionally Phase I included work regarding the external road system as per Alberta Transportation's recommendations.

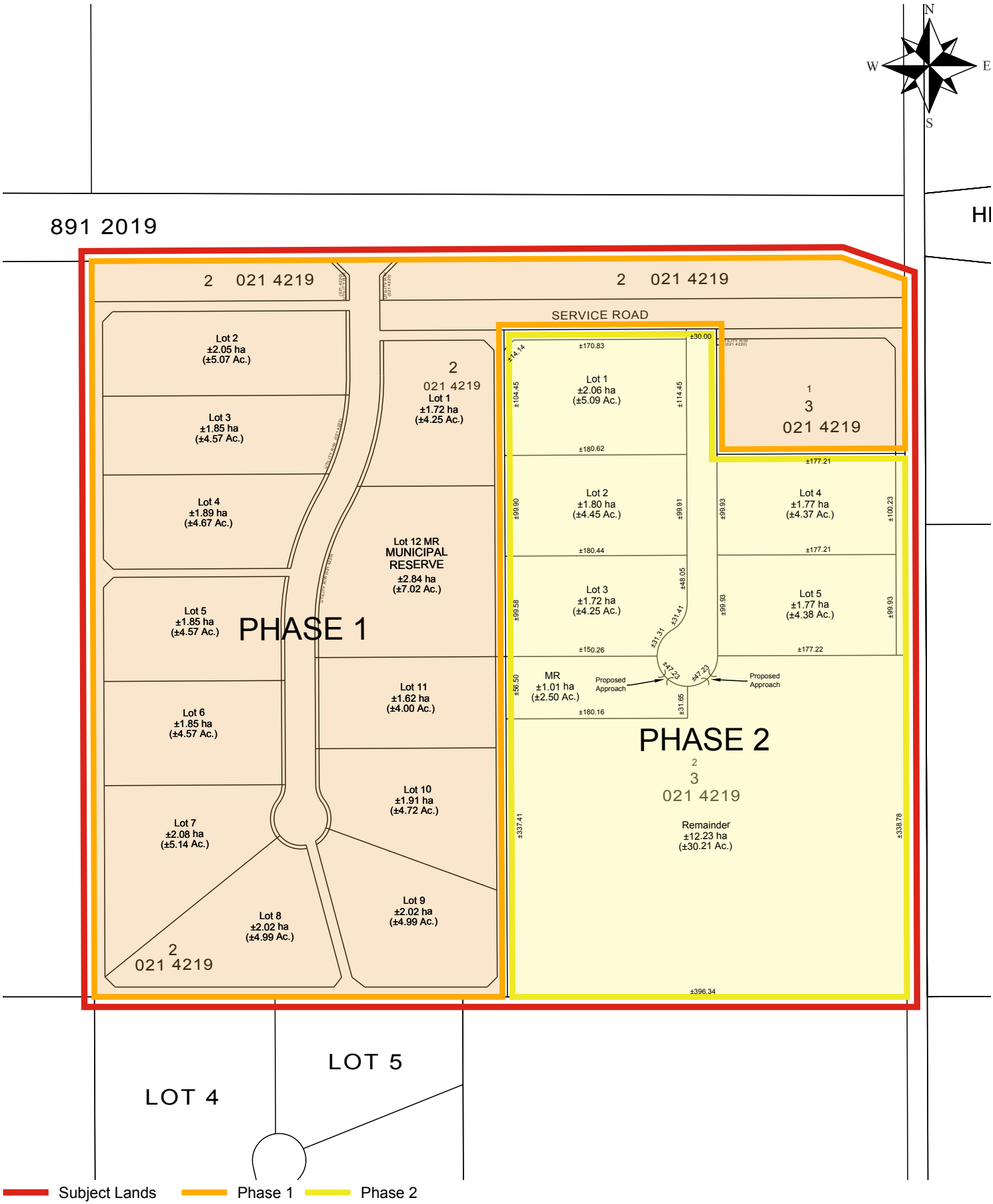
Phase II will create five (5) new country residential lots, a Municipal Reserve parcel, and will add to the walkway system created in Phase I. The boundaries of Phase I and II are identified in Exhibit 6.0 Phasing. If further development phases are considered within the Sundance Trail Plan Area an amendment to this Area Structure Plan will be required.

4.4 Density

As indicated in the M.D. of Foothills No. 31 Municipal Development Plan, a quarter section may contain a total maximum density of thirty-two (32) lots or one (1) lot or unit per five (5) acres under a Country Residential designation. Within the NE Sec. 13-20-01-W5M there were twelve (12) Country Residential lots registered in Phase I. Phase II will add an additional five (5) Country Residential lots to the quarter section with a remainder of 32.89± acres. The total developable area of the parent parcel including the lands required for road widening was 158.51 acres, equating to a maximum density of thirty-one (31) lots. The total density for the Plan Area, Phases I and II will be seventeen (17) Country Residential lots and one (1) Agricultural lot. The total density ratio is therefore 1:8.81 or one lot per 8.81 acres. Based on this density the Sundance Trail Area Structure Plan meets the requirements of the M.D. of Foothills No. 31 Municipal Development Plan for Country Residential parcels.

TABLE 1: DENSITY TABLE

	Phase I	**Phase II**	**Area Required for Road (Hwy. 7)**	**Total Parent Parcel Area**
Total Number of Country Residential Lots	12 lots	6 lots		18 lots
Total Area	86.23± acres	59.33± acres	12.95± acres on Road Plan 8912019	158.51± acres
Total Density	1 lot per 7.19 acres	1 lot per 9.89 acres		1 lot per 8.81 acres



Sundance Trail
Area Structure Plan
NE ¼ Sec. 13 - 20 - 01 - W5M

Phasing Plan

Exhibit 6.0

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Source:

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4.5 Impact on Adjacent Lands

By utilizing a design that incorporates topography, the existing structures and the external road system, the Developer will reduce the impact the Plan Area will have on the adjacent lands. Additionally, the Developer plans to minimize the impact on adjacent lands through proper storm water management and architectural controls.

The lands to the north of the Plan Area will be minimally impacted, if at all, due to the buffer created by Highway 7. To the south, southwest, and southeast of the Plan Area multi-lot subdivisions have already been approved. The land to the west of the Plan Area has been subdivided, with one (1) lot already removed from the parent quarter section. The lands to the east will have an improved and safer access situation from Highway 7, via the service road built for Sundance Trail; furthermore the architectural controls will identify building sites that reduce the visual impact of the new parcels in relation to the existing residences.

The Developer will take the proper measures to ensure that the Plan Area does not impact the adjacent landowners in a negative way. In this respect, the Plan Area has been designed to fit in with existing character of the area. Additionally, groundwater tests and percolation testing have been completed for the quarter section and a storm water management plan will be completed, as a condition of approval and if required by Council, to ensure that the Plan Area will not affect adjacent landowners.

4.6 Environmental Considerations

Wildlife is not abundant in this area and the quarter section does not contain features that are typically popular to wildlife. The Developer will strive to complete this subdivision with minimal impact on the environment. The initial steps that have been taken to ensure that this occurs are the completion of various studies, such as a groundwater study and percolation testing. Additionally an Agrologist report has been completed, and a storm water management plan will be completed at the request of Council, as a condition of approval. Explanations and a summary of these studies are listed below and attached in the Appendix of this document.

4.6.1 GROUNDWATER STUDY

For the development of Phase I, Groundwater Exploration & Research Ltd. completed a preliminary groundwater study in December 1999, to address the feasibility of finding sufficient volumes of groundwater to sustain 20 lots in the NE ¼ Sec. 13–20–01-W5M. A copy of this study is attached as Appendix D. Groundwater Exploration & Research Limited utilized information from Alberta Environmental Protection's groundwater database file to undertake this study. A total of 35 well records were available for review from the surrounding eight-quarter sections of land. The information provided by Groundwater Exploration & Research Ltd. shows that the water resources in the area could support a minimum of twenty (20) lots.

The Groundwater Supply Evaluation was updated in March 2005 with the review of two (2) new wells that were drilled in the Phase II area. The intention of Phase II is to provide a well on each new parcel, however the updated report concluded that one (1) of the new wells would be capable of supplying water to service up to ten (10) lots. Furthermore, the new well would not interfere with any household users, licensees, or traditional agricultural users who existed at the time the report was prepared. The report also concluded that historical non-pumping water levels do not yield a concern for any significant decline in the water level. The updated report has also been attached as Appendix D. Section 4.8.1 of this Plan refers to the policies for the development of water wells within Sundance Trail.

4.6.2 PERCOLATION TESTING (SHALLOW SUBSURFACE CONDITIONS)

To ensure that the lots are suitable for standard sewage disposal field tile systems the Developer completed shallow subsurface testing for Phases I and II. The Phase I testing (report completed in January of 2000) indicated that only one (1) lot within Phase I would require a raised septic field of 1.0 metre. The Phase II testing (report completed in March 2005) indicated that all test locations are suitable for standard sewage disposal field tile systems. The reports completed by Almor Testing Services Limited are attached as Appendix E. Policies regarding sewage disposal for Sundance Trail are located in Section 4.8.2 of this Plan.

4.6.3 AGROLOGIST REPORT

Previous landowners who have farmed this quarter section have deemed it incapable of agricultural production due to excessive stoniness resulting in damage to the machinery far outweighing any income from the sale of crops taken off this quarter section.

On February 11, 1999, Matrix Solutions Inc. was hired to assess the potential for arable agriculture on the NE ¼ Sec. 13-20-01-W5M. This report is attached as Appendix C. The site specification evaluation of the subject property resulted in a rating of Class 4DP for 65 acres across the north half of the quarter section and a rating of Class 6TP for 90 acres across the south half of the quarter section (see Figure 3). The remaining 5.0 ± acres on the quarter section comprise the farmstead and driveway.

As indicated in the Agrologist report, the NE ¼ Sec. 13-20-01-W5M is not suitable for agriculture because of excessive stoniness. Additionally, the land does not exceed 15% slope. For these reasons, the development going on in this area and the Plan Area's close proximity to Okotoks, Country Residential development is ideal for this quarter section.

4.7 Transportation

4.7.1 INTERNAL ROAD SYSTEM

The Developer will construct a high quality road system to the M.D. of Foothills No. 31 Road Construction Standards. The following policies will apply to the internal road system:

a. The speed limit on the internal road will be set at 40 km per hour;

b. Construction of the internal roadways shall be the responsibility of the Developer.

4.7.2 EXTERNAL ROAD SYSTEM

With regards to the external road system the following policies will apply:

a. The developer shall meet all requirements of Alberta Transportation as a condition of approval.

b. If required by Council, the Developer shall upgrade the service road to Municipal standards, to the location of the Phase II access point.

c. Road improvement fees required by Council shall be as per the 2007 Planning Fees Schedule, noting that the Schedule states that:

"no municipal road improvement fee will be imposed under the following conditions:
d. Council requires a developer to build, rebuild, dust control or surface a municipal road and the cost of that work exceeds the road improvement fee."

4.7.2.1 Subdivision Access Location

A sight distance analysis was completed for the intersection of Highway 7 and Meridian Road. The results of the analysis indicated that the Meridian Road/Highway 7 intersection was not suitable when Phase I was developed. Based on the results of the sight distance analysis, the Highway 7 intersection was located as identified on Exhibit 4.0, facilitating acceptable sight distances at the new intersection constructed during Phase I. A summary of the sight distance analysis results is contained in Appendix F.

4.7.2.2 Subdivision Access Design

Based on analysis, and upon discussion with Alberta Transportation a Type lll (a) standard at-grade intersection was required at the Phase I development stage, thereby resulting construction of the access from the Plan Area onto Highway 7. A study completed by IBI Group (attached as Appendix F) ensured that this access met all site distance requirements as per Alberta Transportation.

4.7.2.3 Meridian Road

As per Alberta Transportation requirements, lots to the east of the Plan Area, which have gained access at the Highway 7/Meridian Road intersection, will now gain access by way of the service road. Furthermore, The MD of Foothills No. 31 will be required to make application to close a portion of Meridian Road, to prevent future access to Highway 7.

Upon closure of a portion of Meridian road by the Municipality the Developer will remove the road surfacing on Meridian Road to allow the lands to be leased for pasture purposes. The road surface will only be removed in the areas where the adjacent lands do not require the surfacing for access purposes. The following policies will apply to the removal of the road surface:

a. The road surfacing along Meridian Road will only be removed in those areas where it will not prevent access for the adjacent landowners;

b. The road surfacing removal will be at the full expense of the Developer;

c. The road surfacing removal could be subject to Municipal approval.

4.7.2.4 Road Widening

As required as a condition of approval for Phase I a forty meter (40 m) wide strip for future road widening purposes was provided by the Developer and is identified in Exhibit 4.0 Plan Area. Alberta Transportation has indicated that should other lands within the vicinity of the Plan Area, on the south side of Highway 7, be further developed that they would require a similar setback as indicated in Exhibit 4.0.

4.7.2.5 Service Road

As requested by Alberta Transportation, provision for the development of a continuous thirty meter (30m) service road network is provided, shown in Exhibit 4.0. This dedication will enhance the access situation for the landowner to the east and Sundance Trail by providing a safer access location from Highway 7 than the Meridian Road intersection.

4.7.2.6 Highway Buffering

To reduce the impact the highway may have on the subdivision, the landowners of the lots adjacent to the highway may use various buffering techniques. The restrictive covenant placed on the title of each new lot will allow landowners adjacent to the highway to landscape and place trees along the north boundary of the lots providing all setbacks from the highway and service road are met.

Additionally, building envelopes for Phase II will be indicated on each lot by way of the restrictive covenant that will exceed the required setbacks from Highway 7. The Developer is also proposing a fenced walkway system that will provide further buffering and protection to all landowners of the Plan Area from Highway 7.

4.8 Servicing

4.8.1 WATER SUPPLY

The lots of the Plan Area will be serviced with potable water via individual wells, which will be drilled on each of the lots. Two (2) wells were drilled within the Phase II lands in 2005, one (1) of which has been calculated at 5.53 Cgpm, and the second that has an estimated flow rate of 4.50 Cgpm. As indicated in the reports by Groundwater Exploration & Research Ltd., sufficient water for this development will be available. Furthermore, an updated Groundwater Supply Evaluation completed in March 2005, concluded that the historical non-pumping water levels do not yield a concern for any significant decline in regional water level. Wells will be developed in accordance with the recommendations contained in the Groundwater Exploration & Research Ltd. reports attached as Appendix D.

As per the Municipal Water Policy, “for all applications where 6 or more lots (including existing) will be on a quarter section, proof of water must conform to the Water Act”.

The following policies will apply with respect to the water supply:

a. The developer shall drill a water well on each new lot that meets the requirements of the Water Act as a condition of redesignation approval;

In addition to the Municipal Water Policy and the Water Act, the following policy will apply to the development of Phase II:

b. If the Developer fails to provide a well on each Country Residential lot within Phase II that meets the Water Act and the Municipal Water Policy the Subdivision Plan shall be amended for fewer Country Residential parcels.

4.8.2 SEWAGE DISPOSAL

During the development of Phase I the Developer hired Almor Testing Services Ltd. to complete a test of the shallow subsurface conditions (attached as Appendix E). Their investigation revealed that the standard disposal field tile systems would be adequate for all locations on the NE Sec. 13-20-01 W5M, excluding one lot as indicated in the report. This lot would require a raised septic field of 1.0 meter (1 m) to be suitable for a standard disposal field tile system.

In preparation of amending the Sundance Trail Area Structure Plan, the Developer hired Almor Testing Services Limited to update their original report. A total of six (6) additional percolation test holes were completed. Their investigation revealed that the test locations are suitable for standard sewage disposal field tile systems. Furthermore, it was apparent that the near surface water table will be below the vertical distance required by Alberta Environmental Protection and therefore, will meet Alberta Environmental Protection guidelines for location of disposal fields during the months of June to August, when the highest groundwater conditions are experienced. The

following guidelines will apply in regards to the private sewage systems, which will be installed on each lot by the purchaser of each lot, upon an approval of this amendment.

a. The Developer will meet all recommendations of Almor Testing Services Limited, stated in their report attached as Appendix E;

b. The septic systems shall be properly engineered and shall meet all requirements of the Alberta Private Sewage Systems Standard of Practice.

4.8.3 STORM WATER MANAGEMENT

Proper ditching and road construction along the internal road will ensure that the Plan Area drains correctly. The following policies regarding storm water management will apply to the Plan Area:

a. The Developer shall complete a Storm Water Management Plan, if required by Council as a condition of approval;

b. Best Management Practices (BMP's) will be implemented throughout the Plan Area.

4.9 Utilities

The Developer, using the appropriate service companies for the area will provide electricity, gas, and telephone services to each lot. With regard to the utilities, the following policies will apply:

a. The Developer, at their sole expense will provide all utility easements and agreements to the satisfaction of the Municipality and the utility companies;

b. Shallow utilities (power, phone, gas) will be provided at the expense of the Developer.

4.10 Protective Services

4.10.1 FIRE PROTECTION

Fire services will be dispatched from Okotoks, which is approximately 3.0 kilometers away from the Plan Area. Easy access to the Plan Area from Okotoks will ensure minimal response times. Tanker trucks will provide water to the Plan Area in event of fire. With regards to fire protection the following policy will apply:

a. The design of the subdivision shall ensure that emergency vehicles will have all weather developed access to each parcel created in the Plan Area.

4.10.2 POLICE PROTECTION

Police services will be dispatched from the Okotoks detachment of the RCMP. The Plan Area's close proximity of the Plan Area to Okotoks would allow for minimum response times in the event of an emergency.

5. IMPLEMENTATION

When Council adopts the amendments to the Sundance Trail Area Structure Plan, in accordance with the provisions of the Municipal Government Act the amendments will be incorporated into the existing Statutory Plan of the M.D. of Foothills No. 31. The Developer shall begin construction of Phase II upon redesignation approval to Phase II from the M.D. of Foothills No. 31 Council.

APPENDIX A

BYLAWS OF ADOPTION

172/2000

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 N.E.13-20-1 W5; 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 "*Sundance Trail Area Structure Plan*".

2. The Sundance Trail Area Structure Plan being Schedule "A" attached hereto and forming part of this Bylaw.

3. That the Sundance Trail 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: October 26, 2000

Roy R. McLean
Reeve

Municipal Manager

SECOND READING: July 12, 2001

Roy R. McLean
Reeve

Municipal Manager

THIRD READING: July 12, 2001

Roy R. McLean
Reeve

Municipal Manager

PASSED IN OPEN COUNCIL assembled at the Town of High River in the Province of Alberta this 12 day of. July 2001.

BYLAW 229/2007

BEING A BYLAW OF THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31 TO ADOPT AN AMENDMENT TO 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 lands legally described as NE 13-20-1 W5;

WHEREAS the '*SUNDANCE TRAIL AREA STRUCTURE PLAN'* was adopted by Council on July 12, 2001;

WHEREAS the *SUNDANCE TRAIL 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;

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 "*Sundance Area Structure Plan (Phase II). Plan".*

2. The *SUNDANCE TRAIL AREA STRUCTURE PLAN'* (PHASE II) being Schedule "A" attached hereto and forming part of this Bylaw.

3. That the *SUNDANCE TRAIL AREA STRUCTURE PLAN (PHASE II)* 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: November 15, 2007

Roy R. McLean
Reeve

Municipal Manager

SECOND READING: January 31, 2008

Roy R. McLean
Reeve

Municipal Manager

THIRD READING: January 31, 2008

Roy R. McLean
Reeve

Municipal Manager

PASSED IN OPEN COUNCIL assembled at the Town of High River in the Province of Alberta this31 day of January, 2008

APPENDIX B

CERTIFICATE OF TITLE

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0029 693 884	0214219;2;6	031 247 717

LEGAL DESCRIPTION
PLAN 0214219
BLOCK 2
LOT 6
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 1.85 HECTARES (4.57 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 5;1;20;13;NE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 021 442 410 +9

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
031 247 717	24/07/2003	TRANSFER OF LAND	$110,000	$110,000

OWNERS

RODERICK D MARTIN

AND
LINDA L MARTIN
BOTH OF:
SITE 14, BOX 25, RR#1
OKOTOKS
ALBERTA T1S 1A1
AS JOINT TENANTS
(DATA UPDATED BY: CHANGE OF ADDRESS 061291825)

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
861 074 421	05/05/1986	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.
981 313 990	08/10/1998	RESTRICTIVE COVENANT
021 428 612	05/12/2002	CAVEAT RE : DEVELOPMENT AGREEMENT PURSUANT TO MUNICIPAL GOVERNMENT ACT CAVEATOR - THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31. BOX 5605 HIGH RIVER ALBERTA T1V1M7
021 442 412	16/12/2002	UTILITY RIGHT OF WAY GRANTEE - TELUS COMMUNICATIONS INC.. 12040-107 ST EDMONTON ALBERTA T5G2S7 GRANTEE - ATCO GAS AND PIPELINES LTD.. 909 11 AVE SW CALGARY ALBERTA T2R1L8 GRANTEE - FORTISALBERTA INC.. 320-17 AVE SW CALGARY ALBERTA T2S2V1 AS TO PORTION OR PLAN:0214220 (DATA UPDATED BY: CHANGE OF NAME 041425949)
021 442 413	16/12/2002	RESTRICTIVE COVENANT
031 361 110	20/10/2003	MORTGAGE MORTGAGEE - CIBC MORTGAGES INC.. P.O. BOX 2620 CALGARY ALBERTA T2P2M7 ORIGINAL PRINCIPAL AMOUNT: $340,174
061 303 357	27/07/2006	MORTGAGE MORTGAGEE - CANADIAN IMPERIAL BANK OF COMMERCE. 100 ANDERSON RD SE CALGARY ALBERTA T2J3V1 ORIGINAL PRINCIPAL AMOUNT: $430,000

(CONTINUED)

TOTAL INSTRUMENTS: 007

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 17 DAY OF APRIL, 2008 AT 02:22 P.M.

ORDER NUMBER:11057804

CUSTOMER FILE NUMBER: 14246 KS

END OF CERTIFICATE

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0029 693 892	0214219;2;7	031 166 311

LEGAL DESCRIPTION
PLAN 0214219
BLOCK 2
LOT 7
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 2.08 HECTARES (5.14 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 5;1;20;13;NE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 021 442 410 +10

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
031 166 311	22/05/2003	TRANSFER OF LAND	$373,609	SEE INSTRUMENT

OWNERS

BLAIR HANDEL

AND
GEORGIA HANDEL
BOTH OF:
46 SHEEP RIVER CRESCENT
OKOTOKS
ALBERTA T1S 1R3
AS JOINT TENANTS

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
861 074 421	05/05/1986	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.
981 313 990	08/10/1998	RESTRICTIVE COVENANT
021 428 612	05/12/2002	CAVEAT RE : DEVELOPMENT AGREEMENT PURSUANT TO MUNICIPAL GOVERNMENT ACT CAVEATOR - THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31. BOX 5605 HIGH RIVER ALBERTA T1V1M7
021 442 412	16/12/2002	UTILITY RIGHT OF WAY GRANTEE - TELUS COMMUNICATIONS INC.. 12040-107 ST EDMONTON ALBERTA T5G2S7 GRANTEE - ATCO GAS AND PIPELINES LTD.. 909 11 AVE SW CALGARY ALBERTA T2R1L8 GRANTEE - FORTISALBERTA INC.. 320-17 AVE SW CALGARY ALBERTA T2S2V1 AS TO PORTION OR PLAN:0214220 (DATA UPDATED BY: CHANGE OF NAME 041425949)
021 442 413	16/12/2002	RESTRICTIVE COVENANT
071 448 640	07/09/2007	MORTGAGE MORTGAGEE - THE BANK OF NOVA SCOTIA. 201 SOUTHRIDGE DR OKOTOKS ALBERTA T1S1B2 ORIGINAL PRINCIPAL AMOUNT: $750,000

(CONTINUED)

TOTAL INSTRUMENTS: 006

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 17 DAY OF APRIL, 2008 AT 02:22 P.M.

ORDER NUMBER:11057804

CUSTOMER FILE NUMBER: 14246 KS

END OF CERTIFICATE

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0029 693 843	0214219;2;2	031 259 634

LEGAL DESCRIPTION
PLAN 0214219
BLOCK 2
LOT 2
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 2.05 HECTARES (5.07 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 5;1;20;13;NE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 031 219 582

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
031 259 634	02/08/2003	TRANSFER OF LAND	$350,817	CASH & MORTGAGE

OWNERS

JANICE BROADLEY
OF SITE 14, BOX 26, RR 1
OKOTOKS
ALBERTA T1S 1A1
(DATA UPDATED BY: 031321372)
(DATA UPDATED BY: CHANGE OF ADDRESS 031354739)

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
861 074 421	05/05/1986	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
		LIMITED.
981 313 990	08/10/1998	RESTRICTIVE COVENANT
021 428 612	05/12/2002	CAVEAT RE : DEVELOPMENT AGREEMENT PURSUANT TO MUNICIPAL GOVERNMENT ACT CAVEATOR - THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31. BOX 5605 HIGH RIVER ALBERTA T1V1M7
021 442 412	16/12/2002	UTILITY RIGHT OF WAY GRANTEE - TELUS COMMUNICATIONS INC.. 12040-107 ST EDMONTON ALBERTA T5G2S7 GRANTEE - ATCO GAS AND PIPELINES LTD.. 909 11 AVE SW CALGARY ALBERTA T2R1L8 GRANTEE - FORTISALBERTA INC.. 320-17 AVE SW CALGARY ALBERTA T2S2V1 AS TO PORTION OR PLAN:0214220 (DATA UPDATED BY: CHANGE OF NAME 041425949)
021 442 413	16/12/2002	RESTRICTIVE COVENANT
031 259 635	02/08/2003	MORTGAGE MORTGAGEE - CIBC MORTGAGES INC.. P.O. BOX 2620 CALGARY ALBERTA T2P2M7 ORIGINAL PRINCIPAL AMOUNT: $266,533
031 273 270	14/08/2003	BUILDER'S LIEN LIENOR - E & M PLUMBING (1998) LTD.. 86-2A ST SE HIGH RIVER ALBERTA T1V1G6 AGENT - MARILYN K ROTH AMOUNT: $11,504
031 281 251	21/08/2003	BUILDER'S LIEN

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
		LIENOR - CVITANOVICH HOLDING LTD.. C/O LOW, GLENN & CARD 3475-26 AVE NE CALGARY ALBERTA T1Y6L4 AGENT - THOMAS F GLENN AMOUNT: $18,410
031 285 484	25/08/2003	BUILDER'S LIEN LIENOR - 995866 ALBERTA LTD.. C/O A GEORGE DEARING PROFESSIONAL CORPORATION 103, 14-2 AVE SE HIGH RIVER ALBERTA T1V1G4 AGENT - MIGUEL LEIVA AMOUNT: $1,764 WAGES
031 285 546	25/08/2003	BUILDER'S LIEN LIENOR - JOSE HECTOR ROJAS C/O A GEORGE DEARING PROFESSIONAL CORPORTION #103, 14 - 2ND AVENUE S.E. HIGH RIVER ALBERTA T1V1G4 AMOUNT: $1,292 WAGES
031 286 700	26/08/2003	BUILDER'S LIEN LIENOR - CLASSIC KITCHENS & CABINETS LIMITED. ATTN:STEPEHN CARTER-EDWARDS C/O GOWLING LAFLEUR HENDERSON 1400,700 2 ST SW CALGARY ALBERTA T2P4V5 AGENT - SALIM G KANJI AMOUNT: $10,625
031 287 810	26/08/2003	BUILDER'S LIEN LIENOR - G. GOSS & SON CONSTRUCTION LTD.. C/O A GEORGE DEARING PROFESSIONAL CORPORATION #103, 14 - 2ND AVE. S.E. HIGH RIVER ALBERTA T1V1G4 AGENT - WILLIAM ROSS AMOUNT: $3,686
031 289 320	27/08/2003	BUILDER'S LIEN

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
		LIENOR - REGAL BUILDING MATERIALS LTD..
		7131 D-6 STREET SE
		CALGARY
		ALBERTA T2H2M8
		AGENT - JAMES AUCOIN
		AMOUNT: $4,921
031 289 526	27/08/2003	BUILDER'S LIEN
		LIENOR - ROY GIBSON CONTRACTING LTD..
		C/O A. GEORGE DEARING PROFESSIONAL CORPORATION
		103, 14-2 AVE SE
		HIGH RIVER
		ALBERTA T1V1G4
		AGENT - BEVERLY JOAN GIBSON
		AMOUNT: $1,498
031 295 942	02/09/2003	BUILDER'S LIEN
		LIENOR - CUSTOM ELECTRIC LTD..
		C/O DAVID F. YOUNGGREN OF DUNPHY BEST BLOCKSOM
		2100, 777 - 8TH AVE SW
		CALGARY
		ALBERTA T2P3R5
		AGENT - DAVID F YOUNGGREN
		AMOUNT: $10,179
041 053 201	05/02/2004	CERTIFICATE OF LIS PENDENS
		AFFECTS INSTRUMENT: 031286700
041 054 928	06/02/2004	CERTIFICATE OF LIS PENDENS
		AFFECTS INSTRUMENT: 031281251
041 056 524	09/02/2004	CERTIFICATE OF LIS PENDENS
		AFFECTS INSTRUMENT: 031273270
041 063 529	13/02/2004	CERTIFICATE OF LIS PENDENS
		AFFECTS INSTRUMENT: 031285484
041 063 530	13/02/2004	CERTIFICATE OF LIS PENDENS
		AFFECTS INSTRUMENT: 031287810
041 063 531	13/02/2004	CERTIFICATE OF LIS PENDENS
		AFFECTS INSTRUMENT: 031289526
041 063 532	13/02/2004	CERTIFICATE OF LIS PENDENS
		AFFECTS INSTRUMENT: 031285546
041 072 296	23/02/2004	CERTIFICATE OF LIS PENDENS

(CONTINUED)

AFFECTS INSTRUMENT: 031295942

TOTAL INSTRUMENTS: 023

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 17 DAY OF APRIL, 2008 AT 02:22 P.M.

