HISTORICAL RESOURCES
IMPACT ASSESSMENT

FINAL REPORT

GLACIER POWER LTD.
Dunvegan Hydroelectric Project
South Power Line and Access Road Revisions
(Sections 6 and 7, Twp 080, Rge 04, W6M)

PERMIT 2004-358

Prepared for
Glacier Power Ltd.
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February 2005
Glacier Power Ltd.
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Attention: Kelly Matheson

Dear Ms. Matheson

I am pleased to submit to you this report entitled *Historical Resources Impact Assessment, Glacier Power Ltd., Dunvegan Hydroelectric Project, South Power Line and Access Road Revisions (Sections 6 and 7, Twp 080, Rge 04, W6M), Permit 2004-358.*

Should you have any questions regarding this project, please do not hesitate to contact me.

Yours truly,

FMA HERITAGE RESOURCES CONSULTANTS INC.

Jeremy J. Leyden, M.A.
jl
EXECUTIVE SUMMARY

In 1999, FMA Heritage Resources Consultants Inc. conducted an Historical Resources Impact Assessment (HRIA) on lands associated with the proposed Dunvegan Hydroelectric Project. At that time, two alternate facility access routes were considered (one on the north side of the Peace River and the other to the south). Following a review of the assessment’s findings by Alberta Community Development (ACD), both of these access road routes were moved. This relocation necessitated that additional work be undertaken with regards to newly proposed southern portions of the south access road. In addition, Glacier Power’s associated transmission line right-of-way would also require assessment. These developments are located to the south of Highway 2. This work was initiated and subsequently completed in 2004 by FMA Heritage Resources Consultants Inc. This document summarises the findings of the 2004 assessment thus fulfilling all outstanding HRIA requirements.

The 2004 HRIA of the Dunvegan Hydroelectric Project south powerline and new access road right-of-way was undertaken by FMA Heritage Resources Consultants Inc. at the request of Glacier Power Ltd. The development is located in Sections 6 and 7, Township 080, Range 04, West of the Fourth Meridian. The south power line ties into Alberta Power’s 144kV transmission line and parallels an existing trail which will form the most southerly portion of the southern access road. The rights-of-way for both the realigned south power line and the additional access road segment are approximately two kilometres in length and traverse both cultivated and forested lands situated directly adjacent to the Peace River valley.

In addition to an intensive ground reconnaissance, the 2004 assessment involved the excavation of a total of nine shovel tests at targeted portions of the proposed south power line and access road development. No
new historical, paleontological or archaeological resources were identified at any point during this investigation. Based on the results of this Historical Resources Impact Assessment it is recommended that Glacier Power Ltd. be granted Historical Resources Act Clearance for the proposed Dunvegan Hydroelectric Project realignments of the south power line and access road.
# PROJECT PERSONNEL

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INTRODUCTION

At the request of Glacier Power Ltd., FMA Heritage Resources Consultants Inc. conducted an Historical Resources Impact Assessment (HRIA) for the realignment of the proposed south power line and access road rights-of-way associated with the Dunvegan Hydroelectric Project. This development is located in Sections 6 and 7, Township 080, Range 04, West of the Fourth Meridian. This study completes outstanding HRIA requirements associated with the previous HRIA completed for this project in 1999 (Fedirchuk McCullough & Associates 2000; Permit 99-111). At that time, two alternate power line and access road options (one on the north side of the Peace River and the other to the south) were considered. The south power line, tying into Alberta Power’s 144kV transmission line, is the selected option and parallels an existing trail which will form the most southerly portion of the southern access road. These new developments are located to the south of Highway 2. The rights-of-way for both the realigned south power line and the additional access road segment are approximately two kilometres in length and traverse both cultivated and forested lands situated directly adjacent to the Peace River valley.

One previously recorded site occurs adjacent to the area assessed during the current HRIA. Site GIQp-16, which was identified during the 1999 assessment, has been described as a small prehistoric artifact scatter and is located approximately 350m to the east of the proposed development area. This site has been assigned an Historical Resource Value (HRV) by Alberta Community Development (ACD) of “0” and is therefore considered to be of low overall significance. Most of the land designated for development is currently owned by the Crown, Alberta Transportation or the Fort Dunvegan Historical Society. However, the SW ¼ of section 6 is privately owned. FMA Heritage Resources Consultants Inc. completed a permit
Figure 1  Location of project area
application for the conduct of an HRIA along the proposed south access road and transmission line right-of-way. This application was approved by Alberta Community Development through permit 2004-358.

