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Mining & Minerals Division  
BC Geological Survey

Assessment Report  
Title Page and Summary

TYPE OF REPORT [type of survey(s)]: PROSPECTING/GEOCHEMICAL SAMPLING

TOTAL COST: 50,009.99

AUTHOR(S): Patrick Kluczny, P.Geol.

SIGNATURE(S):

William Miller, Geol.I.T.



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YEAR OF WORK: 2010

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PROPERTY NAME: MQ Property, Bonanza Lake Property, Nimpkish Property

CLAIM NAME(S) (on which the work was done): NIM 14-22, NIM 4-5, MQ EAST, MQ WEST, MQ CENTRAL, MQHR

COMMODITIES SOUGHT: Limestone

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: Nanaimo

NTS/BCGS: 92L07, 92L10, 92L11

LATITUDE: 50 ° 27 '19 " LONGITUDE: 126 ° 56 '06 " (at centre of work)

OWNER(S):

1) Graymont Western Canada Inc.

2)

MAILING ADDRESS:

260, 4311 - 12 Street NE

Calgary, AB. T2E 4P9

OPERATOR(S) [who paid for the work]:

1) Graymont Western Canada Inc.

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MAILING ADDRESS:

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PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):

Carbonates, limestone, Triassic, Vancouver Group, Quatsino Formation

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS: 2010: Ass. Rpt. 31443;

2009: Ass. Rpt. 30565; 2000: Ass. Rpt. 26386; Ass. Rpt. 26136

TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
<b>GEOLOGICAL (scale, area)</b>			
Ground, mapping	_____	_____	_____
Photo interpretation	_____	_____	_____
<b>GEOPHYSICAL (line-kilometres)</b>			
<b>Ground</b>			
Magnetic	_____	_____	_____
Electromagnetic	_____	_____	_____
Induced Polarization	_____	_____	_____
Radiometric	_____	_____	_____
Seismic	_____	_____	_____
Other	_____	_____	_____
<b>Airborne</b>			
_____	_____	_____	_____
<b>GEOCHEMICAL (number of samples analysed for...)</b>			
Soil	_____	_____	_____
Silt	_____	_____	_____
Rock	_____	_____	_____
Other	_____	_____	_____
<b>DRILLING (total metres; number of holes, size)</b>			
Core	_____	_____	_____
Non-core	_____	_____	_____
<b>RELATED TECHNICAL</b>			
Sampling/assaying	_____	_____	_____
Petrographic	_____	_____	_____
Mineralographic	_____	_____	_____
Metallurgic	_____	_____	_____
<b>PROSPECTING (scale, area)</b>			
_____	_____	_____	_____
<b>PREPARATORY / PHYSICAL</b>			
Line/grid (kilometres)	_____	_____	_____
Topographic/Photogrammetric (scale, area)	_____	_____	_____
Legal surveys (scale, area)	_____	_____	_____
Road, local access (kilometres)/trail	_____	_____	_____
Trench (metres)	_____	_____	_____
Underground dev. (metres)	_____	_____	_____
Other	_____	_____	_____
		<b>TOTAL COST:</b>	_____

**BC Geological Survey  
Assessment Report  
31663**

**GRAYMONT WESTERN CANADA INC.**  
**2010 EXPLORATION AND FIELDWORK  
ON THE MQ, NIMPKISH AND BONANZA LAKE PROPERTIES**  
**NORTHERN VANCOUVER ISLAND, BRITISH COLUMBIA**  
Nanaimo Mining Division

NIM 4, 5, 14-22  
MQ EAST, MQ WEST, MQ CENTRAL, MQHR

Geographic Coordinates  
50°24' N to 50°37' N  
126°48' W to 127°26' W

NTS Sheets 92 L/7, 10, 11

Owner & Operator: Claims NIM 4,5, 14-22; MQ EAST, MQ WEST, MQ CENTRAL, MQHR  
Graymont Western Canada Inc.  
260, 4311 - 12 Street NE  
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Date Submitted: September 17, 2010



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## **1. INTRODUCTION**

Examination of the Nimpkish Lake area for high-calcium limestone commenced in 1993. Based on this exploration, Ecowaste Industries Ltd. (Ecowaste), a wholly-owned subsidiary of Graymont Western Canada Inc. (Graymont), acquired claims in 1993, 1994, and 1999. Claims NIM 1, and NIM 4 to 13, were staked to cover high-calcium limestone deposits of the Quatsino Formation east of Nimpkish Lake. Exploration in the 1990's included surface mapping and sampling, and a ground magnetometer survey. A drill program was conducted in 2000, involving the completion of 22 drill holes. Following a period of relative inactivity, Graymont staked additional claims, NIM 14 and 15, in the Fall of 2007, and NIM 16 in the Spring of 2008. Due to promising results obtained in a sampling program conducted in May of 2008, claims NIM 17 and 18 were staked in July, 2008. Following another successful exploration program conducted in the Fall of 2008, the Bonanza Lake Property was staked, comprised of claims NIM 19 through 22. Following promising exploration results in both the Nimpkish and Bonanza Lake areas, the "MQ" claims were staked in June 2009 to cover exposures of Quatsino Formation along Highway 19, between Port Hardy and Port McNeill. In addition, all of the Ecowaste claims were converted to the property of Graymont in 2007 for consistency of their B.C. properties.

Dahrouge Geological Consulting Ltd. (Dahrouge) and Graymont carried out an exploration program on the MQ, Nimpkish, and Bonanza Lake claims from June 7 to 17, 2010. A total of 75 samples were collected and analyzed to further test the limestone quality in the Nimpkish and Bonanza Lake areas, as well as initially test the MQ claims. On the MQ claims, a significant amount of time was spent outlining outcrop areas and access roads, and identifying the frequency and concentration of Tertiary dykes within and near the property. This report describes the 2010 exploration and provides an interpretation of the results. The 2010 exploration was authorized by Bob Robison of Graymont Western Canada Inc.

Three statements of work have been filed with respect to the exploration described in this report (event numbers 4700831, 4700911, and 4700972).

### **1.1 GEOGRAPHIC SETTING**

#### **1.1.1 Location and Access of the MQ, Nimpkish and Bonanza Lake Claims**

The MQ, Nimpkish, and Bonanza Lake properties are within the Insular Belt near the northern end of Vancouver Island, southwestern British Columbia. The MQ claims lie approximately 19 km west-northwest of Port McNeill and 15 km southeast of Port Hardy to the north and west of

Highway 19. The Nimpkish claims lie along the northeastern shore of Nimpkish Lake, about 48 km southeast of the town of Port Hardy, 18 km south-southeast of the town of Port McNeill, and less than 10 km southwest of Beaver Cove (Fig. 1.1) The Bonanza Lake claims lie east of Nimpkish Lake and south of Beaver Cove, about 55 km southeast of the town of Port Hardy, 23 km southeast of the town of Port McNeill, and 8 km south of Beaver Cove (Fig. 1.1).

Port Hardy, with a population of about 5,000, is approximately 450 km from Victoria via Highways 1 and 19 (Fig. 1.2). Port Hardy is serviced by daily air transport from Vancouver and has facilities and services expected for a community of its size. The regional economy, and that of the local communities, is primarily based on lumber, fishing, and tourism.

Port McNeill, with year-round facilities, is about 40 km southeast of Port Hardy via Highway 19. It is located on Broughton Strait, near the north end of the inside passage of Vancouver Island. It has a population of about 2,700 and is a service centre for the forestry and fishing industries, with several motels and restaurants.

From Port McNeill, the MQ Property is accessed by driving westerly on Highway 19 (Island Highway), for about 10-15 km, at which point a network of logging roads criss-cross the property, some of which are maintained year-round. The logging roads generally parallel the highway and trend east-west, providing excellent access throughout the claim group. The logging roads are owned and maintained by Western Forest Products (WFP); although access is not restricted, it is highly recommended that WFP be contacted prior to the utilization of these roads.

The Nimpkish Lake Property is accessed by driving easterly and southeasterly along paved Highway 19. About 30 km easterly and southerly from the Port McNeill turnoff along Highway 19, a gravel logging road spurs off to the east. The slightly overgrown road crosses the railroad tracks and merges into Noomas Road, currently a maintained logging road, just north of Noomas Creek. A network of logging roads provide access throughout the southern part of the Nimpkish Property. Many of the decommissioned roads are inaccessible by truck but provide access via ATV's or hiking. The current network of logging roads generally grade less than 8 percent. The northeastern part of claim NIM 17 may be reached by turning east onto the Beaver Cove Road towards Telegraph Cove, about 12 km south along Highway 19 from the Port McNeill turnoff. Approximately 11 km from the Highway, a gravel logging road provides southern access at a T-intersection. A southwesterly fork, about 1 km along the gravel road, roughly parallels the railway tracks and provides access to claim NIM 17. Many other logging roads and spurs in the area do not reach the property but provide excellent access for regional exploration.

The Bonanza Lake Property is also accessed by driving easterly and southeasterly along paved



Highway 19. About 8 km from the Port McNeill turnoff along Highway 19, Beaver Cove Road turns east towards Telegraph Cove. Approximately 11 km from the Highway along Beaver Cove Road, a gravel logging road provides southern access at a T-intersection. A southeasterly fork, about 1 km along the gravel road, roughly parallels the railway tracks and provides access to claim NIM 20. In addition, there are abundant logging roads and spurs that provide excellent access to the claims and surrounding area.