ORDER NUMBER:11057804

CUSTOMER FILE NUMBER: 14246 KS

END OF CERTIFICATE

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0029 693 918	0214219;2;10	031 143 450

LEGAL DESCRIPTION
PLAN 0214219
BLOCK 2
LOT 10
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 1.91 HECTARES (4.72 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 5;1;20;13;NE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 021 442 410 +12

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
031 143 450	06/05/2003	TRANSFER OF LAND	$110,000	$110,000

OWNERS

DWAYNE B KRAUSS

AND
DIANE E KRAUSS
BOTH OF:
166 WOODBEND WAY
OK0T0KS
ALBERTA T1S 1M1
AS JOINT TENANTS
(DATA UPDATED BY: 031148475)

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
861 074 421	05/05/1986	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.
981 313 990	08/10/1998	RESTRICTIVE COVENANT
021 428 612	05/12/2002	CAVEAT RE : DEVELOPMENT AGREEMENT PURSUANT TO MUNICIPAL GOVERNMENT ACT CAVEATOR - THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31. BOX 5605 HIGH RIVER ALBERTA T1V1M7
021 442 412	16/12/2002	UTILITY RIGHT OF WAY GRANTEE - TELUS COMMUNICATIONS INC.. 12040-107 ST EDMONTON ALBERTA T5G2S7 GRANTEE - ATCO GAS AND PIPELINES LTD.. 909 11 AVE SW CALGARY ALBERTA T2R1L8 GRANTEE - FORTISALBERTA INC.. 320-17 AVE SW CALGARY ALBERTA T2S2V1 AS TO PORTION OR PLAN:0214220 (DATA UPDATED BY: CHANGE OF NAME 041425949)
021 442 413	16/12/2002	RESTRICTIVE COVENANT
041 054 362	06/02/2004	MORTGAGE MORTGAGEE - CANADIAN IMPERIAL BANK OF COMMERCE. 300 VILLAGE LANE OKOTOKS ALBERTA T0L1T4 ORIGINAL PRINCIPAL AMOUNT: $300,000

(CONTINUED)

TOTAL INSTRUMENTS: 006

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 17 DAY OF APRIL, 2008 AT 02:22 P.M.

ORDER NUMBER:11057804

CUSTOMER FILE NUMBER: 14246 KS

END OF CERTIFICATE

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0029 693 801	0214219;2;12MR	021 442 410 +1

LEGAL DESCRIPTION
PLAN 0214219
BLOCK 2
LOT 12MR (MUNICIPAL RESERVE)
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 2.84 HECTARES (7.02 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 5;1;20;13;NE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 021 428 613

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
021 442 410	16/12/2002	SUBDIVISION PLAN		

OWNERS

THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31.
OF BOX 5605
HIGH RIVER
ALBERTA T1V 1M7

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
861 074 421	05/05/1986	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER | DATE (D/M/Y) | PARTICULARS

981 313 990 08/10/1998 RESTRICTIVE COVENANT

TOTAL INSTRUMENTS: 002

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 17 DAY OF APRIL, 2008 AT 02:22 P.M.

ORDER NUMBER:11057804

CUSTOMER FILE NUMBER: 14246 KS

END OF CERTIFICATE

LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0029 693 819	0214219;3;2	031 192 844

LEGAL DESCRIPTION
PLAN 0214219
BLOCK 3
LOT 2
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 24.01 HECTARES (59.33 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 5;1;20;13;NE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 021 442 410 +2

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
031 192 844	10/06/2003	TRANSFER OF LAND	$465,000	NOMINAL

OWNERS

LORNE READ

AND
LEANNE READ
BOTH OF:
SITE 14, BOX 16, RR #1
OKOTOKS
ALBERTA T1S 1A1
AS JOINT TENANTS

(CONTINUED)

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
731 011 297	08/05/1973	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED. "20 FT STRIP"
861 074 421	05/05/1986	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.
981 313 990	08/10/1998	RESTRICTIVE COVENANT
021 428 612	05/12/2002	CAVEAT RE : DEVELOPMENT AGREEMENT PURSUANT TO MUNICIPAL GOVERNMENT ACT CAVEATOR - THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31. BOX 5605 HIGH RIVER ALBERTA T1V1M7
071 102 513	01/03/2007	MORTGAGE MORTGAGEE - THE BANK OF NOVA SCOTIA. 721 CORNERSTONE 201 SOUTHRIDGE DR OKOTOKS ALBERTA T1S1B2 ORIGINAL PRINCIPAL AMOUNT: $750,000

TOTAL INSTRUMENTS: 005

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 17 DAY OF APRIL, 2008 AT 02:22 P.M.

ORDER NUMBER:11057804

CUSTOMER FILE NUMBER: 14246 KS

END OF CERTIFICATE

(CONTINUED)

THIS ELECTRONICALLY TRANSMITTED LAND TITLES PRODUCT IS INTENDED FOR THE SOLE USE OF THE ORIGINAL PURCHASER, AND NONE OTHER, SUBJECT TO WHAT IS SET OUT IN THE PARAGRAPH BELOW.

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LAND TITLE CERTIFICATE

S

LINC	SHORT LEGAL	TITLE NUMBER
0029 693 876	0214219;2;5	031 149 911

LEGAL DESCRIPTION
PLAN 0214219
BLOCK 2
LOT 5
EXCEPTING THEREOUT ALL MINES AND MINERALS
AREA: 1.85 HECTARES (4.57 ACRES) MORE OR LESS

ESTATE: FEE SIMPLE
ATS REFERENCE: 5;1;20;13;NE

MUNICIPALITY: MUNICIPAL DISTRICT OF FOOTHILLS NO. 31

REFERENCE NUMBER: 021 442 410 +8

REGISTERED OWNER(S)

REGISTRATION	DATE(DMY)	DOCUMENT TYPE	VALUE	CONSIDERATION
031 149 911	09/05/2003	TRANSFER OF LAND	$106,000	$106,000

OWNERS

HOWEY JOSEPH DUPONT
OF BOX 10, SITE 9, R.R. 2
OKOTOKS
ALBERTA T1S 1A2

ENCUMBRANCES, LIENS & INTERESTS

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
861 074 421	05/05/1986	UTILITY RIGHT OF WAY GRANTEE - CANADIAN WESTERN NATURAL GAS COMPANY LIMITED.

(CONTINUED)

REGISTRATION NUMBER	DATE (D/M/Y)	PARTICULARS
981 313 990	08/10/1998	RESTRICTIVE COVENANT
021 428 612	05/12/2002	CAVEAT RE : DEVELOPMENT AGREEMENT PURSUANT TO MUNICIPAL GOVERNMENT ACT CAVEATOR - THE MUNICIPAL DISTRICT OF FOOTHILLS NO. 31. BOX 5605 HIGH RIVER ALBERTA T1V1M7
021 442 412	16/12/2002	UTILITY RIGHT OF WAY GRANTEE - TELUS COMMUNICATIONS INC.. 12040-107 ST EDMONTON ALBERTA T5G2S7 GRANTEE - ATCO GAS AND PIPELINES LTD.. 909 11 AVE SW CALGARY ALBERTA T2R1L8 GRANTEE - FORTISALBERTA INC.. 320-17 AVE SW CALGARY ALBERTA T2S2V1 AS TO PORTION OR PLAN:0214220 (DATA UPDATED BY: CHANGE OF NAME 041425949)
021 442 413	16/12/2002	RESTRICTIVE COVENANT
061 307 218	31/07/2006	MORTGAGE MORTGAGEE - ALBERTA TREASURY BRANCHES. 122 CENTRE AVE W BOX 147 BLACK DIAMOND ALBERTA T0L0H0 ORIGINAL PRINCIPAL AMOUNT: $400,000

(CONTINUED)

TOTAL INSTRUMENTS: 006

THE REGISTRAR OF TITLES CERTIFIES THIS TO BE AN ACCURATE REPRODUCTION OF THE CERTIFICATE OF TITLE REPRESENTED HEREIN THIS 17 DAY OF APRIL, 2008 AT 02:22 P.M.

ORDER NUMBER:11057804

CUSTOMER FILE NUMBER: 14246 KS

END OF CERTIFICATE

APPENDIX C

AGROLOGIST REPORT

Matrix Solutions Inc.

ASSESSMENT OF ARABILITY
FOR THE
NE1/4 13-020-01 W5M

Report Prepared for:

LORNE READ

Prepared by:

MATRIX SOLUTIONS INC.

Blair Nicholson

Blair Nicholson, P.Ag.
Project Agrologist

February, 1999
Calgary, Alberta

230, 319 - 2 Avenue S.W.
Calgary, Alberta, Canada T2P 0C5

Telephone: (403) 237-0606
Facsimile: (403) 263-2493

TABLE OF CONTENTS

1.0 INTRODUCTION

In response to a request from Mr. Lorne Read, the NE1/4 13-020-01 W5M was inspected on February 11, 1999, by Blair Nicholson, an agrologist with Matrix Solutions Inc. The purpose of the inspection was to assess the property's potential for arable agriculture. This report summarizes the findings of the field inspection.

The subject property is located southwest of Okotoks in the Municipal District of Foothills, No. 31 (Figure 1). It can be accessed from Meridian Street. The north end of Meridian Street, bordering the subject property, has been developed (Photo 1), the remainder of Meridian Street is an undeveloped road allowance (Photo 2). The north side of the subject property is bordered by Highway 7 (386 Avenue W), which is paved (Photo 3). The south side of the subject property is bordered by rangeland and a subdivision (Photo 4). The west side of the subject property is bordered by farmland (Photo 5).

All of the NE1/4 13-020-01 W5M was inspected. At the time of inspection some 50 acres of the subject property was in hay production (Photo 6) with the balance in rangeland (Photo 7). All of the subject property boundaries were fenced except for the west boundary. A number of cross fences divide the quarter section (Photo 8). A farmyard (Photo 9) and driveway (Photo 10) are located along the east boundary of the subject property.

Field inspection for this assessment consisted of walking and driving over the property, describing soil profiles according to the Canadian System of Soil Classification (Agriculture Canada Expert Committee on Soil Survey, 1987), noting landforms, taking slope readings with a clinometer, measuring slope lengths, taking photographs and, in general, looking for any limitations recognized in the two rating systems used to assess agricultural capability. To penetrate the frost layer, a hydraulic drill mounted on a 1 tonne truck was used to provide a soil profile core to the 1 m depth (Photo 11). No soil samples were collected for analysis during the inspection. An airphoto of the subject property, at a scale of 1:10,000, was used for mapping.

2.0 RATING SYSTEMS

The two recognized systems for rating arability of land that were used in this report are the Canada Land Inventory Soil Capability for Agriculture in Alberta (Brocke, 1977); and the Land Capability Classification for Arable Agriculture in Alberta (Alberta Soils Advisory Committee, 1987). Both of these systems recognize seven classes, with the limitations for agriculture becoming progressively greater from Class 1 to Class 7.

The Canada Land Inventory (CLI) rating system was developed in the early 1960s. Fourteen different kinds of limitations are recognized in this system as a result of adverse climate, soil or landscape characteristics. Final class placement is based on the most limiting of these three components. The CLI is an interpretive soil capability classification system derived from extrapolating soil survey data, climatic data and crop data, that rates land for arable agriculture under a dryland management system. Published CLI classifications (Agriculture Canada Soil Research Institute, 1971), at a scale of 1:250,000, exist for the property in question (Figure 2). Field inspections are necessary to confirm these classifications for local or site specific developments.

The Land Capability Classification for Arable Agriculture in Alberta (LCCAAA) was developed in the late 1980s, using all of the basic assumptions and guidelines of the CLI system as well as a system called the Storie Index. It was designed to replace the CLI rating system. The LCCAAA recognized twenty-one different kinds of limitations and utilized updated agro-climatic information and increased specificity of soil characteristics, as compared to those which are included in the guidelines for the CLI. No published maps exist for the LCCAAA rating system. The ratings are designed to be performed on small scale, site specific applications. Use of the LCCAAA is strongly endorsed by the Alberta Soil Survey; Alberta Environmental Protection; Alberta Forests and Wildlife; Alberta Agriculture Food and Rural Development; and Alberta Municipal Affairs.

3.0 GENERAL DESCRIPTION OF THE SUBJECT PROPERTY

3.1 Soil Survey of the Blackfoot and Calgary Sheets

The soils of the subject property are described in the Soil Survey of the Blackfoot and Calgary Sheets (Wyatt et al., 1942). This survey delineates one soil map unit for the NE1/4 13-020-01 W5M (Figure 3). This survey describes the soils as being part of a group of glacial soils referred to as Okotoks Glacial Loams.

The soil map unit delineated for the subject lands is characterized as 3.2.2. This map unit is located in the shallow black soil zone as the number 3, the first numeric within the map unit, reveals. Although these soils have formed under a fairly high annual rainfall, a relatively high evaporation rate has restricted the depth of organic matter accumulation. Thus, a shallow profile along with a shallow black surface horizon has developed.

The second number within the map unit deals with the parent material on which the soil profile developed. Parent material is the name given by the soil scientist to the geological material in which the soil develops. The number 2 refers to unsorted glacial soils, that is, soils which have developed on the unsorted till just as left by the receding ice. These soils are characterized by a rough topography and few to many stones scattered throughout the profile. The texture of these soils is often quite variable.

The third number in the map unit deals with profile variation, and the degree of salinization of the soil. Chemical and physical weathering of the parent material, the movement of soluble substances throughout the soil profile by the percolating rain water, the addition of organic matter due to vegetative growth and the activity of soil microorganisms are some of the agencies that have aided in creating the soil profile. The number 2 in this column refers to soils that are non-saline and have a normal profile development; that is, they are normal for their texture and the amount of rainfall they receive.

In general, Okotoks Glacial Loams are associated with elevated land of gently rolling to rolling topography. A 10 to 20 cm depth of black surface soil is the norm for this unit. Throughout this unit, fairly shallow stony profiles are common. A limey till layer is often encountered at 25 to 40 cm from the surface.

3.2 Site Specific Evaluation

A description of the 160 acres of the NE1/4 13-020-01 W5M based on the February 11, 1999, site specific evaluation follows.

The subject property is characterized by the irregular topography of a glaciated landscape. The till plain surface expression is one of undulating and ridged topography on an inclined landform that increases in strength from north to south. The highest points of land are located in the southwest corner of the quarter section.

Slopes in the 2-5% range dominate the north half of the subject land. These slopes give way to 6-9% slopes on the south half of the quarter section. To a lesser extent, inclines in the 10-15% range are present in this portion of the quarter section as well. All of these slopes converge towards the southeast corner of the quarter section where the lowest point in the landscape is located. From this basin, the excess surface runoff from the uplands exits the quarter section.

As the excess surface runoff moves downslope, off the upland topography, erosion takes place. This erosion process creates a channelled landscape as the excess runoff follows preferential flow lines downslope. The greater the relief, the greater the dissection of the landscape caused by this process. Photos 12 through 14 depict the type of erosional channels found on the subject land.

To capture some of this runoff, a few small dams have been constructed across these erosional channels. Photo 15 depicts one of the dams on the property. As runoff moves off the slopes into the draws, the stony till becomes exposed. The eroded material of the hillsides then collects at the base of the slopes and in basins. The deepest profiles described for the quarter section were found in the lower landscape positions. No wet or poorly drained subsoils were noted on these sites.

Associated with these sloped glaciated landscape is a high concentration of surface and subsurface coarse fragment material. Eight of the eleven boreholes examined had restrictive gravel and/or bedrock within the 1 m depth below surface. During the site specific evaluation concentrated stoniness was encountered throughout the subject property. The surface concentrations were visually observed to be stronger across the quarter section from north to south. As well, the profiles were found to be shallower across the subject property from north to south, reflecting the stronger erosional process at work on the steeper landscape. Coarse fragments of all sizes (gravel <8 cm in diameter; cobbles 8-25 cm in diameter; stones >25 cm in diameter) are present. Photos 16 to 19 depict the concentration of these coarse fragments on the surface of the soil. Photo 20 depicts the heavy concentration of coarse fragments in an erosional channel on the subject property.

4.0 CLI SITE SPECIFIC EVALUATION

The portion of the NE/14 13-020-01 W5M investigated has been classified under the CLI Soil Classification for Agriculture System on Map Sheet 82J Kananaskis Lakes (Agriculture Canada Soil Research Institute, 1971), at a scale of 1:250,000 (Figure 2). This study maps the subject area as Class 3T because of adverse topography (T). However, this information does not constitute a site specific evaluation as ratings are averaged over large areas and were made using airphotos and soil information without extensive ground truthing. Field inspections are necessary to confirm this classification for local or site specific development.

Using the CLI manual, a site specific CLI classification was done for the subject property and is presented as Figure 4. Two areas were mapped for the 160 acres assessed. The site specific evaluation of the subject property resulted in a rating of Class 4DP for 65 acres across the north half of the quarter section and a rating of Class 6TP for 90 acres across the south half of the quarter section. The remaining 5 acres on the quarter section comprises the farmstead and driveway.

The "D" symbol represents structural limitations in the subsoil. This limitation was applied to the north half of the subject property to reflect the structural limitations placed on the agricultural use of the land by shallow bedrock and gravelly subsoils. The "P" symbol represents excessive stoniness. This limitation is applied against soils that are sufficiently stony so as to hinder agricultural activities. The "T" symbol represents adverse topography, both steepness of slopes and pattern. This subclass applies to areas where topography is considered to be a limitation to agricultural use. Assessment of this limitation includes evaluation of the hazards imparted to cultivation by the degree of slopes as well as those due to irregularity of field patterns and lack of soil uniformity as a result of complex landform patterns.

These three characteristics, two landscape (stoniness and topography) and one soils (structure), are the most important factors limiting agricultural activities on the subject property.

In summary, the CLI classification for the 160 acres of the NE1/4 13-020-01 W5M investigated is as follows, with the boundaries as shown on Figure 4. Acreages are approximate. The rating symbol shows class placement and limitation.

5 acres - Farmstead and driveway
65 acres - 4DP
90 acres - 6TP

5.0 LCCAAA SITE SPECIFIC EVALUATION

Using the LCCAAA manual, a site specific LCCAAA classification was done for the subject property and is presented in Figure 5. Again, the overall classification is governed by the most limiting of the three major components (soils, climate and landscape). The landscape and soil factors are the most limiting components on this property as presented in the CLI rating system. The worksheets for the LCCAAA rating system are found in Appendix A. The site specific evaluation for the NE1/4 13-020-01 W5M using the LCCAAA rating system resulted in no changes from the previously outlined CLI site specific classification. The landscape factors of stoniness and topography and the soils factor of structural limitations were again judged to be the most limiting factors for all of the subject property using the LCCAAA. In summary, the LCCAAA classification for the 160 acres of the NE1/4 13-020-01 W5M investigated is as follows, with the boundaries as shown on Figure 5. The rating symbol shows class placement and limitation.

5 acres - Farmstead and driveway
65 acres - 4DP
90 acres - 6TP

6.0 CONCLUSION

The soil capability classification system used in this report is based on several assumptions. Three of these assumptions are: that shrubs, trees and stumps are not considered a limitation unless it is not feasible to remove them; that good soil management practices that are feasible and practical under a largely mechanized system of agriculture are used; and, that this system is based on limitations for agriculture and general productive capacity for common field crops.

In conclusion, the February 11, 1999, site specific evaluation using the most up to date LCCAAA system of rating land (LCCAAA evaluation), places 65 acres of the land inspected within the NE1/4 13-020-01 W5M into Class 4 and 90 acres into Class 6. Class 4 lands are considered marginal for arable agriculture. They have such severe limitations that they are suited only for a very narrow range of crops and the risk of crop failure is high. Class 6 lands have very severe limitations for sustained arable agriculture as well. The severity of the limitations of these soils renders them unsuitable for annual cultivation. They are capable only of producing perennial forage crops. The limitations are so severe that improvement practices are not feasible.

7.0 CERTIFICATION

I certify that I inspected the portion of the NE1/4 13-020-01 W5M identified in this report on February 11, 1999. Using information from the field inspection and information from previously published CLI map sheet Kananaskis Lakes 82J at a scale of 1:250,000, as well as the Soil Survey of the Blackfoot and Calgary Sheets, the classification of the subject property was done using the guidelines for two systems of classification: the Canada Land Inventory (CLI) Soil Classification for Agriculture, and the Land Capability Classification for Arable Agriculture in Alberta (LCCAAA). The subject property is classified by both systems, but the preferred system is the LCCAAA. The classification of that portion of the NE1/4 12-020-01 W5M inspected is, therefore, as follows:

5 acres - farmstead and driveway
65 acres - 4DP
90 acres - 6TP

I certify that I have no undisclosed interest, either actual or contemplated, in the property being inspected, nor is the fee contingent on the conclusions reached.

No legal survey was conducted during the inspection, and area estimates in this report are approximate, derived from dot grid assessments of aerial photographs. Information provided by others and used in this report is believed to be accurate, but that cannot be guaranteed.

This report has been prepared under the Code of Ethics of the Alberta Institute of Agrologists.

MATRIX SOLUTIONS INC.

ALBERTA INSTITUTE OF AGROLOGISTS
BLAIR NICHOLSON, P.AG.
1914
MEMBER

Blair Nicholson

Blair Nicholson, P.Ag.
Project Agrologist

February, 1999

8.0 REFERENCES

Agriculture Canada Expert Committee on Soil Survey, 1987. "The Canadian System of Soil Classification." 2nd Edition. Agric. Can. Publ. 1646. 164 pp.

Agriculture Canada Soil Research Institute, 1971. "Canada Land Inventory Soil Capability for Agriculture, Kananaskis Lakes Map Sheet Area 82J." Ottawa, Ontario.

Alberta Soils Advisory Committee, 1987. "Land Capability Classification for Arable Agriculture in Alberta (1987)." Edited by W.W. Pettapiece. Alberta Agriculture, Edmonton, Alberta.

Brocke, L.K., 1977. "The Canada Land Inventory Soil Capability for Agriculture in Alberta." Alberta Environment, Edmonton, Alberta.

Wyatt, F.A., Newton, J.D., Bowser, W.E. and Odynsky, W., 1942. "Soil Survey of Blackfoot and Calgary Sheets." University of Alberta. Edmonton, Alberta. Bulletin #39.

Photo 1. Meridian Street, a gravel road, which borders the east side of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

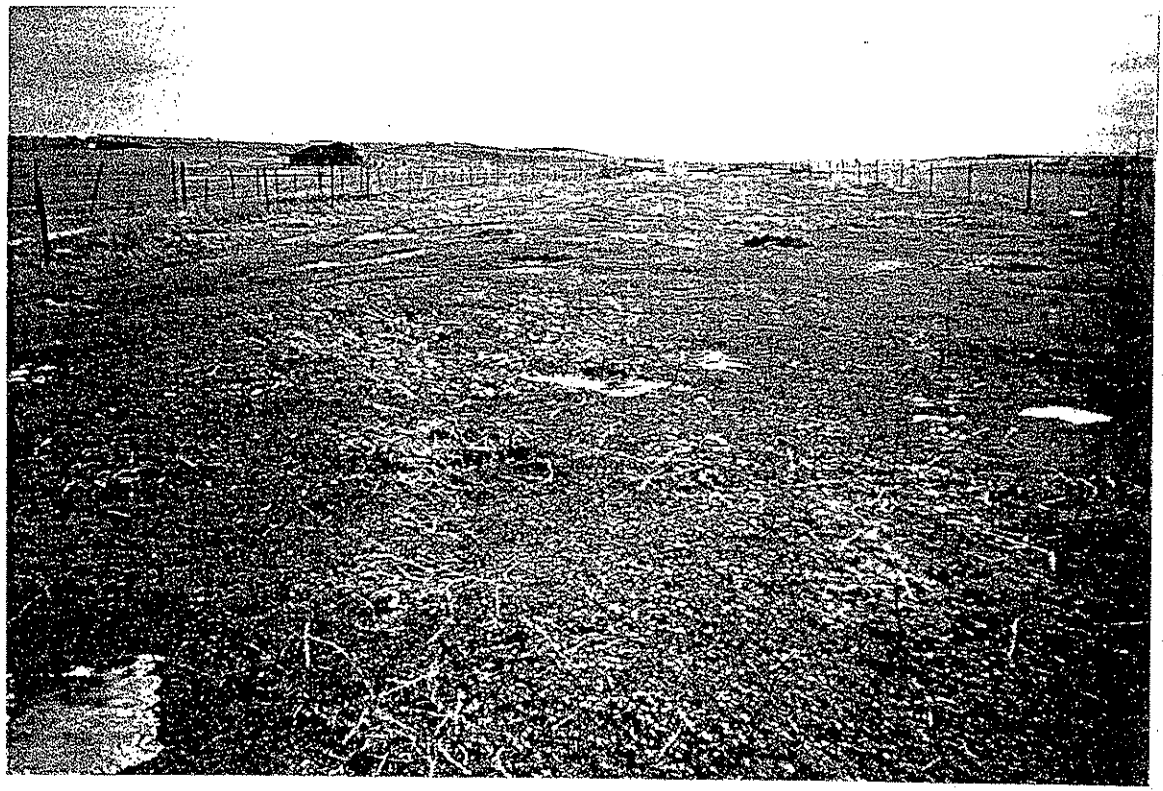


Photo 2. Undeveloped road allowance (Meridian Street) which borders the east side of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

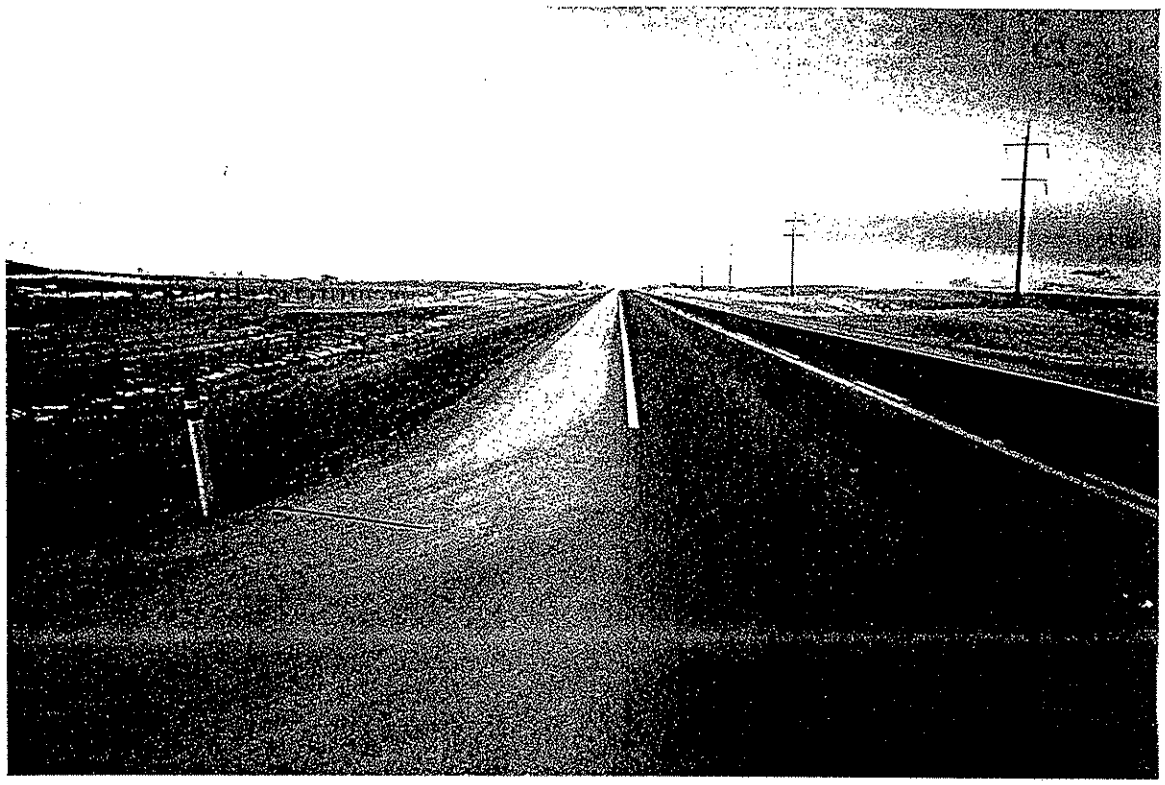


Photo 3. Highway 7 (386 Avenue W), a paved road, which borders the north side of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