OBJECTIVES

The purpose of the HRIA was to determine the relationship between the potential archaeological resources in the development area and the nature of the proposed impacts. The primary objectives of the assessment were to:

1. inventory historical resource sites within the vicinity of the proposed south power line and access road development;
2. evaluate the significance of the individual sites identified;
3. assess the nature and magnitude of site impacts; and
4. design an acceptable site mitigation program which would significantly eliminate or mitigate adverse impacts to identified sites prior to construction.

SCOPE OF WORK

The scope of work for the Historical Resources Impact Assessment undertaken by FMA Heritage Resources Consultants Inc. consists of the following components:

1. **Record Review** - to identify previously recorded sites that could be affected by the development project, and to determine the nature of the database in the area.

2. **Ground Reconnaissance** - to relocate, in the field, historical resource sites that may have been previously recorded, as well as to identify and record any new sites within the development zone. Site discovery was based on surficial inspection of exposures and subsurface testing, using a conventional shovel testing program in areas lacking suitable exposures and in areas of high archaeological potential. Deep testing, using a backhoe or auger, may be undertaken in localities of high site potential associated with good depositional characteristics.
3. **Site Evaluation** - to evaluate the nature of the existing resource database, the quantity and quality of observable remains (e.g. site condition, content, uniqueness, and complexity) and the potential of the site to contribute to public enjoyment and education. Sites are evaluated by inspection of exposures, or by a standard shovel testing program. Additional controlled assessment may be conducted when a site is perceived to contain potentially significant cultural material. In the event that such potentially significant sites, concealed by sediments, are encountered, the need for further evaluation is satisfied through either an extensive systematic subsurface testing program or a controlled excavation program.

4. **Impact Assessment** - to delineate the magnitude of forecasted impacts to the individual identified historical resource sites, as well as the local and regional database, and to recommend site-specific mitigative measures commensurate with the assigned value of the site.
ENVIRONMENTAL SETTING

INTRODUCTION

The natural environment provides the parameters within which human cultures may develop by providing both opportunities and limitations. Elements of the regional environment are important considerations in the understanding of cultural development, as they influenced not only the types of activities that could be conducted, but the ways in which they could be accomplished. In the archaeological record, this pattern is seen in the type and location of archaeological sites in specific environments. Human populations were not uniformly distributed across the landscape, but were clustered in the most suitable habitats. In Alberta, archaeological sites are generally found associated with specific landforms (including valley edges, knolls, rivers, lakes and sloughs) which direct travel, bias routes of communication and enhance or restrict resource procurement and occupation. In order to provide a context for the archaeological interpretation of the current study, a brief overview of the regional and local environments is presented.

REGIONAL ENVIRONMENT

The proposed transmission line is located along the margin of both the Peace River Parkland Subregion of the Parkland natural region and the Dry Mixedwood Subregion of the Boreal Forest Natural Region (Alberta Environmental Protection 1994) (Figure 2). The Peace River Parkland Subregion is characterized by broad, gently rolling plains interspersed with scattered uplands. Most of the grasslands have been cultivated and only small remnants of the native cover remain. The forested regions are virtually
Figure 2  Natural Regions and Subregions of Alberta
(Alberta Environmental Protection 1994)
indistinguishable from the surrounding Mixedwood Boreal forest and are typically composed of aspen and white spruce. While Solodic soils tend to underlie the grassland areas of the parkland, grey luvisols are typical of forested regions in both the parkland and Dry Mixedwood zones. Brunisols are frequent in sandy upland areas while in wet-low lying areas gleysols are not uncommon. Climate in both subregions tends to be Boreal with short cool summers and long colder winters.

Both the Peace River Parkland and Dry Mixedwood subregions are transitional and display flora and fauna that are typical of the surrounding regions (Alberta Environmental Protection 1994). In the parkland, grassland communities may include sagewort but are usually dominated by a variety of grasses and sedges. Within forested areas, including the Dry Mixedwood zone, aspen, balsam poplar, balsam fir and white spruce are prevalent. Understory vegetation is diverse but a wide array of mosses and lichens is typical. A large number of bird species frequent forested areas within both these subregions. Mammalian fauna is typical of the surrounding areas, but some of the major species include moose, black bear, grey wolf, lynx and a variety of mustelids (Alberta Environmental Protection 1994).

