

Birkill Subdivision

Area Structure Plan

Proposed Country Residential

Pt. NW 31 - 68 - 14 - W4M

Lakeland County

Revised June 07, 2003

DONATBERRY DESIGN LTD.

1.0 Introduction

- 1. R. Birkill Professional Corporation, owner of Pt. NW - 31 - 68 - 14 - W4M has requested the residential subdivision and therefore the rezoning of the above parcel.**

- 2. This Area Structure Plan has been prepared as an integral requirement for rezoning within Lakeland County.**

- 3. The Lakeland County Municipal Planning Commission along with Lakeland County advisor, Lovatt Planning Consultants Inc., have recommended Country Residential Rezoning and therefore 1st reading was given by Lakeland County Council to Bylaw # 02-007 on May 22, 2002 for that purpose.**

- 4. The proposed subdivision includes 12 country residential parcels with a conservation area wetland to be dedicated as Environmental Reserve by the Owner. This wetland area will be incorporated in the stormwater management plan with the existing natural catchment area remaining intact "post development".**

2.0 Existing Land

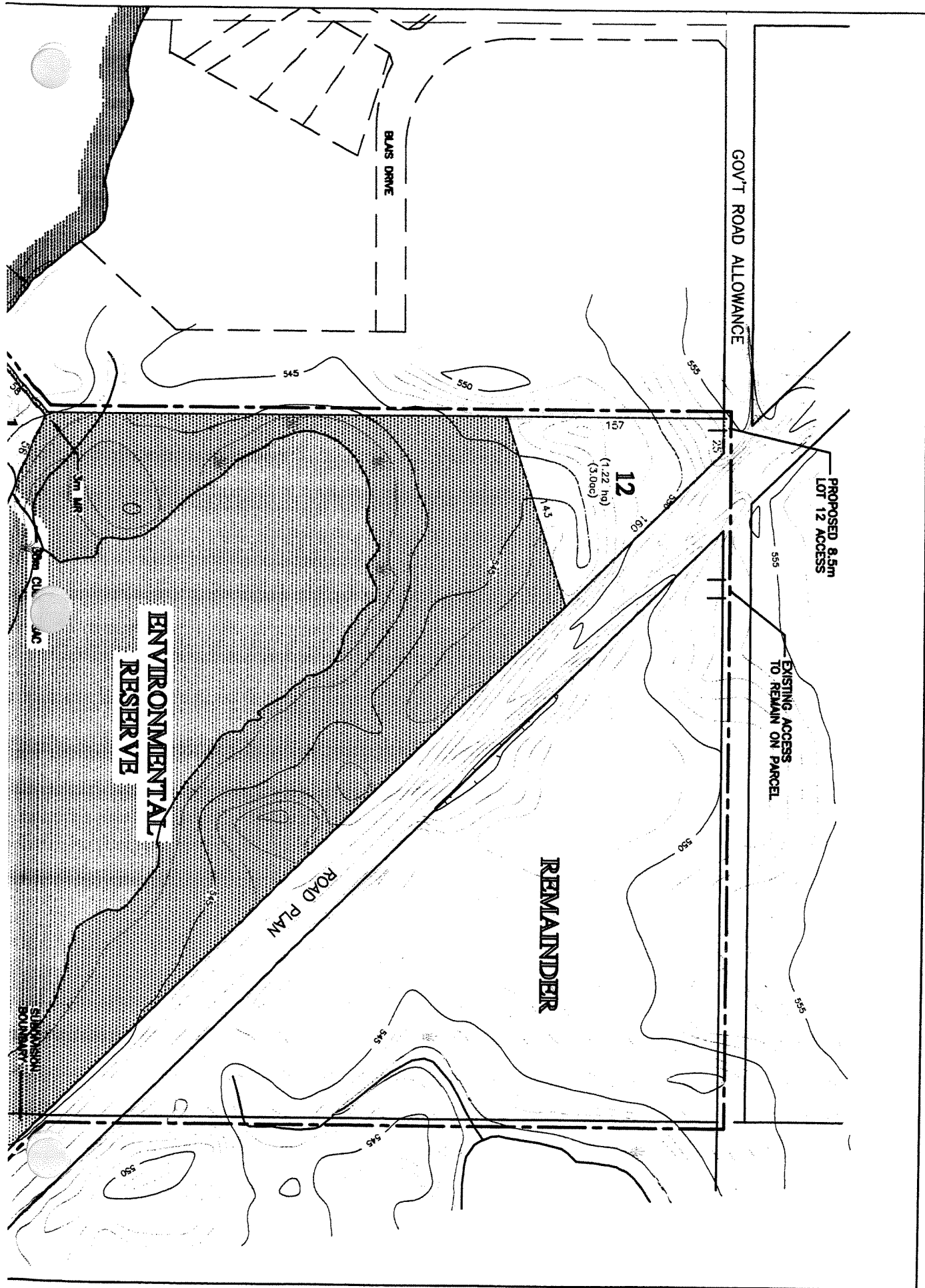
1. The existing parcel consists of 36.26 ha (89.6 ac.) as described within the Certificate of Title.

2. Highway 858 (plan # 812 0430) bisects the parcel within the northeast corner isolating a remainder of 9.1 ha (22.48 ac). The remainder land will not be further subdivided within this Area Structure Plan.

3. The existing parcel is bounded by Lac La Biche Lake to the South and is located just east of an existing lakeshore country residential subdivision - Blais Resort. Land to the southeast of the existing parcel is fractioned into several large parcels by existing Lakeland County roadways.

4. An existing residence within the proposed subdivision will remain in its present location and will be accommodated within proposed Lot 3.

5. Two additional triangular fractions of land which are situated between the Birkill titled area and the short segment of local road to the east is in the process of negotiation with the adjacent land owner for inclusion in the Area Structure Plan and eventual subdivision.



ENVIRONMENTAL
RESERVE VIE

ROAD PLAN

REMAINDER

12

(1.22 ha)
(3.0ac)

GOV'T ROAD ALLOWANCE

PROPOSED 8.5m
LOT 12 ACCESS

EXISTING ACCESS
TO REMAIN ON PARCEL

BLISS DRIVE

SUN LANE

STURGEON
BOUNDARY



5.0 Impact Assessment

1.0 The proposed development provides a relative low density for the residential component, along with the dedication of Environmental Reserve, Lake Access Reserve, and Municipal Reserve totaling approx. 50% of the plan area.

2.0 The proximity to the lakeshore has moved the Owner to suggest an increased level of sewage treatment and the elimination of possible septic field (blackwater) contamination.

3.0 The establishment of a Landowner Association to oversee the conservation of the natural areas will be promoted. 'Green' landscaping will be encouraged to eliminate toxic herbicides, pesticides and fertilizers. Green products will be promoted along with tree planting and natural area rejuvenation.

4.0 Utilization of the existing approaches, upgraded Lakeland County roadway and existing Provincial Highway access, and the relative low impact of additional traffic volumes from this proposal will not significantly impact existing infrastructure.

5.0 The proposal fits in well with the surrounding land uses of the existing country residential subdivision to the west, and existing recreational and agricultural parcels to the north and east.

6.0 The additional residences will contribute to the viability of local schools, community halls, hospitals, municipal governments, and businesses in the surrounding area.

REPORT ABSTRACT

At the request of Mr. Wayne Duplessis of Donatberry Design Ltd., on behalf of Dr. Birkill Professional Corporation, an Historical Resources Impact Assessment (HRIA) was conducted for the proposed Dr. Birkill Professional Corporation Subdivision in PT. NW 31-68-14-W4M, near Lac La Biche, Alberta. The fieldwork for this project was undertaken on August 2, 2002 by Altamira Consulting Ltd. In-field investigations consisted of a foot survey of the entire proposed development area, and shovel testing within select parts of the proposed development area. A total of 44 shovel tests were excavated during the survey.

One archaeological site (GfPa-15) was revisited and relocated during the survey of the proposed subdivision development area. The site location was found to have been heavily disturbed and no cultural materials were found to be present in the undisturbed sediments below the surface disturbance layer. No diagnostic archaeological materials were found during the inspection of GfPa-15. The artifacts were found in a disturbed context. GfPa-15 is not considered to be significant since the artifacts found here offer little information beyond the presence of the artifacts themselves.

No other Historical Resources Sites were found during the survey. Subsequently, this study concludes that the proposed development lands do not contain significant undisturbed archaeological, palaeontological or historic resources, and that no further archaeological work is warranted for this project area.

In conclusion, the lands within the study area are of limited archaeological potential and no further examination, collection, testing or excavation is

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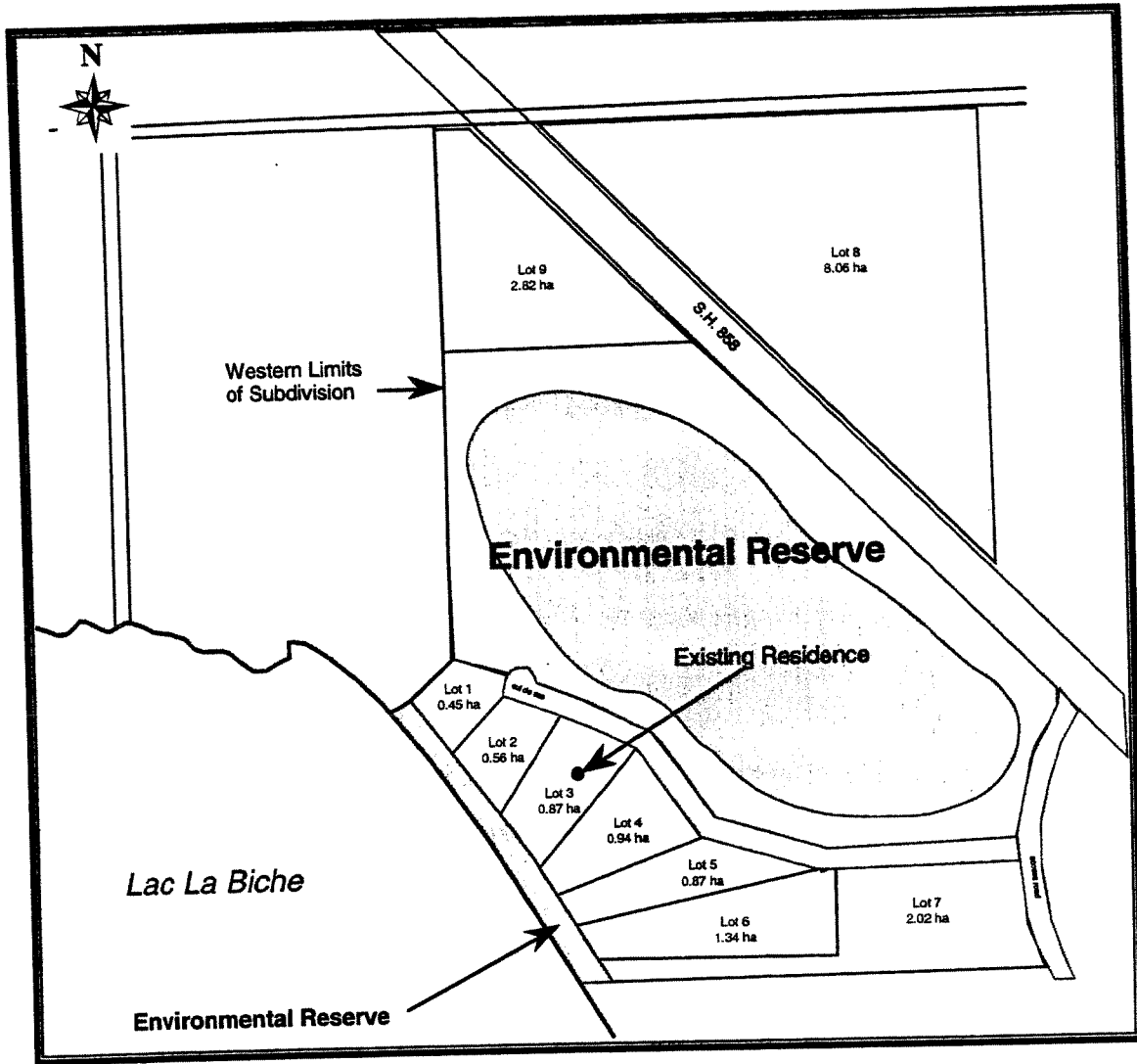


Figure 3. Sketch map of the proposed Dr. Birkill Professional Corporation Subdivision study area in PT. NW 31-68-14-W4M.