Photo 4. Rangeland and subdivision which borders the south fenceline of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

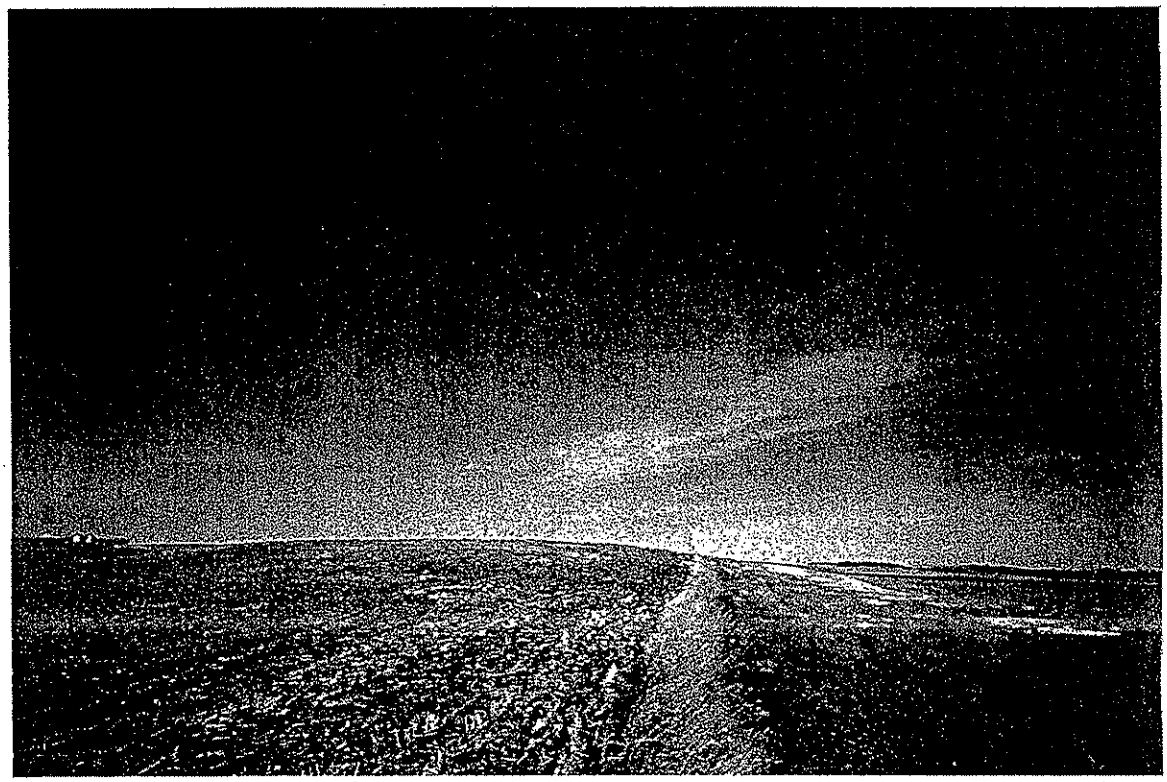


Photo 5. West boundary, which is not fenced, of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

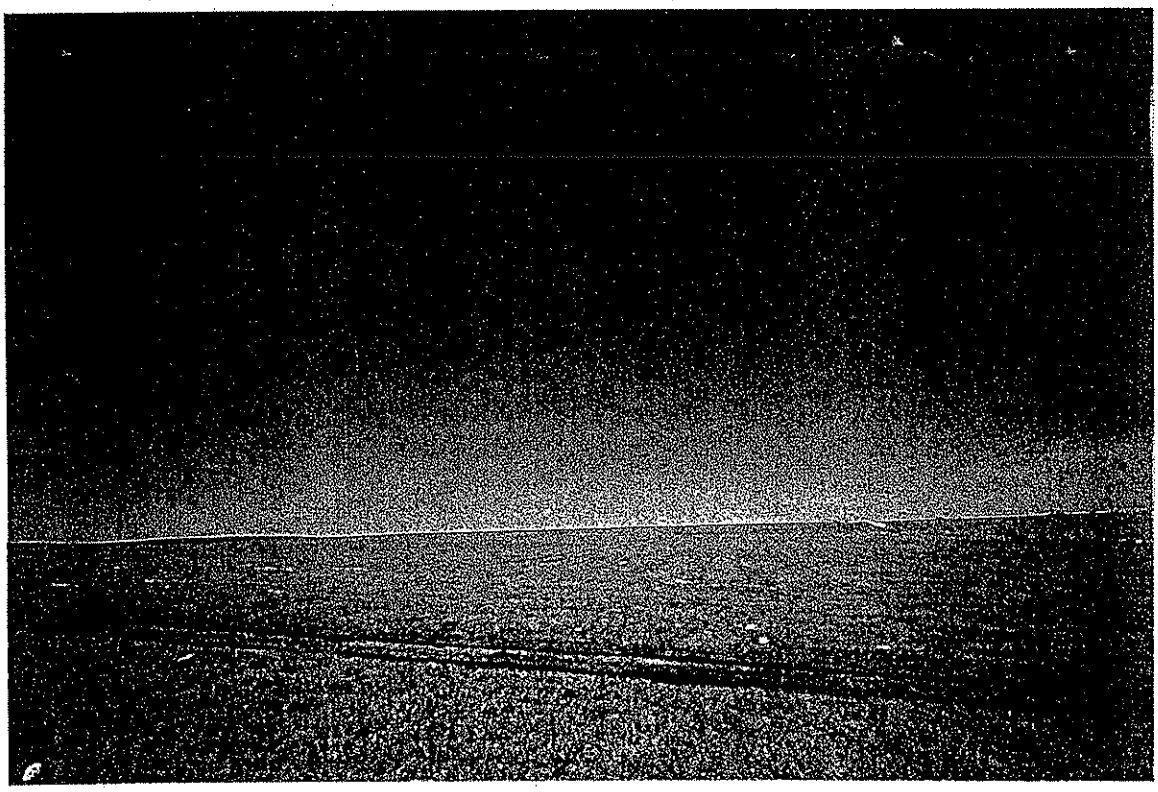


Photo 6. One of the land uses (hay production) on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

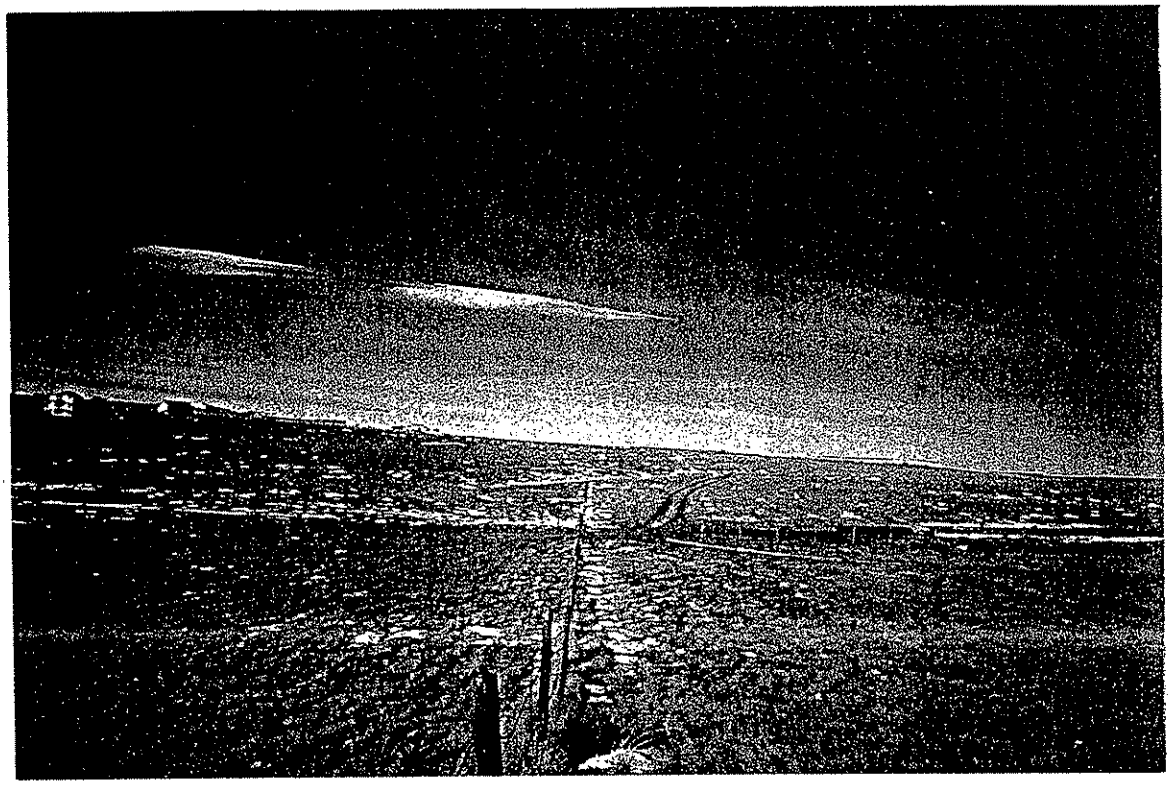


Photo 7. One of the land uses (grazing) on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

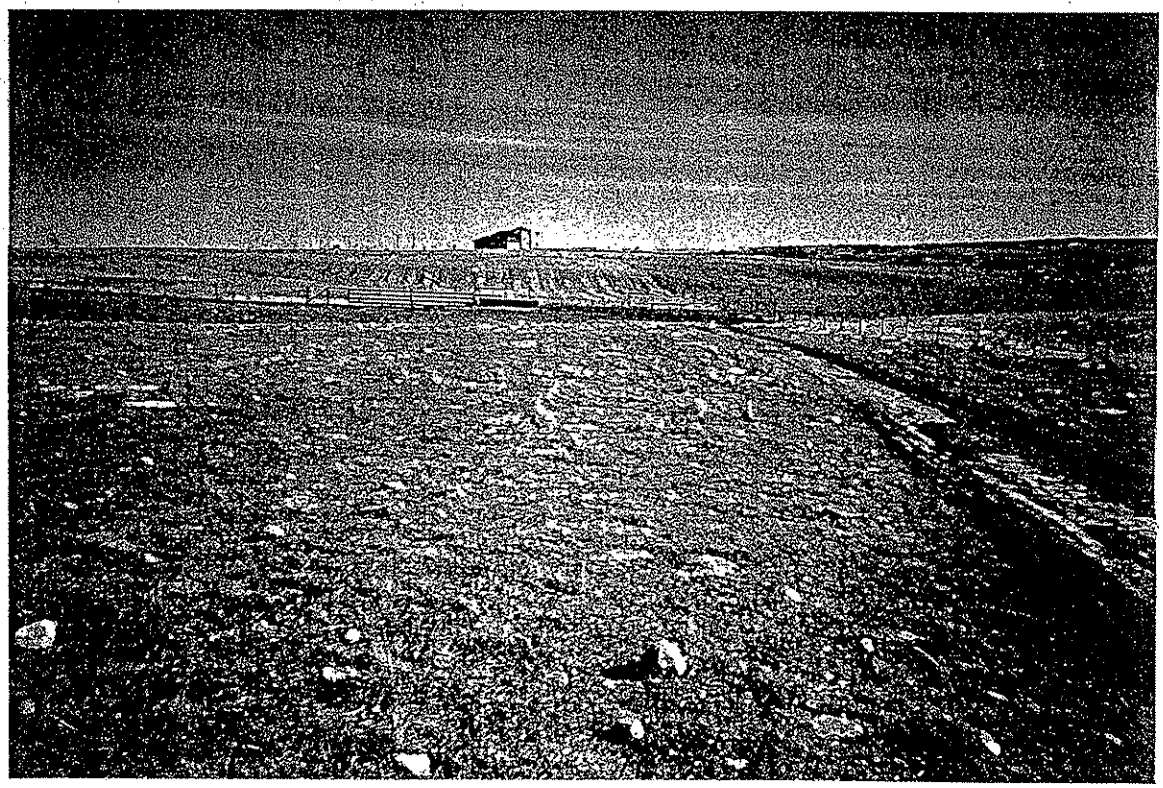


Photo 8. One of the cross fences on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

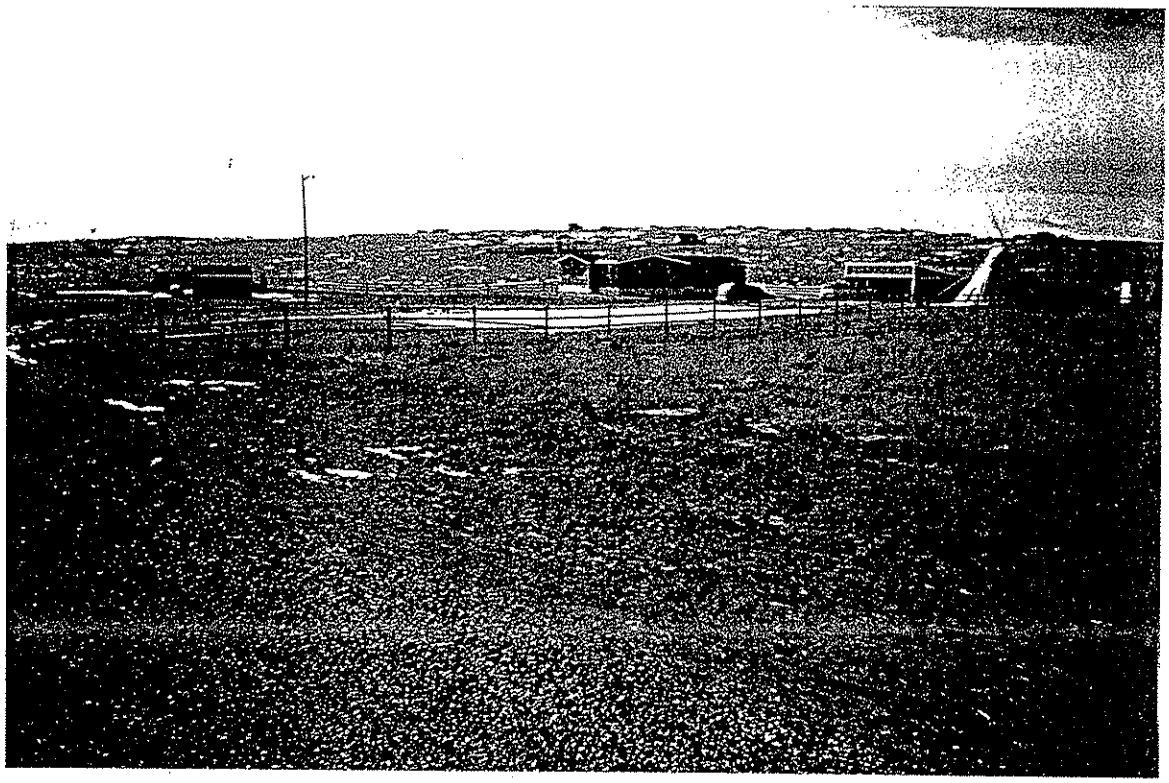


Photo 9. Farmyard on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

Photo 10. Driveway on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

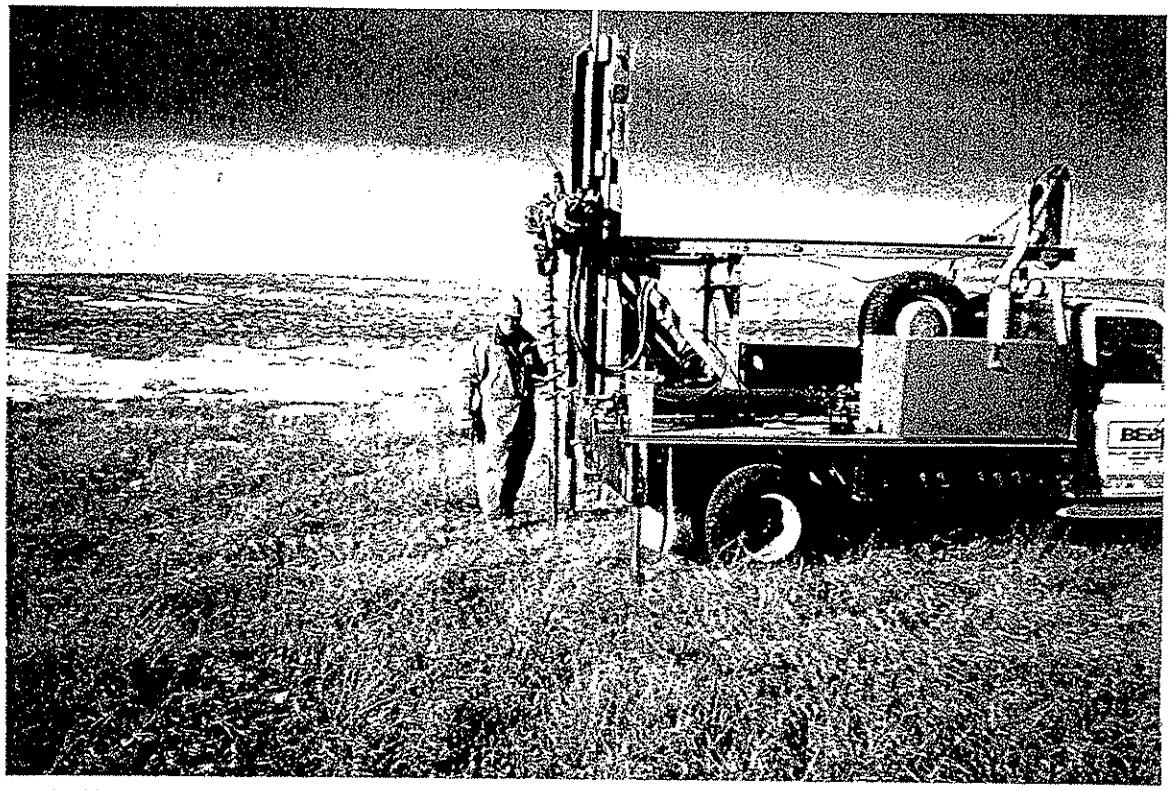


Photo 11. Drill truck used during the site specific evaluation of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

Photo 12. Wave like undulations on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

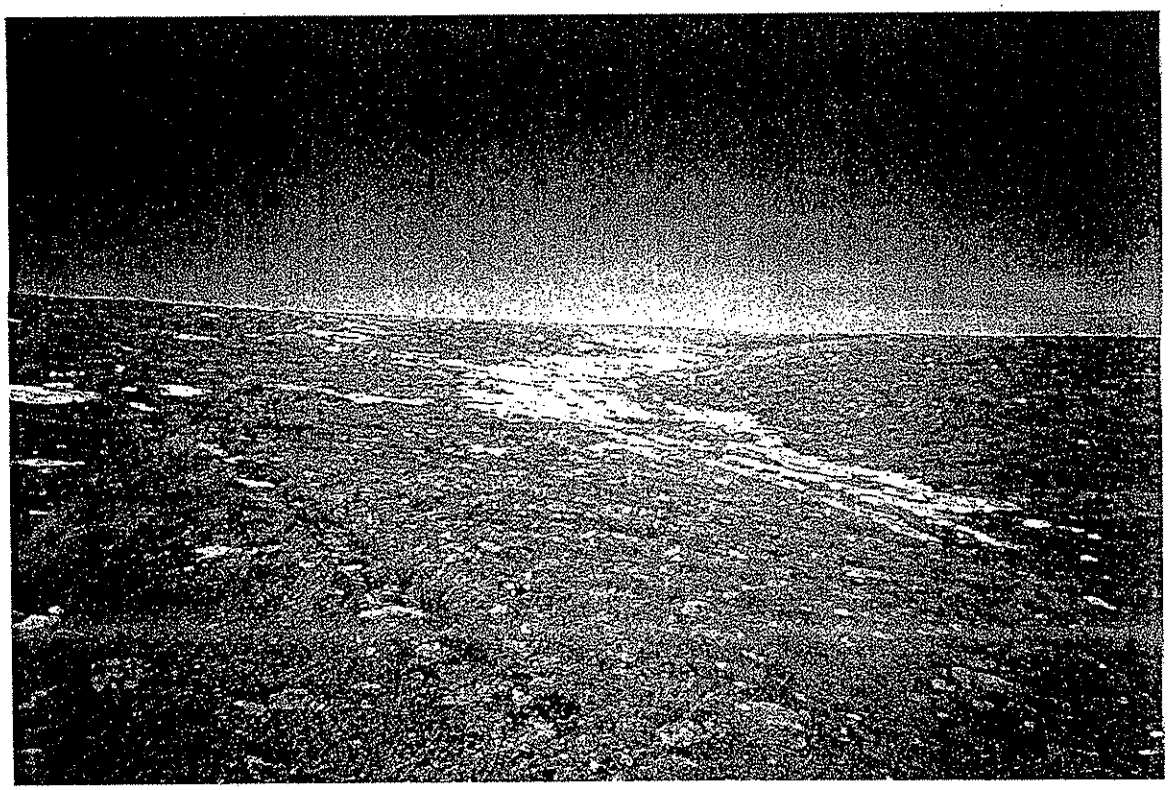


Photo 13. Downslope draw on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

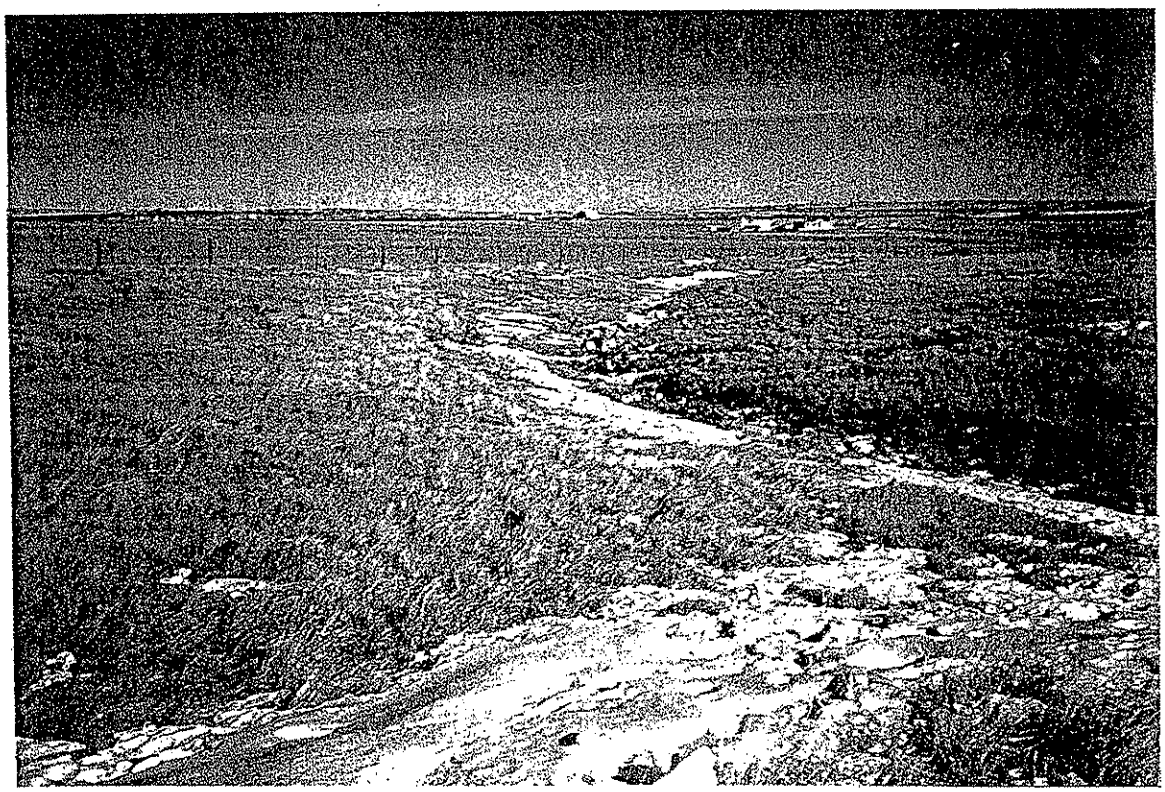


Photo 14. Erosional channel that transports water downslope on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

Photo 15. Small dam located on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

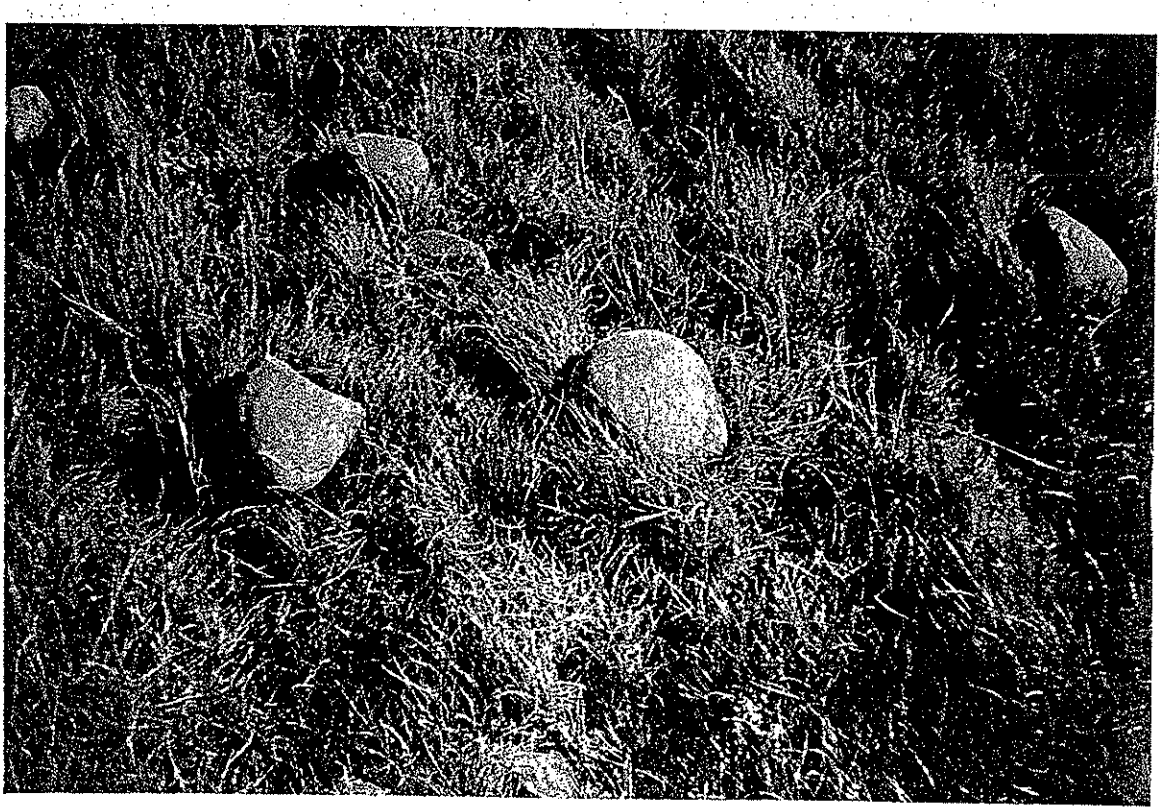


Photo 16. Coarse fragments on the surface of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

Photo 17. Coarse fragments on the surface of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

Photo 18. Coarse fragments on the surface of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

Photo 19. Coarse fragments on the surface of the subject property (NE1/4 13-020-01 W5M). February 11, 1999.