The network of logging roads that traverse the Nimpkish and Bonanza Lake properties, and the surrounding area, are owned and maintained by Western Forest Products Ltd. and Lemare Lake Logging. Access to the roads and other surface rights are not restricted; however, contacting the companies prior to utilizing the roads is highly recommended.

### **1.1.2 Topography, Vegetation and Climate**

Topography in the Nimpkish and Bonanza Lake areas is characterized by north-trending ridges and knobs of moderate relief cut by small valleys (Fig.'s 1.3 & 1.4). Elevations in the Bonanza Lake claims range from 20 m along Tsulton River up to about 860 m within claim NIM 21. Many of the ridges have been clear-cut logged within recent years. Topography in the MQ area is characterized by discontinuous knobs and ridges of low relief. Elevations in the MQ claims range from 0 m along the coast up to approximately 130 m along Island Highway 19. Most of the MQ area, and much of the Nimpkish and Bonanza Lake areas, have been logged within the last 50 years. Portions that have been logged more than 10 years ago are covered by decomposing slash and a very thick cover of secondary growth. The remainder of the properties are covered with mature forest. Forest vegetation is variable and consists of tall stands of Alder, Balsam, Cedar, Hemlock, Douglas Fir, Poplar, and Spruce. Spruce and Cedar are predominant in areas of lower relief with poor drainage, while Douglas Fir and Hemlock are more common in areas with well developed drainage. Tree cover is widely spaced with fairly open undergrowth. Near impenetrable underbrush is formed locally by Alder and Salal, or by immature Cedar and Spruce in areas of recent logging.

The area is considered part of the coastal rainforest climatic zone with generally mild and wet conditions. Temperatures rarely exceed 25°C during summer months and less than -20°C during winter months. Precipitation is considered heavy throughout the region, with average annual precipitation of 180 cm. Most precipitation occurs during winter months, however heavy and prolonged rainfall during summer months is not uncommon.

## 1.2 PROPERTY

The MQ Property consists of a total of 4 contiguous claims, MQ East, MQ West, MQ Central, and MQHR (Table 1.1, Fig. 1.5). The claims were staked in June, 2009 through the BC Mineral Titles online staking system.

**TABLE 1.1: LIST OF MQ CLAIMS**

Claim Name	Tenure Number	Record Date	Current Expiry Date	Expected Expiry Date
MQ EAST	606666	2009 06 29	2010 06 29	2012 12 31
MQ WEST	606667	2009 06 29	2010 06 29	2012 12 31
MQ CENTRAL	606668	2009 06 29	2010 06 29	2012 12 31
MQHR	606670	2009 06 29	2010 06 29	2012 12 31

The Nimpkish Property consists of a total of 16 contiguous claims (Table 1.2, Fig. 1.6). In 1993 and 1994, claims NIM 6, 9, and 10 were staked as two-post claims, and claims NIM 1, 4, 5, 7, and 8 were staked as four-post claims. In 1999, NIM 11 and 12 were staked as two-post claims and NIM 13 was staked as a four-post claim.

Claims NIM 14 to 18 were acquired in 2007 and 2008 through the BC Mineral Titles online staking program.

**TABLE 1.2: LIST OF NIMPKISH CLAIMS**

Claim Name	Tenure Number	Record Date	Current Expiry Date	Expected Expiry Date
NIM 1	322208	1993 10 22	2012 12 31	2012 12 31
NIM 4	322209	1993 10 23	2011 12 31	2012 12 31
NIM 5	322210	1993 10 23	2011 12 31	2012 12 31
NIM 6	322216	1993 10 20	2012 12 31	2012 12 31
NIM 7	322211	1993 10 23	2012 12 31	2012 12 31
NIM 8	322212	1993 10 23	2012 12 31	2012 12 31
NIM 9	322217	1993 10 18	2012 12 31	2012 12 31
NIM 10	323507	1994 02 08	2012 12 31	2012 12 31
NIM 11	372022	1999 09 10	2012 12 31	2012 12 31
NIM 12	372021	1999 09 10	2012 12 31	2012 12 31
NIM 13	372695	1999 10 22	2012 12 31	2012 12 31
NIM 14	569579	2007 11 07	2011 12 31	2012 12 31
NIM 15	569581	2007 11 07	2011 12 31	2012 12 31
NIM 16	580078	2008 04 01	2011 12 31	2012 12 31
NIM 17	588721	2008 07 22	2011 12 31	2012 12 31
NIM 18	588722	2008 07 22	2011 12 31	2012 12 31

The Bonanza Lake Property consists of a total of 4 contiguous claims, NIM 19-22 (Table 1.3, Fig. 1.6). The claims were staked in February, 2009 through the BC Mineral Titles online staking system.

**TABLE 1.3: LIST OF BONANZA LAKE CLAIMS**

<b>Claim Name</b>	<b>Tenure Number</b>	<b>Record Date</b>	<b>Current Expiry Date</b>	<b>Expected Expiry Date</b>
NIM 19	598752	2009 02 05	2011 12 31	2012 12 31
NIM 20	598753	2009 02 05	2011 12 31	2012 12 31
NIM 21	598754	2009 02 05	2011 12 31	2012 12 31
NIM 22	598755	2009 02 05	2011 12 31	2012 12 31

### 1.3 HISTORY AND PREVIOUS INVESTIGATIONS

In 1993, Dr. Stanley Krukowski of Continental Lime Inc. recognized the potential for deposits of high-calcium limestone within the vicinity of Nimpkish Lake. Several claims were staked on the northeast side of Nimpkish Lake in the latter part of 1993. Subsequently, 104 samples (Krukowski, 1993) were collected from the extensive network of roads within the western part of the property and several in the vicinity of Noomas rail crossing.

In 1999, a total of 125 surface samples were collected from 17 sample sections and an area of approximately 7 km<sup>2</sup> was geologically mapped at a scale of 1:7,500. Additional work during 2000 included 22 NQ-sized diamond drill holes, totalling 2,464.3 metres, to assess the quarriability of the Centre Ridge area on the NIM 4 claim. As Dahrouge and Pana (2000) and Gidluck and Stabb (2000) provide detailed descriptions of the exploration and results, the information is not repeated herein. In 2008, the Nimpkish Claims were explored again, including some initial prospecting of the eastern (Bonanza) belt of Quatsino Formation (Klarenbach and Kluczny, 2009). Finally, in 2009, the Bonanza Lake Claims were prospected in detail and the initial results compared to the Nimpkish Claims (Klarenbach and Kluczny, 2010).

### 1.4 PURPOSE OF WORK

The work on the MQ Property described in this report was undertaken to gather initial information on the quality and extent of limestones in the area along Highway 19 between Port Hardy and Port McNeill. Outlining outcrop areas and access roads, and identifying Tertiary dykes were secondary objectives.

The work on the Nimpkish and Bonanza Lake properties described in this report was

undertaken as a followup to exploration in the Nimpkish and Bonanza Lake areas to provide additional information on the quality and extent of limestone within and surrounding these areas. Identifying the presence and quantity of Tertiary dykes was a secondary objective.

## **1.5 SUMMARY OF WORK**

In June 2010, Dahrouge Geological Consulting Ltd. and Graymont Western Canada Inc., conducted exploration for carbonate lithotypes within and surrounding the MQ, Nimpkish and Bonanza Lake properties. Exploration on the MQ Property consisted of acquiring rock samples from throughout the area for comparative purposes, outlining outcrops and potential access roads, and identifying the concentration and frequency of Tertiary dykes. Exploration on the Nimpkish and Bonanza Lake properties consisted of detailed rock sampling in under-explored areas of those properties.

A total of 75 samples were examined and collected at more than 44 locations from the MQ, Nimpkish and Bonanza Lake claims (Fig.'s 1.3 & 1.4). Twenty-six samples were collected from the MQ claims, 33 from the Nimpkish claims, and 16 from the Bonanza Lake claims. Samples were collected by chipping outcrops perpendicular to defined or assumed bedding. Bedding was commonly difficult to see due to the very-fine-grained homogeneous nature of the limestone. Where bedding was uncertain or had been obscured by structure, stratigraphic thicknesses were calculated using orientations from adjacent units. Where more than one bedding orientation was measured, the mean orientation was used.

Geological observations were recorded, including lithologic information, measurements of structural elements, and other pertinent details (Appendix 4). A solution of 6% HCl was used to assess carbonate quality in the field. Samples were shipped to Graymont's lab in Salt Lake City, Utah for preparation and analyses by standard ICP techniques, and LOI. Analytical procedures are described in Appendix 2 and assay sheets are provided in Appendix 3.

Field maps were completed on 1:10,000 and 1:20,000 scale map sheets and concentrated on the MQ, Nimpkish and Bonanza Lake claims. A magnetic declination of 18½° east was used. Areas with abundant or highly concentrated Tertiary dykes were noted.

Personnel were based in a motel in Port McNeill. Access to and from the property was by a rented four-wheel-drive vehicle. Access throughout the properties was by SUV where possible, and by hiking where necessary. Notes were compiled regarding access and current road status, as roads in the area are commonly rehabilitated and overgrown or reactivated for logging purposes.