PROJECT ENVIRONMENT

The proposed realignment of the south power line and the associated segment of new access road form part of the larger Glacier Power Ltd. Dunvegan Hydroelectric Project and are located along the southern terraces of the Peace River valley. The most southern portions of the proposed development route are situated along a gently sloping, cultivated plain consisting largely of pastureland (Plate 1). This region is heavily disturbed. The remaining forested areas are located north towards the Peace River and cover the majority of the study area (Plate 2). Within this zone, the western margins of the proposed right-of-way are disrupted by a gravel road and associated ditching. While the eastern portions appear undisturbed, the land grades markedly towards the river.
Plate 1  Pastureland in the south of the development area. General view north.

Plate 2  Forest to the north of the development area. General view west.
valley. (Plate 3). In general, the upper banks of a significant water source such as the Peace River, possess a high potential for historical resources sites.

The soils underlying the project area vary somewhat (Plate 4). In the southern portions of the undisturbed forest, a topsoil layer (0-10 cm below surface) occurs above a brown sandy silt (10-25cm BS). This eventually gives way to a base of brown/grey clay (25+ cm BS). Moving north towards the river, the clay content of the soils appears to diminish and gravels begin to show in the lower horizons (25+ cm BS).
Plate 3  View looking north, showing the grade of the study area.

Plate 4  Soil profile from a shovel test in the forested part of the project area.
HISTORICAL RESOURCES

DEFINITION

In Alberta, historical resources are protected under the Alberta Historical Resources Act (RSA 2000) and are defined as precontact, historic, and palaeontological sites and their contents. Cultural landscapes and traditional use sites may also be associated with historical resources. Precontact sites are comprised of artifacts, features, and residues of native origin. They predate the arrival of Europeans and are typically characterized by modified bone and stone artifacts, as well as stone features or structures. Historic sites are characterized by structures, features, and objects of European influence. Buildings and building remains represent the most prominent type of historic sites. Palaeontological sites are areas where fossils of ancient animals or plants have been preserved. Palaeontological sites include only those sites which contain fossils of multicellular invertebrates, vertebrates, and plants. Traditional use sites are identified in consultation with members of aboriginal communities and may include camping or hunting locales, plant collection locations or areas related to matters of a spiritual nature.

POTENTIAL IMPACTS

Due to the fact that precontact archaeological, historical, palaeontological and traditional land use sites represent discrete episodes of past activities, they are non-renewable and, therefore, are susceptible to alteration or removal by modern industrial development. Precontact and historic archaeological resources are comprised of residues of past cultures or societies. Although the cultural entities responsible for deposition of the archaeological material are unavailable for observation, the preserved context
and associations in which the remains functioned can reveal many clues about past human behaviour, adaptations and relationships to the natural world. The key to the interpretation of these resources, however, is in their pattern of cultural deposition, which is extremely fragile, ephemeral, and the product of unique processes and conditions of preservation. Consequently, once they are disturbed, they cannot be replaced, re-created or restored. Due to the nature of their origin and preservation, archaeological resources are finite in quantity. As a result, archaeological resources are increasingly susceptible to destruction and depletion through natural and cultural disturbances.
METHODOLOGY

RECORD REVIEW

The record review consisted of a search of the Archaeological Site Inventory Data records maintained by the Heritage Resource Management Branch (Alberta Community Development).

GROUND RECONNAISSANCE

The ground reconnaissance consisted of a pedestrian traverse and intensive visual examination of the power line and access road. All fortuitous exposures such as deflated areas, rodent disturbances, track surfaces and previous construction disturbances were examined for evidence of cultural material. Visual inspection of these areas was considered adequate for assessing the presence of near surface cultural remains. Excavation of shovel tests (approximately 40 x 40 centimetres) was conducted in areas of limited exposure or in areas deemed to have potential for buried cultural deposits. The depth of each shovel test varied according to local soil conditions.