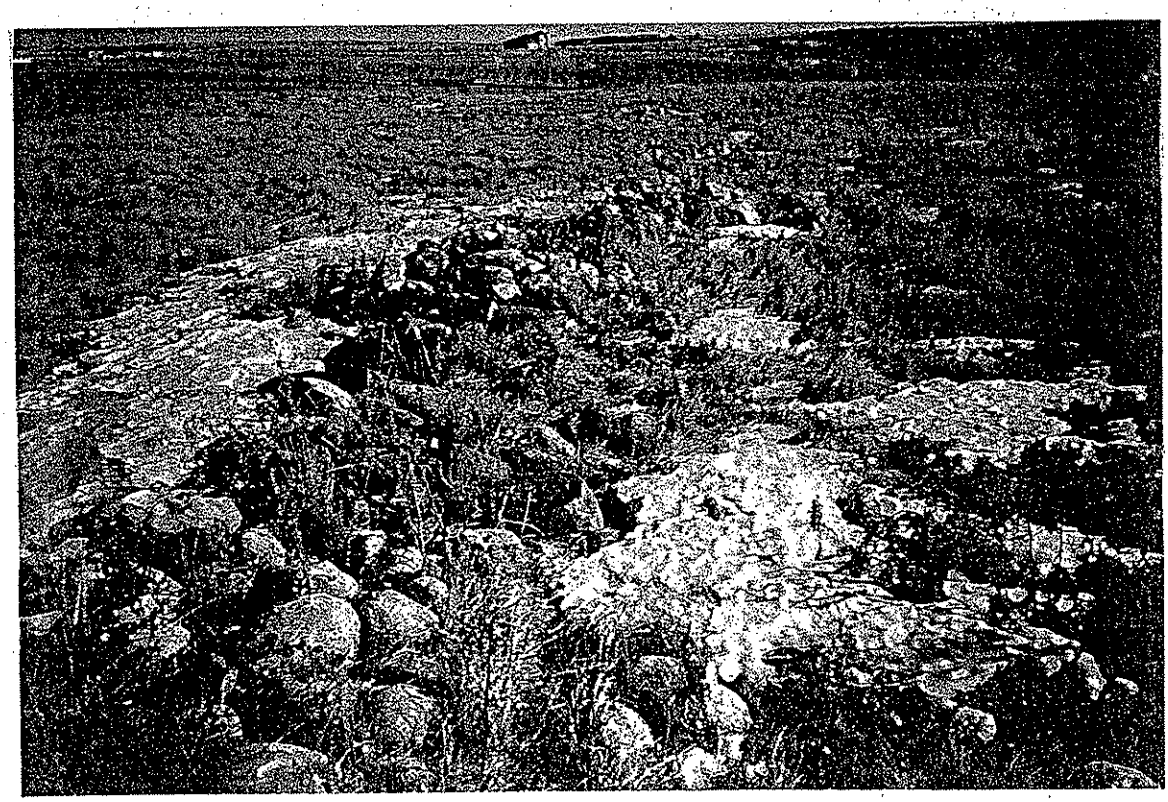
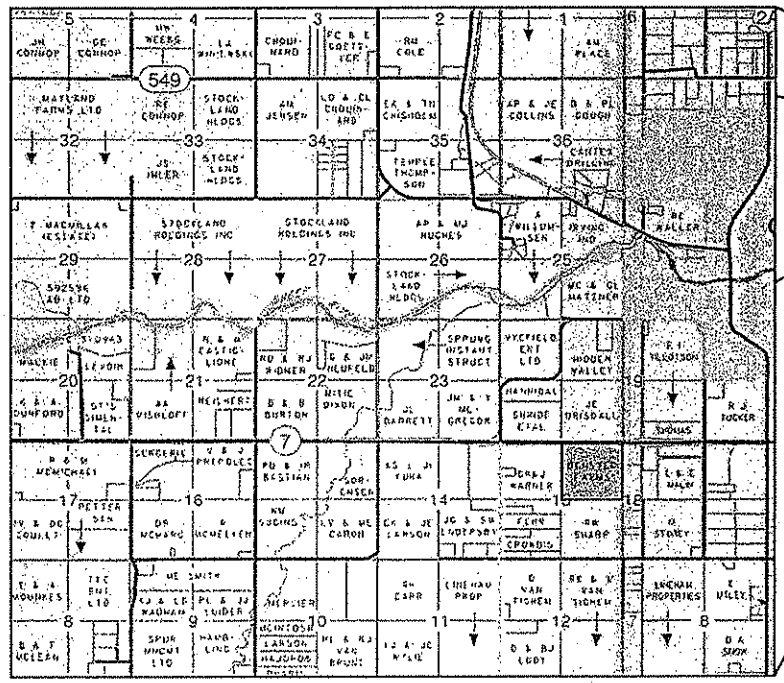


Photo 20. Coarse fragments picked from the surface and deposited in an erosional channel located on the subject property (NE1/4 13-020-01 W5M). February 11, 1999.



SCALE 1:100,000

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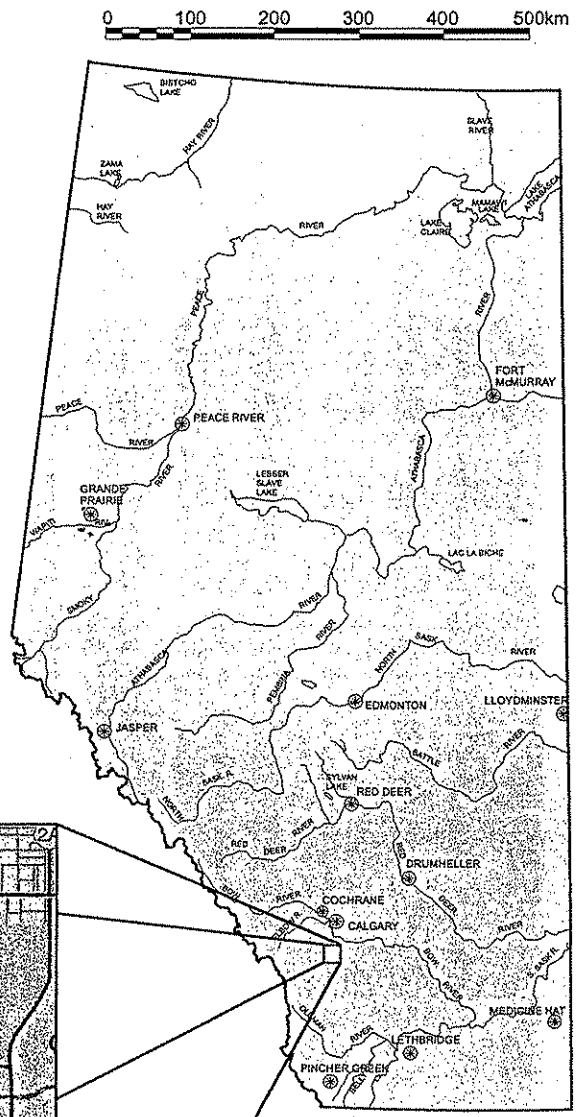
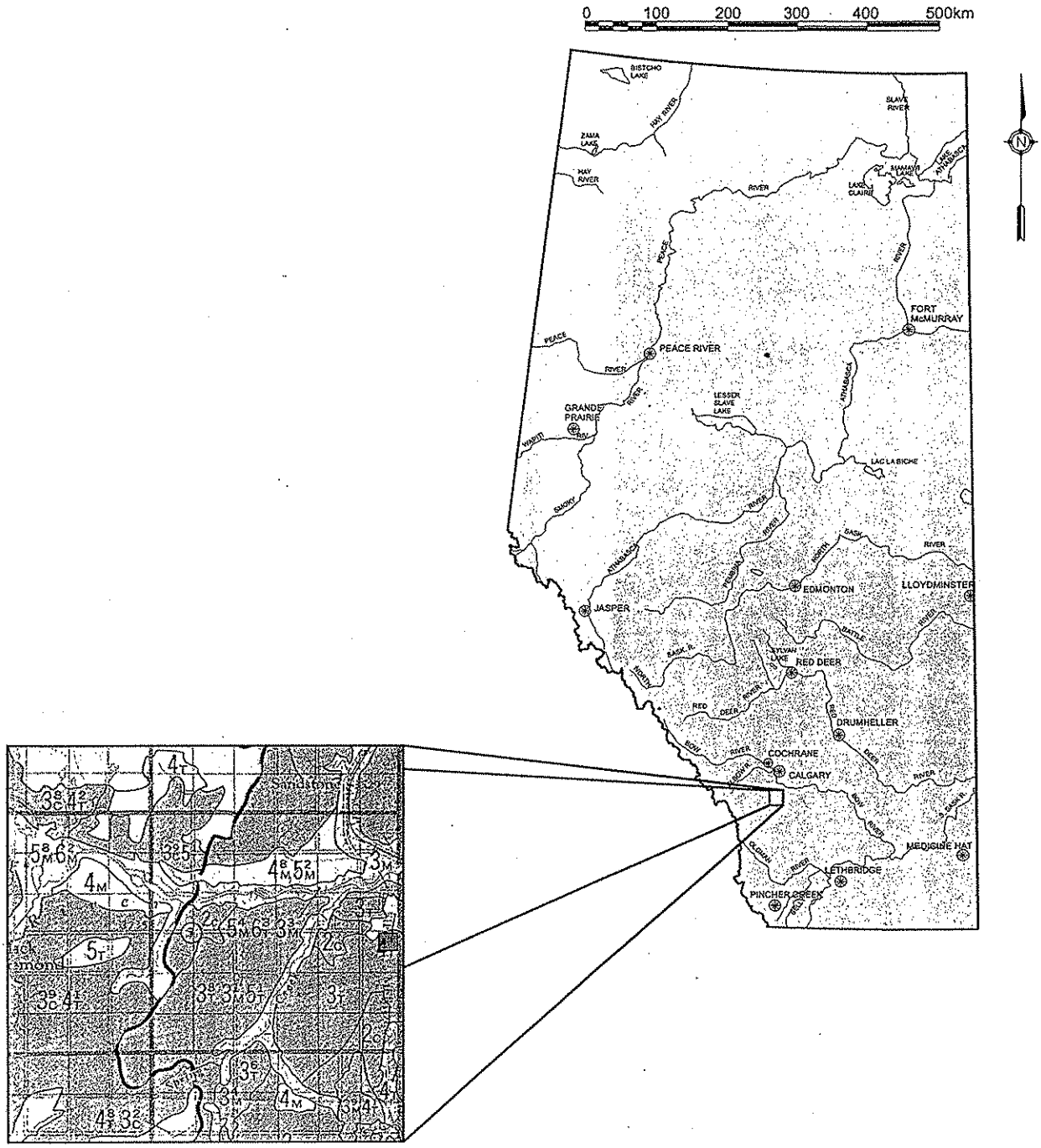
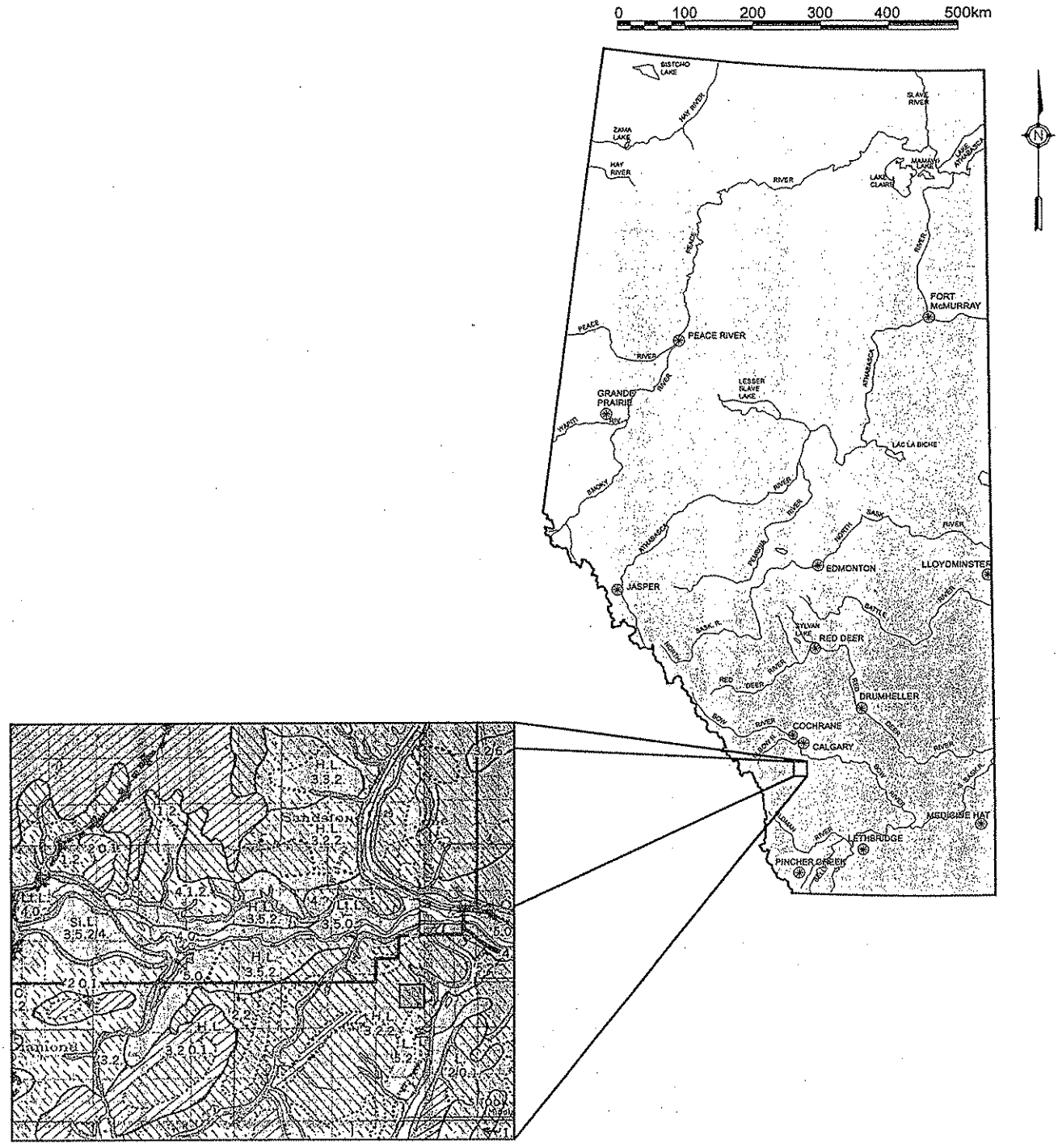


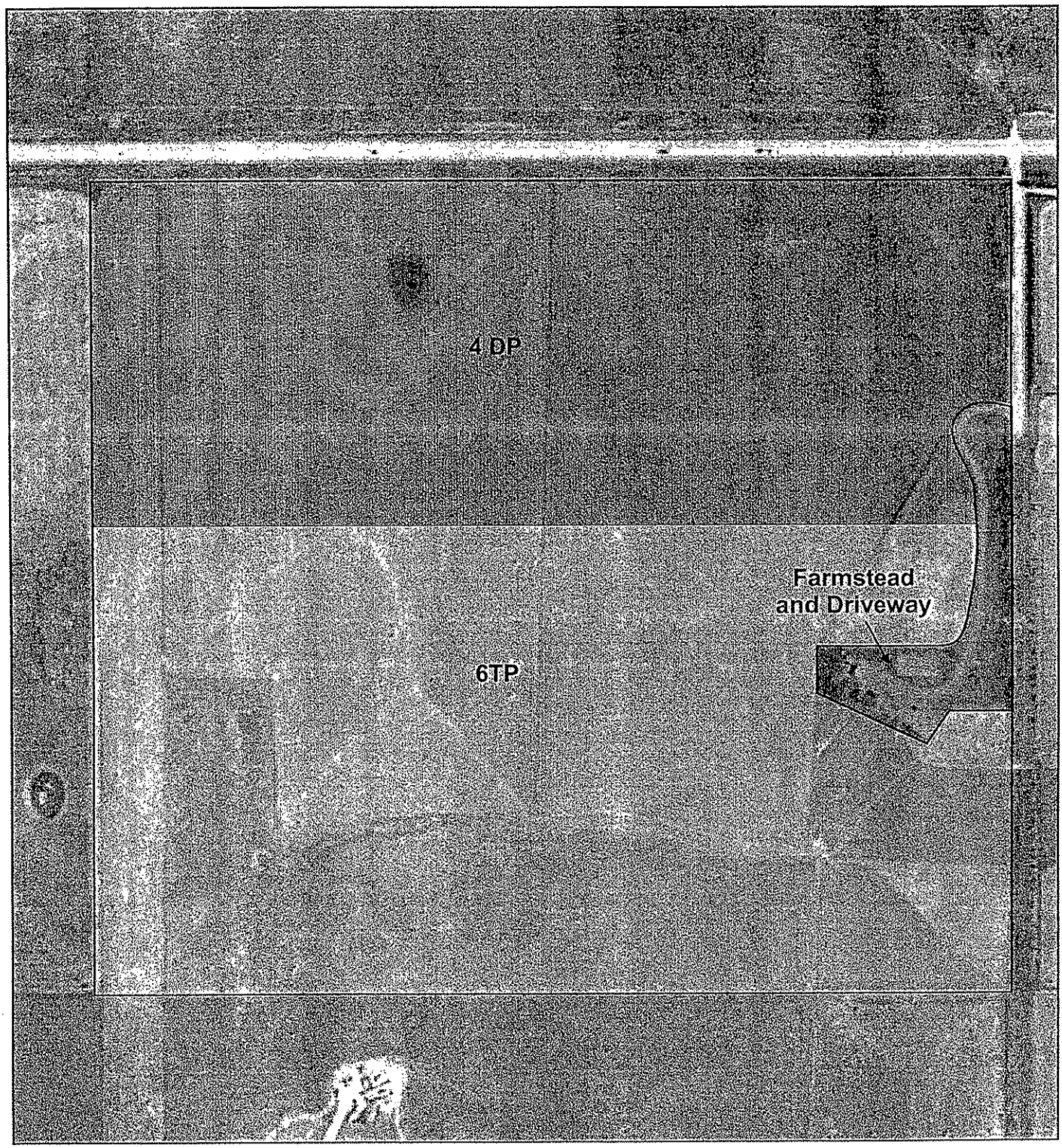
Matrix Solutions Inc.	JOB 1675-402	BY BN	LOCATION OF THE SUBJECT PROPERTY [NE¼ 13-20-1 W5]
	DATE 02/17/99	DRWN LMA	FIGURE 1
	FILE Figures1-5.cdr	CHKD BN	



Matrix Solutions Inc.	JOB 1675-402	BY BN	MAP SHOWING THE PUBLISHED CLI CLASSIFICATION (CLASS 3T) FOR THE SUBJECT PROPERTY [NE¼ 13-20-1 W5]	FIGURE 2
	DATE 02/17/99	DRWN LMA		
	FILE Figures1-5.cdr	CHKD BN		



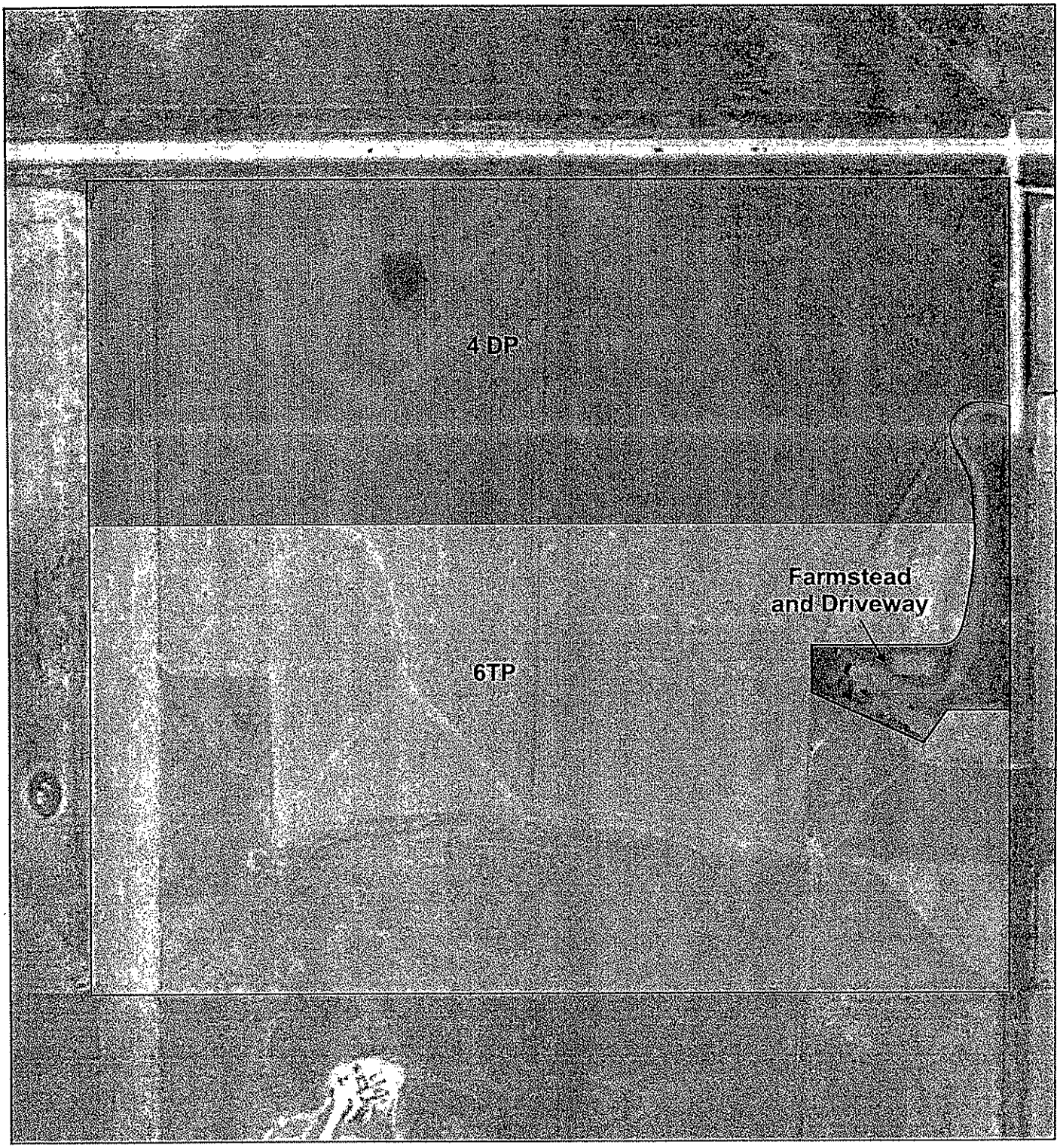
Matrix Solutions Inc.	JOB 1675-402	BY BN	EXCERPT FROM THE SOIL SURVEY OF BLACKFOOT & CALGARY SHEETS SHOWING THE MAP UNIT FOR THE SUBJECT PROPERTY [NE¼ 13-20-1 W5]	FIGURE 3
	DATE 02/17/99	DRWN LMA		
	FILE Figures1-5.cdr	CHKD BN		



SCALE 1:5,000

0 100 200m

Matrix Solutions Inc.	JOB 1675-402	BY BN	SITE SPECIFIC CLI RATING OF THE SUBJECT PROPERTY [NE¼ 13-20-1 W5]	FIGURE 4
	DATE 02/17/99	DRWN LMA		
	FILE Figures1-5.cdr	CHKD BN		



SCALE 1:5,000

0 100 200m

Matrix Solutions Inc.	JOB 1675-402	BY BN	SITE SPECIFIC LCCAAA RATING OF THE SUBJECT PROPERTY [NE¼ 13-20-1 W5]	FIGURE 5
	DATE 02/17/99	DRWN LMA		
	FILE Figures1-5.cdr	CHKD BN		

APPENDIX A

WORKSHEETS

AGRICULTURAL CAPABILITY RATING WORKSHEET
(NE1/4 13-020-01 W5M)

Class	Index
1	80 -100
2	60 - 79
3	45 - 59
4	30 - 44
5	20 - 29
6	10 - 19
7	0 - 9

AGRO-CLIMATE (C)

Moisture Component (A)	Value	Deduction
P-PE Index	-250	18
A =	100 -	18 = 82

Energy Component (H)

E G D O Index	1100	50
H =	100 -	50 = 50

Basic Climate Rating is the lower of A or H = a) 50

Modifying Factors		(% deduction)
Spring Moisture	-35	2
Fall Moisture	-25	0
Hail	8	3
Fall Frost	0	0

Modification deduction 5% of a) = b) = 2.5

FINAL CLIMATE RATING = a) 50 - b) 2.5 = 47.5

= Class 3, H Subclass

LCCAAA AGRICULTURAL CAPABILITY RATING FORM

Location: NE1/4 13-020-01 W5M			R.BL (Ca) BH 1		O.BL BH 2	
			Value	% Ded.	Value	% Ded.
SOILS (S)	1. SURFACE FACTORS	Texture (M) (P-PE = -250)	Gr.L	23	L	23
		Subsoil texture	Gr.L	0	L-CL	0
		Structure (D)	Gran	0	Gran	0
		Org. Matter (F)	10YR2/2	0	10YR2/2	0
		Depth of Topsoil (cm) (E)	10	10	15	0
		Acidity (V)	--	--	--	--
		Salinity (N)	--	--	--	--
		Sodicity (Y)	--	--	--	--
		Calcareous (K)	10	10	--	--
		Peaty Surface (O)	--	--	--	--
	Basic Soil Rating		57		77	
	2. SUBSOIL FACTORS	Structure (D)	mass	50	SAB	
		Depth (R, D, M) (cm)	70	20		
		Acidity (V)				
		Salinity (N)				
		Sodicity (Y)				
	Subsoil Deduction		50% = 28.5		% =	
	Interim Soil Rating					
	3. DRAINAGE (W)		% =		% =	
	Final Soils Rating		28.5		77	
LANDSCAPE (L) Region 2	1. SLOPE (T)	Steepness (%)	10		5	
		Length (m)	50		100	
		LS Factor	(1.9) 50		(1.0) 40	
	Basic Landscape Rating		50		60	
	2. STONINESS (P)	Stoniness Deduction	(S4) 70 % = 35		(S3) 40 % = 24	
	Interim Landscape Rating		15		36	
	3. PATTERN (J)	Pattern Deduction	( ) % =		( ) % =	
	Final Landscape Rating		15		36	
FINAL RATING			6TP		4TP	

LCCAAA AGRICULTURAL CAPABILITY RATING FORM

Location: NE1/4 13-020-01 W5M			R.BL (Ca) BH 3		O.BL BH 4	
			Value	% Ded.	Value	% Ded.
SOILS (S)	1. SURFACE FACTORS	Texture (M) (P-PE = -250)	L	23	L	23
		Subsoil texture	CL	0	L	0
		Structure (D)	Gran	5	Gran	0
		Org. Matter (F)	10YR2/2	0	10YR2/2	0
		Depth of Topsoil (cm) (E)	14	6	15	0
		Acidity (V)	--	--	--	--
		Salinity (N)	--	--	--	--
		Sodicity (Y)	--	--	--	--
		Calcareous (K)	10	10	--	--
		Peaty Surface (O)	--	--	--	--
	Basic Soil Rating		56		77	
	2. SUBSOIL FACTORS	Structure (D)	mass	0	SAB	0
		Depth (R, D, M) (cm)	14	70		
		Acidity (V)				
		Salinity (N)				
		Sodicity (Y)				
	Subsoil Deduction		70% = 39		% =	
	Interim Soil Rating		17			
	3. DRAINAGE (W)		% =		% =	
	Final Soils Rating		17		77	
LANDSCAPE (L) Region 2	1. SLOPE (T)	Steepness (%)	10		10	
		Length (m)	50		50	
		LS Factor	(1.9) 50		(1.9) 50	
	Basic Landscape Rating		50		50	
	2. STONINESS (P)	Stoniness Deduction	(S4) 70 % = 35		(S4) 70 % = 35	
	Interim Landscape Rating		15		15	
	3. PATTERN (J)	Pattern Deduction	( ) % =		( ) % =	
	Final Landscape Rating		15		15	
FINAL RATING			6TP		6TP	