## 2. REGIONAL GEOLOGY

The Insular Belt of the Pacific Margin comprises several discrete terranes of disparate origin, the largest of which are Alexander and Wrangellia terranes (Gabrielse et al., 1991). The Wrangellia Terrane is a complex of Paleozoic through Cenozoic volcanic arc, oceanic, and clastic wedge assemblages comprising the modern Pacific Continental Margin from Vancouver Island northward to Queen Charlotte Islands. It is disrupted by northwesterly trending, dextral, transcurrent faults, westerly verging thrust faults, plutonic rocks, and anticlinoria.

Within the Insular Belt of southwestern British Columbia, high-calcium limestone has been noted in the Mount Mark Formation of the Sicker Group, and the Quatsino and Parsons Bay formations of the Vancouver Group (Table 2.1).

**TABLE 2.1** **STRATIGRAPHY OF**  
**THE NORTHERN PART OF VANCOUVER ISLAND \***

Period	Stratigraphic Unit			
	Group	Formation	Lithology	Approx. Thick. (m)
Tertiary	-	Tertiary Volcanics and Sediments		305
	-	Tertiary Intrusions	quartz diorite	-
Cretaceous	Nanaimo		clastics, coal	125
	Queen Charlotte		clastics, coal	305 - 1050
	-	Longarm Formation	clastics	60 - 400
	-	Pacific Rim Sequence	clastics	-
Jurassic	-	Island Intrusions	granitic intrusives	-
	Triassic	Vancouver	Bonanza	volcanics
Harbledown			clastics and tuffs	
Parsons Bay <sup>1</sup> - Sutton			calcareous clastics and limestone	305 - 710
Quatsino <sup>2</sup>			limestone	30 - 750
Karmutsen			volcanics	3000 - 6100
Sediment Sill Unit	clastics and volcanics	750		
Pennsylvanian	Buttle Lake <sup>o</sup>	Mount Mark (Buttle Lake)	limestone	215

\* Modified after Muller et al. (1974) and Fischl (1992)

<sup>o</sup> Formerly of the Sicker Group (Massey and Friday, 1988)

<sup>1</sup> Equivalent to the Sutton Formation of western Vancouver Island (Jeletzky, 1970)

<sup>2</sup> In part, previously mapped as Sutton Formation on southern Vancouver Island and equivalent to the Marble Bay Formation of Texada Island (Fischl, 1992)

## 2.1 STRATIGRAPHY

### 2.1.1 Mount Mark (Buttle Lake) Formation

The Pennsylvanian Mount Mark Formation of the Buttle Lake Group (Massey and Friday, 1988) conformably overlies and grades into the Cameron River Formation of the Sicker Group (Table 2.1). The Mount Mark Formation is equivalent to the Buttle Lake Formation (Massey and Friday, 1988). It consists of massive, fine- to coarse-grained, crinoidal limestone beds with minor argillaceous and chert interbeds. Significant outcrops of Mount Mark Formation are found within the Cowichan uplift of southeastern Vancouver Island, near Tofino along the west coast, within the Buttle Lake Uplift between 50 and 100 km southeast of Nimpkish Lake, and along the southern part of Texada Island. It reaches thicknesses of 150 m near Buttle Lake and up to 300 m within the Cowichan uplift.

### 2.1.2 Quatsino Formation

The Upper Triassic Quatsino Formation of the Vancouver Group paraconformably overlies and is interbedded with volcanic and limestone litho-types of the Karmutsen Formation. The Karmutsen Formation includes basaltic and andesitic flows, tuffs, agglomerates, and breccias, with minor interbedded limestone (Hoadley, 1953). The Karmutsen is widely exposed along the southwest Pacific margin (Muller et al., 1974).

Extensive outcrops of the Quatsino Formation are known from Texada and Vancouver islands. Within the northern part of Vancouver Island, the formation is exposed along three parallel belts (Fig. 2.1):

Belt *	Length	Location
(West) Quatsino-Tlupana	165 km	from Quatsino Sound to Tlupana Inlet
(Central) Nimpkish	39 km	east and south of Nimpkish Lake
(East) Bonanza	30 km	west of Telegraph Cove to Bonanza Lake

\* After McCammon (1968)

The Quatsino Formation attains a maximum thickness of 760 m at a location immediately south of Alice Lake, within the western belt (Fischl, 1992). Near Nimpkish Lake, within the central belt, Coffin and Soux (1988) reported a drill intersection thickness of about 135 m for the lower part of the Quatsino Formation. Within northern Vancouver Island, the Quatsino is divisible into lower and upper parts (Hoadley, 1953 and Muller et al., 1974). The lower part, with highly variable thickness (Table 2.2), is characterized as a thick-bedded to massive, brownish-grey to black, fine-grained to

microcrystalline limestone (Muller et al., 1974) and includes a few thin interbeds of andesite or basalt (Hoadley, 1953).

**TABLE 2.2 MEASURED THICKNESS OF THE QUATSINO FORMATION FROM THE NORTHERN PART OF VANCOUVER ISLAND**

Location	Quatsino Formation *		Description
	Lower Part Approx. Thick. (m)	Upper Part Approx. Thick. (m)	
<b><u>Western Belt</u></b>			
Alice Lake	488	302	- immediately south of Alice Lake
Klaskino	25	49	- along north side of Klaskino Inlet (50°18'50", 127°51'50")
<b><u>Central Nimpkish Belt</u></b>			
Tsulton Property°	~ 135	-	- opposite halfway Islands on Nimpkish Lake
<b><u>Eastern Belt</u></b>			
Beaver Cove	76 +	140	- along a tributary of Tsulton River south of Beaver Cove (50°29'50", 126°53'20")

\* Modified after Muller et al. (1974)

°After Coffin and Soux (1988; Appendix 2)

The upper part of the Quatsino Formation consists of thin-bedded limestone with black calcareous siltstone interbeds and laminations. Upwards, laminae and interbeds of calcareous black shale increase in frequency and thickness. Toward the top of the unit, the limestone is increasingly dark-grey or black, due to increasing quantities of carbonaceous matter (Hoadley, 1953). Bedding and color banding is distinctive and well preserved. Locally the upper part contains abundant ammonites and pelecypods (Muller et al., 1974).

Toward central and southern Vancouver Island, the Quatsino Formation thins considerably and is complicated by intense faulting and folding. According to Fischl (1992), it is less than 75 m thick at Cowichan Lake, about 40 km south of Nanaimo.

On Texada Island, the Quatsino Formation is divisible into a northern and southern belt. The northern belt is up to 3 km wide by 13 km long and the southern belt, which is located on the southwest coast, is up to 6 km long. Based on chemical composition, Mathews and McCammon (1957) divided the northern belt into three members, each up to 200 m thick. The lowermost member is composed predominantly of high-calcium limestone; the middle member is predominantly high-calcium limestone with some dolomitic interbeds; the upper member is

dominantly dolomite and dolomitic limestone.

### **2.1.3 Parsons Bay Formation**

The Parsons Bay Formation of the Vancouver Group conformably overlies and is interbedded with limestones of the underlying Quatsino Formation. The lower part consists of light-grey limestone with laminae and thin interbeds of calcareous black shale (Muller et al., 1974). The Parsons Bay Formation has a similar distribution to the Quatsino Formation. Near Alice Lake, it is up to 610 m thick and is only about 60 m thick near Beaver Cove (Muller et al., 1974).

Along the west-central part of Vancouver Island, near Checleset Bay, the Parsons Bay Formation includes a massive limestone unit between 18 and 27 m thick within its upper part, which was termed the 'Sutton Limestone Formation' by Jeletzky (1970). Near Smith Cove, on the southern side of Quatsino Inlet, the Sutton Formation is divisible into upper and lower members. Jeletzky (1976) described the Upper Limestone Member as predominately quite pure, grey, well-bedded limestone up to 45 m thick.

## **2.2 INTRUSIONS**

### **2.2.1 Island Intrusions**

Within the northern part of Vancouver Island, Jurassic dykes, sills, stocks, and batholiths are widespread. The Island Intrusions (Eastwood, 1965), which have invaded all rock types, are medium- to coarse-grained and range in composition from gabbro to quartz monzonite. Typically elongate in a northwesterly direction, they form narrow 3 km to 8 km wide northwesterly trending belts separated by Upper Triassic volcanic and sedimentary rocks (Hoadley, 1953). The intrusive belts are up to 80 km in length and show a pronounced decrease in size towards the western part of Vancouver Island. Localized recurrent folding of the Quatsino Formation, along northwesterly axes, was accompanied by emplacement of andesitic sills and dykes (Carlisle, 1972). According to Hoadley (1953),

"The fact that the lineation is more or less parallel with the general fold structure of the invaded rocks indicates that the intrusions were associated with orogenic disturbances, and that they were intruded at about the time the invaded rocks were folded. They were probably guided in part by contemporaneous faults."



Intense metamorphism associated within the emplacement of large scale batholiths and stocks is common. Most bodies exhibit well developed intrusive breccias within marginal zones. Within a few kilometres of the intrusive bodies, limestone lithotypes can be strongly contorted, fractured, and jointed, cut by numerous dykes, and altered to calc-silicate minerals. Skarn mineralization is common; however, it rarely results in the complete alteration of limestone bodies (Eastwood, 1965).