Historical Resources are commonly divided into three categories: 1) palaeontological, 2) archaeological and 3) historic.

Historical resource sites are fragile and precious and easily suffer damage or destruction from such activities as road and pipeline construction, route realignments, construction activities, landscaping, soil and gravel removal, recreational activities, and landfill development. Once the context is disturbed or destroyed, the informational and interpretive value of historical resources are seriously affected and in some cases lost forever. The purpose of a Historical Resources Impact Assessment is to locate and evaluate the significance of all historical resource sites within a defined development area and to formulate recommendations regarding the importance of sites discovered and the necessity for mitigative action. Mitigation may involve avoidance or further study.

Management and protection of Historical Resources is the responsibility of *Alberta Community Development*. While all observations, conclusions and recommendations made in this report are the result of research undertaken by the permit holder, this work is subject to the review and acceptance or modification by the *Cultural Facilities and Historical Resources Division, Alberta Community Development*. All recommendations regarding either the need for further work or that no further work is necessary must be ratified, in writing, by *Alberta Community Development* before they can be considered acceptable in terms of the requirements of the development.

In Alberta there are two ecologically-based land classification systems that are commonly used by government and private industry: the Natural Regions and Subregions classification (Achuff 1994) and the Ecoregions of Alberta classification (Strong and Leggat 1981; Strong 1992). There are many similarities between the two systems however, the primary difference lies in the emphasis given to climate in the latter. The Natural Regions classification “. . . emphasizes overall landscape pattern which, in some cases, reflects climate but in others, reflects the predominance of geological or soil factors” (Achuff 1994:5). Achuff goes on to note that the differences are largely a reflection of purpose. The former is used primarily in studies of agriculture, forestry and wildlife production whereas the Natural Region system is utilized more in ecosystem and biodiversity modeling. The land classification system used here to describe the physical landscape is entitled ‘*Natural Regions, Subregions and Natural History Themes of Alberta: a Classification For Protected Areas Management*’ prepared for Park Services, Alberta Environmental Protection by Peter Achuff in 1992 and updated and revised in 1994.

Natural Regions are recognized on the basis of broad differences in landscape patterns, especially the broad vegetational, soil and physiographic features, for example grassland vs. parkland vs. forest, Chernozemic soils vs. Luvisolic soils, or mountains vs. foothills vs. plains. These features also reflect broad patterns of climate and geology. To a lesser extent, wildlife features are used, although wildlife occurrence patterns are usually not as distinctive or useful as soil, physiographic and vegetation patterns (Achuff 1994:5).

In Alberta, six Natural Regions are currently recognized (Achuff 1992): Grassland, Parkland, Foothills, Rocky Mountain, Boreal Forest, and Canadian Shield. The six Natural Regions are divided into 20 Subregions based on recurring landscape patterns relative to other parts of the Natural Region. One of the 20 Subregions is present in the study area. This is the Dry Mixedwood Subregion of the Boreal Forest Natural Region (Figure 4). The following outline of the Dry Mixedwood Subregion is from Achuff (1992).

2.1.1 Dry Mixedwood Subregion

2.1.1.1 *Geology And Landforms*

The Dry Mixedwood Subregion is characterized by low relief and level to undulating terrain. Surficial materials are mostly till as ground moraine and hummocky moraine landforms with some areas of aeolian dunes and sandy outwash plain. The Subregion includes two main areas: the southern edge of the Boreal Forest Natural Region from Cold Lake west to about Barrhead and south along the western edge of the Central Parkland Subregion to about Gull Lake and a broad land from Lesser Slave Lake to Grande Prairie then north along the Peace River to Fort Vermilion. The Cooking Lake moraine east of Edmonton is a disjunct portion of this Subregion.

Drainage is to both the Saskatchewan and Mackenzie river systems via numerous rivers and small streams.

2.1.1.2 *Climate*

The climate of this Subregion is subhumid, continental with short, cool summers and long, cold winters. The mean May - September temperature is about 13C and the growing period is about 90 days. Annual precipitation averages about 350 mm with June and July the wettest months. Winters are relatively dry with about 60 mm of precipitation. Overall, the climate is somewhat drier and warmer than the Central Mixedwood Subregion with somewhat higher moisture deficits.

2.1.1.3 *Soils*

Soils are typically Gray Luvisols in well-drained, upland till sites and Eutric Brunisols in coarse-textured sandy uplands. Organics and Gleysolics occur on wet depressional sites.

Mixedwood forests generally contain a mosaic of deciduous and coniferous patches with species typical of each occurring through the stand.

Dry, sandy upland sites are usually occupied by *Pinus banksiana* (jack pine) forests. These may be quite open and have a prominent ground cover of lichens. Other understory species may include *Arctostaphylos uva-ursi* (bearberry), *Vaccinium myrtilloides* (low bilberry), *Vaccinium vitis-idaea* (bog cranberry) and *Rosa acicularis* (prickly rose).

Peatlands are common throughout the Subregion and are extensive in some areas, e.g. south of Athabasca, but are not as prevalent as in other Boreal Forest Subregions. Peatland complexes typically contain both nutrient-poor, acidic bog portions, dominated by *Picea mariana* (black spruce), *Ledum groenlandicum* (Labrador tea), and *Sphagnum* spp. (peatmosses) and more nutrient-rich fens, containing *Larix laricina* (tamarack), *Betula* spp. (dwarf birches), *Carex* spp. (sedges), and brown mosses (*Aulacomnium palustre*, *Tomenthypnum nitens*, *Drepanocladus* spp.). Patterned peatlands occur in several areas.

2.1.1.5 Wildlife

Characteristic species of deciduous forests in the Dry Mixedwood Subregion include least flycatcher, house wren, ovenbird, red-eyed and warbling vireos, Baltimore oriole and rose-breasted grosbeak. Species of mixedwood forests include yellow-bellied sapsucker, Swainson's thrush, solitary vireo, magnolia warbler, white-throated sparrow, pileated woodpecker and northern goshawk.

A few species are restricted to the Cold Lake area and represent an eastern faunal element. These include yellow rail, sedge wren, great-crested flycatcher, chestnut-sided warbler and blackburnian warbler. Typical mammals include beaver, moose, varying hare, black bear, wolf, lynx and ermine.

The importance of defining site type has been previously noted by Ball:

.....identification and classification of site types are considered to be the key to the definition of prehistoric settlement patterns and are almost totally dependent upon a detailed analysis and classification of the artifacts which comprise the site (Ball 1986: 139).

Ball (1986:151) goes on to note that it is extremely difficult to interpret site types from the small, predominantly lithic artifact assemblages.

A further complication in interpreting the prehistory of northwestern Alberta is that the many of projectile points collected have not yet been typologically classified (Brink and Dawe 1986: 241). The typology of projectile point sequences known for the Northern Plains is generally applied, rightly or wrongly, to the northwestern materials when strong similarities are present. These typological classifications are commonly used by archaeologists to develop chronological understandings and sometimes even movements of ideas, materials, and peoples in prehistoric times. In addition to the small size of many of the archaeological assemblages, artifact collections are often poorly preserved, or are from poorly understood contexts which further limit the information that can be gleaned from these collections. Many of the known projectile points for instance, were discovered by farmers plowing their fields earlier this century (Wormington and Forbis 1965; LeBlanc and Wright 1990).

These difficulties have resulted in vague and often inconclusive interpretations of sites and site types in the Boreal Forest regions in general, and in the study area in particular. Research to date has produced some useful information about the distribution of archaeological sites on the landscape, but there remains much to be learned about the prehistory of northwestern Alberta.

Each of these periods displays a relatively different archaeological landscape. The periods are, for the most part, defined on the basis of environmental change, resource use, settlement patterns and artifact styles. In general, this sequence may be applied to the province as a whole, since similar artifact styles have been found in almost all areas of Alberta. Regional differences and the clarity of the definitions remains somewhat cloudy largely due to a lack of consistent research in all areas. The theory is that each of these periods can be further divided into ever decreasing subsets of more specific groups or cultural manifestations. These cultural manifestations or theoretical archaeological constructs are known as Traditions and Complexes. Depending upon the evidence at hand these may be further divided into subsets of more specific archaeological culture types, such as "Phases".

2.2.2 Early Prehistoric Period

The Early Prehistoric Period, dating from 11,000 to 8,000 years BP, is the first time period for which there exists material evidence of people living in Alberta. The Early Prehistoric Period is sometimes referred to as the Paleo-Indian Period (Ellis and Deller 1990). It is possible that people may have entered Alberta earlier than 11,000 years ago, and there are researchers who have advanced such speculation, but as of yet no compelling evidence of pre-11,000 year occupation exists (cf. Beaudoin et al. 1996; Forbis 1982; and Vickers 1986).

The Early Prehistoric peoples are known primarily for their use of large spear points and an associated emphasis on big game hunting. In the northern Boreal Forest regions this coincides with the occurrence of large game such as the bison, camel, elk, horse and woolly mammoth. This period includes several different cultural traditions (based on characteristic projectile point styles including Clovis, Folsom, Agate Basin, Cody, Lusk, Alberta, and Frederick

2.2.3 The Transitional Period

By 8,000 years BP there is a change in the archaeological record, and side-notched and corner-notched points begin to appear, and become prominent in the archaeological record. These new point styles mark the beginning of a new technological tradition that we refer to here as the Transitional Period (Boag 1989). The Transitional Period extends from approximately 8,000 years BP to 5,500 years BP. It is in this period that we begin to see an increase in the number of archaeological sites. It correlates to changes in vegetation, fauna, and the disappearance of all remnants of glacial ice.