LCCAAA AGRICULTURAL CAPABILITY RATING FORM

Location: NE1/4 13-020-01 W5M			R.BL (Ca) BH 5		O.BL BH 6	
			Value	% Ded.	Value	% Ded.
SOILS (S)	1. SURFACE FACTORS	Texture (M) (P-PE = -250)	L	23	L	23
		Subsoil texture	CL	0	L	0
		Structure (D)	Gran	0	Gran	0
		Org. Matter (F)	10YR2/1	0	10YR2/1	0
		Depth of Topsoil (cm) (E)	15	5	15	0
		Acidity (V)	--	--	--	--
		Salinity (N)	--	--	--	--
		Sodicity (Y)	--	--	--	--
		Calcareous (K)	10	10	--	--
		Peaty Surface (O)	--	--	--	--
	Basic Soil Rating		62		77	
	2. SUBSOIL FACTORS	Structure (D)	mass	50	SAB	0
		Depth (R, D, M) (cm)	50	30	60	50
		Acidity (V)				
		Salinity (N)				
		Sodicity (Y)				
	Subsoil Deduction		50% = 31		50% = 38.5	
	Interim Soil Rating		31		38.5	
	3. DRAINAGE (W)		% =		% =	
	Final Soils Rating		31		38.5	
LANDSCAPE (L) Region _2_	1. SLOPE (T)	Steepness (%)	3		4	
		Length (m)	75		100	
		LS Factor	(0.4) 25		(0.7) 35	
	Basic Landscape Rating		75		65	
	2. STONINESS (P)	Stoniness Deduction	(S3) 40 % = 30		(S3) 30 % = 19.5	
	Interim Landscape Rating		45		45	
	3. PATTERN (J)	Pattern Deduction	( ) % =		( ) % =	
	Final Landscape Rating		45		45	
FINAL RATING			4DP		4DP	

LCCAAA AGRICULTURAL CAPABILITY RATING FORM

Location: NE1/4 13-020-01 W5M			R.BL BH 7		O.BL BH 8	
			Value	% Ded.	Value	% Ded.
SOILS (S)	1. SURFACE FACTORS	Texture (M) (P-PE = -250)	L	23	L	23
		Subsoil texture	L	0	L	0
		Structure (D)	Gran	0	Gran	0
		Org. Matter (F)	10YR2/1	0	10YR2/1	0
		Depth of Topsoil (cm) (E)	10	10	10	2
		Acidity (V)	--	--	--	--
		Salinity (N)	--	--	--	--
		Sodicity (Y)	--	--	--	--
		Calcareous (K)	--	--	--	--
		Peaty Surface (O)	--	--	--	--
	Basic Soil Rating		67		75	
	2. SUBSOIL FACTORS	Structure (D)	mass	50	SAB	0
		Depth (R, D, M) (cm)	25	50	60	25
		Acidity (V)				
		Salinity (N)				
		Sodicity (Y)				
	Subsoil Deduction		50% = 33.5		25% = 19	
	Interim Soil Rating		33.5		56	
	3. DRAINAGE (W)		% =		% =	
	Final Soils Rating		33.5		56	
LANDSCAPE (L) Region _2_	1. SLOPE (T)	Steepness (%)	5		5	
		Length (m)	75		100	
		LS Factor	(0.8) 36		(1.0) 40	
	Basic Landscape Rating		64		60	
	2. STONINESS (P)	Stoniness Deduction	(S4) 70 % = 45		(S3) 40 % = 24	
	Interim Landscape Rating		19		36	
	3. PATTERN (J)	Pattern Deduction	( ) % =		( ) % =	
	Final Landscape Rating		19		36	
FINAL RATING			6PT		4DP	

LCCAAA AGRICULTURAL CAPABILITY RATING FORM

Location: NE1/4 13-020-01 W5M			O.BL BH 9		R.BL BH 10	
			Value	% Ded.	Value	% Ded.
SOILS (S)	1. SURFACE FACTORS	Texture (M) (P-PE = -250)	L	23	L	23
		Subsoil texture	L	0	L	0
		Structure (D)	Gran	0	Gran	0
		Org. Matter (F)	10YR2/1	0	10YR2/1	0
		Depth of Topsoil (cm) (E)	8	12	7	13
		Acidity (V)	--	--	--	--
		Salinity (N)	--	--	--	--
		Sodicity (Y)	--	--	--	--
		Calcareous (K)	--	--	--	--
		Peaty Surface (O)	--	--	--	--
	Basic Soil Rating		65		64	
	2. SUBSOIL FACTORS	Structure (D)	mass	50	mass	50
		Depth (R, D, M) (cm)	75	15	15	70
		Acidity (V)				
		Salinity (N)				
		Sodicity (Y)				
	Subsoil Deduction		50% = 32.5		70% = 45	
	Interim Soil Rating		32.5		19	
	3. DRAINAGE (W)		% =		% =	
	Final Soils Rating		32.5		19	
LANDSCAPE (L) Region 2	1. SLOPE (T)	Steepness (%)	4		10	
		Length (m)	50		40	
		LS Factor	(0.6) 32		(1.7) 45	
	Basic Landscape Rating		69		55	
	2. STONINESS (P)	Stoniness Deduction	(S3) 30 % = 20		(S4) 70 % = 39	
	Interim Landscape Rating		48		16	
	3. PATTERN (J)	Pattern Deduction	( ) % =		( ) % =	
	Final Landscape Rating		48		16	
FINAL RATING			4DP		6TP	

LCCAAA AGRICULTURAL CAPABILITY RATING FORM

Location: NE1/4 13-020-01 W5M			O.BL BH 11 Value	% Ded.
SOILS (S)	1. SURFACE FACTORS	Texture (M) (P-PE = -250)	L	23
		Subsoil texture	CL	0
		Structure (D)	Gran	0
		Org. Matter (F)	10YR2/1	0
		Depth of Topsoil (cm) (E)	15	0
		Acidity (V)	--	--
		Salinity (N)	--	--
		Sodicity (Y)	--	--
		Calcareous (K)	--	--
		Peaty Surface (O)	--	--
	Basic Soil Rating		77	
	2. SUBSOIL FACTORS	Structure (D)		
		Depth (R, D, M) (cm)		
		Acidity (V)		
		Salinity (N)		
		Sodicity (Y)		
	Subsoil Deduction		% =	
	Interim Soil Rating			
	3. DRAINAGE (W)		% =	
	Final Soils Rating		77	
LANDSCAPE (L) Region _2_	1. SLOPE (T)	Steepness (%)	3	
		Length (m)	100	
		LS Factor	(0.4) 25	
	Basic Landscape Rating		75	
	2. STONINESS (P)	Stoniness Deduction	(S4) 70 % = 53	
	Interim Landscape Rating		22	
	3. PATTERN (J)	Pattern Deduction	( ) % =	
	Final Landscape Rating		22	
FINAL RATING			5PT	

APPENDIX D

WATER REPORT

- **Original Report (Phase I) Completed December 1999**
- **Updated Report (Phase II) Completed March 2005**

#99162

Groundwater Supply Feasibility
Reed Property: NE-13-20-01-W5M

Submitted to:

Challenger Surveys & Services Ltd

Prepared by:

Groundwater Exploration & Research Ltd
December 1999

Groundwater Exploration & Research LTD

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

December 6, 1999
File No: 99162

Challenger Surveys & Services Ltd
#300, 6940 Fisher Road SE
Calgary, AB.
T2H 0W3

Attention: Marcello Battilana

Dear Marcello:

RE: Reed Property: NE-13-20-01-W5M
Area Structure Plan-Groundwater Feasibility Assessment

Enclosed find our report which addresses the groundwater feasibility in the immediate area of the Reed property at NE-13-20-01-W5M in the Municipal District of Foothills.

Background Information

The Reed property is located southwest of the Town of Okotoks. The quarter section of land is adjacent to Highway 7 and the intersection of Meridian Street [see enclosed portion of the MD land ownership map]. A tentative subdivision plan for 20 lots is being proposed for the quarter section. Some country residential subdivision currently exists in the immediate area of NE-13.

In accordance with the Municipal District of Foothills land development 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 up to 20 lots at the NE-13-20-01-W5M location.

Geomorphic/Geologic Setting

Much of the land in the area of NE-13-20-01-W5M is characterized by gently rolling topography which slopes northeastward toward the Sheep River drainage system. The Reed property is located on the northeast flank of an upland area trending southwest to northeast and located approximately 4 km to the southwest. The elevation change across the quarter section is approximately 15 meters [Turner Valley sheet 82 J/9; 1:50,000 scale]. There is currently an existing parcel in the northeast corner of the quarter section.

The bedrock in the area [Green, 1970: Geologic Map of Alberta; 1:267,000] is mapped as the Porcupine Hills Formation. The Porcupine Hills Formation consists of pale grey, thick bedded, cherty, calcareous sandstone; and pale grey calcareous mudstone of non-marine origin.

Borneuf [1980: Hydrogeology of the Kananaskis Lake area, Alberta; Alberta Research Council, Report 79-4] maps the area as having a groundwater potential of 33 to 164 m^3/day [5-25 igpm]. The regional groundwater flow is northeastward toward the Bow River drainage basin.

The surficial geology of the site has been mapped as glaciolacustrine sand and silt, with the development of some eolian [sand dunes] deposits in the northeast corner of the quarter section [Shetson: 1987; Quaternary Geology of Southern Alberta; Alberta Research Council, Map 207].

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 NE-13 and the surrounding 8 quarter sections of land was undertaken utilizing available information from Alberta Environmental Protection's groundwater database file. A total of 35 well records were available for review. There were no well records on file for the subject property in the NE-13 quarter section. A summary of available water well information is summarized in Table 1, appended to this report.

[1] Well depths vary significantly from 7.6 to 73.2 meters over the nine quarter sections with a maximum range of 51.8 to 73.2 meters being observed in section 13. The range in well depths exceeds the elevation change of approximately 15 meters suggesting that the water wells are not completed in a water bearing zone that is continuous across Section 13. The geometric mean well depth based on the 35 well records is 34 meters.

[2] The depth of the completion interval varies from shallow completions of 6.1 to 7.6 meters [Robichaud, SE-07], to deeper completions of 62.5 to 68.6 meters [Oliverio, SW-13] also providing evidence that there are multiple water bearing zones that are not continuous across the quarter section.

[3] Preliminary flow estimates vary from 13.1 to 196.4 m^3/day [2 to 30 Cgpm]. The high variability in flow rate is typical of discontinuous water bearing zones; and /or aquifer zones controlled by bed geometry, texture and cementation characteristics. Based on 35 preliminary flow rates, the geometric mean flow is 58.3 m^3/day which would support up to 17 lots.

[4] There are no well records on file for the NE-13 quarter section.

[5] Multi-level completions are indicated in a few of the wells [Warner, SW-13]. Multi-level completion is generally indicative of low yield wells.

[6] Two of the highest producing wells are located in the adjacent SW-13 quarter section. Preliminary flow rate data indicates 144.0 to 196.4 m^3/day [22 to 30 Cgpm] which is more than adequate to sustain a 20 lot subdivision.

Licenced Users

There is one licenced users within an 800 meter radius of the proposed country residential subdivision on the Reed property. There are two groundwater allocation licence for a total of 4940 m^3/year [2.1 Cgpm on a continuous flow basis] for stockwatering purposes under the application name of Malin.

Existing Q_{20} Tests

Groundwater Exploration & Research Ltd has undertaken the assessment of four flow tests within the 9 quarter section block. Test results are summarized as follows:

Location	Owner	Transmissive Capacity (m^2/day	Calculated Q_{20} (m^3/day)
SE-13	Sharpe	18.7	26.2
SE-13	Sharpe	272.4	49.1
SE-13	Sharpe	21.8	26.2
NE-07	Roschak	237.0	55.6

The flow test data, to date, indicates a considerable variation in transmissive capacity across the 9 quarter section block. However, the transmissive capacity values are quite high. The variability in transmissive capacity values is consistent with a physical aquifer model consisting of laterally discontinuous water bearing units reflecting bed geometry, texture and cementation characteristics.

In accordance with Alberta Environmental Protection guidelines, water requirements for country residential development vary from a minimum of 1.82 m^3/day [400 gpd/lot] to a maximum of 3.42 m^3/day [753 gpd/lot]. Available Q_{20} test data reflects a flow range of 26.2 to 55.6 m^3/day. The recommended Q_{20} rates do not reflect the maximum well flow capacity, but rather the maximum rate at which the well was tested.

Based on the proposed maximum 20 lot subdivision, the total minimum water requirement would be 36.4 m^3/day [5.6 Cgpm]; and the total maximum water requirement would be 68.4 m^3/day [10.5 Cgpm]. Based on 35 preliminary flow estimates from existing well records, the geometric mean flow rate was 58.3 m^3/day which is slightly less than the maximum water requirement of 68.4 m^3/day [10.5 Cgpm].

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	= maximum 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 all of the proposed 13 wells are 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.

Based on existing flow test data in the immediate area, the transmissivity capacity exceeded, by a wide margin, a critical transmissivity capacity value of 3.5 m^2/day.

The transmissive capacity value can only be determined from a pump test conducted on site specific wells drilled on each proposed parcel. Given that the lot sizes are likely to exceed 1.62 hectares [4 acres], a well separation distance exceeding 25 meters is probable.

Summary of Findings

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

[1] Existing well depths, completion intervals and preliminary flow estimates, indicate that there are multiple water bearing zones existing both laterally and vertically.

[2] Based on the three Sharpe [SE-13] flow tests there appears to be sufficient groundwater resources to serve up to 20 lots at the total minimum requirement of 36.4 m^3/day. Thirty-five preliminary flow test estimates across the block of 9 quarter sections, generates a geometric mean flow rate of 58.3 m^3/day, which also exceeds the total minimum water requirement.

[3] Due to the presence of fractured and/or discontinuous water bearing zones, the availability of groundwater needs to be assessed on a well by well basis. From historical well record information, it is anticipated that the well depths for the new subdivision would encompass a range of well depths, with completion in different water bearing zones, thereby reducing well interference on neighbouring wells.

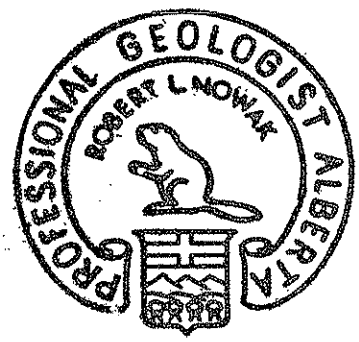
[4] To minimize a concern for well interference, the critical parameters are a minimum transmissive capacity of 3.5 m^2/day and a well separation distance of at least 25 meter. The well separation distance parameter is generally feasible given the anticipated nominal 1.62 hectare lot size.

[5] The transmissive capacity will need to be calculated on an individual well basis. Existing flow test data, in the immediate area of NE-13 indicates that calculated transmisive capacity would exceed a minimum requirement of 3.5 m^2/day. A minimum well test duration of 12 hours pumping and 12 hours of recovery is sufficient to generate the required data.

Closure

If you have any questions or comments regarding the 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

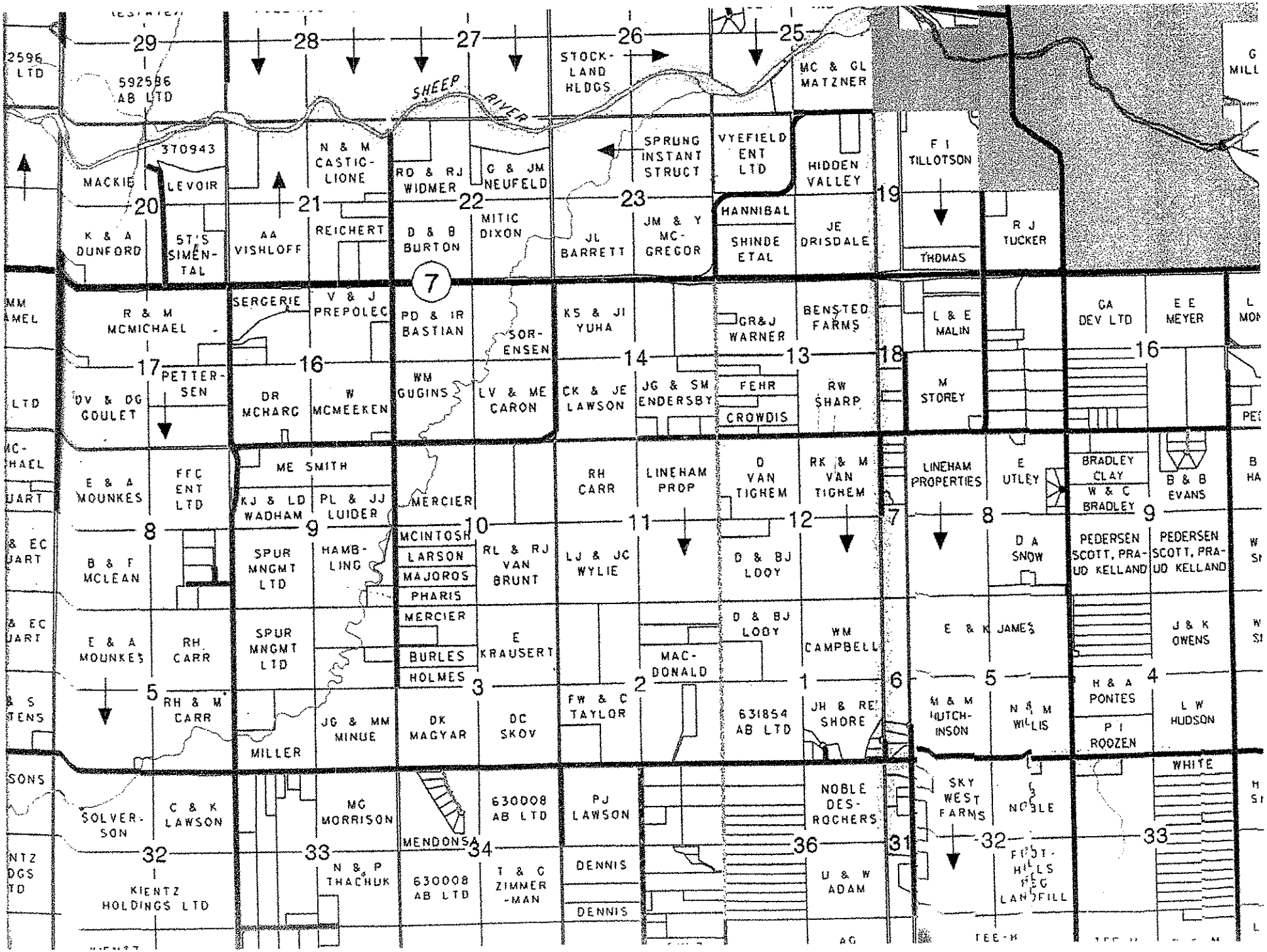

SHEEP RIVER
29
28
27
26
25
2596 LTD
592586 AB LTD
STOCK-LAND HLDGS
MC & GL MATZNER
370943
MACKIE
LEVOIR
N & M CASTIC-LIONE
RD & RJ WIDMER
G & JM NEUFELD
SPRUNG INSTANT STRUCT
VYEFIELD ENT LTD
HIDDEN VALLEY
F I TILLOTSON
20
21
22
23
19
K & A DUNFORD
ST'S SIMEN-TAL
AA VISHLOFF
REICHERT
D & B BURTON
MITIC DIXON
JL BARRETT
JM & Y MC-GREGOR
HANNIBAL
SHINDE ETAL
JE DRISDALE
THOMAS
R J TUCKER
7
R & M MCMICHAEL
SERGERIE
V & J PREPOLEC
PD & IR BASTIAN
SOR-ENSEN
KS & JI YUHA
GR&J WARNER
BENSTED FARMS
L & E MALIN
CA DEV LTD
E E MEYER
17
16
14
13
18
16
PETTER-SEN
DV & DG GOULET
DR MCHARG
W MCMEEKEN
WM GUGINS
LV & ME CARON
CK & JE LAWSON
JG & SM ENDERSBY
FEHR
CROWDIS
RW SHARP
M STOREY
E & A MOUNKES
FFC ENT LTD
ME SMITH
KJ & LD WADHAM
PL & JJ LUIDER
MERCIER
RH CARR
LINEHAM PROP
D VAN TIGHEM
RK & M VAN TIGHEM
LINEHAM PROPERTIES
E UTLEY
BRADLEY CLAY
W & C BRADLEY
B & B EVANS
8
9
10
11
12
7
8
9
B & F MCLEAN
SPUR MNGMT LTD
HAMB-LING
MCINTOSH
LARSON
MAJOROS
PHARIS
RL & RJ VAN BRUNT
LJ & JC WYLIE
D & BJ LOOY
D A SNOW
PEDERSEN SCOTT, PRA-UD KELLAND
PEDERSEN SCOTT, PRA-UD KELLAND
E & A MOUNKES
RH CARR
SPUR MNGMT LTD
MERCIER
BURLES
HOLMES
E KRAUSERT
MAC-DONALD
D & BJ LOOY
WM CAMPBELL
E & K JAMES
J & K OWENS
5
RH & M CARR
3
2
1
6
5
4
MILLER
JG & MM MINUE
DK MAGYAR
DC SKOV
FW & C TAYLOR
631854 AB LTD
JH & RE SHORE
M & M HUTCH-INSON
N & M WILLIS
H & A PONTES
P I ROOZEN
L W HUDSON
WHITE
SOLVER-SON
C & K LAWSON
MG MORRISON
MENDONSA
630008 AB LTD
PJ LAWSON
NOBLE DES-ROCHERS
SKY WEST FARMS
S NOBLE
32
33
34
36
31
32
33
KIENTZ HOLDINGS LTD
N & P THACHUK
630008 AB LTD
T & C ZIMMER-MAN
DENNIS
DENNIS
U & W ADAM
FIRST HILLS REG LANDFILL

Table 1
Summary of Groundwater Well Data

Location	Landowner	Date Drilled	Td/Npwl (ft)	Flow Estimate (Cgpm)	Completion Interval (ft)
TP20, R01 W5M					
NW-13	Warner	Mar 90	200/95	2 Cgpm/2.3 hrs	95 - 155
SW-13	Warner	Jul 90	240/148	5 Cgpm/4.5 hrs	130 - 160 & 190 - 230
SW-13	Warner	Jul 90	240/148	6 Cgpm/1.5 hrs	130 - 160 & 190 - 230
SW-13	Oliverio	unknown	225/?	3 Cgpm/2 hrs	205 - 225
SW-13	Jensen	Mar 74	195/?	20 Cgpm/?	160 - 170
SW-13	Lillejord	Jul 93	200/152	9 Cgpm/4 hrs	170 - 190
SW-13	Bryant	Sep 92	195/133	4 Cgpm/4 hrs	135 - 195
SW-13	Lillejord	Mar 89	170/135	22 Cgpm/2 hrs	130 - 170
SW-13	Jensen	May 75	170/50	30 Cgpm/2 hrs	150 - 170
SE-24	Minue	Mar 82	55/25	6.5 Cgpm/2 hrs	35 - 55
SW-24	Tiki Farm	Jul 77	80/40	2 Cgpm/1 hr	60 - 75
NE-24	Disdale	Jul 89	120/11.5	6 Cgpm/3 hrs	39 - 48 & 68 - 84
TP20, R29 W4M					
NE-07	McDonald	May 96	138/49.8	12 Cgpm/2 hrs	98 - 138
NE-07	Wilson	Jun 59	110/57	15 Cgpm/?	unknown
NE-07	McDonald	Jan 94	127/50.7	>30 Cgpm/2 hrs	80 - 112
NE-07	Roschak	Jun 91	75/25	15 Cgpm/2 hrs	45 - 75
NE-07	Roschak	Aug 92	120/77	8 Cgpm/4 hrs	80 - 120
NH-07	Roschak	Oct 94	110/60.1	12.8 Cgpm/12 hrs	70 - 110
SE-07	MacDonald	Nov 91	70/26	20 Cgpm/2 hrs	50 - 70
SE-07	Davis	Oct 79	86/64	8 Cgpm/2.5 hrs	72 - 86
SE-07	Rio Frio Ranch	Sep 72	25/?	15 Cgpm/?	20 - 25
SE-07	Robichaud	Sep 75	27/11	8 Cgpm/1 hr	22 - 27
SW-07	Carr	Apr 84	160/70	2 Cgpm/3 hrs	120 - 160
SW-17	Storey	Apr 94	71/9.2	10 Cgpm/8 hrs	68 - 71
SW-17	Kroeker	Nov 71	100/?	12 Cgpm/2 hrs	unknown
SW-17	Chalet Real Estate	Sep 72	98/65	16 Cgpm/1 hrs	70 - 95
SW-17	Rowe	Jun 73	105/70	12 Cgpm/1.3 hrs	70 - 102

Table 1 (continued)
Summary of Groundwater Well Data

Location	Landowner	Date Drilled	Td/Npwl (ft)	Flow Estimate (Cgpm)	Completion Interval (ft)
SE-18	Beatty	Mar 90	125/60	6 Cgpm/2 hrs	85 - 125
SE-18	Hatcher	Jan 71	90/65	unknown	48 - 51 & 56 - 60 & 66 - 72
SE-18	Hruska	Nov 74	81/35	15 Cgpm/?	35 - 70
SE-18	Beatty	Mar 90	125/60	6 Cgpm/2 hrs	85 - 125
SE-18	Wilson	Aug 89	130/75	10 Cgpm/2 hrs	90 - 130
SE-18	Beatty	May 85	100/40	10 Cgpm/3 hrs	40 - 100
NE-18	Wing	May 88	200/120	5 Cgpm/3 hrs	140 - 200
NE-18	Cunningham	Jan 95	215/88	5 Cgpm/2 hrs	175 - 215

ALBERTA ENVIRONMENTAL PROTECTION

COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 353735

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

CONTRACTOR:

NAME: *NIEMANS DRILLING (1980) LTD.*

ADDRESS: *Box 564*
High River, Alberta T0L-1B0

LICENCE NO.: *0820* JOURNEYMAN NO. *VA5635*

WELL OWNER:

NAME: *WARNER, GARRY*

ADDRESS: *RR1, OKOTOKS*

POSTAL CODE: *T0L 1T0*

WELL LOCATION: IC#: *04*

~ OR LSD	SEC	TWP	RGE	W. MER
SW	13	020	01	W5

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:	
204	*Sandstone*
215	*Shale*
219	*Fractured Shale & Sandstone*
225	*Shale*
229	*Shale & Sandstone*
235	*Shale*
238	*Shale & Sandstone*
240	*Shale*

DRILLING METHOD: *ROTARY*

TYPE OF WORK: *RECONSTRUCTED*

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

WELL COMPLETION DATA:

WELL FINISH: *CASING/PERFORATED LINER*
TOTAL HOLE DEPTH: *240* 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: *0.214* Inch
TOP AT: *15* Feet BOTTOM AT: *240* Feet
PERFORATED FROM: *130* Feet TO: *160* Feet
190 Feet TO: *230* Feet
Feet TO: Feet

SIZE OF PERFORATIONS: *0.125* Inch X *10.000* Inch
HOW PERFORATED: *SAW*

SEAL TYPE:
INTERVAL TOP: Feet TO: 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 12, 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: *0* Gal/Min
TEST DURATION: *4* Hours *30* Minutes
TESTING METHOD: *BAILER & AIR*
DEPTH OF PUMP/DRILL STEM: *240* Feet
WATER LEVEL AT END OF TEST: Feet
NON-PUMPING (STATIC) WATER LEVEL: *148.0* FEET
TOTAL DRAWDOWN: Feet

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

DATE WORK STARTED: *July 11, 1990*

DATE WORK COMPLETED: *July 12, 1990*

COMMENTS: *Original Well ID# 353734. Had been abandoned.*
(Maximum of 9 lines printed)

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN: *N* HELD: *1* DOCUMENTS HELD: *2*

WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY:

DATE FORM PRINTED: November 26, 1999 11:31:32 *DATE DATA KEYED: November 27, 1991* *GIC56* *SA*

ALBERTA ENVIRONMENTAL PROTECTION

COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 380534

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

CONTRACTOR:

NAME: NIEMANS DRILLING (1980) LTD.