Smaller stocks, sills, and dykes genetically related to the Island Intrusions generally exhibit limited metamorphism and sharp contacts with the surrounding country rock. However, these intrusive bodies are most abundant within the contact aureole of the larger batholiths.

### **2.2.2 Nimpkish Intrusions**

The Nimpkish Batholith is an irregular-shaped intrusive situated between Nimpkish Lake southeasterly to Woss Lake, where it is in tectonic contact with the Vernon Batholith. Muller et al. (1974) include the Bonanza Batholith along the eastern shore of Bonanza Lake and several smaller plutons in the vicinity of Beaver Cove within this group. These intrusives are evident throughout the entire Vancouver Group.

Contacts of the Nimpkish Batholith are highly irregular and include a large number of small sills and dykes (Gunning, 1932b), which are

“...frequently much contorted, fractured, and sheared near the intrusive and in a number of places are silicified and mineralized with pyrite, pyrrhotite and calcite. In a few places, and particularly where the granodiorite intrudes limestone, contact metamorphic silicates, magnetite, and copper, iron or zinc sulphides are quite extensively developed.”

### **2.2.3 Tertiary Intrusions**

Small Tertiary stocks to medium intrusive bodies, commonly as dykes, sills and small plutons, are exposed throughout the entire length of Vancouver Island. These rocks vary widely in size, texture, and mineralogical composition and include medium- to coarse-grained granite porphyry, diorite porphyry, gabbro, and finer-grained dacitic rocks.

According to Hoadley (1953), the Tertiary intrusions are most commonly dark-green to black, diabasic gabbro dykes, which vary in width from a few centimetres up to 5 m. Furthermore (Hoadley, 1953),

“where these dykes occur in Vancouver Group rocks they are almost impossible to distinguish in the field from dykes associated with the Triassic volcanic rocks.”

Near Port Alberni, Massey and Friday (1989) note that these intrusives occur as dykes up to 3 m wide and are commonly found along fault zones, which may have acted as conduits for emplacement.

## **2.3 STRUCTURE**

The northern part of Vancouver Island is dominated by north to northwesterly trending anticlinoria, which are flanked by fault blocks with outward dipping stratigraphy. The region is cut by steep normal or strike-slip vertical faults. Detailed accounts of regional structure are available in Hoadley (1953) and Muller et al. (1974).

The main structural elements of the Nimpkish Lake Block from northeast to southwest are Bonanza Fault, Nimpkish Syncline, and Nimpkish Fault. Bonanza and Nimpkish faults define the respective eastern and western boundaries of Nimpkish Block. Both structures have variable amounts of displacement and are in part defined by valley lineaments.

# **3. PROPERTY GEOLOGY**

## **3.1 STRATIGRAPHY AND LITHOLOGY**

As only initial prospecting work has been performed on the MQ claims, a detailed description of the property geology is not yet possible. During the 2010 exploration, three lithological units were identified on the MQ property: the Karmutsen, Parson’s Bay and Quatsino formations. Regional geology maps show the eastern part of the MQ property being underlain by rocks of the Suquash Sequence (Fig. 2.1), however no outcrops of this unit were identified in 2010; it is unknown if this is the result of the topography of the area, or if the unit tends to be recessive. Similar to the Nimpkish and Bonanza Lake areas, the Karmutsen Formation comprises incompletely metamorphosed basaltic and andesitic flows, tuffs, agglomerates, and breccias, with minor interbedded limestone (Hoadley, 1953). The high-quality limestone occurrences on/near the MQ claims are part of the Quatsino Formation of the Vancouver Group. The Parson’s Bay Formation was not examined in the MQ claims area during the 2010 exploration. The following is a brief summary of the limestone units encountered near Nimpkish Lake, which is applicable to both the Nimpkish and Bonanza Lake properties.

### **3.1.1 Karmutsen Formation**

Exposures of the Karmutsen Formation can be traced from the eastern shore of Nimpkish Lake southeasterly towards Noomas rail crossing. The southerly contact of the Karmutsen Formation with the overlying Quatsino Formation is well exposed along a forestry road leading westerly from Noomas rail crossing. The uppermost part of the Karmutsen Formation consists of rusty-brown to brown weathered, green fresh, medium-grained volcanics. Outcrops are typically recessive and deeply weathered.

### **3.1.2 Quatsino Formation**

As previously indicated (Section 2.1.2), the most detailed published work on the stratigraphy of the Quatsino Formation is that of Hoadley (1953) and Muller et al. (1974); they indicate that the Quatsino is divisible into a lower and an upper part. The lower part, with highly variable thickness, is thick-bedded to massive, brownish-grey to black, fine-grained to microcrystalline limestone with a few thin interbeds of andesite or basalt. The upper part consists of thin-bedded limestone with black calcareous siltstone interbeds and laminations. Laminae and interbeds of calcareous black shale increase in frequency and thickness upwards.

The lower part of the Quatsino Formation is the main limestone unit that outcrops in the Nimpkish claims. The majority consists of variably recrystallized, massive to thick-bedded, grey weathered, dark-grey to black fresh, micritic limestone with rare patches of chert.

The upper part of the Quatsino Formation is variably buff to medium-grey weathered, very dark grey to black fresh, thick-bedded, interbedded micritic limestone and buff dolomite.

Within the lower part of the Quatsino Formation, clear bedding surfaces or sedimentary laminae are rare. Definitive bedding surfaces generally indicate shallow north to northeasterly dips. Variations are common due to wavy bedding planes.

The lack of a readily recognized marker horizon within the massive limestones of the Quatsino Formation hinders stratigraphic correlations. Hence, thickness determinations must be taken with caution as the continuity of stratigraphy across vast covered intervals with probable concealed internal structures, is uncertain. Slight variations in major and minor constituents may aid in correlating stratigraphy.

### **3.1.3 Parson's Bay Formation**

The Parson's Bay Formation has not been examined in detail, however, it generally consists of low-quality, light-grey lime mudstones with laminae and thin interbeds of calcareous black shale. The mudstone is often siliceous to weakly calcareous.

### **3.1.4 Intrusions**

Throughout the area, dykes and sills, presumably part of the Tertiary Suite of intrusives, vary from a few centimetres to more than 5 m thick. The intrusives appear preferentially aligned along the pre-existing structural fabric which is dominantly steeply dipping to vertical, and northwest to northeast. Several dykes and sills occur at other orientations. The intrusives are typically recessive and generally only evident in well exposed outcrops of massive limestone.

The intrusives are commonly rusty-brown weathered, green fresh, and fine- to medium-grained. Commonly, they exhibit strong jointing parallel to intrusive alignment.

Associated alteration includes thin haloes to several metres of thermal recrystallization with negligible chemical alteration, and thin zones of skarnification adjacent to intrusives.

## **3.2 RECENT SEDIMENTS AND WEATHERING**

Much of the region is covered by a veneer of unconsolidated glacial sediments, which range in thickness up to several metres. Within upland areas, bedrock exposures are common. It is expected that within major valleys such as at Nimpkish and Bonanza Lakes and Tsulton River, unconsolidated sediments may be tens of metres thick. It appears that much of the MQ property is overlain by significant thicknesses of glacial sediments, based on the overall lack of outcrop exposure.

Surficial weathering has resulted in a weathering profile that varies from a few centimetres up to several metres thickness. Many of the erosional (topographic) features appear elongate along the pre-existing structural trend. Locally, the bedrock surface is highly irregular.

### **3.3 STRUCTURE**

Structural measurements were collected from numerous limestone and dyke units (Appendix 4). Where unequivocally determined, original bedding is generally shallow dipping, whereas joints and cleavages are steeply dipping or near vertical. Intensity of deformation within the limestone unit varies, so that individual outcrops may display either mentioned planar structures or none of them.

## **4. RESULTS OF 2010 EXPLORATION**

The exploration program was conducted in order to further assess the limestone quality and extent in the Bonanza Lake and Nimpkish Lake areas, and to initially test the limestone quality and extent in the MQ claims. Secondary objectives included outlining outcrop areas, examining the access, and identifying the frequency and concentration of Tertiary dykes and sills within Quatsino Formation limestones.

The 2010 groundwork on the MQ Property concentrated on/near the claims MQ EAST, MQ WEST, MQ CENTRAL, and MQHR, and was the first exploration program within these claims. Work on the Nimpkish Property was concentrated on/near claims NIM 14-18, and work on the Bonanza Lake Property was concentrated on/near claims NIM 19-22. Limestone outcrops were examined and sampled at 44 different locations in the MQ, Nimpkish Lake, and Bonanza Lake areas (Fig.'s 1.3 & 1.4). Visible dykes/sills were relatively rare on the MQ property; however, they appear to increase in abundance near major structures and/or geologic contacts. Dykes/sills in the southern part of the Nimpkish Property and most of the Bonanza Lake Property are quite rare, although they do appear to increase in concentration in the southern part of the Bonanza Lake Property.

During the program, geological observations were recorded, including lithologic information, measurements of structural elements, and other pertinent details (Appendix 4). A solution of 6% HCl was used to assess carbonate quality in the field. In some instances, interval thicknesses were determined by measuring outcrops perpendicular to bedding, where it could be identified.