The inference is that for much of Alberta there occurred a change in subsistence and settlement patterns and an increase in population. There was also a change toward a more regionalized - settled - lifestyle after 8,000 BP. It may be that sites of this period are simply more visible. Bison and other large mammals continue to be an important resource, but the archaeological evidence shows that other animals became increasingly important.

The major projectile point styles of the Transitional Period are known as Salmon River Side-notched (also called Gowen), Mt. Albion Corner-notched, Hawken Side-notched, Blackwater Side-notched, and Northern Side-notched (Figure 7). The size of these points indicates that they were probably used for spears and darts. Salmon River points have been recovered from the Hawkwood Site (Van Dyke and Stewart 1985) in southern Alberta, and dated at 8,200 years BP. Similar points recovered from the Gowen site (Walker 1980 and 1987) in Saskatchewan were dated from 6,000 to 5,100 years BP.

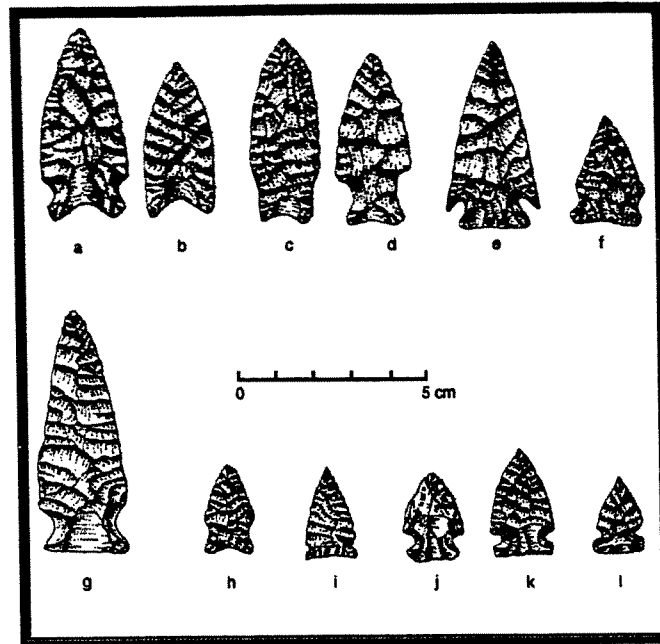


Figure 8. Examples of Middle Prehistoric Period Plains projectile point styles: a & b - Oxbow; c - Duncan; d - Hanna; e - Pelican Lake; f - Sandy Creek; g & h Besant (g-Sonata & h-Samantha); i - Avonlea; j - Prairie Side-notch; and K & l - Plains Side-notch.

Like other point types in the Northwestern Plains typology, Oxbow points are also common to parts of the Boreal Forest. Like other styles, they too appear to date later in the Boreal Forest regions than they do in sites found farther to the south (Spurling and Ball 1981). Generally, Oxbow points seem to appear in the north after 4,000 years BP.

For the Middle Prehistoric Period, as for the Early Prehistoric Period, there is evidence of intensive lakeshore occupation. However, it should be noted that it is likely the repeated, long-term use of these lacustrine locations, that make them so prevalent in the archaeological record. While it seems likely that sites were occupied in other geographical situations, they were probably occupied for shorter periods of time, and were not revisited on a yearly basis. Such sites

problems in the Boreal Forest. It is perhaps complicated by the apparent existence of artifact styles that are different from those which occur in neighboring regions. However, this latter manifestation is likely the result of data gaps and the establishment of a different subsistence and settlement pattern than is present in neighboring areas. Moreover, the information discontinuities are largely due to a lack of well organized, problem-oriented research in the region. In general, it can be said that there has been less archaeology carried out in the north than in other regions of the province.

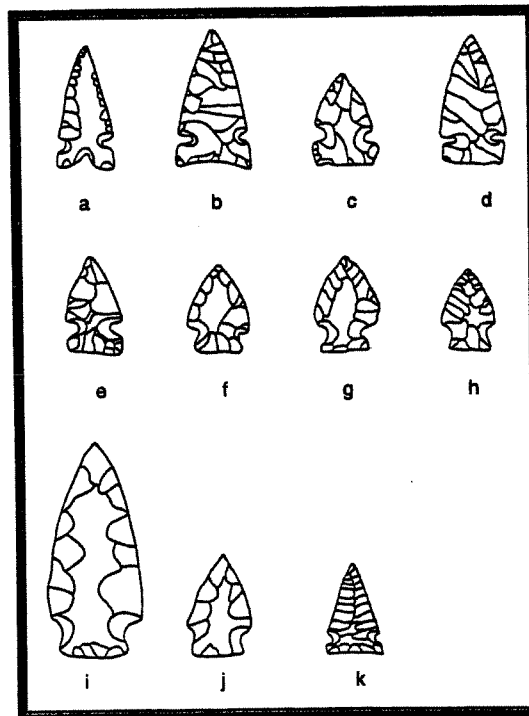


Figure 9. Examples of Late Prehistoric Period Plains projectile point styles from Vickers 1986: a, b, c & d are Plains Side-notch (Trinotch, Washita, Pekisko and Paskapoo respectively); e, f, g & h are Priarie Side-notch types (Nanton, Lewis, Irvine and High River styles); i – Besant; j Samantha (Besant); and k – Timber Ridge (Avonlea).

It should also be noted that previous archaeological investigations in the immediate vicinity of the study area have not been comprehensive, and that the scarcity of the located sites in the area away from Lac La Biche, could be attributed to this fact.

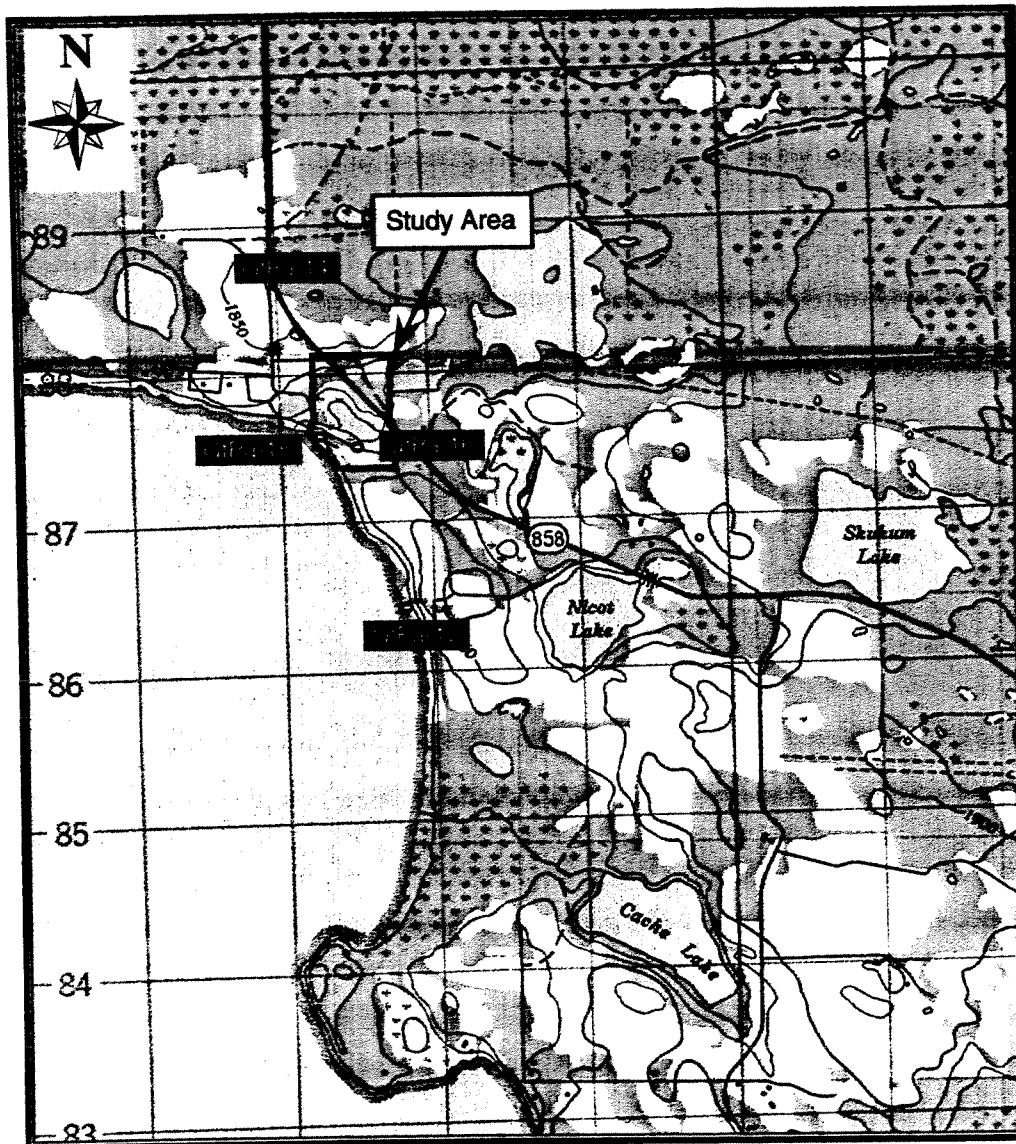


Figure 10. Map showing the previously recorded sites in closest proximity to the study area (after 1:50,000 NTS Map 83 I/16 - Plamondon).

Borden No.	Site Type	Artifact Assemblage	Environmental Setting
GfPa-40	Historic		Cabin cellar depression
GfPa-41	Campsite	Pottery, bone, lithics	Beach on Lac La Biche
GfPa-42	Campsite	29 Flakes, 18 bone, FBR	Beach on Lac La Biche
GfPa-43	Isolated Find	Flake	Ridge by Lac La Biche
GfPa-44	Campsite	39 Flakes, 7 bone	Ridge by Lac La Biche
GfPa-45	Campsite	32 Flakes, 2 bone	Ridge by Lac La Biche
GfPa-46	Surface Scatter	3 Flakes	Ridge by Lac La Biche
GfPa-47	Campsite	Flakes, bone, FBR	Terrace on island in Lac La Biche
GfPa-48	Campsite	8 Flakes, FBR	Terrace on island in Lac La Biche
GfPa-49	Campsite	24 Flakes, bone, FBR	Terrace on island in Lac La Biche
GfPa-50	Historic		Cabin cellar depression
GfPa-51	Historic		Cabin cellar depression
GfPa-52	Historic/Scatter	Modern garbage, flakes	Shore of island in Lac La Biche
GfPa-53	Isolated Find	End scraper	Bluff on island in Lac La Biche
GfPa-54	Surface Scatter	1 Biface, flakes	Point in Lac La Biche
GfPa-55	Isolated Find	Core	Shore of Lac La Biche
GfPa-56	Isolated Find	Biface	Shore of Lac La Biche
GfPa-57	Campsite	Flakes, core	Peninsula in Lac La Biche

All of the four sites found within or in closest proximity to the study area (GfPa-14, GfPa-15, GfPa-16 and GfPa-17) consist of scatters found in cultivated areas.