ADDRESS: Box 564
High River, Alberta T0L-1B0

LICENCE NO.: 0820 JOURNEYMAN NO. VA5635

WELL OWNER:

NAME: WARNER, GARRY

ADDRESS: OKOTOKS

POSTAL CODE:

WELL LOCATION: IC#:

~ OR LSD	SEC	TWP	RGE	W. MER
SW	13	020	01	W5

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:	
200	Predrilled
204	Sandstone
215	Shale
219	Fractured Shale & Sandstone
225	Shale
229	Shale & Sandstone
235	Shale
238	Shale & Sandstone
240	Shale

DRILLING METHOD: ROTARY

TYPE OF WORK: DEEPENED

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

WELL COMPLETION DATA:

WELL FINISH: PERFORATED CASING/LINER
TOTAL HOLE DEPTH: 240 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: 0.214 Inch
TOP AT: 15 Feet BOTTOM AT: 240 Feet
PERFORATED FROM: 130 Feet TO: 160 Feet
190 Feet TO: 230 Feet
Feet TO: Feet

SIZE OF PERFORATIONS: 0.125 Inch X 10.000 Inch
HOW PERFORATED: SAW

SEAL TYPE:
INTERVAL TOP: Feet TO: 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 12, 1990 START TIME: 12:00

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

WATER REMOVAL RATE DURING TEST: 6 Gal/Min
TEST DURATION: 1 Hours 30 Minutes
TESTING METHOD: BAILER
DEPTH OF PUMP/DRILL STEM: 184 Feet
WATER LEVEL AT END OF TEST: 184 Feet
NON-PUMPING(STATIC) WATER LEVEL: 148.0 FEET
TOTAL DRAWDOWN: 36 Feet

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

DATE WORK STARTED: July 11, 1990

DATE WORK COMPLETED: July 12, 1990

COMMENTS:
(Maximum of 9 lines printed)

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN: N HELD: 1 DOCUMENTS HELD: 3

WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY:

DATE FORM PRINTED: November 26, 1999 11:31:33 **DATE DATA KEYED:** June 29, 1994 GIC56 RG

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

WELL I.D. 380534

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

CONTRACTOR:

NAME: *NIEMANS DRILLING (1980) LTD.*

ADDRESS: *Box 564*
High River, Alberta T0L-1B0

LICENCE NO.: *0820* JOURNEYMAN NO.:

WELL OWNER:

NAME: *WARNER, GARRY*

ADDRESS: *OKOTOKS*

POSTAL CODE:

WELL LOCATION: IC#:

~ OR LSD	SEC	TWP	RGE	W. MER
SW	13	020	01	W5

LOCATION VERIFICATION METHOD:
LOCATION IN QUARTER:

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain:

FORMATION LOG DESCRIPTION:

Depth (Feet):	Lithology:
Ground to:	

DRILLING METHOD:

TYPE OF WORK:

FLOWING WELL: **RATE:**
GAS PRESENT: OIL PRESENT:
DATE OF ABANDONMENT:
MATERIAL USED:
PROPOSED USE:

WELL COMPLETION DATA:

WELL FINISH:
TOTAL HOLE DEPTH: Feet

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

PERFORATED CASING/LINER:
TYPE:
SIZE OD: Inch ID: Inch
WALL THICKNESS: Inch
TOP AT: Feet BOTTOM AT: Feet
PERFORATED FROM: Feet TO: Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: Inch X Inch
HOW PERFORATED:

SEAL TYPE:
INTERVAL TOP: Feet TO: 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 12, 1990* START TIME: *16:00*

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

WATER REMOVAL RATE DURING TEST: *6* Gal/Min
TEST DURATION: *1* Hours *30* Minutes
TESTING METHOD: *BAILER*
DEPTH OF PUMP/DRILL STEM: *184* Feet
WATER LEVEL AT END OF TEST: *184* Feet
NON-PUMPING(STATIC) WATER LEVEL: *148.0* FEET
TOTAL DRAWDOWN: *36* Feet

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

DATE WORK STARTED:

DATE WORK COMPLETED:

COMMENTS:
(Maximum of 9 lines printed)

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN: HELD: DOCUMENTS HELD:

WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY:

DATE FORM PRINTED: **DATE DATA KEYED:**

ALBERTA ENVIRONMENTAL PROTECTION

COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 383924

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

CONTRACTOR:

NAME: FOOTHILLS DRLG

ADDRESS:

LICENCE NO.: JOURNEYMAN NO.:

WELL OWNER:

NAME: OLIVERIO, TONY

ADDRESS: 2208-VISTA CRES. NE, CALGARY

POSTAL CODE:

WELL LOCATION: IC#: 00

~ OR LSD	SEC	TWP	RGE	W. MER
SW	13	020	01	W5

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:	
14	Clay & Rocks
225	Shale & 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 & STOCK

WELL COMPLETION DATA:

WELL FINISH: CASING/PERFORATED LINER
TOTAL HOLE DEPTH: 225 Feet

CASING TYPE: STEEL
SIZE OD: 5.50 Inch WALL THICKNESS: Inch
BOTTOM AT: 15 Feet

PERFORATED CASING/LINER:
TYPE: UNKNOWN
SIZE OD: 4.50 Inch ID: Inch
WALL THICKNESS: Inch
TOP AT: Feet BOTTOM AT: 215 Feet
PERFORATED FROM: 205 Feet TO: 225 Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: Inch X Inch
HOW PERFORATED: UNKNOWN

SEAL TYPE:
INTERVAL TOP: Feet TO: 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: 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: 3 Gal/Min
TEST DURATION: 2 Hours 0 Minutes
TESTING METHOD: AIR
DEPTH OF PUMP/DRILL STEM: Feet
WATER LEVEL AT END OF TEST: Feet
NON-PUMPING(STATIC) WATER LEVEL: FEET
TOTAL DRAWDOWN: Feet

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

DATE WORK STARTED:

DATE WORK COMPLETED:

COMMENTS: S.W.L. NOT GIVEN IN FILE.
(Maximum of 9 lines printed)

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES TAKEN N HELD: 1 DOCUMENTS HELD: 2

WELL OWNER'S ANTICIPATED WATER REQUIREMENTS PER DAY:

DATE FORM PRINTED: November 26, 1999 11:31:34 DATE DATA KEYED: August 17, 1994 GIC56 FO

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

WELL I.D. 350022

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

CONTRACTOR:

NAME: AARON/INTERPROVINCIAL WATERWELL DRILLING

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

LICENCE NO.: 0892 JOURNEYMAN NO.: VA4996

WELL OWNER:

NAME: SHARPE RAY #3272

ADDRESS: 6118 30 ST S.E. CALGARY ALTA

POSTAL CODE: T2C 2A6

WELL LOCATION: IC#:

¼ OR LSD	SEC	TWP	RGE	W. MER
SE	13	020	01	W5

LOCATION VERIFICATION METHOD: FIELD
LOCATION IN QUARTER:

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain: SURVEY-AIR

FORMATION LOG DESCRIPTION:

Depth (Feet)	Lithology
Ground to:	
10	Sandy Clay
17	Brown Shale
22	Gray Shale
26	Gray Sandstone
27	Brown Shale
32	Brown Sandstone
39	Gray Shale
41	Gray Sandstone
55	Gray Shale
63	Gray Water Bearing Sandstone
65	Gray Shale

DRILLING METHOD: ROTARY

TYPE OF WORK: NEW WELL

FLOWING WELL: **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: 65 Feet

CASING TYPE: STEEL
SIZE OD: 6.62 Inch WALL THICKNESS: 0.188 Inch
BOTTOM AT: 28 Feet

PERFORATED CASING/LINER:
TYPE: PLASTIC
SIZE OD: 5.00 Inch ID: Inch
WALL THICKNESS: 2.190 Inch
TOP AT: 23 Feet BOTTOM AT: 65 Feet
PERFORATED FROM: 55 Feet TO: 65 Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: 0.188 Inch X 10.000 Inch
HOW PERFORATED: SAW
SEAL TYPE: DRIVEN
INTERVAL TOP: 26 Feet TO: 28 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: September 10, 1997 START TIME: 3:00

Elapsed Time in Min:Sec	Depth to Water Level During Pumping (Feet)	Depth to Water Level During Recovery (Feet)
1:00	28.90	
2:00	28.94	
3:00	28.97	
5:00		28.87
15:00	28.97	
20:00	29.00	
50:00	29.04	
60:00	29.07	
180:00	29.07	
210:00	29.10	
240:00	29.10	
300:00	29.10	
360:00	29.13	
660:00	29.13	
720:00	29.16	

WATER REMOVAL RATE DURING TEST: 7.5 Gal/Min
TEST DURATION: 12 Hours 0 Minutes
TESTING METHOD. PUMP
DEPTH OF PUMP/DRILL STEM: 60 Feet
WATER LEVEL AT END OF TEST: 29 Feet
NON-PUMPING(STATIC) WATER LEVEL: 28.9 FEET
TOTAL DRAWDOWN: Feet

RECOMMENDED PUMPING RATE: 5 Gal/Min
RECOMMENDED PUMP INTAKE AT: 60 Feet
TYPE OF PUMP INSTALLED:
MODEL: H.P.:

DATE WORK STARTED: September 10, 1997

COMMENTS: (Maximum of 9 lines printed)

DATE WORK COMPLETED: September 10, 1997

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES HELD: DOCUMENTS HELD: 1

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

DATE FORM PRINTED: September 23, 199710:39:23 **DATE DATA KEYED:** September 23, 1997 GIC5 BM

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

WELL I.D. 350023

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

CONTRACTOR:

NAME: AARON/INTERPROVINCIAL WATERWELL DRILLING

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

LICENCE NO.: 0892 JOURNEYMAN NO.: VA4996

WELL OWNER:

NAME: SHARPE RAY #3273

ADDRESS: 6116 30 ST S E CALGARY ALTA

POSTAL CODE: T2C 2A6

WELL LOCATION: IC#:

¼ OR LSD	SEC	TWP	RGE	W. MER
SE	13	020	01	W5

LOCATION VERIFICATION METHOD: FIELD
LOCATION IN QUARTER:

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain: SURVEY-AIR

FORMATION LOG DESCRIPTION:

Depth (Feet):	Lithology:
Ground to:	
2	Topsoil
15	Clay & Gravel
29	Brown Shale
33	Brown Sandstone
44	Gray Shale
45	Gray Sandstone
51	Gray Shale
56	Gray Sandstone
61	Gray Shale
67	Gray Water Bearing Sandstone
76	Gray Shale
80	Gray Sandstone

DRILLING METHOD: ROTARY

TYPE OF WORK: NEW WELL

FLOWING WELL: **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: 80 Feet

CASING TYPE: STEEL
SIZE OD: 6.62 Inch WALL THICKNESS: 0.188 Inch
BOTTOM AT: 29 Feet

PERFORATED CASING/LINER:
TYPE: PLASTIC
SIZE OD: 5.00 Inch ID: Inch
WALL THICKNESS: 0.219 Inch
TOP AT: 20 Feet BOTTOM AT: 80 Feet
PERFORATED FROM: 65 Feet TO: 80 Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: 0.188 Inch X 10.000 Inch
HOW PERFORATED: SAW
SEAL TYPE: DRIVEN
INTERVAL TOP: 27 Feet TO 29 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: September 10, 1997 START TIME: 3:00

Elapsed Time in Min:Sec	Depth to Water Level During Pumping (Feet)	Depth to Water Level During Recovery (Feet)
1:00	26.74	26.87
2:00	26.74	26.77
3:00	26.84	26.64
4:00	26.94	26.57
5:00	26.97	26.48
6:00	26.97	
7:00	27.00	
8:00	27.03	
9:00	27.10	
10:00	27.17	26.41
12:00	27.30	
15:00	27.43	26.34
20:00	27.53	26.25
25:00	27.59	26.18
30:00	27.66	26.15
40:00	27.72	26.06
50:00	27.76	26.05
60:00	27.79	26.02
75:00	27.82	25.98
90:00	27.85	25.95
105:00	27.89	25.91
120:00	27.92	25.85
150:00	27.99	25.81
180:00	28.05	
210:00	28.08	
240:00	28.12	
300:00	28.18	
360:00	28.22	
420:00	28.25	
480:00	28.28	

WATER REMOVAL RATE DURING TEST: 4 Gal/Min
TEST DURATION: 12 Hours 0 Minutes
TESTING METHOD: PUMP
DEPTH OF PUMP/DRILL STEM: 75 Feet
WATER LEVEL AT END OF TEST: 28 Feet
NON-PUMPING(STATIC) WATER LEVEL: 25.5 FEET
TOTAL DRAWDOWN: 3 Feet

RECOMMENDED PUMPING RATE: 4 Gal/Min
RECOMMENDED PUMP INTAKE AT: 75 Feet
TYPE OF PUMP INSTALLED:
MODEL: H.P.:

DATE WORK STARTED: September 10, 1997

DATE WORK COMPLETED: September 10, 1997

COMMENTS: WATER ANALYSIS
(Maximum of 9 lines printed) TDS 450
IRON <0.5
HARD 14

ADDITIONAL TEST AND/OR PUMP DATA:

CHEMISTRIES HELD: DOCUMENTS HELD: 1

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

DATE FORM PRINTED: September 23, 199710:39:21 DATE DATA KEYED: September 23, 1997 GIC5 BM

ALBERTA ENVIRONMENTAL PROTECTION

COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 350021

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

CONTRACTOR:

NAME: AARON/INTERPROVINCIAL WATERWELL DRILLING

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

LICENCE NO.: 0892 JOURNEYMAN NO.: VA4996

WELL OWNER:

NAME: SHARPE RAY #3271

ADDRESS: 6118 30 ST S.E. CALGARY ALTA

POSTAL CODE: T2C 2A6

WELL LOCATION: IC#

¼ OR LSD	SEC	TWP	RGE	W. MER
SE	13	020	01	W5

LOCATION VERIFICATION METHOD: FIELD
LOCATION IN QUARTER:

LOT: BLOCK: PLAN:
WELL ELEV: Feet How obtain: SURVEY-AIR

FORMATION LOG DESCRIPTION:

Depth (Feet):	Lithology:
Ground to:	
7	Brown Clay
15	Green Shale
17	Grey Shale
23	Grey Sandstone
27	Brown Shale
40	Brown Sandstone
56	Gray Shale
66	Gray Water Bearing Sandstone
75	Grey Shale

DRILLING METHOD: ROTARY

TYPE OF WORK: NEW WELL

FLOWING WELL.: **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: 75 Feet

CASING TYPE: STEEL
SIZE OD: 6.62 Inch WALL THICKNESS: 0.188 Inch
BOTTOM AT: 38 Feet

PERFORATED CASING/LINER:
TYPE: PLASTIC
SIZE OD: 5.00 Inch ID: Inch
WALL THICKNESS: 0.219 Inch
TOP AT: 35 Feet BOTTOM AT: 75 Feet
PERFORATED FROM: 60 Feet TO: 75 Feet
Feet TO: Feet
Feet TO: Feet

SIZE OF PERFORATIONS: 0.188 Inch X 10.000 Inch
HOW PERFORATED: SAW

SEAL TYPE:
INTERVAL TOP: Feet TO. 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: September 9, 1997 **START TIME:** 3:00

Elapsed Time in Min:Sec	Depth to Water Level During Pumping (Feet)	Depth to Water Level During Recovery (Feet)
0:00	(Static)	
1:00	40.84	41.85
2:00	41.10	41.75
3:00	41.24	41.66
4:00	41.37	41.59
5:00	41.46	41.54
6:00	41.56	41.51
7:00	41.66	41.47
8:00	41.73	
9:00	41.79	
10:00	41.86	41.42
12:00	41.99	
15:00	42.19	41.38
20:00	42.48	41.31
25:00	42.81	41.27
30:00	42.91	41.2
40:00	43.01	41.08
50:00	43.07	40.19
60:00	43.14	40.82
75.00	43.20	40.69
90:00	43.27	40.56
105:00	43.30	40.48
120:00	43.30	40.33
150:00	43.33	40.1
180.00	43.40	
210:00	43.47	
240:00	43.50	
300:00	43.53	
360:00	43.56	
420:00	43.60	

WATER REMOVAL RATE DURING TEST: 4 Gal/Min
TEST DURATION: 12 Hours 0 Minutes
TESTING METHOD: PUMP
DEPTH OF PUMP/DRILL STEM: 70 Feet
WATER LEVEL AT END OF TEST: 43 Feet
NON-PUMPING(STATIC) WATER LEVEL: 39.7 FEET
TOTAL DRAWDOWN: 4 Feet

RECOMMENDED PUMPING RATE: 4 Gal/Min
RECOMMENDED PUMP INTAKE AT 70 Feet
PUMP INSTALLED:
HP:

DATE WORK STARTED: September 9, 1997

DATE WORK COMPLETED: September 9, 1997

ADDITIONAL TEST AND/OR PUMP DATA:

COMMENTS: water analysis
(Maximum of 9 lines printed) TDS 400
IRON 0
HARD 12

CHEMISTRIES HELD: DOCUMENTS HELD: 1

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

DATE FORM PRINTED: September 22, 199716:40:01 **DATE DATA KEYED:** September 22, 1997 GIC5 BM

#05-04

Groundwater Supply Evaluation
678921 Alta Ltd property: NE-13-20-01-W5M

Submitted to:

IBI Group

Prepared by:

Groundwater Exploration & Research Ltd.
March 2005

Groundwater Exploration & Research Ltd

Box 15
Balzac, Alberta; T0M 0E0
Phone: (403) 226-0330 Fax: (403) 226-6593 Email: gerl@telus.net

March 10, 2005
File No: 04-127

IBI Group
#500, 1167 Kensington Road NW
Calgary, AB.
T2N 1X7

Attention: Brandy Clements

RE: Proposed Phase 2 subdivision of the 678921 Alta Ltd property at NE-13-20-01-W4M: Municipal District of Foothills

Enclosed find our letter report which summarizes well completion details; includes a table of pump test data; a graph of the drawdown and recovery data from a field test conducted on the well; and makes a recommendation with respect to the calculated Q_{20} for a well at the above captioned location.

1.0 Background Information

The subject property is located southwest of the Town of Okotoks near the intersection of Highway 7 and Meridian Road. The west half of the quarter section contains 11 lots associated with the Phase 1 development of the Sundance Trail subdivision. A new well was drilled on the east half of the quarter section which comprises the Phase 2 development. A total of 12 lots, varying in size from 1.21 to 2.76 hectares, will be created in Phase 2. There are two existing wells on the property, so that 10 new wells will be required to serve the Phase 2 subdivision using individual wells.

A well test was conducted on a new well drilled in the southwest corner of the east-half , +/-32.37 hectare parcel. The new well is located within the vicinity of the proposed Lot 5.

2.0 Well Completion Details

Total Depth:		71.65 meters
Non-Pumping Water Level:		23.32 meters below top of casing
Surface Casing:		168 mm steel set to 11.89 meters
Liner:		127 mm PVC set from 4.57 to 71.65 meters; perforated from 53.35 to 71.65 meters
Drilling Contractor:		Aaron Drilling
Pump Test Contractor:		Aaron Drilling
Date Drilled:		February 28, 2005
Lithology:	0.00 - 3.05	till
	3.05 - 10.67	sandstone
	10.67 - 15.24	brown shale
	15.24 - 21.65	gray shale
	21.65 - 26.22	sandstone
	26.22 - 30.49	gray shale
	30.49 - 34.15	sandstone
	34.15 - 35.67	gray shale
	35.67 - 52.13	gray sandstone
	52.13 - 69.51	water bearing sandstone
	69.51 - 71.65	green shale

3.0 Well Test Results

The new well was flow tested by Aaron Drilling on March 1, 2005. The well was pumped at a rate of 52.36 m^3/day [8 gpm] for 1440 minutes followed by 1440 minutes of recovery. Water level measurements were recorded automatically by Aaron Drilling using a pressure transducer and data logger.

The maximum drawdown was observed to be 11.53 meters during the 1440 minute test at a pumping rate of 52.36 m^3/day [8 Cgpm]. After 1440 minutes of termination of pumping, the water level in the well had recovered 90.1 percent.

The maximum available drawdown, measured from the non-pumping water level of 23.32 meters, and the top of the water-bearing sandstone at 52.13 meters is 28.81 meters.

Transmissive capacity has been determined graphically using the Cooper and Jacob semilog plot method, with transmissive capacity based usually on the final limb of the curve according to:

$$T = 2.3Q/4*pi*delta\ s$$

where: T = transmissive capacity, in m^2/day
Q = pump rate, in m^3/day
s = drawdown over one log cycle

and by the non-graphical Sheahan Z(u) and Kasenow SAM methods.

Transmissive capacity, determined from the above methods is summarized as follows:

Stage	Delta s	Transmissivity
drawdown	4.36	2.20
residual drawdown	3.30	2.91
Sheahan Z(u)		3.11
Kasenow SAM		2.93

Based on the above methods of analysis the geometric mean transmissive capacity is 2.76 m^2/day. It should be noted that the calculated transmissive capacity value is time dependent, flow rate dependent [particularly for fractured or stratified heterogeneous media] and reflects the response of an aquifer for the particular time of the year during which the test was conducted. Transmissive capacity is not a constant everywhere in an aquifer and is generally characterized by a log-normal distribution.

The 20 year, long term safe yield index (Q_{20}), neglecting well loss, is determined from the equation:

$$\mathbf{Q_{20} = 0.683TH}$$

where: Q20 = 20 year, long term safe yield, in m^3/day

T = effective transmissive capacity, in m^2/day

H = available drawdown, in meters

The calculation of the 20 year safe yield index for an aquifer, assuming isotropic, homogeneous conditions is derived by extrapolating a downward trend so that the available drawdown lasts for 20 years. This approach neglects the effects of recharge, and is, therefore, a conservative approach.

It is common practice to adjust the Q_{20} by a safety factor to account for unknown boundary conditions due to test duration, well deterioration, well inefficiency, seasonal variability in non-pumping water level and errors associated with assuming isotropic, homogeneous aquifer conditions.

Based on a factor of safety of 1.5 the calculated Q_{20} is 36.21 m^3/day (5.53 Cgpm).

In accordance with the Water Act, every household user is entitled to divert up to a maximum of 1250 cubic meters per year or 3.42 m^3/day. Based on well test data, the new production well is capable of supporting 10 lots.

A second well was also drilled on the east-half of the property, with an estimated flow rate of 29.45 m^3/day [4.5 Cgpm].

4.0 Licenced Users

A review of existing Alberta Environmental groundwater licences indicates no licenced users within an 800 meter radius of the new production well. Operation of the domestic well will not, therefore, interfere with any licenced user existing at the time of subdivision application.

5.0 Potential for Impact by Country Residential Subdivision

One approach to determining if increased country residential development has impacted the regional non-pumping water level is to review water well records on a decade basis. Historical, geometric mean, non-pumping water level data has been summarized for the NE-13 quarter section and the surrounding 8 quarter sections.

The data are tabulated as follows:

Decade	No of Well Records	Npwl (m)	gm Well Depth (m)
1970s	4	12.4	30.4
1980s	5	20.0	36.4
1990s	22	18.3	41.5
2000s	16	22.8	44.0

There is some apparent evidence for a decline in regional water level based on existing water well information. The bulk of country residential subdivision occurred over the 1990s and 2000s decades. The most recent well had a non-pumping water level of 23.3 meters which is comparable to the geometric mean 2000s decade value of 22.8 meters.

6.0 Summary of Findings

Based on the results of the flow test and drill log, the following conclusions have been drawn:

[1] The groundwater production well on Lot 5, Phase 2, has a Q_{20} rating of 36.21 m^3/day. The well is capable of supporting 10 lots at an allocation of 1250 m^3/year in accordance with Section 23(3) of the Water Act. The proposed Phase 2 subdivision is for 12 lots, but only 10 wells because of the presence of two existing wells.

[2] Pumping of the new well, for household purposes, will not interfere with any household users, licensees or traditional agricultural users who exist at the time of subdivision application.

[3] Historical non-pumping water levels do not yield a concern for any significant decline in regional water level.

7.0 Closure

The well owner should be aware, in accordance with Alberta Environment document Draft Environmental Guidelines for the Review of Subdivisions in Alberta; Chapter 2: Guidelines For The Evaluation of Groundwater Supply For Unserviced Residential Subdivision (September 1998) that additional information may be required with this report, particularly chemical and bacteriological analysis of the well water to ensure that the water quality meets drinking water quality guidelines

If you have any questions or comments regarding the conclusions drawn in this groundwater supply evaluation, contact the undersigned at your convenience.

PROFESSIONAL GEOLOGIST ALBERTA
ROBERT NOWAK

Respectfully yours,
Groundwater Exploration & Research Ltd.

Bob Nowak

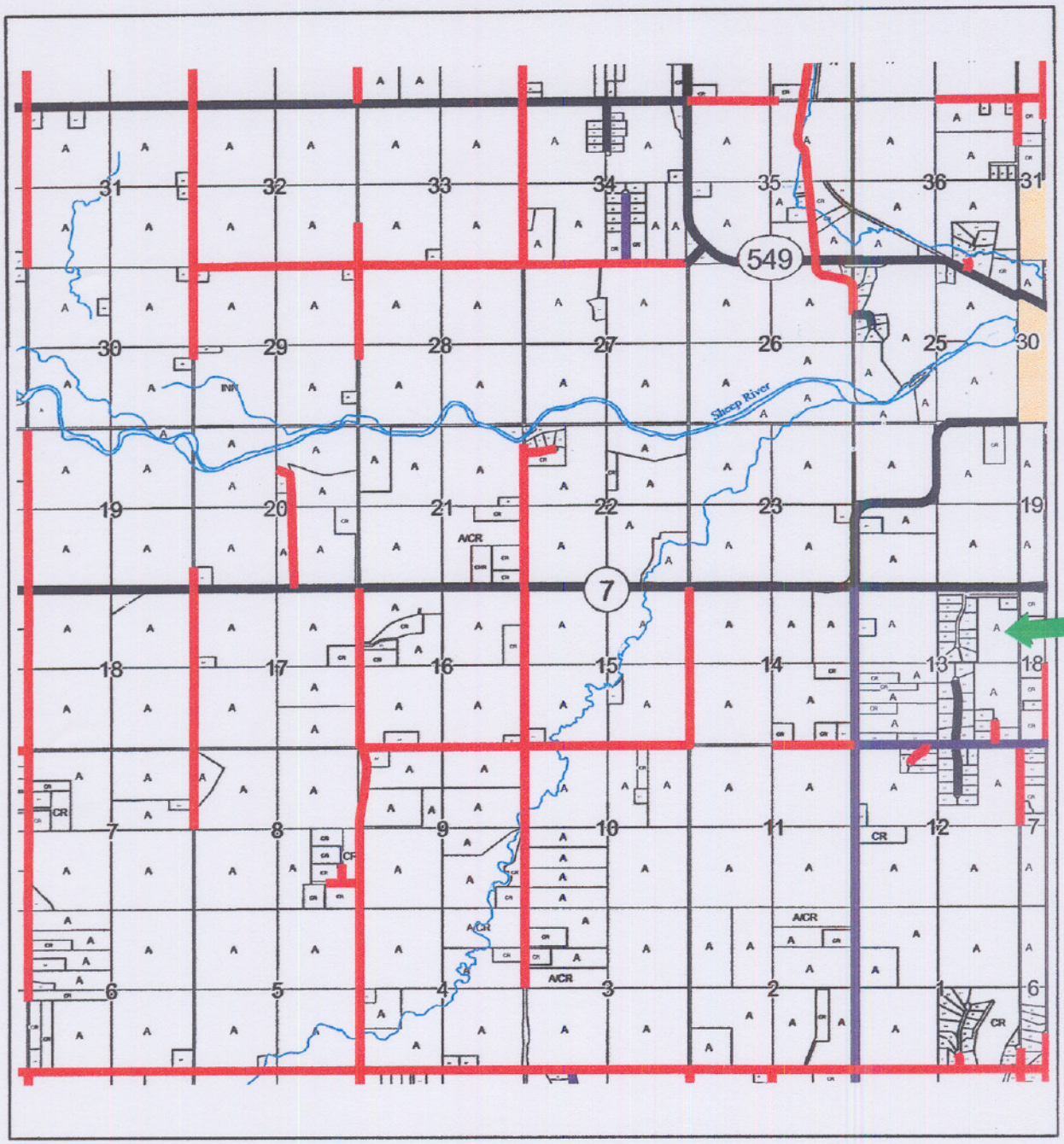
Bob Nowak: Ph.D., P.Geol.
Groundwater Geologist

PERMIT TO PRACTICE
Groundwater Exploration & Research Ltd.
Signature B. Nowak
Date Mar 10/05
PERMIT NUMBER: P 3471
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

Appendix

Municipal District of Foothills No. 31
Land Use Map Book

LU Map 2001



LEGEND

A	Agricultural
CMH	Commercial Hamlet
CMY	Commercial Highway
CMP	Commercial Park
CMR	Commercial Rural
CR	Country Residential
CRA	Country Residential- Subdistrict A
DC1	Direct Control - Spruce Meadows
DC2	Direct Control - Aldersyde Industrial
DC3	Direct Control - Smed
DC4	Direct Control - Private Airport
DC5	Direct Control - Airport
DC6	Direct Control - Gravel Pit
DC7	Direct Control - Silver Tip Ranch Commercial
DC8	Direct Control - Telecommunications Tower
DC9	Direct Control - Nature's Hideaway Campground
DC10	Direct Control - Paradise Ranch Resort
EP	Environmental Protection
ER	Environmental Reserve
INH	Industrial - Hamlet
INN	Industrial - Natural Resources
INP	Industrial - Park
INR	Industrial - Rural
MR	Municipal Reserve
R	Residential
RA	Residential- Subdistrict A
REC	Recreation
	Multiple Land Use (ie. A/CR)