All samples from the 2010 program were shipped to Graymont's lab in Salt Lake City, Utah for preparation and analyses by standard ICP techniques, and LOI (Appendices 2 and 3). Overall, the quality of the west-central belt of Quatsino limestones along Highway 19 is comparable to the high-quality limestone within the Nimpkish and Bonanza Lake properties. Only three of the twenty-six samples collected from MQ claims returned values of less than 95% CaCO<sub>3</sub>, and two of these were samples affected by major structures and/or dyking. Results from the Nimpkish and Bonanza Lake

properties were relatively similar; the 33 Quatsino Formation samples from the Nimpkish Lake Property averaged 95.70%  $\text{CaCO}_3$ , 2.68%  $\text{MgCO}_3$  and 0.84%  $\text{SiO}_2$ . The fifteen Quatsino Formation samples from the Bonanza Lake Property were more variable in quality, ranging from 72.96% to 98.54%  $\text{CaCO}_3$ , 0.44% to 14.25%  $\text{MgCO}_3$ , and 0.34% to 20.65%  $\text{SiO}_2$ . A single sample of Parson's Bay Formation from the Bonanza Lake Property returned values of 41.51%  $\text{CaCO}_3$ , 5.19%  $\text{MgCO}_3$  and 26.54%  $\text{SiO}_2$ .

## **5. DISCUSSION AND CONCLUSIONS**

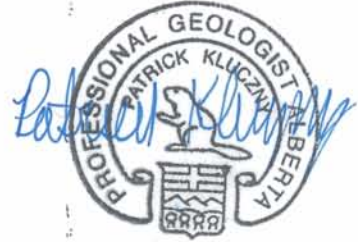
Within the MQ, Bonanza Lake and Nimpkish Lake areas, intervals of the Upper Triassic Quatsino Formation were tested by measuring and sampling stratigraphic sections. A total of 75 samples were collected; as distinct stratigraphic markers are difficult to identify within the Quatsino Formation, it is very likely only a portion of the lower part of the formation was sampled. In addition, the three areas were examined in detail with an attempt to identify the presence of dykes/sills, as they will present a challenge to any future development of limestone in these areas.

The carbonates examined on the MQ Property were high-quality limestones and are similar to the high-quality Quatsino Formation outcrops in the Nimpkish and Bonanza Lake areas. Analyses from all areas returned values, sometimes locally, in excess of 95%  $\text{CaCO}_3$  with relatively minor amounts of  $\text{MgCO}_3$  and  $\text{SiO}_2$ .

Dykes and/or sills do not appear to be prevalent within the MQ Property; however, there is a pronounced increase in concentration and frequency of dykes in proximity to major structures and geologic contacts, such as the contact with the Karmutsen Formation. A detailed magnetic survey will be required in order to verify the presence/absence of intrusives within the property.

The excellent quality and ideal logistical location of carbonates of the Quatsino Formation in the MQ, Nimpkish and Bonanza Lake properties warrant further examination. The MQ claims are located along a major highway, and within a few kilometres of potential loading terminals along the coast. The Nimpkish and Bonanza Lake claims are both located within a few kilometres of a railway and the Bonanza Lake claims are within a few kilometres of potential loading terminals on Beaver Cove. All three properties have excellent quarriability potential.

The next phase of exploration on the MQ, Nimpkish, and Bonanza Lake properties should consist of detailed geologic mapping, limestone sampling, and a detailed magnetic survey to assist with the identification of intrusives. Diamond drilling is also recommended in the southern part of the Nimpkish Lake Property, and the northern part of the Bonanza Lake property to follow up on promising exploration results.



P. Kluczny, B.Sc., P.Geol.

A handwritten signature in blue ink, appearing to read "W. Miller".

W. Miller, B.Sc., Geol. I.T.

Edmonton, Alberta  
2010 09 17

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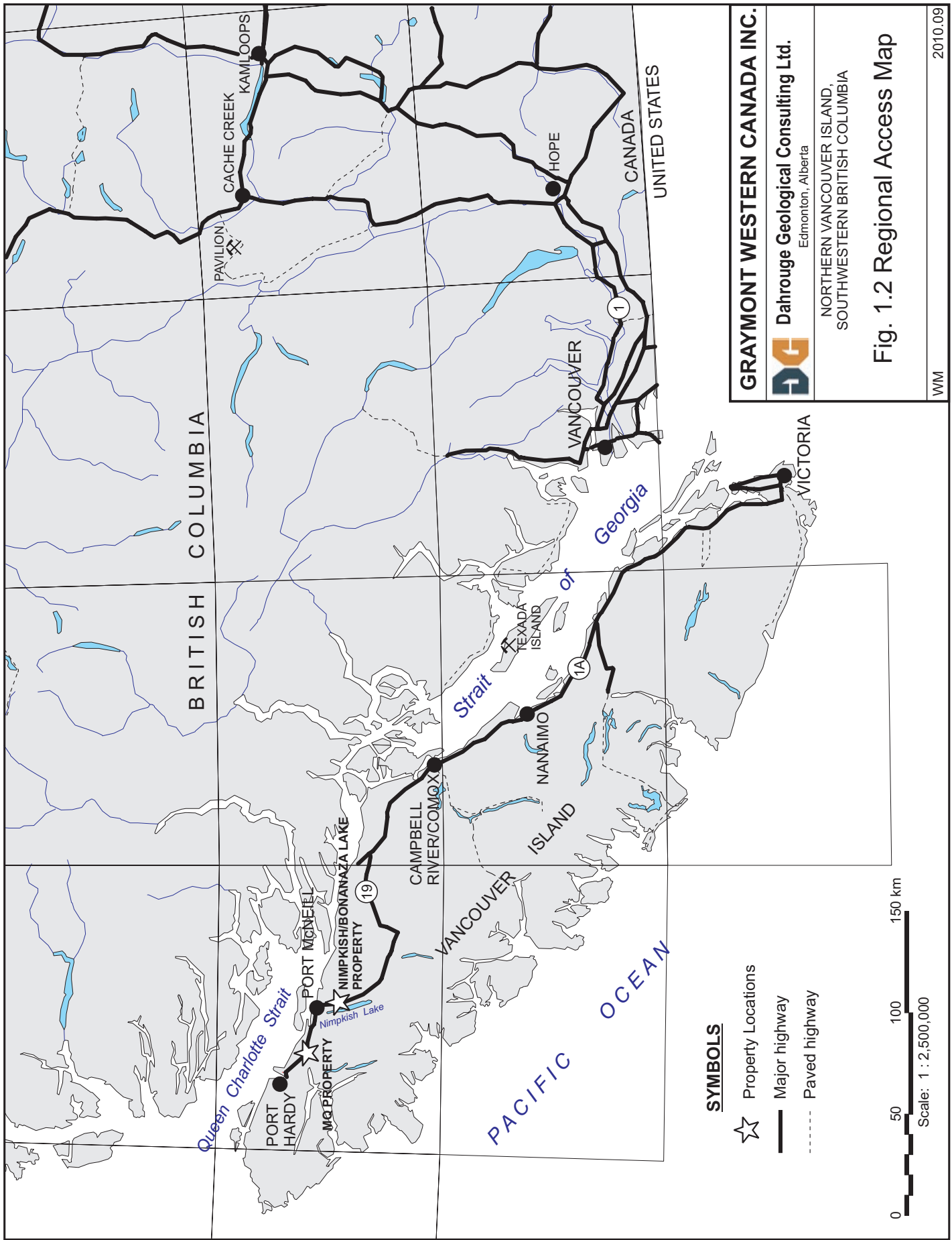
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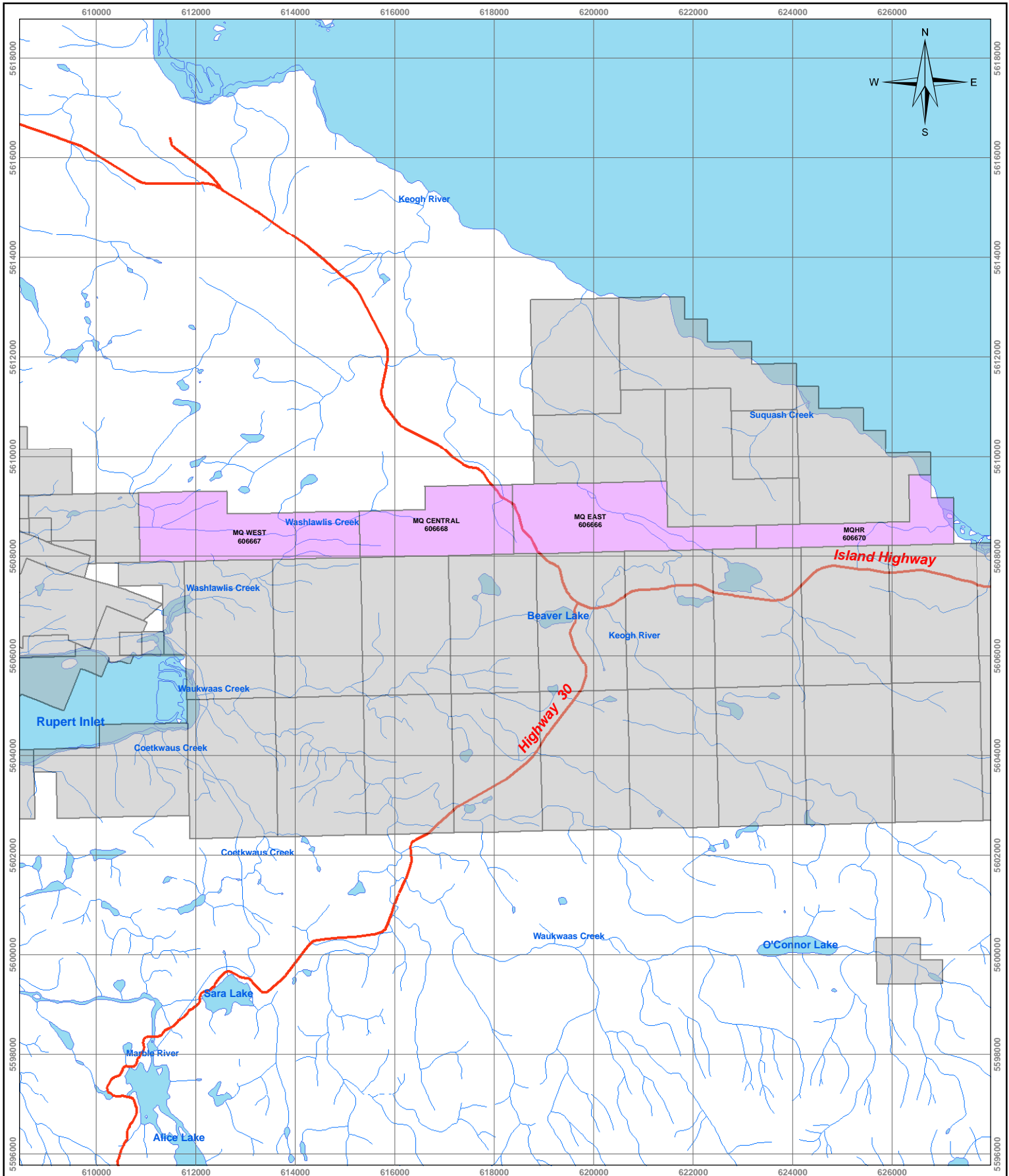