GfPa-15 was recorded in 1975 and consisted of 2 flakes, 4 pieces of shatter, and numerous pieces of Fire-Broken-Rock, and was "located in Mrs. Diesel's garden and in the cut bank immediately SW of the garden" (McCullough 1975).

GfPa-16 was recorded in 1975 and consisted of 2 core fragments, 1 flake, and 1 piece of shatter "located immediately north of the Diesel residence in a ploughed field" and "approximately 200 metres from the lakeshore" (McCullough 1975), while the sketch map accompanying the 1975 Site Form indicates that the site was southeast of the Diesel residence.

2.3.2 Palaeontological Sites

The Project area is categorized on the Palaeontological Resources Sensitivity Map as having Unknown potential (Tyrrell Museum of Palaeontology 1984).

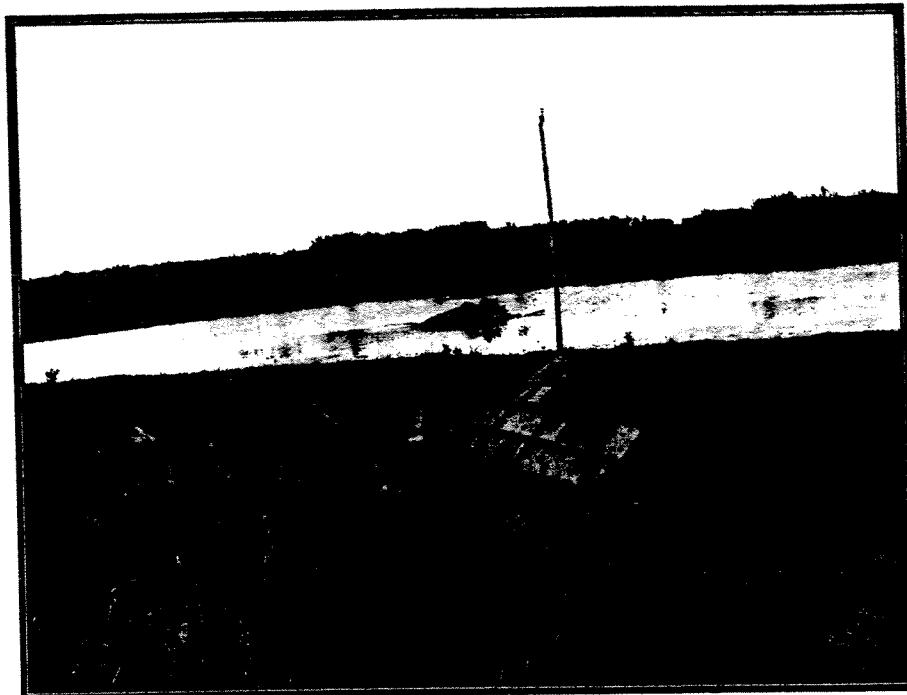
4.0 RESULTS

4.1 SURVEY OBSERVATIONS

The development area is dominated by a small unnamed lake which lies in the center of the development (Figure 11 and Photograph 1). The small lake is in a catchment that is approximately 2-3 meters below the general area level, and a creek channel comes out of the southwest end of the lake and drains into Lac La Biche. The areas immediately adjacent to the small lake and creek are low-lying and poorly-drained, and a well-drained flat to gently undulating terrace lies between the south edge of the small lake and Lac La Biche.

A modern house has been constructed close to the northern edge of this terrace near the mid-point of the small lake (Figure 11 and Photograph 2). The western part of this terrace is flat and has been cultivated, and currently is covered by a thick growth of tall grasses. A thin line of trees runs along both the southern (Photograph 3) and northern edges of this terrace before the sloped drop-offs to the lakes.

East of the house the terrace is more undulating and is bisected by a gravel driveway (Photograph 4). This part of the terrace has been cultivated previously and is also bound on the north, east, and south by lines of trees. South of the southern tree line there is a low-lying area which is periodically flooded by waters from Lac La Biche (pers. com. Mr. Peter Cardinal, local long-term resident and relative of Mr. Max Diesel who previously owned the study area property).



Photograph 1. View to the northwest showing the small unnamed lake which lies in the center of the development.



Photograph 2. View to the north showing the modern house that has been constructed close to the mid-point of the small lake in Lot 3.

East of the existing house are the burned remnants of one of Max Diesel's residences (Photograph 5). Foundation and building remnants are easily visible in the tall grasses. South of the existing house immediately by the edge of the terrace by the beach was the location of Max Diesel's original residence which also was burned, and which was subsequently removed (pers. com. Mr. Peter Cardinal). The original house area was leveled and in-filled, and currently the surface looks no different than other sandy areas along the terrace by the beach (Photograph 6). Some of the debris from this house is located in a garbage pile approximately 75 meters east of the original house location.

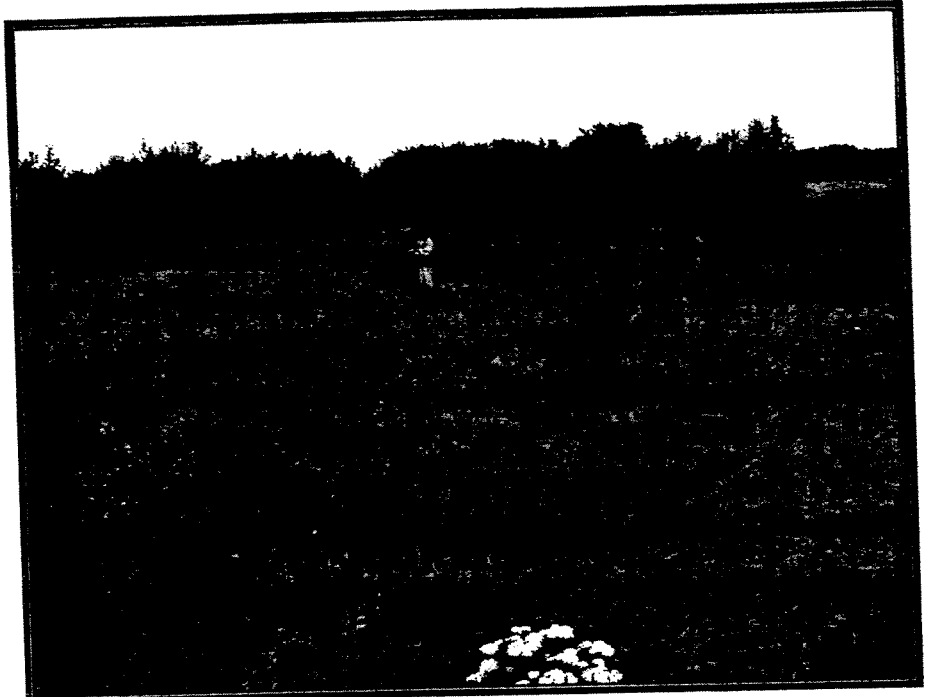
Mr. Cardinal indicated that one of his relatives had cleared and leveled the area for the new existing house and that much of the area south of the house toward the beach had been in-filled and trenches had been excavated in this area for water and electrical lines.

North of the small lake (Figure 11 and Photograph 7) almost all of the well-drained land in the development area has been cultivated previously, except for small groves of trees that occur generally in and around poorly-drained areas. A sandy access road runs along the northern limits of this section of the development, along which there were excellent exposures.

4.2 RESULTS

One previously recorded archaeological site (GfPa-15) was relocated and reassessed (see location on Figure 11), and the general area of previously recorded archaeological site GfPa-16 was re-examined, but the site was not relocated.

Lithic artifacts were found in beach sand and on the sides and top of the terrace in the immediate area around Max Diesel's original residence (Photograph 6).



Photograph 7. View to the west showing the flat to mildly undulating terrain within Lot 8 on the north side of S.H. 858.

The 1975 Site form for GfPa-15 (McCullough 1975) indicated that cultural materials were found in Mrs. Diesel's garden and on the cut bank immediately southwest of the garden. The lithic materials found during the present survey extend from the easternmost extent of the original site boundary, but are considered to be part of GfPa-15. A total of 32 quartzite flakes were found on the ground surface (see Figure 12 and Site Form in Appendix I) scattered over an area approximately 60 meters east-west by 50 meters north-south. Most of the artifacts were found on the beach or below the edge of the terrace. A total of 6 flakes were found on the surface at the location of Max Diesel's old house. Four shovel tests at this site location revealed that there were no undisturbed sediments above the sterile sandy substrate.

GfPa-16 was not relocated, but a total of 15 shovel tests were excavated in the general area of the site (see Figure 11 and Photograph 4; and Site Form Update in Appendix I). The shovel tests indicated that the entire area had been under cultivation, and that no undisturbed sediments remained above the sterile sandy substrate. No cultural materials were found in this area.

A total of 13 shovel tests were excavated on the flat terrace east of the existing new house in the area Mr. Peter Cardinal said was used for the Diesel's garden. Most of the shovel tests were excavated in the treed area closest to the southwest edge of the terrace (see Photograph 3) since it was suspected that this area could have possibly escaped the disturbance of cultivation. No undisturbed sediments remained in the forested area or in the grassy open area, and it appears that at least on one occasion the area was cultivated up to the edge of the terrace. No cultural materials were found in the shovel tests or in the terrace side bank exposures.

No shovel testing was done in the Environmental Reserve area around the small lake, or in the poorly-drained forested area in Lot 7 at the southeast end of the development (Figure 11).

Two shovel tests were excavated in Lot 9 which is located at the northwest corner of the development (Figure 11 and Photograph 8). This lot area is very sloped and hummocky with the general slope down toward the small lake. The shovel tests revealed that the lot had been previously cultivated and that no undisturbed sediments remain above the sterile sandy substrate. No areas suitable for habitation sites are present within this lot, and no part of the lot was considered to have archaeological potential.

Lot 8 (Figure 11) which is located north of Highway 858 ranged from flat to

5.0 RECOMMENDATIONS

One archaeological site (GfPa-15) was relocated during the survey of the proposed subdivision development area. The site location was found to have been heavily disturbed and no cultural materials were found to be present in the undisturbed sediments below the surface disturbance layer. No diagnostic archaeological materials were found during the inspection of GfPa-15. The artifacts were found in a disturbed context. GfPa-15 is not considered to be significant since the artifacts found here offer little information beyond the presence of the artifacts themselves.

No other Historical Resources Sites were found during the survey. Subsequently, this study concludes that the proposed development lands do not contain significant undisturbed archaeological, palaeontological or historic resources, and that no further archaeological work is warranted for this project area.

In this regard, this report recommends that the development should proceed as planned. However, should any fossils be discovered during development, staff at the Royal Tyrrell Museum should be contacted immediately.