0 0.45 0.9 Kilometers

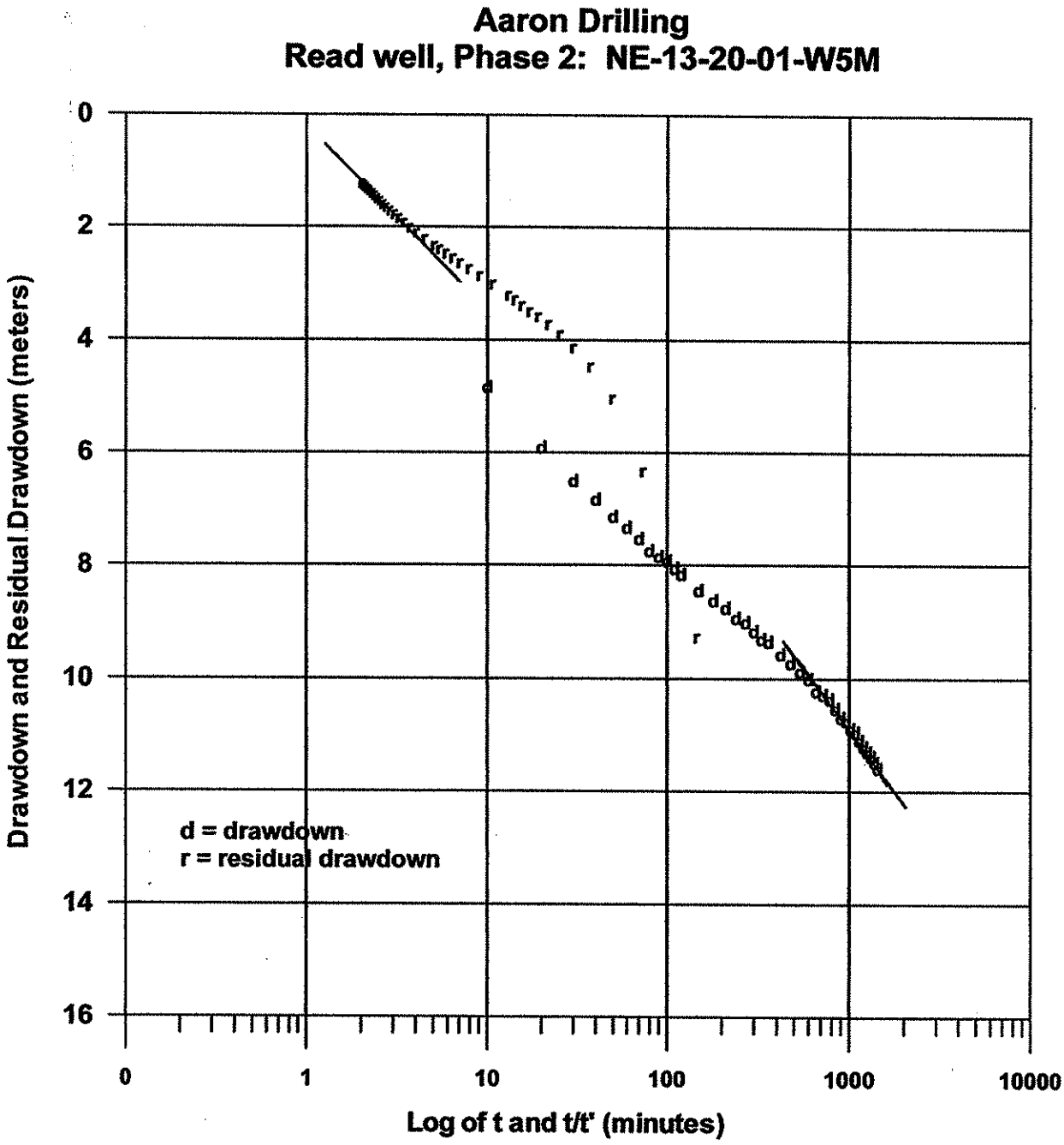
Scale 1:60,000

Aug 30, 2004

Pump Test Data
NE-13-20-01-W5M

Project: 678921 Alta Ltd [Read]; #5611
Date: March 1 - 3, 2005
Non-Pumping Water Level: 23.32 meters, below top of casing
Pump Test Rate: 52.36 m^3/day (8 Cgpm)
Test Duration: 1440 + 1440 minutes

Elapsed Time t (min)	Drawdown (m)	Elapsed Time t/t' (min)	Residual Drawdown (m)
10	4.78	145	9.20
20	5.85	73	6.26
30	6.44	49	4.97
40	6.78	37	4.40
50	7.08	29.8	4.06
60	7.27	25	3.83
70	7.47	21.5	3.65
80	7.69	19	3.52
90	7.79	17	3.43
100	7.86	15.4	3.32
110	8.00	14	3.22
120	8.10	13	3.14
150	8.38	10.6	2.94
180	8.56	9	2.79
210	8.70	7.8	2.67
240	8.87	7	2.57
270	8.94	6.3	2.48
300	9.10	5.8	2.40
330	9.24	5.3	2.33
360	9.29	5	2.26
420	9.51	4.4	2.14
480	9.66	4	2.03
540	9.81	3.6	1.94
600	9.94	3.4	1.85
660	10.16	3.1	1.77
720	10.22	3	1.70
780	10.30	2.84	1.64
840	10.47	2.71	1.57
900	10.63	2.6	1.52


Aaron Drilling
Read well, Phase 2: NE-13-20-01-W5M
Drawdown and Residual Drawdown (meters)
0
2
4
6
8
10
12
14
16
d = drawdown
r = residual drawdown
0
1
10
100
1000
10000
Log of t and t/t' (minutes)

Pump Test Data (continued)
well #5611: NE-13-20-01-W5M

Elapsed Time t (min)	Drawdown (m)	Elapsed Time t/t' (min)	Residual Drawdown (m)
960	10.69	2.5	1.46
1020	10.82	2.41	1.41
1080	10.89	2.33	1.36
1140	11.03	2.26	1.32
1200	11.14	2.2	1.28
1260	11.24	2.14	1.24
1320	11.32	2.09	1.20
1380	11.42	2.04	1.17
1440	11.53	2	1.14

ALBERTA ENVIRONMENTAL PROTECTION

COMPUTER GENERATED WATER WELL DRILLER'S REPORT FORM

WELL I.D. 339487

Page 1 of 1

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

CONTRACTOR:

NAME: AARONIINTERPROVINCIAL WATERWELL DRILLING

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

LICENCE NO.: 0892 JOURNEYMAN NO.: VA4996

WELL OWNER:

NAME: 678921 ALTA LTD#5611

ADDRESS: SITE14 R R 1 OKOTOKS P.O. Box 18

POSTAL CODE: T1S 1A1

WELL LOCATION: IC#:

% OR LSD	SEC	TWP	RGE	W. MER
NE	13	020	01	W5

LOCATION VERIFICATION METHOD: FIELD

LOCATION IN QUARTER:

LOT: BLOCK: PLAN:

WELL ELEV: Feet How obtain: SURVEY-AIR

FORMATION LOG DESCRIPTION:

Depth (Feet)	Lithology:
Ground to:	
1	Topsoil
10	Till
35	Brown Sandstone
50	Brown Shale
71	Gray Shale
88	Sandstone
100	Gray Shale
112	Sandstone
117	Gray Shale
171	Gray Sandstone
228	Water Bearing Sandstone
235	Green Shale

DRILLING METHOD: ROTARY

TYPE OF WORK: NEW WELL

FLOWING WELL: **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: 235 Feet

CASING TYPE: STEEL

SIZE OD: 6.62 Inch WALL THICKNESS: 0.188 Inch

BOTTOM AT: 39 Feet

PERFORATED CASING/LINER:

TYPE: PLASTIC

SIZE OD: 5.00 Inch ID: Inch

WALL THICKNESS: 0.219 Inch

TOP AT: 15 Feet BOTTOM AT: 235 Feet

PERFORATED FROM: 175 Feet TO: 235 Feet

Feet TO: Feet

Feet TO: Feet

SIZE OF PERFORATIONS: 0.188 Inch X 6.000 Inch

HOW PERFORATED: SAW

SEAL TYPE: DRIVEN

INTERVAL TOP: 37 Feet TO: 39 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: March 1, 1905 START TIME: 15:00

Elapsed Time in Min:Sec	Depth to Water Level During Pumping (Feet)	Depth to Water Level During Recovery (Feet)
10:00	82.15	106.69
100:00	102.29	87.55
300:00	108.34	84.28
700:00	109.65	82.12
1440:00	114.32	80.25

WATER REMOVAL RATE DURING TEST: 8 Gal/Min

TEST DURATION: 24 Hours 0 Minutes

TESTING METHOD: PUMP

DEPTH OF PUMP/DRILL STEM: 230 Feet

WATER LEVEL AT END OF TEST: 114 Feet

NON-PUMPING(STATIC) WATER LEVEL: 76.5 FEET

TOTAL DRAWDOWN: 32 Feet

RECOMMENDED PUMPING RATE: 6 Gal/Min

RECOMMENDED PUMP INTAKE AT: 230 Feet

TYPE OF PUMP INSTALLED:

MODEL: H.P.:

DATE WORK STARTED: February 28, 1905

DATE WORK COMPLETED: February 28, 1905

ADDITIONAL TEST AND/OR PUMP DATA:

COMMENTS: Pump test monitored by data logger (Maximum of 9 lines printed) 9 20 report by Groundwater Ex. TDS 475 IRON 1.5 HARD 0

CHEMISTRIES HELD: DOCUMENTS HELD: 1

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

DATE FORM PRINTED: March 4, 2005 10:24:48 DATE DATA KEYED: March 4, 2005 GICS DC

AARON DRILLING

Test name: 5611

Test started on: ######## 13:42:00

Channel number [2]

Measurement type:	Pressure
Channel name:	OnBoard Pressur
Sensor Range:	100 PSI.
Specific gravity:	1
Mode:	TOC
User-defined reference:	76.5 Feet H2O N.P.W.L
Referenced on:	test start
Pressure head at reference:	143.779 Feet H2O
Pump test flow rate	8 igpm

Date	Time	ET (min)	Chan[1] Celsius	Chan[2] Feet H2O
Pump started	3/1/05 13:42:0	0	8.01	76.5
	01/03/2005 13:52	10	7.05	92.176
	01/03/2005 14:02	20	6.88	95.682
	01/03/2005 14:12	30	6.81	97.638
	01/03/2005 14:22	40	6.77	98.727
	01/03/2005 14:32	50	6.84	99.733
	01/03/2005 14:42	60	6.82	100.36
	01/03/2005 14:52	70	7.42	101.006
	01/03/2005 15:02	80	8.09	101.707
	01/03/2005 15:12	90	7.67	102.044
	01/03/2005 15:22	100	6.86	102.293
	01/03/2005 15:32	110	6.76	102.727
	01/03/2005 15:42	120	6.75	103.064
	01/03/2005 15:52	130	6.75	103.29
	01/03/2005 16:02	140	6.75	103.543
	01/03/2005 16:12	150	6.74	103.996
	01/03/2005 16:22	160	6.74	103.945
	01/03/2005 16:32	170	6.74	104.36
	01/03/2005 16:42	180	6.74	104.586
	01/03/2005 16:52	190	6.75	104.521
	01/03/2005 17:02	200	6.75	104.987
	01/03/2005 17:12	210	6.74	105.02
	01/03/2005 17:22	220	6.74	105.209
	01/03/2005 17:32	230	6.74	105.384
	01/03/2005 17:42	240	6.74	105.596
	01/03/2005 17:52	250	6.73	105.753
	01/03/2005 18:02	260	6.74	105.804
	01/03/2005 18:12	270	6.74	105.836
	01/03/2005 18:22	280	6.74	105.979

01/03/2005 18:32	290	6.74	106.219
01/03/2005 18:42	300	6.74	106.348
01/03/2005 18:52	310	6.74	106.602
01/03/2005 19:02	320	6.73	106.524
01/03/2005 19:12	330	6.74	106.81
01/03/2005 19:22	340	6.74	106.731
01/03/2005 19:32	350	6.74	106.86
01/03/2005 19:42	360	6.73	106.971
01/03/2005 19:52	370	6.74	107.225
01/03/2005 20:02	380	6.73	107.354
01/03/2005 20:12	390	6.73	107.257
01/03/2005 20:22	400	6.74	107.626
01/03/2005 20:32	410	6.74	107.58
01/03/2005 20:42	420	6.74	107.691
01/03/2005 20:52	430	6.73	107.963
01/03/2005 21:02	440	6.74	107.949
01/03/2005 21:12	450	6.73	108.009
01/03/2005 21:22	460	6.73	108.092
01/03/2005 21:32	470	6.74	108.189
01/03/2005 21:42	480	6.73	108.189
01/03/2005 21:52	490	6.73	108.221
01/03/2005 22:02	500	6.73	108.507
01/03/2005 22:12	510	6.73	108.507
01/03/2005 22:22	520	6.73	108.475
01/03/2005 22:32	530	6.73	108.572
01/03/2005 22:42	540	6.73	108.683
01/03/2005 22:52	550	6.73	108.637
01/03/2005 23:02	560	6.73	108.923
01/03/2005 23:12	570	6.73	108.89
01/03/2005 23:22	580	6.73	108.909
01/03/2005 23:32	590	6.73	109.162
01/03/2005 23:42	600	6.73	109.116
01/03/2005 23:52	610	6.74	109.421
02/03/2005 0:02	620	6.73	109.278
02/03/2005 0:12	630	6.73	109.37
02/03/2005 0:22	640	6.73	109.532
02/03/2005 0:32	650	6.73	109.564
02/03/2005 0:42	660	6.73	109.818
02/03/2005 0:52	670	6.73	109.707
02/03/2005 1:02	680	6.73	109.836
02/03/2005 1:12	690	6.73	109.771
02/03/2005 1:22	700	6.73	109.85
02/03/2005 1:32	710	6.73	110.14
02/03/2005 1:42	720	6.73	110.03
02/03/2005 1:52	730	6.73	110.09
02/03/2005 2:02	740	6.73	110.205
02/03/2005 2:12	750	6.73	110.413
02/03/2005 2:22	760	6.73	110.394

02/03/2005 2:32	770	6.73	110.316
02/03/2005 2:42	780	6.73	110.283
02/03/2005 2:52	790	6.73	110.445
02/03/2005 3:02	800	6.73	110.685
02/03/2005 3:12	810	6.73	110.782
02/03/2005 3:22	820	6.73	110.653
02/03/2005 3:32	830	6.73	110.796
02/03/2005 3:42	840	6.73	110.846
02/03/2005 3:52	850	6.73	110.828
02/03/2005 4:02	860	6.73	111.054
02/03/2005 4:12	870	6.73	111.022
02/03/2005 4:22	880	6.73	111.132
02/03/2005 4:32	890	6.73	111.132
02/03/2005 4:42	900	6.73	111.358
02/03/2005 4:52	910	6.73	111.211
02/03/2005 5:02	920	6.73	111.197
02/03/2005 5:12	930	6.73	111.405
02/03/2005 5:22	940	6.73	111.483
02/03/2005 5:32	950	6.73	111.358
02/03/2005 5:42	960	6.73	111.548
02/03/2005 5:52	970	6.73	111.483
02/03/2005 6:02	980	6.73	111.691
02/03/2005 6:12	990	6.73	111.534
02/03/2005 6:22	1000	6.73	111.677
02/03/2005 6:32	1010	6.73	111.949
02/03/2005 6:42	1020	6.73	111.995
02/03/2005 6:52	1030	6.73	111.806
02/03/2005 7:02	1040	6.73	111.93
02/03/2005 7:12	1050	6.73	112.286
02/03/2005 7:22	1060	6.73	112.124
02/03/2005 7:32	1070	6.73	112.11
02/03/2005 7:42	1080	6.73	112.221
02/03/2005 7:52	1090	6.73	112.396
02/03/2005 8:02	1100	6.73	112.526
02/03/2005 8:12	1110	6.73	112.41
02/03/2005 8:22	1120	6.73	112.655
02/03/2005 8:32	1130	6.73	112.443
02/03/2005 8:42	1140	6.73	112.682
02/03/2005 8:52	1150	6.73	112.862
02/03/2005 9:02	1160	6.73	112.812
02/03/2005 9:12	1170	6.73	112.733
02/03/2005 9:22	1180	6.73	112.779
02/03/2005 9:32	1190	6.73	113.135
02/03/2005 9:42	1200	6.73	113.051
02/03/2005 9:52	1210	6.73	113.195
02/03/2005 10:02	1220	6.73	113.195
02/03/2005 10:12	1230	6.73	113.135
02/03/2005 10:22	1240	6.73	113.342

	02/03/2005 10:32	1250	6.73	113.278	
	02/03/2005 10:42	1260	6.73	113.356	
	02/03/2005 10:52	1270	6.73	113.453	
	02/03/2005 11:02	1280	6.73	113.374	
	02/03/2005 11:12	1290	6.73	113.388	
	02/03/2005 11:22	1300	6.73	113.467	
	02/03/2005 11:32	1310	6.73	113.55	
	02/03/2005 11:42	1320	6.73	113.628	
	02/03/2005 11:52	1330	6.73	113.582	
	02/03/2005 12:02	1340	6.73	113.55	
	02/03/2005 12:12	1350	6.73	113.951	
	02/03/2005 12:22	1360	6.73	113.822	
	02/03/2005 12:32	1370	6.73	113.822	
	02/03/2005 12:42	1380	6.73	113.965	
	02/03/2005 12:52	1390	6.73	114.03	
	02/03/2005 13:02	1400	6.73	113.887	
	02/03/2005 13:12	1410	6.73	114.076	
	02/03/2005 13:22	1420	6.73	114.159	
	02/03/2005 13:32	1430	6.73	114.062	
	02/03/2005 13:42	1440	6.73	114.316	end test
Pump stopped	3/2/05 13:52:0	1450	6.74	106.68	
	3/2/05 14:02:0C	1460	7.06	97.043	
	02/03/2005 14:12	1470	6.87	92.804	
	02/03/2005 14:22	1480	6.84	90.931	
	02/03/2005 14:32	1490	6.83	89.823	
	02/03/2005 14:42	1500	6.82	89.058	
	02/03/2005 14:52	1510	6.82	88.481	
	02/03/2005 15:02	1520	6.82	88.033	
	02/03/2005 15:12	1530	6.82	87.743	
	02/03/2005 15:22	1540	6.81	87.392	
	02/03/2005 15:32	1550	6.81	87.055	
	02/03/2005 15:42	1560	6.81	86.797	120
	02/03/2005 15:52	1570	6.81	86.557	
	02/03/2005 16:02	1580	6.81	86.349	
	02/03/2005 16:12	1590	6.81	86.156	150
	02/03/2005 16:22	1600	6.8	85.98	
	02/03/2005 16:32	1610	6.8	85.824	
	02/03/2005 16:42	1620	6.8	85.662	180
	02/03/2005 16:52	1630	6.8	85.519	
	02/03/2005 17:02	1640	6.8	85.39	
	02/03/2005 17:12	1650	6.79	85.261	210
	02/03/2005 17:22	1660	6.8	85.15	
	02/03/2005 17:32	1670	6.8	85.021	
	02/03/2005 17:42	1680	6.8	84.924	240
	02/03/2005 17:52	1690	6.8	84.827	
	02/03/2005 18:02	1700	6.8	84.735	
	02/03/2005 18:12	1710	6.8	84.638	270
	02/03/2005 18:22	1720	6.8	84.541	

02/03/2005 18:32	1730	6.81	84.444	
02/03/2005 18:42	1740	6.81	84.366	360
02/03/2005 18:52	1750	6.8	84.283	
02/03/2005 19:02	1760	6.8	84.204	
02/03/2005 19:12	1770	6.8	84.126	330
02/03/2005 19:22	1780	6.81	84.061	
02/03/2005 19:32	1790	6.81	83.978	
02/03/2005 19:42	1800	6.8	83.918	360
02/03/2005 19:52	1810	6.8	83.835	
02/03/2005 20:02	1820	6.8	83.771	
02/03/2005 20:12	1830	6.8	83.706	
02/03/2005 20:22	1840	6.8	83.646	
02/03/2005 20:32	1850	6.81	83.581	
02/03/2005 20:42	1860	6.79	83.517	420
02/03/2005 20:52	1870	6.8	83.452	
02/03/2005 21:02	1880	6.81	83.388	
02/03/2005 21:12	1890	6.81	83.342	
02/03/2005 21:22	1900	6.81	83.291	
02/03/2005 21:32	1910	6.81	83.226	
02/03/2005 21:42	1920	6.81	83.162	480
02/03/2005 21:52	1930	6.81	83.116	
02/03/2005 22:02	1940	6.81	83.069	
02/03/2005 22:12	1950	6.81	83.019	
02/03/2005 22:22	1960	6.81	82.973	
02/03/2005 22:32	1970	6.81	82.908	
02/03/2005 22:42	1980	6.81	82.876	540
02/03/2005 22:52	1990	6.8	82.811	
02/03/2005 23:02	2000	6.81	82.779	
02/03/2005 23:12	2010	6.81	82.7	
02/03/2005 23:22	2020	6.8	82.668	
02/03/2005 23:32	2030	6.79	82.617	
02/03/2005 23:42	2040	6.79	82.571	600
02/03/2005 23:52	2050	6.79	82.525	
03/03/2005 0:02	2060	6.8	82.493	
03/03/2005 0:12	2070	6.8	82.442	
03/03/2005 0:22	2080	6.8	82.396	
03/03/2005 0:32	2090	6.8	82.364	
03/03/2005 0:42	2100	6.8	82.313	660
03/03/2005 0:52	2110	6.8	82.281	
03/03/2005 1:02	2120	6.8	82.234	
03/03/2005 1:12	2130	6.81	82.188	
03/03/2005 1:22	2140	6.8	82.156	
03/03/2005 1:32	2150	6.81	82.124	
03/03/2005 1:42	2160	6.8	82.073	720
03/03/2005 1:52	2170	6.81	82.041	
03/03/2005 2:02	2180	6.81	81.994	
03/03/2005 2:12	2190	6.81	81.962	
03/03/2005 2:22	2200	6.8	81.93	

03/03/2005 2:32	2210	6.81	81.898	
03/03/2005 2:42	2220	6.8	81.865	780
03/03/2005 2:52	2230	6.8	81.819	
03/03/2005 3:02	2240	6.81	81.787	
03/03/2005 3:12	2250	6.81	81.755	
03/03/2005 3:22	2260	6.81	81.722	
03/03/2005 3:32	2270	6.79	81.69	
03/03/2005 3:42	2280	6.8	81.658	840
03/03/2005 3:52	2290	6.79	81.625	
03/03/2005 4:02	2300	6.79	81.593	
03/03/2005 4:12	2310	6.81	81.579	
03/03/2005 4:22	2320	6.81	81.547	
03/03/2005 4:32	2330	6.81	81.496	
03/03/2005 4:42	2340	6.81	81.482	900
03/03/2005 4:52	2350	6.81	81.45	
03/03/2005 5:02	2360	6.81	81.418	
03/03/2005 5:12	2370	6.81	81.386	
03/03/2005 5:22	2380	6.81	81.353	
03/03/2005 5:32	2390	6.81	81.321	
03/03/2005 5:42	2400	6.81	81.289	960
03/03/2005 5:52	2410	6.81	81.256	
03/03/2005 6:02	2420	6.81	81.243	
03/03/2005 6:12	2430	6.81	81.21	
03/03/2005 6:22	2440	6.81	81.178	
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03/03/2005 6:42	2460	6.79	81.132	1020
03/03/2005 6:52	2470	6.79	81.099	
03/03/2005 7:02	2480	6.79	81.081	
03/03/2005 7:12	2490	6.79	81.049	
03/03/2005 7:22	2500	6.81	81.016	
03/03/2005 7:32	2510	6.81	81.003	
03/03/2005 7:42	2520	6.81	80.97	1080
03/03/2005 7:52	2530	6.81	80.938	
03/03/2005 8:02	2540	6.81	80.92	
03/03/2005 8:12	2550	6.81	80.887	
03/03/2005 8:22	2560	6.81	80.873	
03/03/2005 8:32	2570	6.81	80.841	
03/03/2005 8:42	2580	6.81	80.827	1140
03/03/2005 8:52	2590	6.81	80.809	
03/03/2005 9:02	2600	6.81	80.777	
03/03/2005 9:12	2610	6.81	80.763	
03/03/2005 9:22	2620	6.81	80.744	
03/03/2005 9:32	2630	6.81	80.712	
03/03/2005 9:42	2640	6.81	80.698	1200
03/03/2005 9:52	2650	6.81	80.666	
03/03/2005 10:02	2660	6.81	80.666	
03/03/2005 10:12	2670	6.81	80.634	
03/03/2005 10:22	2680	6.81	80.601	

03/03/2005 10:32	2690	6.81	80.569	
03/03/2005 10:42	2700	6.81	80.569	1260
03/03/2005 10:52	2710	6.81	80.537	
03/03/2005 11:02	2720	6.81	80.523	
03/03/2005 11:12	2730	6.81	80.504	
03/03/2005 11:22	2740	6.81	80.491	
03/03/2005 11:32	2750	6.81	80.472	
03/03/2005 11:42	2760	6.81	80.44	1320
03/03/2005 11:52	2770	6.81	80.426	
03/03/2005 12:02	2780	6.81	80.407	
03/03/2005 12:12	2790	6.81	80.394	
03/03/2005 12:22	2800	6.81	80.375	
03/03/2005 12:32	2810	6.81	80.343	
03/03/2005 12:42	2820	6.81	80.329	1380
03/03/2005 12:52	2830	6.81	80.311	
03/03/2005 13:02	2840	6.81	80.297	
03/03/2005 13:12	2850	6.81	80.283	
03/03/2005 13:22	2860	6.81	80.264	
03/03/2005 13:32	2870	6.81	80.251	
03/03/2005 13:42	2880	6.81	80.251	1440

APPENDIX E

ALMOR REPORT

- **Original Report (Phase 1) Completed January 24, 2000**
- **Updated Report (Phase II) Completed March 2, 2005**

ALMOR TESTING SERVICES LTD.

7505 - 40 ST. S.E., CALGARY, ALBERTA T2C 2H5 TELEPHONE (403) 236-8880

2000 01 24 00-088-01-5

Reid Land Development
c/o: Challenger Surveys and Services Ltd.
300, 6940 Fisher Rd SE
Calgary, Alberta T2H 0W3

Attention: Mr. Marcello Battilana

Gentlemen:

Re: Shallow Subsurface Conditions
NE ¼, Sec 13, Twp 20, Rge 1, W5M

Almor Testing Services Ltd. was retained to evaluate the percolation rate of the shallow subsurface soils and groundwater conditions, in accordance with the MD of Foothills and Alberta Environmental Protection guidelines, at the above referenced project. No consideration has been given to specific foundation subsoil conditions, within the building envelopes. The proposed subdivision to be subdivided, is identified by the attached Site Plan.

The field investigation for the water table and percolation rate testing was performed on December 20 and 21, 1999. The percolation test holes and groundwater monitoring test holes, located by our personnel, were advanced by a mobile auger drill. Frost was not present in the test holes.

1.0 SOIL CONDITIONS

The soil conditions at the septic tile field locations (excluding the surficial topsoil and lesser "browns" horizon), consist predominately of light olive silt, with some sand and a trace of clay. The soils are in a damp condition and were of a stiff to very stiff consistency. Natural moisture contents ranged from 3.9% to 13.7% at the 0.9m depth. Soil saturation tests performed on the shallow subsoils yielded a range from 41.1% to 54.1%.

2.0 SEPTIC FIELD - PERCOLATION RATE TESTS

The percolation test holes were advanced at alternate septic field locations throughout the site, to a depth of approximately 0.9m below the depth of native topsoil and the "browns" horizon. Loose materials from the bottom and sides of the test holes were cleaned, prior to filling with water for a minimum depth of 0.45m (18 inches). The water was allowed to soak for a minimum 12 to 24 hour period. The holes were recharged with water and the percolation rates were observed and recorded on December 21, 1999. The results are presented in the attached Table 1.

.../2

3.0 GROUNDWATER CONDITIONS

Free water or saturated soil conditions were not observed, during test hole drilling. Hand-slotted, 30mm PVC standpipe were installed in each test hole, for review of near surface water table. The standpipe were installed to depths ranging from 1.4m to 3.1m below the existing ground surface. Wetted bentonite granules were placed from the ground surface to a depth of 0.3m, to limit surface water infiltration. The standpipes were monitored one week subsequent to installation and groundwater was not present, as noted in Table 2.