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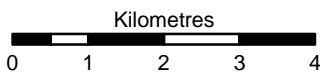






**Legend**

- Railway
- Major Road
- Creek/stream
- Waterbody
- Mineral Tenures**
- Other
- MQ Property



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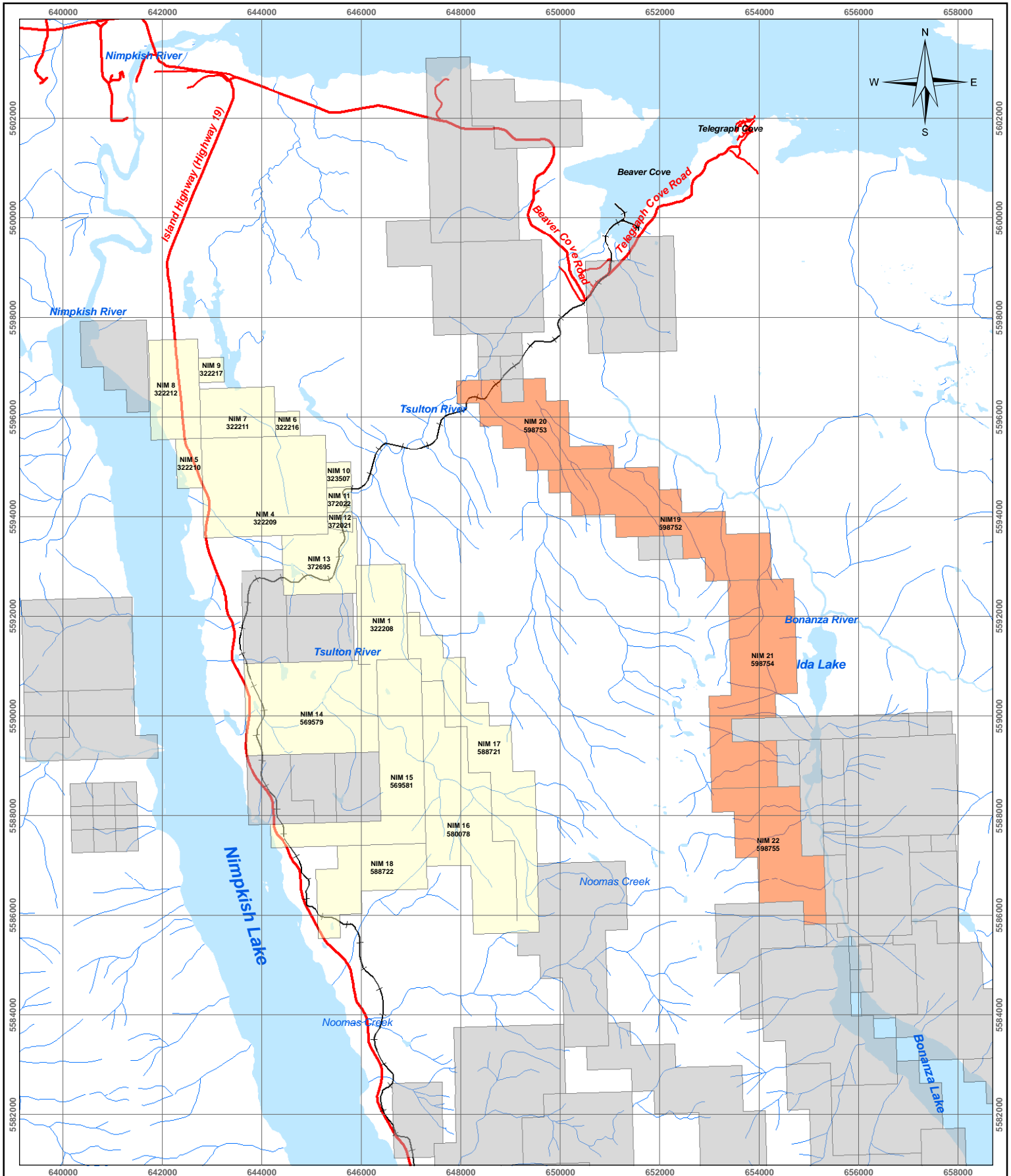
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**GRAYMONT WESTERN CANADA INC.**

**Dahrouge Geological Consulting Ltd.**  
Edmonton, Alberta

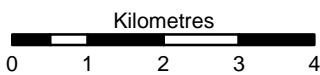
MQ PROPERTY,  
NORTHERN VANCOUVER ISLAND

**Fig. 1.5**  
Claim Map - MQ Claims



**Legend**

- Railway
- Major Road
- Creek/stream
- Waterbody
- Mineral Tenures**
- Bonanza Lake Property
- Nimpkish Property
- Other



1:100,000

Coordinate System: UTM NAD83, Zone 9N

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Edmonton, Alberta

NIMPKISH AND BONANZA LAKE PROPERTIES,  
NORTHERN VANCOUVER ISLAND

Fig. 1.6  
Claim Map - Nimpkish and  
Bonanza Lake Claims

**APPENDIX 1: ITEMIZED COST STATEMENT FOR THE 2010 EXPLORATION - MQ/NIMPKISH/BONANZA****a) Personnel**

J. Dahrouge, geologist

3.0 days field work and travel June 14-16

1.0 days planning and supervision

4.00 days @ \$ 595.00 \$ 2,380.00

D. Anderson, geologist

3.0 days field work and travel June 14-16

3.00 days @ \$ 500.00 \$ 1,500.00

P. Kluczny, geologist

11.0 days field work and travel June 7-17

5.2 days project planning &amp; preparations, supervision, reporting

16.24 days @ \$ 590.00 \$ 9,581.60

W. Miller, geologist

11.0 days field work and travel June 7-17

11.2 days project planning &amp; preparations, reporting

22.21 days @ \$ 470.00 \$ 10,438.70

J. Sandersen, assistant

11.0 days field work and travel June 7-17

5.0 days project planning &amp; preparations, data entry

16.01 days @ \$ 350.00 \$ 5,603.50

K. Krueger, assistant

11.0 days field work and travel June 7-17

2.4 days project planning &amp; preparations, data entry

13.41 days @ \$ 325.00 \$ 4,358.25

\$ 33,862.05

**b) Food and Accommodation**

34 man-days @ \$ 142.12 accommodations \$ 4,832.15

46 man-days @ \$ 61.69 meals \$ 2,837.73

\$ 7,669.88

**c) Transportation**

Flights: Airfare to/from Comox \$ 1,937.16

Airfare to/from Campbell River \$ 923.90

Vehicles: SUV Rental (PK &amp; DA) \$ 1,350.82

Taxi \$ 253.00

Parking \$ 96.00

Fuel \$ 274.05

\$ 4,834.92

**d) Instrument Rental**

Software (ArcGIS) \$ 198.00

Radios \$ 277.20

Chainsaw and fuel \$ 357.39

\$ 832.59

e) Drilling n/a

f) Analyses Central Lab of Graymont Western U.S. Inc.  
(75 rock samples)

75	samples	@	\$	4.50	preparation fee	\$	337.50	
75	samples	@	\$	25.00	sample analysis	\$	1,875.00	
								\$ 2,212.50

g) Other

	Courier and Shipping	\$	348.01	
	Disposable Supplies	\$	129.84	
	Phone Charges	\$	4.70	
	Prints/copies	\$	5.50	
	Plots	\$	110.00	
				\$ 598.05

Total

\$ 50,009.99

Edmonton, Alberta  
September 17, 2010



Patrick Kluczny, B.Sc., P.Géol.