In conclusion, the lands within the study area are of limited archaeological potential and no further examination, collection, testing or excavation is recommended on the project lands. This recommendation is subject to approval by *Alberta Community Development*.

Ellis, Chris J. and D.B. Deller

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APPENDIX I: ARCHAEOLOGICAL SITE INVENTORY DATA FORM

14. Description (spatial extent, patterning, density and variety of remains, diagnostics and exotic material, for historic archaeological sites provide details regarding site ownership, origins, function and context)

The 1975 Site form for GfPa-15 (McCullough 1975) indicated that cultural materials were found in Mrs. Diesel's garden and on the cut bank immediately southwest of the garden. The lithic materials found during the present survey extend from the easternmost extent of the original site boundary, but are considered to be part of GfPa-15. A total of 32 quartzite flakes were found on the ground surface scattered over an area approximately 60 meters east-west by 50 meters north-south. Most of the artifacts were found on the beach or below the edge of the terrace. A total of 6 flakes were found on the surface at the location of Max Diesel's old house. Four shovel tests at this site location revealed that there were no undisturbed sediments above the sterile sandy substrate.

15. Materials observed /collected (frequencies if possible)

observed / collected	observed / collected	observed / collected
..... projectile points	..... faunal remains	..... shell
..... lithic tools	..... human remains	..... metal
.....32..... lithic debitage	..... floral remains	..... glass
..... bone tools	..... tephra	..... other, specify
..... ceramics	..... soil samples	.....
..... fire cracked rock	..... macrofossils	.....
..... charcoal	..... wood	

16. Collection Remarks (formed tools, raw materials,)

The surface finds were not collected because of the mixed nature of the sediment at this location, some of which was brought there as fill to level an old house site.

17. Collection Repository Provincial Museum of Alberta, Archaeological Survey Private collection Other

Dispositions File No.

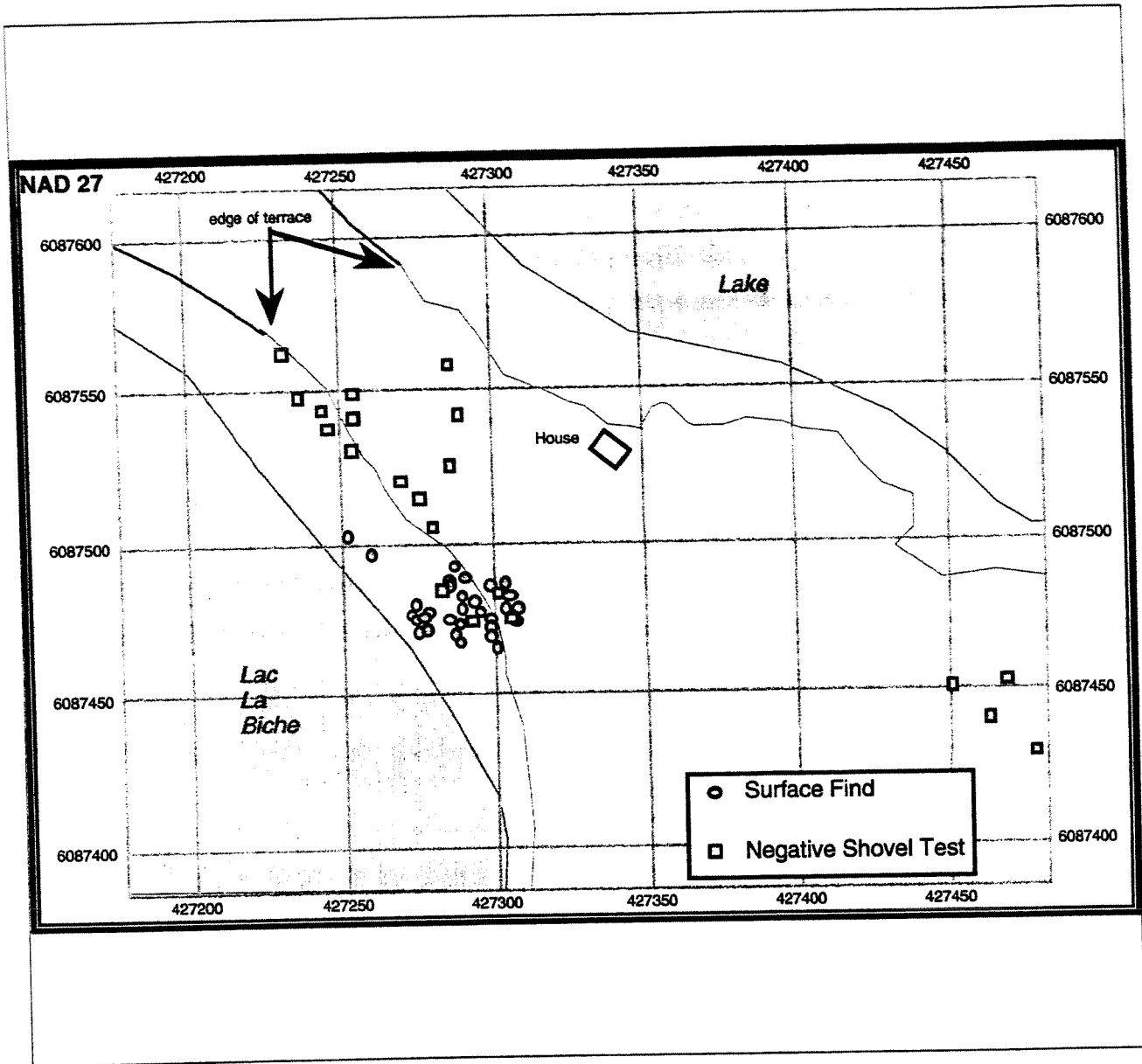
18. Photo/Images Yes No Repository Altamira Consulting Ltd.....

19. Culture Early Prehistoric Late Prehistoric Historic Other Middle Prehistoric Fur Trade/Contact Undetermined

Cultural Affiliation (Complexes, phases, traditions, projectile point types, ethnographic & ethnic groups)

20. Calendar Date (A.D./B.C.)

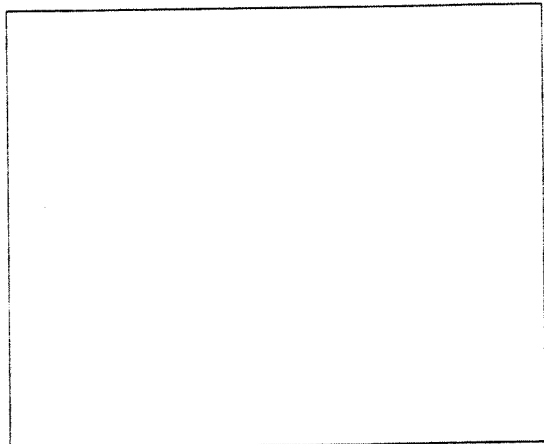
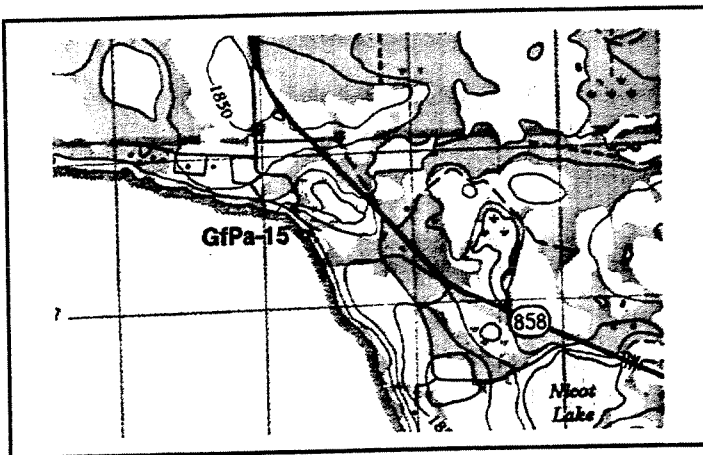
21. Radiocarbon Dates



N.T.S. 1:50,000 Map Inset

Map No.: 83.I/16 - Plamondon.....

Legend



U.T.M. NAD 27 Civilian Zone ...12U... VR..... Easting 0427250 To 0427310 Northing 6087460 To 6087510
 U.T.M. NAD 83 ...12U... VR..... Easting 0427184 To 0427244 Northing 6087677 To 6087727

4. Description (spatial extent, patterning, density and variety of remains, diagnostics and exotic material, for historic archaeological sites provide details regarding site ownership, origins, function and context)

THE SITE WAS NOT RELOCATED.

15. Materials observed /collected (frequencies if possible)

observed / collected

observed / collected

observed / collected

..... projectile points

..... faunal remains

..... shell

..... lithic tools

..... human remains

..... metal

..... lithic debitage

..... floral remains

..... glass

..... bone tools

..... tephra

..... other, specify

..... ceramics

..... soil samples

..... fire cracked rock

..... macrofossils

..... charcoal

..... wood

16. Collection Remarks (formed tools, raw materials,)

THE SITE WAS NOT RELOCATED.

17. Collection Repository Provincial Museum of Alberta, Archaeological Survey Private collection Other

Dispositions File No.