At identified sites, a shovel testing program is typically implemented to determine whether additional buried cultural material is present. The shovel testing program generally consists of four 40 x 40 centimetre tests to determine the presence, nature and depth of cultural materials. A representative sample of surface cultural material is collected from each identified site where cultural material was observed. All materials recovered from shovel tests are retained. These items are bagged as distinct provenience units.
RESULTS

RECORD REVIEW

A review of the site inventory data records revealed eight archaeological sites that have been previously recorded within the legal sections in which this project occurs. Most of these are located on the north side of the river and are associated with Fort Dunvegan and the Historic Dunvegan settlement. Nevertheless, one previously recorded site does occur adjacent to the proposed power line and road right-of-way. Site GIQp-16, has been described as a small prehistoric artifact scatter and is located approximately 350m to the east of this area. The recovered materials consisted of two pieces of lithic debitage and were found along a small dirt foot trail. Given the surficial nature of the finds and their proximity to the of a disturbance (foot trail) this site has been assigned an HRV value of “0” and is considered to be of low overall significance.

GROUND RECONNAISSANCE

The ground reconnaissance portion of the HRIA for the south power line and access road revisions was undertaken by Jeremy Leyden, M.A., and Patricia Andres, B.A., of FMA Heritage Resources Consultants Inc. The assessment was conducted under frost-free and snow-free conditions in September of 2004. All fortuitous exposures, such as rodent burrows, vehicle tracks and disturbance from previous development activities were examined for the presence of cultural materials. In areas of limited exposure, deep sediments or high archaeological site potential, the surface examination was supplemented by shovel tests to evaluate the presence and/or nature of subsurface cultural deposits (Figure 3). At the time of the reconnaissance,
Figure 3  Reconnaissance Strategy
the power line right-of-way was not marked along its projected proposed route. Nevertheless, the boundaries and projected course for the transmission line right-of-way was discernable using existing land marks in conjunction with plan maps provided by the client. The new segment of the south access road was clearly visible. Although the existing trail was traversed, the area was clearly disturbed and no further assessment was required.

No cultural materials were observed during the investigation of the proposed south power line and new access road segment. Surface visibility was variable, ranging from moderate in the drier cultivated areas (Plate 5) to moderately poor in forested or overgrown regions exhibiting significant surface moisture (Plate 6). The examination of the most southerly regions assessed during this HRIA was expedited given the obvious impact of agricultural activity. This disturbance consisted primarily of localized cultivation along with the disruption caused by cattle grazing and the activities of rodents and badgers. A total of 9 shovel tests were excavated over the course of this investigation, one in the cultivated regions and eight within the forested tracts to the north (Figure 4). No cultural materials were observed within any of the shovel tests. Despite road development to the west associated with Highway #2, much of the forested portions along the power line right-of-way appeared to be largely undisturbed. Nevertheless, the associated slope along the southern wall of the Peace River valley limits the archaeological potential of the transect.

In summary, the ground reconnaissance of the areas investigated did not result in the identification of any newly recorded archaeological sites. No new historical resources of any kind were observed over the course of these investigations.
Plate 5  Ground coverage across the southern portion of the study area.

Plate 6  Ground coverage across the northern portion of the study area.
Figure 4  Sketch map of the development area.
SUMMARY AND RECOMMENDATIONS

At the request of Glacier Power Ltd., FMA Heritage Resources Consultants Inc. conducted an Historical Resources Impact Assessment (HRIA) for the realignment of the proposed south power line and access road rights-of-way associated with the Dunvegan Hydroelectric Project. This development is located in Sections 6 and 7, Township 080, Range 04, West of the Fourth Meridian. This study completes outstanding HRIA requirements associated with the previous HRIA completed for this project in 1999 (Fedirchuk McCullough & Associates 2000; Permit 99-111). At that time, two alternate power line and access road options (one on the north side of the Peace River and the other to the south) were considered. The south power line, tying into Alberta Power’s 144kV transmission line, is the selected option and parallels an existing trail which will form the most southerly portion of the southern access road. These new developments are located to the south and east of Highway 2. The rights-of-way for both the realigned south power line and the additional access road segment are approximately two kilometres in length and traverse both cultivated and forested lands situated directly adjacent to the Peace River valley.

In addition to an intensive ground reconnaissance, a total of nine shovel tests were excavated at targeted points along the proposed south power line and access road routes. No new historical resources of any kind were observed over the course of these investigations. Based on the results of this Historical Resources Impact Assessment it is recommended that Glacier Power Ltd. be granted Historical Resources Act Clearance for the proposed Dunvegan Hydroelectric project realignment of the south power line and south access road.
REFERENCES CITED

Alberta Community Development

Alberta Environmental Protection

Fedirchuk McCullough and Associates Ltd.