## APPENDIX 2: ANALYTICAL LABORATORY INFORMATION AND TECHNIQUES

### Name and Address of the Lab:

Graymont Western US Inc., Central Laboratory.  
670 East 3900 South, Suite 200  
Salt Lake City, Utah, 84107

### Statement of Qualifications:

Jared Leikam obtained a B.S. in Chemistry from the University of Utah in the class of 2003. Jared started working for Graymont in February of 2004 and has been working with the ICP Spectrometer for two and a half years, under the direct supervision of Carl Paystrup (Lab Supervisor).

Vonda Stuart obtained a B.S. in Chemistry from Weber State University in 2004. Vonda started with Graymont in August of 2007 and started working in the ICP Lab the following September.

### Sample Preparation, Procedures, Reagents, Equipment, etc.:

For the ICP sample preparation, 0.5 grams of the sample is mixed with 3 g of lithium carbonate. The sample and the lithium carbonate are then fused together in a muffle furnace at 850°C. Following the fusion process, the samples are dissolved in 1:1 HCl; a total of 40 mL 1:1 HCl is used in the dissolving process. The samples are then diluted to 200 mL and spiked with 10 ppm Co. Cobalt is used as an internal standard. At this point the samples are ready for analysis on the Perkin Elmer, Optima 7300V.

### Mesh Size Fraction, Split and Weight of Sample:

Upon receiving the samples, the prep room technician riffles and then splits the stone down to a manageable size (roughly 200 g). The stone is then dried in an oven at 120°C. Once the samples have been dried they get pulverized to a -200 mesh size. A split of this pulverized material is then sent for testing in the main part of the lab.

### Quality Control Procedures:

The ICP spectrometer is calibrated with two certified reference materials prior to analyzing a batch of samples. A batch typically contains 96 samples. Every 12<sup>th</sup> sample in a batch is a certified limestone reference sample. In addition to the 8 reference samples imbedded in the batch, there are 2 limestone reference samples analyzed at the beginning and at the end of the batch to ensure the accuracy of our Na and P numbers. Every element being analyzed in a sample is backed up by data from the certified reference materials. We also use an internal standard (10 ppm Co) to further ensure the quality and accuracy of the analysis.

Date	Sample	CaO %	CaCO3 %	MgO %	MgCO3 %	Fe2O3 %	Al2O3 %	SrO ppm	MnO ppm	SiO2 %	BaO ppm	K2O ppm	Na2O ppm	P2O5 ppm	TiO2 ppm	Total %
6/21/2010	74701	47.44	84.67	6.81	14.25	0.187	0.080	547	69	0.34	4	<30	42	167	43	99.59
6/21/2010	74702	55.04	98.24	0.24	0.50	0.092	0.034	602	90	0.44	15	<30	<20	467	22	99.38
6/21/2010	74703	55.21	98.54	0.22	0.46	0.085	0.028	673	86	0.41	15	<30	<20	943	23	99.60
6/21/2010	74704	23.26	41.51	2.48	5.19	3.098	3.618	1396	688	26.54	1509	3531	21021	11767	3133	84.26
6/21/2010	74705	54.61	97.47	0.35	0.73	0.087	0.083	1603	49	0.89	9	67	122	328	49	99.48
6/21/2010	74706	54.37	97.04	0.30	0.63	0.125	0.255	1095	115	1.06	3	66	<20	497	39	99.24
6/21/2010	74707	54.50	97.27	0.34	0.71	0.100	0.070	8989	47	0.59	49	52	47	642	34	99.73
6/21/2010	74708	55.12	98.38	0.22	0.46	0.126	0.062	2003	112	0.44	16	<30	<20	120	19	99.68
6/21/2010	74709	50.00	89.24	1.89	3.95	0.189	0.380	2148	73	4.78	12	476	216	2413	182	99.11
6/21/2010	74710	51.56	92.02	1.38	2.89	0.119	0.246	2673	83	2.59	17	400	139	1603	106	98.36
6/21/2010	74711	50.44	90.03	0.98	2.05	0.119	0.287	2399	188	5.37	24	484	133	2936	104	98.49
6/21/2010	74712	40.88	72.96	0.81	1.69	0.433	0.695	1281	179	20.65	41	1306	133	1464	345	96.92
6/21/2010	74713	53.39	95.29	0.98	2.05	0.098	0.134	1965	216	1.32	26	85	39	2635	61	99.39
6/21/2010	74714	47.51	84.80	4.03	8.43	0.133	0.156	2031	194	5.21	22	139	54	2121	61	99.19
6/21/2010	74715	47.22	84.28	1.67	3.49	0.413	0.497	1746	100	10.30	53	692	134	1852	200	99.45
6/21/2010	74716	54.28	96.88	1.09	2.28	0.148	0.018	526	92	0.25	3	<30	<20	543	18	99.65
6/21/2010	74717	48.97	87.40	1.13	2.36	0.135	0.244	691	151	9.20	18	233	101	2149	93	99.69
6/21/2010	74718	51.81	92.47	3.22	6.74	0.099	0.041	418	74	0.38	1	<30	23	130	22	99.78
6/21/2010	74719	53.51	95.50	1.57	3.28	0.175	0.059	430	128	0.51	1	36	44	<100	24	99.60
6/21/2010	74720	53.94	96.27	1.31	2.74	0.093	0.034	533	56	0.39	3	109	<20	<100	18	99.61
6/21/2010	74721	55.03	98.22	0.56	1.17	0.108	0.043	470	42	0.25	<1	<30	<20	230	30	99.85
6/21/2010	74722	53.25	95.04	1.96	4.10	0.116	0.025	416	60	0.45	1	<30	<20	<100	23	99.78
6/21/2010	74723	54.25	96.83	1.22	2.55	0.104	0.025	483	61	0.17	3	50	<20	174	21	99.75
6/21/2010	74724	52.54	93.77	2.54	5.31	0.120	0.049	402	69	0.26	<1	<30	<20	<100	29	99.57
6/21/2010	74725	52.83	94.29	2.10	4.39	0.165	0.065	535	119	0.51	2	116	<20	143	42	99.51
6/21/2010	74726	54.81	97.82	0.62	1.30	0.087	0.028	623	71	0.48	2	<30	<20	140	16	99.79
6/21/2010	74727	48.21	86.05	5.91	12.36	0.153	0.066	1382	116	0.48	8	77	<20	158	28	99.27
6/21/2010	74728	53.53	95.54	1.39	2.91	0.134	0.080	1522	98	0.82	3	<30	<20	<100	35	99.65
6/21/2010	74729	50.27	89.72	4.37	9.14	0.181	0.035	2161	157	0.44	4	<30	<20	<100	24	99.76
6/21/2010	74730	49.31	88.01	5.11	10.69	0.136	0.031	3459	108	0.34	5	<30	<20	<100	16	99.56
6/21/2010	74731	54.46	97.20	0.64	1.34	0.186	0.047	4413	43	0.30	18	157	<20	<100	35	99.54
6/21/2010	74732	54.59	97.43	0.60	1.26	0.112	0.030	4865	50	0.32	9	63	<20	<100	35	99.65
6/21/2010	74733	51.65	92.18	0.12	0.25	1.691	1.721	489	792	2.92	8	425	25	762	2893	99.32
6/21/2010	74734	55.03	98.22	0.13	0.27	0.181	0.062	559	724	0.80	4	38	56	275	39	99.70
6/21/2010	74735	54.98	98.13	0.11	0.23	0.114	0.036	620	478	0.79	3	30	<20	<100	29	99.42
6/21/2010	74736	55.11	98.36	0.10	0.21	0.196	0.053	535	448	0.77	4	50	27	235	47	99.72
6/21/2010	74737	55.17	98.47	0.10	0.21	0.192	0.044	930	453	0.49	4	65	45	383	23	99.61
6/21/2010	74738	55.13	98.40	0.11	0.23	0.181	0.022	558	422	0.73	5	41	21	302	29	99.70
6/21/2010	74739	54.55	97.36	0.11	0.23	0.168	0.021	540	444	1.50	6	<30	<20	440	30	99.38
6/21/2010	74740	54.07	96.50	0.15	0.31	0.345	0.417	645	551	1.82	8	213	46	875	185	99.65
6/21/2010	74741	54.35	97.00	0.13	0.27	0.351	0.150	415	595	1.85	6	<30	24	625	102	99.73