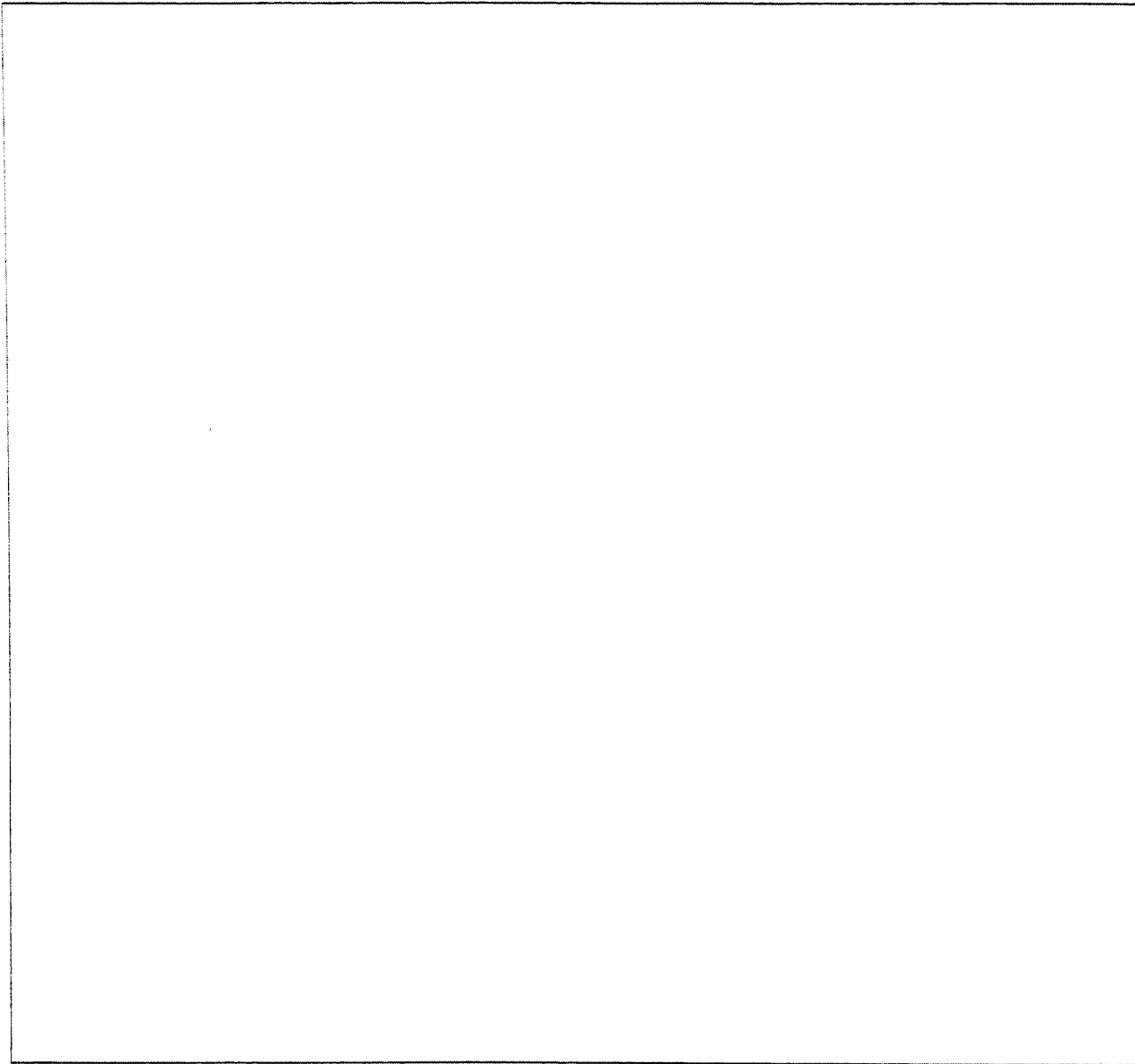
18. Photo/Images Yes No Repository Altamira Consulting Ltd.....

19. Culture Early Prehistoric Late Prehistoric Historic Other
 Middle Prehistoric Fur Trade/Contact Undetermined

Cultural Affiliation (Complexes, phases, traditions, projectile point types, ethnographic & ethnic groups)

20. Calendar Date (A.D./B.C.)

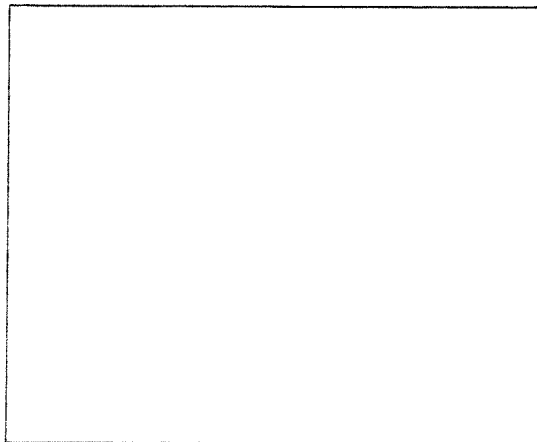
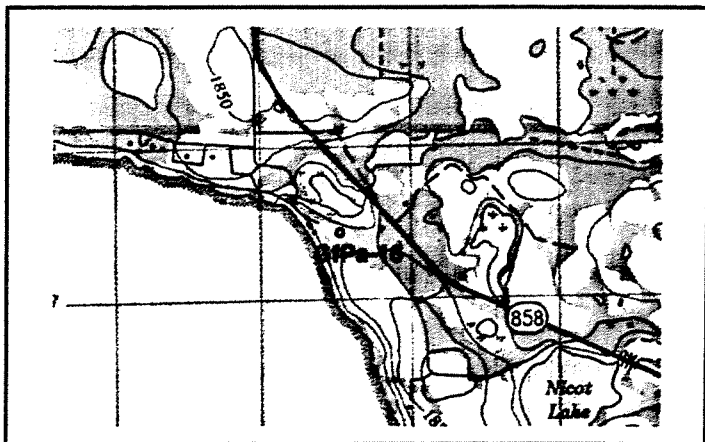
21. Radiocarbon Dates



N.T.S. 1:50,000 Map Inset

Map No.: 83.I/16 - Plamondon

Legend



U.T.M. NAD 27 Civilian Zone 12U VR Easting .0427500 To Northing .6087500 To

U.T.M. NAD 83 12U VR Easting .0427436 To Northing .6087716 To

Mr. Wayne Duplessis

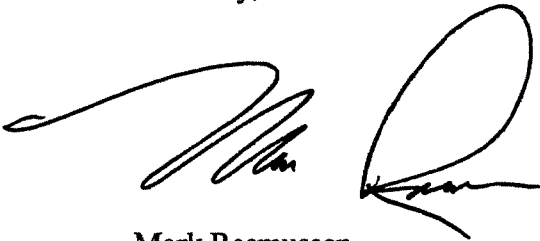
August 21, 2002

Page 2

Should you require additional information or have any questions regarding our Department's review of this project, please contact Barry Newton of the Heritage Resource Management Branch, (780-431-2330, Cultural Facilities and Historical Resources Division, Alberta Community Development, 8820 - 112 Street, Edmonton, Alberta, T6G 2P8; or Fax 780-427-3956).

On behalf of Alberta Community Development, I would like to thank you for your co-operation in our endeavour to conserve Alberta's past.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mark Rasmussen', with a large, stylized flourish on the right side.

Mark Rasmussen
Assistant Deputy Minister
Cultural Facilities and
Historical Resources Division

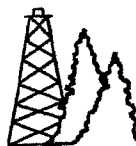
cc: Walt Kowal, Altamira Consulting Ltd.
Barry Newton, Heritage Resource Management Branch, 2002-057.FIN

**Unserviced Residential Subdivision Soils Report
NW 31-068-13-W4M**

**Prepared For DonatBerry Design Ltd.
For Viewing By: Lakeland County Subdivision Authority**

May 24, 2003

K-File: 01793



**KENTON
ENVIRONMENTAL INC.**

Box 990 Lac La Biche, Alberta T0A 2C0 Ph:(780) 623-4545 Fax :(780) 623-2626

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3.0 METHODOLOGY

3.1 Ground Water Test Holes

Water table test holes were drilled in order to evaluate the ground water table on the proposed development.

In order to determine the depth to water table, two 14 ft holes were drilled at suspected high and low water table areas on the site (See diagram in Appendix). Soils at the base of the holes were heavy gray-blue clay, which indicates anaerobic activity, and suggests the presence of the water table. Once drilled, the holes were monitored for a period of 4 days.

3.2 Percolation Test

Percolation tests were performed according to the suggestions made by Alberta Environment (Standards and Guidelines Branch et al 1998). Three percolation test holes were drilled. Each hole was 8 inches in diameter and 36 inches in depth. The holes were located on representative areas on the varying topography of the site (See Base Map in Appendix). Each hole was prepared according to the method outlined in the guidelines pg 33-3, and 33-4. Testing was conducted according to the method recommended in Alberta Private Sewage Systems Standards of Practice-1999 Handbook First Edition July, 2000 page 94 A.6. and are outlined below.

Percolation Test Procedure:

- 1) Test holes were soaked for a period of 24hrs where 18inches of water was continually added to each hole
- 2) A minimum depth of 18inches was maintained in the hole for 4 hours before percolation measurements were taken.
- 3) The water level in the hole was adjusted to 18 inches prior to starting the percolation test.
- 4) Immediately after adjustment the water level was measured from a fixed point every 30minutes using a percometer.
- 5) Water level was adjusted to 18 inches after every meter reading.
- 6) The test was continued until two successive water level drops did not vary by more than 1/8 inch or remained constant.
- 7) The last water level drop was used to calculate the percolation rate

3.3 Sodium Adsorption Ratio

It is suggested in the guidelines that Sodium Adsorption Ratio (SAR) of household water be calculated and analyzed as part of the testing procedure. SAR was not determined on site as there is no household water supply and a water supply is yet to be determined. SAR can be determined at a later date if necessary.

Unserviced Residential Subdivision Soils Report

Results of the Percolation Tests were as follows:

Table 3. Refill Percolation Test Results

<u>Percolation Test Hole #1</u>			
Trial #	Time Increment	Water Level Drop	Percolation Rate (min/inch)
1	30 min	5.00 in	6.00
2	30 min	3.75 in	8.00
3	30 min	3.50 in	8.57
4	30 min	3.25 in	9.23
5	30 min	3.25 in	9.23

<u>Percolation Test Hole #2</u>			
Trial #	Time Increment	Water Level Drop	Percolation Rate (min/inch)
1	30 min	3.50 in	8.57
2	30 min	1.875 in	16.00
3	30 min	1.75 in	17.14
4	30 min	1.75 in	17.14
5	30 min	1.75 in	17.14

<u>Percolation Test Hole #3</u>			
Trial #	Time Increment	Water Level Drop	Percolation Rate (min/inch)
1	30 min	2.00 in	15
2	30 min	1.5 in	20
3	30 min	1.5 in	20
4	30 min	1.5 in	20
5	30 min	1.5 in	20

5.0 DISCUSSION

5.1 Evaluation of Water Table

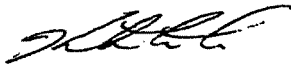
Over a monitoring period of 96 hours, no water was found in the 14 ft. water well test holes. According to the Standards and Guidelines Branch a high water table is within 8 feet (2.4m) of the ground surface. This indicates that the ground water table is very low. A low water table will not interfere with the functioning of a sewage disposal system. Risk of ground water contamination is very low.



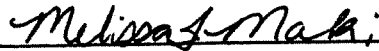
6.0 CONCLUSION

Overall, site observation and field-testing methods have provided sufficient information to determine the feasibility of specific sewage disposal treatments for the proposed unserviced subdivision.

Kenton Environmental Inc. is satisfied, that all testing performed by Kenton Environmental Employees Kenton Miller and Melissa Maki has been conducted to the specifics outlined in the following references. All procedures were conducted in a manner that would eliminate variation or inconsistency of results. Data for this report is based solely on the field assessment and the following references.



Date: May 26, 2003
Kenton Miller
President Kenton Environmental Inc.