TABLE 2
GROUNDWATER CONDITIONS

Test Hole No.	Depth of Standpipe	------ Depth Below Existing Ground Surface (m) ------- At Completion Dec 20/99	Jan 3/00
1	2.55*	dry	dry
2	3.00*	dry	dry
3	3.05	dry	dry
4	1.40*	dry	dry
5	3.10	dry	dry
6	3.00	dry	dry
7	2.50*	dry	dry

* Auger Refusal

Typically, highest groundwater conditions are experienced during the months of June to August, as they are periods of groundwater table recharge. It is apparent, where bedrock is not present, that the near surface water table will be below a vertical distance of 1.5m from the weeping lateral trench bottom, as specified by Alberta Environmental Protection guidelines for location of disposal fields in this time period. However, bedrock is also a consideration in Lot 4. The field should be raised 1.0m.

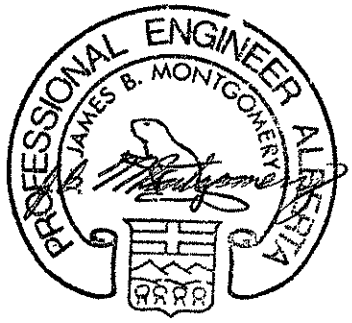
..../3

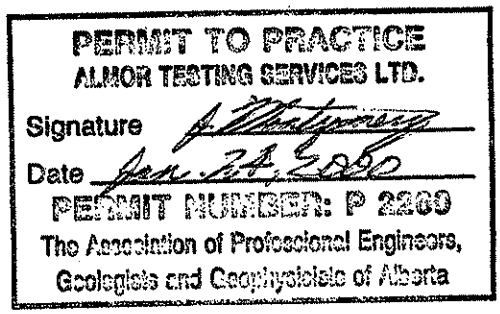
4.0 CLOSING

In review, the percolation rates were recorded to be between 2.0 min/cm and 23.6 min/cm, with the exception of Percolation Hole #4B. The shallow groundwater table is below a minimum 1.5m distance from the weeping lateral trench bottom (2.4m below grade) except for bedrock in Lot 4. We recommend that these field locations, except for Lot 4, are suitable for standard disposal field tile systems. However, Lot 4 requires a raised septic field of 1.0m to be suitable in the field and/or sideslopes.

We trust this meets with your present requirements.

Respectfully submitted,
ALMOR TESTING SERVICES LTD.





J.B. Montgomery, P.Eng.

SD:ms:A99344

Attachments

TABLE 1
PERCOLATION TEST RESULTS

Percolation Hole #1A

Location: Refer to Site Plan

Soil Type: SILT, some sand, trace clay

Time of Reading	min/cm
20 min.	3.0
40 min.	2.9
Hour 1	3.2
80 min.	3.0
100 min.	2.9

Percolation Hole #1B

Location: Refer to Site Plan

Soil Type: Silty fine SAND

Time of Reading	min./cm
20 min.	2.3
40 min.	2.2
Hour 1	2.5
80 min.	2.3
100 min.	2.4
Hour 2	2.4

Percolation Hole #2A

Location: Refer to Site Plan

Soil Type: Silty SAND, trace clay, trace gravel

Time of Reading	min./cm
20 min.	5.2
40 min.	4.5
Hour 1	5.1
80 min.	4.6
100 min.	5.4
Hour 2	4.6

TABLE 1
PERCOLATION TEST RESULTS

Percolation Hole #2B

Location: Refer to Site Plan

Soil Type: SILT, some sand, trace clay

Time of Reading	min./cm
20 min.	8.7
40 min.	6.4
Hour 1	5.1
80 min.	4.4
100 min.	5.4
Hour 2	4.0

Percolation Hole #3A

Location: Refer to Site Plan

Soil Type: Sandy SILT, trace gravel

Time of Reading	min./cm
20 min.	5.2
40 min.	6.4
Hour 1	5.0
80 min.	5.2
100 min.	5.7
Hour 2	5.6

Percolation Hole #3B

Location: Refer to Site Plan

Soil Type: Sandy SILT, trace gravel

Time of Reading	min./cm
20 min.	3.4
40 min.	3.4
Hour 1	3.7
80 min.	3.4
100 min.	5.0
Hour 2	4.4

TABLE 1
PERCOLATION TEST RESULTS

Percolation Hole #4A

Location: Refer to Site Plan

Soil Type: Fine sandy SILT, trace gravel

Time of Reading	min./cm
20 min.	3.5
40 min.	3.3
Hour 1	3.3
80 min.	4.0
100 min.	3.4
Hour 2	3.1

Percolation Hole #4B

Location: Refer to Site Plan

Soil Type: Silty fine SAND, trace gravel

Time of Reading	min./cm
20 min.	1.8
40 min.	1.8
Hour 1	1.9
80 min.	1.8
100 min.	1.8
Hour 2	1.9

Percolation Hole #5A

Location: Refer to Site Plan

Soil Type: SILT, some sand to sandy, trace gravel

Time of Reading	min./cm
20 min.	4.9
40 min.	6.6
Hour 1	6.0
80 min.	5.7
100 min.	6.2
Hour 2	6.4

TABLE 1
PERCOLATION TEST RESULTS

Percolation Hole #5B

Location: Refer to Site Plan

Soil Type: SILT, some sand, trace clay, trace gravel

Time of Reading	min./cm
20 min.	7.9
40 min.	8.5
Hour 1	8.3
80 min.	8.0
100 min.	8.3
Hour 2	8.0

Percolation Hole #6A

Location: Refer to Site Plan

Soil Type: SILT, some fine sand to sandy, some gravel

Time of Reading	min./cm
20 min.	5.0
40 min.	5.4
Hour 1	5.0
80 min.	5.3
100 min.	5.4

Percolation Hole #6B

Location: Refer to Site Plan

Soil Type: SILT, some fine sand to sandy, trace to some gravel

Time of Reading	min./cm
20 min.	4.4
40 min.	4.8
Hour 1	4.7
80 min.	4.9
100 min.	5.0
Hour 2	4.9

TABLE 1
PERCOLATION TEST RESULTS

Percolation Hole #7A

Location: Refer to Site Plan

Soil Type: Fine sandy SILT, trace clay, trace gravel

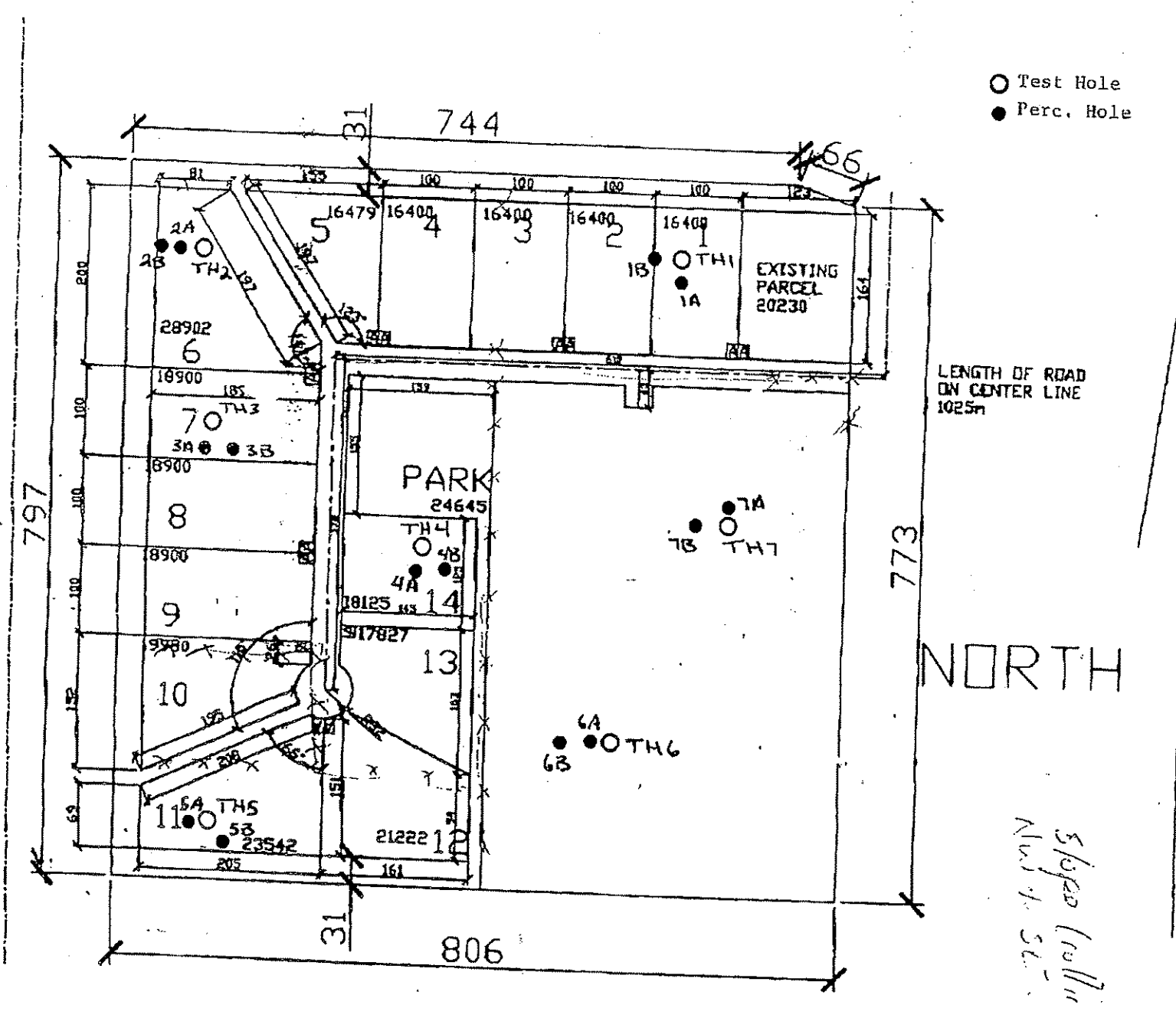
Time of Reading	min./cm
20 min.	2.2
40 min.	2.2
Hour 1	2.1
80 min.	2.1
100 min.	2.2

Percolation Hole #7B

Location: Refer to Site Plan

Soil Type: SILT, some fine sand, trace clay, trace gravel

Time of Reading	min./cm
20 min.	3.3
40 min.	3.1
Hour 1	3.2
80 min.	3.3
100 min.	3.2
Hour 2	3.2


Test Hole
Perc. Hole
744
31
66
797
773
806
31
EXISTING PARCEL 20230
LENGTH OF ROAD ON CENTER LINE 1025m
PARK
24645
NORTH
TH1
TH2
TH3
TH4
TH5
TH6
TH7
1A
1B
2A
2B
3A
3B
4A
4B
5A
5B
6A
6B
7A
7B
16479
16400
28902
16900
18900
9980
18125
17827
21222
23542

ALMOR TESTING SERVICES LTD.

7505 - 40 STREET S.E., CALGARY, AB T2C 2H5 PHONE (403) 236-8880 · FAX (403) 236-1707

2005 03 02

55-011-01-5

IBI Group
400, 1167 Kensington Cres NW
Calgary, Alberta T2N 1X7

Attention: Brandy Clements

Re: Shallow Subsurface Conditions
Sundance Trail Subdivision - Phase 2
NE ¼, Sec 13-20-01-W5M

Almor Testing Services Ltd. was retained to complete a Site Investigation, in accordance with MD of Foothills and Alberta Environmental Protection "Interim Guidelines for the Evaluation of Water Table Conditions and Soil Percolation Rates for Unserviced Residential Subdivision", at the above referenced project. No consideration has been given to specific foundation subsoil conditions, within the building envelopes. The lot proposed to be subdivided is identified on the attached Site Plan. There was no free surface water at the time of the investigation and overall surface drainage is directed to the southeast.

The field investigation and percolation rate testing was performed on January 31, 2005. The percolation test holes and groundwater monitoring test hole locations were advanced by an auger drill. The percolation holes were advanced within alternate proposed septic tile field locations, on-site.

1.0 SOIL CONDITIONS

The soil conditions within the proposed septic tile field locations tested (excluding the surficial topsoil and lesser "browns" horizon), consisted mainly of an olive silt/sand, with some gravel. The soils were in a dry to damp condition. Natural moisture contents ranged from 3.9% to 7.4%.

2.0 SEPTIC FIELD - PERCOLATION RATE TESTS

A total of six (6) percolation test holes were augered, within alternate proposed septic field locations within the lot, to a depth of approximately 0.9m below the depth of native topsoil and "browns" horizon. Loose materials from the bottom and sides of the test holes were cleaned, prior to placing bottom gravel and filling with water for a minimum depth of 0.45m (18 inches). The water was allowed to soak for a minimum 15 to 30 hour period. The holes were recharged with water, maintained for four hours and the percolation rates were observed and recorded on February 1, 2005. The results are presented in the attached Table 1.

.../2

3.0 GROUNDWATER CONDITIONS

Free water or saturated soil conditions were not observed in the test holes, during drilling. Hand-slotted, 30mm PVC standpipe were installed, for review of the near surface water table. The standpipe were installed to depths ranging from 2.75m to 3.40m below the existing ground surface. Wetted bentonite granules were placed around the pipe from the ground surface to a depth of 0.3m, to limit surface water infiltration. The standpipe were monitored one week subsequent to installation and the results are presented in Table 2.

TABLE 2
GROUNDWATER CONDITIONS

Test Hole No.	Depth of Standpipe	------ Depth Below Existing Ground Surface (m) ------ At Completion Jan 31/05	Feb 7/05
1	3.40	dry	dry
2	2.80	dry	dry
3	2.75	dry	dry

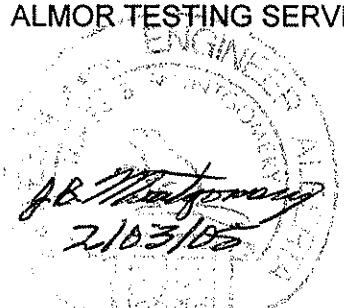
Typically, highest groundwater conditions are experienced during the months of June to August, as they are periods of groundwater table recharge and therefore seasonal fluctuation is then taken into consideration. It is apparent that the near surface water table will be below a vertical distance of 1.5m from the weeping lateral trench bottom, as specified by Alberta Environmental Protection guidelines for location of disposal fields, in this time period.

3.0 CLOSING

In review, the percolation rates recorded are between the specified limits of 2 min/cm and 23.6 min/cm and the shallow groundwater table is below a minimum 1.5m distance from the weeping lateral trench bottom (2.4m below grade). Therefore, we recommend the test locations are suitable for standard sewage disposal field tile systems.

We trust this meets with your present requirements.

Respectfully submitted,
ALMOR TESTING SERVICES LTD.



* APEGGA Permit to Practice #P2260

J.B. Montgomery, P.Eng.
JBM:ms:A01301

Attachments

TABLE 1
PERCOLATION TEST RESULTS

Percolation Hole #1A

Location: Refer to Site Plan

Soil Type: Sandy SILT, some gravel to gravelly

Time of Reading	min/cm
20 min.	5.3
40 min.	5.6
Hour 1	6.1
80 min.	5.6
100 min.	5.6
Hour 2	5.9
Average	5.6

Percolation Hole #1B

Location: Refer to Site Plan

Soil Type: Silty SAND, some gravel to gravelly

Time of Reading	min/cm
20 min.	2.9
40 min.	3.4
Hour 1	3.6
80 min.	3.8
100 min.	3.9
Hour 2	4.0
Average	3.6

Percolation Hole #2A

Location: Refer to Site Plan

Soil Type: SILT, some sand, trace gravel

Time of Reading	min/cm
20 min.	2.5
40 min.	2.7
Hour 1	2.7
80 min.	2.9
100 min.	2.8
Hour 2	2.9
Average	2.8

TABLE 1
PERCOLATION TEST RESULTS

Percolation Hole #2B

Location: Refer to Site Plan

Soil Type: Sandy SILT, some gravel to gravelly

Time of Reading	min/cm
20 min.	4.2
40 min.	4.4
Hour 1	4.4
80 min.	4.3
100 min.	4.5
Hour 2	4.4
Average	4.4

Percolation Hole #3A

Location: Refer to Site Plan

Soil Type: SILT & SAND, some gravel to gravelly

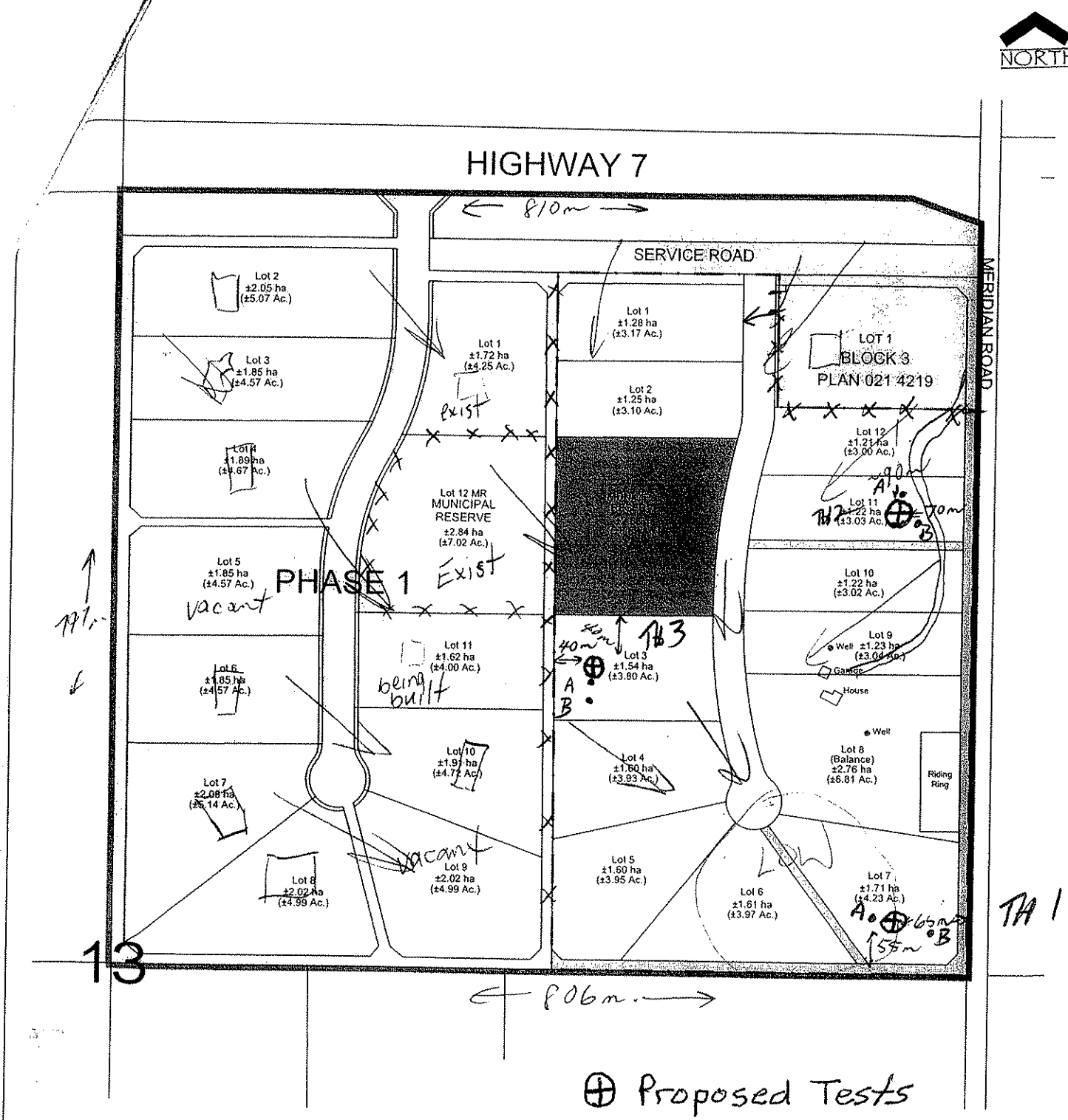
Time of Reading	min/cm
20 min.	1.4
40 min.	1.8
Hour 1	1.8
80 min.	2.0
100 min.	2.0
Hour 2	2.1
Average	1.9

Percolation Hole #3B

Location: Refer to Site Plan

Soil Type: SILT, & SAND, some gravel to gravelly

Time of Reading	min/cm
20 min.	3.6
40 min.	5.1
Hour 1	5.1
80 min.	4.9
100 min.	5.3
Hour 2	5.3
Average	4.9



SUNDANCE TRAIL

IBI GROUP

AREA STRUCTURE PLAN
N.E. 1/4 Sec. 13-20-01-W5M

PLAN AREA

Scale: 1:5000
January 3, 2005
EXHIBIT 3.0

APPENDIX F

TRANSPORTATION REPORT

[E1]

TABLE OF CONTENTS

1.0 INTRODUCTION

IBI Group has been retained to prepare a traffic and access assessment for an Area Structure Plan (ASP) application for lands described as the NE ¼ 13-20-01-05.

The purpose of this report is to evaluate access to the ASP lands from Highway 7 with respect to:

1. location of an access road relative to sight distance criteria; and
2. design of the access road intersection at Highway 7.

1.1 SITE LOCATION

The subject lands are located within the Municipal District of Foothills adjacent to the south boundary of the Highway 7 right-of-way, approximately 2.0 kilometres (1.25 mi) west of the Highway 7/ Highway 2A intersection, south of the Town of Okotoks.

The location of the ASP lands is shown in Exhibit 1.1

Photographic images of Highway 7 in the vicinity of the ASP lands are shown in Exhibits 1.2 and 1.3.

2.0 TRAFFIC VOLUMES

Analysis of the intersection design is performed per the intent and procedures contained in Chapter D of the *Alberta Infrastructure Highway Geometric Design Guide* (1999). The methodology is intended to determine the most appropriate type of at-grade intersection for the given location, and is traffic volume warrant-based. Average Annual Daily Traffic (AADT) volumes are employed in the warrant/ design process.

2.1 NON-SITE TRAFFIC

A Traffic Volume History report has been obtained for the point on Highway 7, 0.8 km west of the Highway 2A intersection from Alberta Infrastructure. Traffic volumes at this location are deemed representative of non-development (background) traffic volumes adjacent to the ASP area.

Based on 5 years of historical traffic growth data on Highway 7, a 4% per annum growth rate has been determined for purposes of future traffic growth projections. The historical rate is applied in a linear, non-compounded fashion to a 15 year design horizon, or "design year". Incremental growth horizons of 5 years and 10 years have also been evaluated.

Table 2.1 summarizes the traffic growth calculations for Highway 7, including the 30th highest hour DHV (Design Hour Volume) and directional split calculations for non-site traffic components.

2.2 SITE-GENERATED TRAFFIC

The proposed ASP contains 20 residential lots, split into two development phases.

A trip generation rate of 10 trip ends/ household/ day has been applied, with 1.0 trip end/ household/ hour applied in the peak hour of analysis. Table 2.2 summarizes the daily (24-hour) trip generation calculations, and Table 2.3 summarizes trip generation calculations, and directional calculations, for the PM peak hour period to build-out of the subdivision.

Traffic distribution for the ASP lands is determined to be 90% to / from the east (Calgary, Okotoks, High River) and 10% to / from the west.

Table 2.1
Traffic Growth Projections - Highway 7 West of 2A

Volume:	Design Year			
	Current 1999	5 year	10 year	15 year
AADT:	3370	4179	4853	5527
DHV CALC.				
K =	0.100	0.100	0.100	0.100
DHV result:	**337**	**418**	**485**	**553**
DIRECTION CALC., DHV AM				
EB Split =	0	0	0	0
EB Result	**0**	**0**	**0**	**0**
WB Split =	0	0	0	0
WB Result	**0**	**0**	**0**	**0**
DIRECTION CALC., DHV PM				
EB Split =	49.4%	49.4%	49.4%	49.4%
EB Result	**166**	**206**	**240**	**273**
WB Split =	50.6%	50.6%	50.6%	50.6%
WB Result	**171**	**211**	**246**	**280**

Table 2.2
Subject Site Traffic Generation: 24-hour Period

	Value (x)	24 - Hour Hour Rate	24 - Hour Hour Trips	24 - Hour Directional Splits Inbound		Outbound	
Phase 1 Residential Lots	12units	10T/ unit	120	50%	60	50%	60
Phase 2 Residential Lots	8units	10T/ unit	80	50%	40	50%	40
TOTAL	***20***		***200***		***100***		***100***

Table 2.3
Subject Site Traffic Generation: PM Peak Hour (Design Hour) Period

	Value (x)	PM Peak Hour Trip Rate	PM Peak Hour Trips	PM Peak Hour Directional Splits Inbound		Outbound	
Phase 1 Residential Lots	12 units	1 T/ unit	12	65%	8	35%	4
Phase 2 Residential Lots	8 units	1 T/ unit	8	65%	5	35%	3
TOTAL	***20***		***20***		***13***		***7***

3.0 INTERSECTION DESIGN ANALYSIS

The starting point for the analysis is the traffic volume warrant chart contained in Chapter D of the *Alberta Infrastructure Highway Geometric Design Guide* (Figure D-7.4). Based on the main and intersecting AADT traffic volumes, the volume warrant chart suggests that detailed analysis is required to determine the intersection type.

The detailed intersection design analysis procedures for the 5 year, 10 year and 15 (design) year horizons are documented in the following sections. In all cases, full build-out of the subdivision is assumed to have occurred.

3.1 5 YEAR HORIZON

The calculations for the 5 year horizon, per section D.7.5 of the *Alberta Infrastructure Highway Geometric Design Guide* follow. Right turn warrant conditions, as per section D.7.7 of the *Alberta Infrastructure Highway Geometric Design Guide.*

Left Turn Lane Warrant

Design Speed = 110/120/130 km/h

V_l = 12 vph

V_a = 211 + 12 = 223 vph

% left turn = 5.4%

V_o = 206 + 2 = 208 vph

Lookup from Figure D-7.6a:

Type II, no left turn storage required.

Right Turn Lane Warrant

AADT, Main or Through ≥ 1800	AADT, Intersecting ≥ 900	Daily Right Turn ≥ 360
●	X	X

NO right turn lanes required.

3.2 10 YEAR HORIZON

The calculations for the 10 year horizon, per section D.7.5 of the *Alberta Infrastructure Highway Geometric Design Guide* follow. Right turn warrant conditions, as per section D.7.7 of the *Alberta Infrastructure Highway Geometric Design Guide.*

Left Turn Lane Warrant

Design Speed = 110/120/130 km/h

V_l = 12 vph

V_a = 246 + 12 = 258 vph

% left turn = 4.65%

V_o = 240 + 2 = 242 vph

Lookup from Figure D-7.6a:

Type II / III, no left turn storage required.

Right Turn Lane Warrant

AADT, Main or Through ≥ 1800	AADT, Intersecting ≥ 900	Daily Right Turn ≥ 360
●	X	X

NO right turn lanes required.

3.3 15 YEAR HORIZON (DESIGN YEAR)

The calculations for the 15 year horizon, per section D.7.5 of the *Alberta Infrastructure Highway Geometric Design Guide* follow. As determined at the outset of the study, the 15 year horizon is assumed to represent the design year for purposes of this analysis. Right turn warrant conditions, as per section D.7.7 of the *Alberta Infrastructure Highway Geometric Design Guide.*

Left Turn Lane Warrant

Design Speed = 110/120/130 km/h

V_l = 12 vph

V_a = 280 + 12 = 292 vph

% left turn = 4.10%

V_o = 273 + 2 = 275 vph

Lookup from Figure D-7.6a:

Type III, no left turn storage required.

Right Turn Lane Warrant

AADT, Main or Through ≥ 1800	AADT, Intersecting ≥ 900	Daily Right Turn ≥ 360
●	X	X

NO right turn lanes required.

4.0 CONCLUSIONS

A traffic and access assessment for a residential subdivision consisting of 20 lots on a portion of NE ¼ 13-20-01-05 by area structure plan.

The results of the foregoing analysis support the following findings:

1. During an interim period of time, for approximately 10 years, a Type II(a) intersection will be required.
2. At the full build-out of the development, approximately 15 years, a Type III(a) intersection will be required.

Attached are Figures D-7c, and D-7f from the *Alberta Infrastructure Highway Geometric Design Guide*, which illustrate the geometric design of Type II(a) and III(a) intersections, respectively.

Also attached is a drawing of the geometric road design and profile along Highway 7, which illustrates a preferred area for road placement in agreement with Alberta Highway Design Standards.