Date: May 26, 2003
Melissa Maki, B.A.E.M
Project Supervisor



8.0 APPENDIX
Topographical Map and Base Map

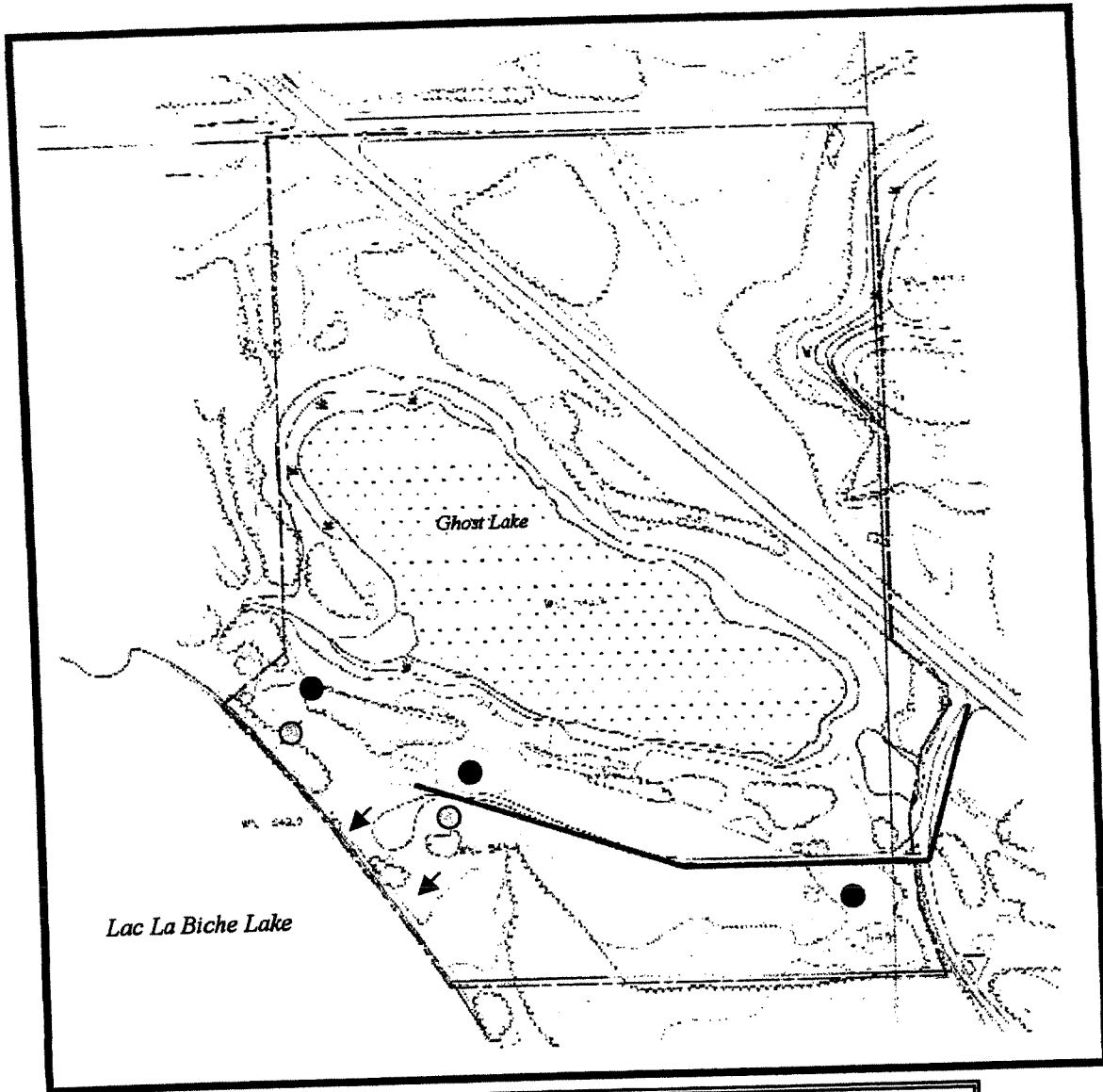


KENTON ENVIRONMENTAL INC.

Subdivision Soils Report
NW-31-68-14 W4M
K-1793
Page 8

APPENDIX


Figure 2. Base Map for the Proposed Subdivision NW Sec.31 Twp.68 Rng. 14



Legend

Percolation Test Hole	●	Existing Residence	○
Water Table Test Hole	○	Existing Road	—
Direction of slope	→		

Scale: Unknown
Note: Sketch taken from DonatBerry Design Ltd.

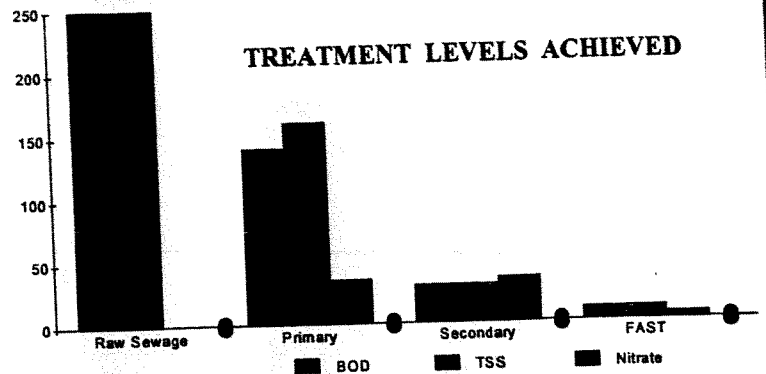


EFFLUENT QUALITY

In domestic sewage wastewater, the two (2) main characteristics often mentioned are Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS) which are expressed as being 250 mg/l respectively. The graph shows the treatment levels of the BOD and TSS from a septic tank, a secondary treatment device, or a FAST® sewage wastewater treatment plant. The FAST® has the capabilities of achieving tertiary treatment levels of:

BOD less than 10 mg/l
TSS less than 10 mg/l
Total Nitrogen 70% Reduction
Nitrate less than 5 mg/l.

Nitrate is one of the elements that can harm groundwater and aquifers that feed into or become drinking water sources and are created in septic systems from the conversion of ammonia-nitrogen. During the conversion nitrite is also created. Total Nitrogen is the sum of ammonia-nitrogen, nitrite and nitrate. The reduction of Total Nitrogen is important because the residual amounts of ammonia-nitrogen and nitrite may convert to nitrate in the environment and thereby may cause harm to drinking water resources. FAST® has the capability to reduce Total Nitrogen and thereby help protect the fresh water resource.



FAST® has the capability to reduce Total Nitrogen and thereby help protect the fresh water resource.

SERVICE / MAINTENANCE

The FAST® Sewage Treatment Plant is certified by the National Sanitation Foundation, International. As part of the certification by NSF *International* there is provided a two (2) year inspection plan at no charge with each FAST® system installed in residential applications. This inspection service is performed by the local Service Agent who is factory trained and authorized to perform the work required under the NSF *International* protocol. Contact us directly for list of the Authorized Service Agent close to you.

Service is simplicity itself. There is nothing inside to be removed, replaced, or cleaned such as submersible sewage pumps, sand, peat, fabric, or foam filters, moving parts or bubble diffusers.

SOLIDS IN SUSPENSION REMOVAL

Typically, the liquids and sewage solids in suspension will need to be removed once every three (3) years dependent on how the systems is used.

WARRANTY

Materials and Workmanship warranty is provided by BioMicrobics Inc. All residential units listed by NSF *International* have a two (2) year warranty on the air pump. Commercial, institutional and non-NSF *International* listed units have a one (1) year warranty on the air pump. The FAST® treatment module insert is manufactured from plastic that is corrosion resistant and should not ever need replacement.

APPEARANCE

The FAST® treatment plant is typically buried in ground (above ground available). At the surface you may have two 24" diameter service access green coloured lids (one for the trash chamber and one for the main treatment chamber) and one of either a 4" or 6" diameter PVC cap/vent

AIR PUMPS

The only moving and serviceable part is the air pump which is outside the FAST® located either inside the basement, crawl space, garage or outside free from flooding and snow cover. The air pump can be located up to 100 ft. away from the unit (further if necessary - contact Pinnacle) and comes with its own outdoor sound-insulated ventilated cover.

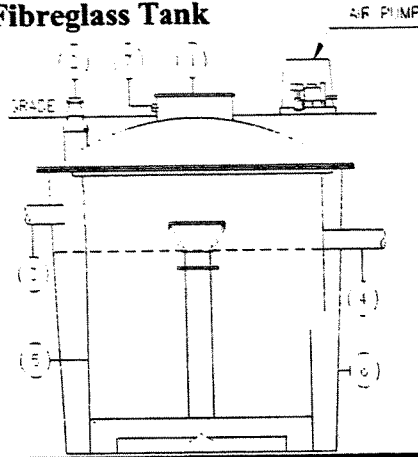
APPROVALS

The FAST® sewage treatment plant available from Pinnacle Environmental Technologies Inc. is approved for use in Provinces of British Columbia, Alberta, Saskatchewan, Manitoba, and Ontario as well as in the USA through the FAST® system's prime manufacturer, Bio-Microbics Incorporated of Kansas. The National Sanitation Foundation *International*, an independent testing agency approved by the Standards Council of Canada, has certified the FAST® under Standard 40, Class One. Electrical Components are UL, CSA and CE listed.

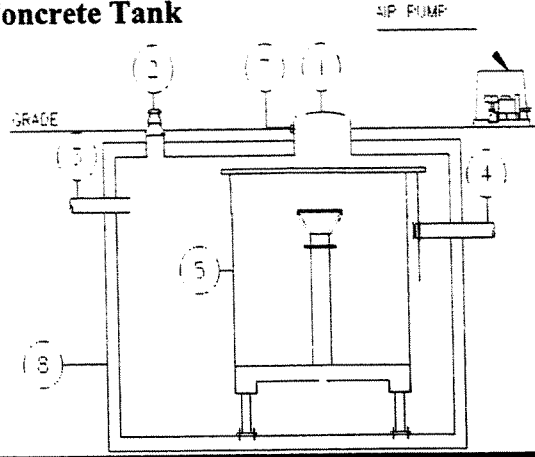
Single Chamber Tank

Single Chamber Tanks to be used on sites where there is either an existing septic tank, a trash collector tank or tank supplied by others in accordance with the volumetric working capacities detailed below. The single chamber tank is to have a minimum volumetric working capacity as detailed under the heading of "Min. Main Chamber".

Fibreglass Tank



Concrete Tank



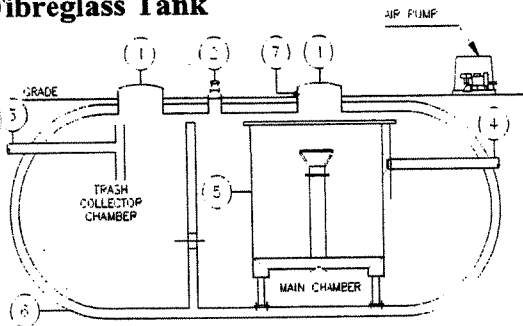
LEGEND

1. 20" dia. Access Hatch
2. 6" - 4" dia. Port for inspection, pumpout and vent
3. 4" dia. Inlet
4. 4" dia. Outlet
5. FAST® Insert Module
6. Fibreglass Tank
7. 2" diameter rubber grommet for PVC air line
8. Concrete Tank
9. Not Shown is Ultra-Violet Light Unit for Disinfection attaches to item 4

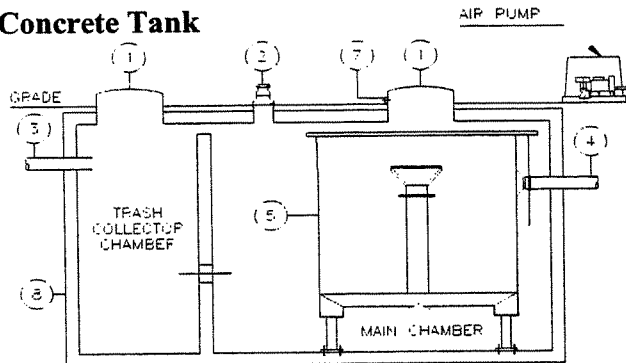
Two Chamber Tank

Two Chamber Tanks to have the volumetric working capacities detailed below for the each of the chambers, with the first chamber being the trash collector chamber and the second being the main treatment chamber.

Fibreglass Tank



Concrete Tank



	Volumetric Working Capacity		Power Requirements		Volumetric Working Capacity		Power Requirements		
	Trash Tank	Min Main Chamber	HP	VOLTS	Trash Tank	Min Main Chamber	HP	VOLTS	
FAST 0.5	1,327 - 2,841	1,704 litres	1/3	110	FAST 3.0	5,682 - 11,365	8,517 litres	1 1/2	220
FAST 0.75	1,891 - 4,320	2,839 litres	1/3	110	FAST 4.5	5,323 - 25,550	15,971 litres	2 1/2	220 / 460
FAST 0.9	1,891 - 5,114	2,839 litres	1/3	110	FAST 9.0	10,650 - 51,097	31,941 litres	5	220 / 460
FAST 1.5	2,841 - 8,525	4,259 litres	1/2	110 / 220					



Bio-Microbics, Inc.'s constant product improvement program may result in changes not included in this pamphlet.

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**BIRKILL SUBDIVISION
Area Structure Plan**

Lakeland County

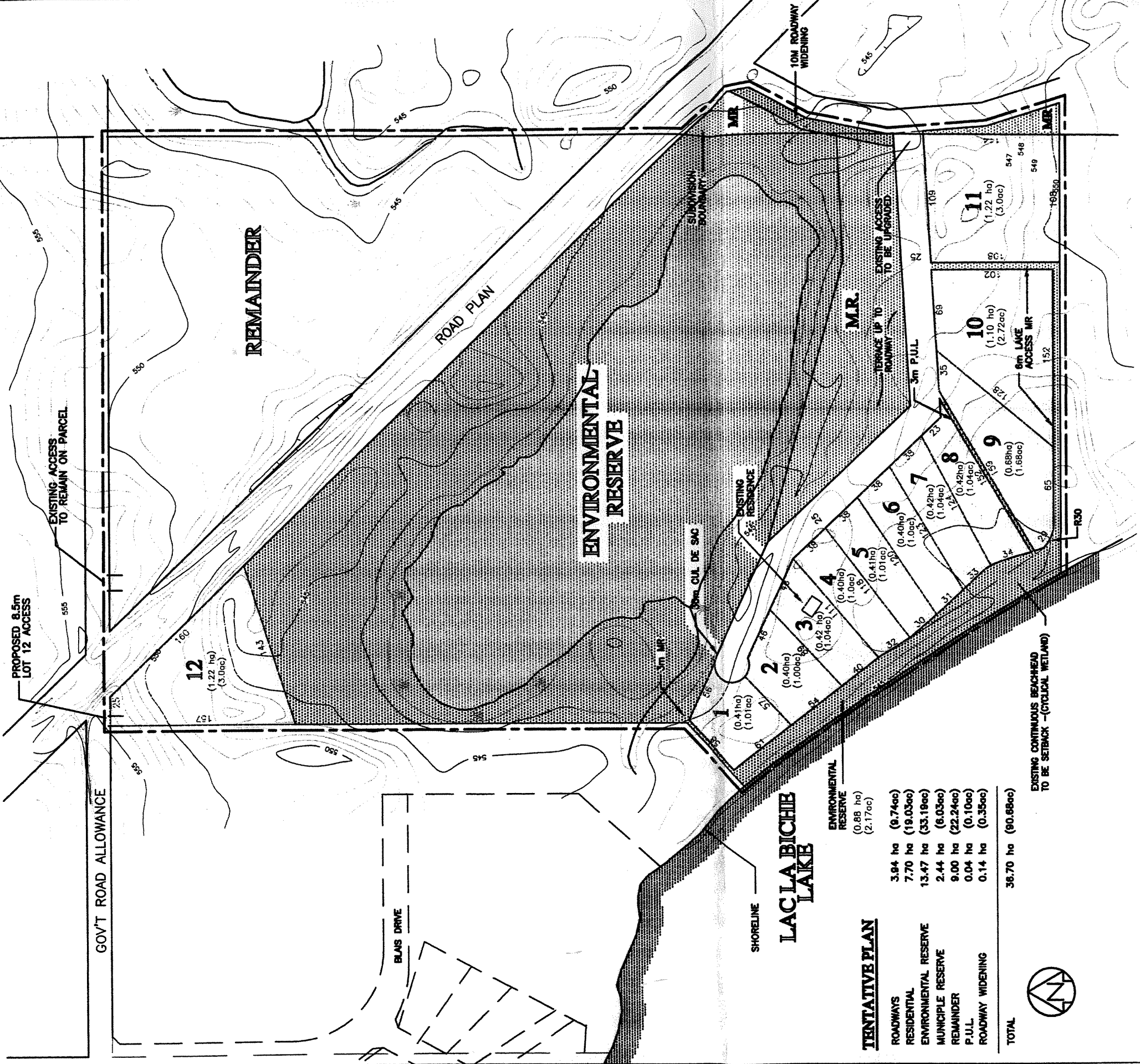
Figure 02

Existing Conditions

- SUB. Boundary
- [Stippled Box] Low Areas
- [Square with L-shape] Buildings
- [Cloud Shape] Treed area
- 0.5 Contours

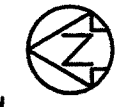
DONATBERRY DESIGN LTD.
PROJECT DESIGN & MANAGEMENT

JUNE, 2003



TENTATIVE PLAN

ROADWAYS	3.84 ha (9.74ac)
RESIDENTIAL	7.70 ha (19.03ac)
ENVIRONMENTAL RESERVE	13.47 ha (33.19ac)
MUNICIPAL RESERVE	2.44 ha (6.03ac)
REMAINDER	9.00 ha (22.24ac)
P.U.L.	0.04 ha (0.10ac)
ROADWAY WIDENING	0.14 ha (0.35ac)
TOTAL	38.70 ha (96.88ac)



- SUB. Boundary
- Residential
- ▨ Environmental Reserve
- ▩ Municipal Reserve

BIRKILL SUBDIVISION
Area Structure Plan

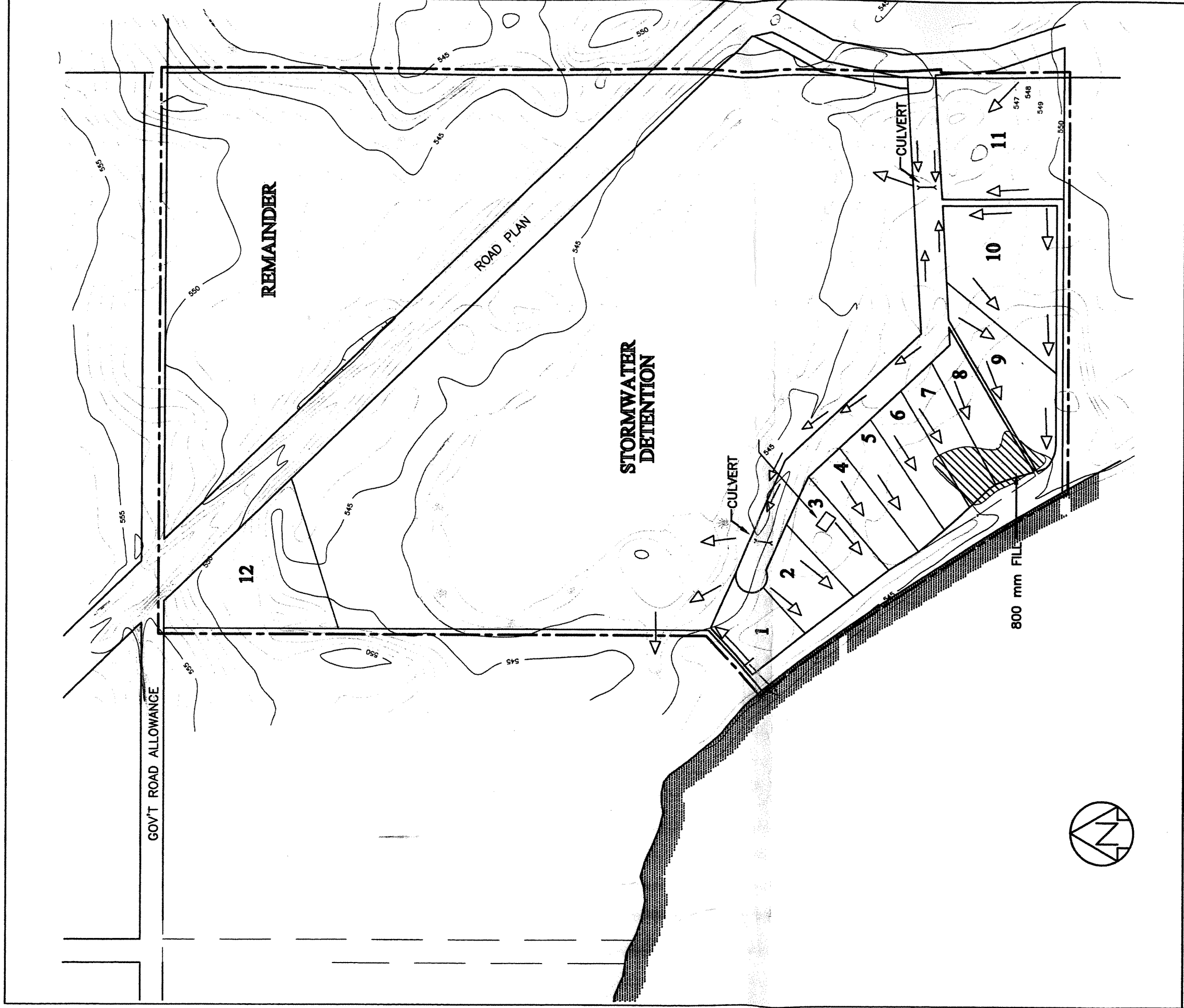
Lakeland County

Figure 03

DONATBERRY DESIGN LTD.
PROJECT DESIGN & MANAGEMENT

JUNE, 2003

Development Concept



BIRKILL SUBDIVISION
Area Structure Plan

Lakeland County

Figure 04

Proposed Drainage
 Concept

JUNE, 2003

◁ — Probable Drainage Course

DONATBERRY DESIGN LTD.
 PROJECT DESIGN & MANAGEMENT