Date	Sample	CaO %	CaCO3 %	MgO %	MgCO3 %	Fe2O3 %	Al2O3 %	SrO ppm	MnO ppm	SiO2 %	BaO ppm	K2O ppm	Na2O ppm	P2O5 ppm	TiO2 ppm	Total %
6/21/2010	74742	44.61	79.62	0.11	0.23	1.946	3.131	410	574	10.10	13	383	46	901	2097	95.47
6/21/2010	74743	54.94	98.06	0.10	0.21	0.254	0.081	405	507	0.98	6	36	<20	522	55	99.69
6/21/2010	74744	54.08	96.52	0.13	0.27	0.251	0.226	540	551	1.56	8	182	38	779	112	99.06
6/21/2010	74745	54.60	97.45	0.14	0.29	0.219	0.177	582	474	1.43	10	246	130	817	118	99.81
6/21/2010	74746	6.62	11.82	2.91	6.09	6.658	4.176	747	1913	21.79	759	7248	26968	3058	3834	54.97
6/21/2010	74747	53.50	95.49	0.10	0.21	0.368	0.165	310	1269	3.26	6	101	186	<100	84	99.69
6/21/2010	74748	54.54	97.34	0.08	0.17	0.325	0.065	360	1074	1.51	3	56	37	<100	36	99.57
6/21/2010	74749	53.79	96.00	0.40	0.84	0.292	0.384	1057	351	1.99	9	1266	123	102	202	99.82
6/21/2010	74750	54.41	97.11	0.30	0.63	0.133	0.204	938	86	1.37	4	586	<20	114	76	99.62
6/21/2010	74751	54.69	97.61	0.26	0.54	0.199	0.075	860	78	0.83	1	187	<20	128	48	99.38
6/21/2010	74752	54.91	98.00	0.21	0.44	0.119	0.037	1522	73	0.47	1	74	<20	139	28	99.25
6/21/2010	74753	55.08	98.31	0.23	0.48	0.091	0.043	1059	57	0.55	1	87	<20	234	31	99.59
6/21/2010	74754	51.06	91.13	2.90	6.07	0.141	0.104	3648	78	1.35	15	128	27	153	69	99.20
6/21/2010	74755	54.35	97.00	0.40	0.84	0.113	0.122	1449	75	1.07	25	351	<20	287	58	99.35
6/21/2010	74756	55.10	98.34	0.24	0.50	0.137	0.055	399	117	0.46	2	157	<20	<100	53	99.57
6/21/2010	74757	55.36	98.81	0.22	0.46	0.112	0.018	682	95	0.35	1	35	<20	<100	15	99.84
6/21/2010	74758	55.05	98.25	0.31	0.65	0.236	0.059	513	194	0.66	<1	<30	<20	<100	20	99.93
6/21/2010	74759	55.10	98.34	0.18	0.38	0.198	0.018	1404	119	0.13	<1	40	<20	<100	13	99.23
6/21/2010	74760	54.66	97.56	0.20	0.42	0.151	0.051	1281	210	1.30	1	147	<20	321	31	99.65
6/21/2010	74761	54.63	97.50	0.33	0.69	0.213	0.111	1123	113	0.96	2	258	<20	567	124	99.64
6/21/2010	74762	55.31	98.72	0.19	0.40	0.191	0.044	1884	135	0.26	5	50	<20	181	19	99.82
6/21/2010	74763	55.08	98.31	0.31	0.65	0.137	0.048	1706	63	0.19	1	106	22	229	32	99.54
6/21/2010	74764	55.30	98.70	0.26	0.54	0.166	0.020	1444	74	0.14	<1	47	<20	165	20	99.74
6/21/2010	74765	54.78	97.77	0.11	0.23	0.218	0.071	489	545	0.82	3	67	34	112	38	99.24
6/21/2010	74766	55.17	98.47	0.07	0.15	0.202	0.022	403	438	0.70	2	49	<20	<100	37	99.63
6/21/2010	74767	55.16	98.45	0.12	0.25	0.212	0.055	491	512	0.81	2	124	40	<100	33	99.90
6/21/2010	74768	54.88	97.95	0.07	0.15	0.239	0.069	408	463	1.12	2	101	<20	<100	44	99.63
6/21/2010	74769	54.64	97.52	0.07	0.15	0.311	0.092	373	504	1.78	4	148	<20	<100	54	99.97
6/21/2010	74770	55.05	98.25	0.07	0.15	0.239	0.022	472	475	1.00	1	34	<20	<100	20	99.75
6/21/2010	74771	54.98	98.13	0.07	0.15	0.212	0.017	351	510	1.29	1	<30	<20	<100	21	99.88
6/21/2010	74772	54.81	97.82	0.10	0.21	0.199	0.062	409	547	1.08	3	80	<20	<100	44	99.49
6/21/2010	74773	54.54	97.34	0.11	0.23	0.320	0.067	760	481	1.33	4	39	40	285	47	99.47
6/21/2010	74774	54.94	98.06	0.12	0.25	0.269	0.081	651	487	0.91	4	<30	27	334	55	99.71
6/21/2010	74775	54.73	97.68	0.21	0.44	0.172	0.061	2639	72	0.59	38	158	<20	<100	85	99.25
6/21/2010	74776	54.40	97.09	0.14	0.29	0.273	0.179	578	500	1.26	8	196	70	593	96	99.31

## APPENDIX 4: 2010 SAMPLE DESCRIPTIONS AND ASSAY RESULTS FROM THE MQ, NIMPKISH AND BONANZA LAKE AREAS

Notes: Stratigraphic thicknesses are based on measured attitudes of bedding listed below, with appropriate interpolations.  
 Attitudes are strike and dip (right-hand rule). Samples are listed in numerical order; however, sections will list the samples from stratigraphic top to bottom.  
 Most samples consist of chips at 30 cm intervals. UTM coordinates are NAD83, Zone 9N. Section locations are shown in Figures 1.3 and 1.4.

Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
<b>Isolated Station</b> (UTM 653828 E, 5588670 N)											
74701	Quatsino	4½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, micritic to very-fine-grained, resistant, thickly bedded (2-3 m), moderately "cooked", weak to moderate reaction with HCl, jointing 060°770° SE, bedding 18 4°24°W	84.67	14.25	0.34	0.08	0.19	547	69	167
<b>Section 2010-01</b> (UTM 653764 E, 5587894 N)											
74703	Quatsino	2½	<b>Lime Mudstone</b> , same as 74702, good reaction with HCl	98.54	0.46	0.41	0.03	0.09	673	86	943
74702	Quatsino	3	<b>Lime Mudstone</b> , medium-brown-grey weathered, medium- to dark-grey fresh, cryptocrystalline to micritic, massive(?), abundant calcite veining, moderate to good reaction with HCl, sub-horizontal bedding (?)	98.24	0.50	0.44	0.03	0.09	602	90	467
<b>Isolated Station</b> (UTM 653778 E, 5587261 N)											
74704	Parson's Bay?	3	<b>Calcareous Mudstone</b> , dark-brown-grey weathered, very-dark-grey fresh, very-fine grained, thinly bedded (1-20 cm), imprint of shell or leaf (?), minor calcite nodules, very rusty close to dyke(s), minor pyrite mineralization on fractured surfaces, moderate reaction with HCl, bedding 210°25°NW	41.51	5.19	26.54	3.62	3.10	1396	688	11767
<b>Isolated Station</b> (UTM 654782 E, 5586872 N)											
74705	Quatsino	1	<b>Lime Mudstone</b> , medium- to dark-grey weathered, white-grey to white fresh, recrystallized (cooked), cryptocrystalline to very-fine-grained, massive(?), resistant, very good reaction with HCl	97.47	0.73	0.89	0.08	0.09	1603	49	328
<b>Isolated Station</b> (UTM 654756 E, 5586589 N)											
74706	Quatsino	2½	<b>Lime Mudstone</b> , medium- to dark-grey weathered, white and medium- to dark-grey fresh, cryptocrystalline to micritic, crystalline in places (white), massive, resistant, abundant calcite veining, good reaction with HCl, no obvious bedding	97.04	0.63	1.06	0.26	0.13	1095	115	497
<b>Section 2010-02</b> (UTM 655142 E, 5587530 N)											
74708	Quatsino	2½	<b>Lime Mudstone</b> , same as 74707	98.38	0.46	0.44	0.06	0.13	2003	112	120
74707	Quatsino	3	<b>Lime Mudstone</b> , medium- to dark-grey weathered, white and translucent fresh, moderate to coarsely crystalline, massive, completely recrystallized (pure calcite), recrystallized throughout area, rubbly, very good reaction with HCl, no reliable bedding surfaces	97.27	0.71	0.59	0.07	0.10	8989	47	642

Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
<b>Isolated Station</b> (UTM 653783 E, 5592616 N)											
74709	Quatsino	3	<b>Lime Mudstone</b> , medium- to dark-grey weathered, dark- to very-dark-grey fresh, cryptocrystalline with minor micritic, relatively resistant, thickly bedded (½ - 2 m), rubbly, conchoidal fracturing, good reaction with HCl, bedding 150°32° SW (approximate)	89.24	3.95	4.78	0.38	0.19	2148	73	2413
<b>Section 2010-03</b> (UTM 653786 E, 5592345 N)											
74711	Quatsino	2½ 25 offset	<b>Lime Mudstone</b> , same as 74710, ~ 25 m offset	90.03	2.05	5.37	0.29	0.12	2399	188	2936
74710	Quatsino	3	<b>Lime Mudstone</b> , medium- to dark-grey weathered, dark- to very-dark-grey fresh, cryptocrystalline, resistant (cliff-former), medium bedded (20 cm to 1 m), conchoidal fracturing, very good reaction with HCl, bedding 180°18° W	92.02	2.89	2.59	0.25	0.12	2673	83	1603
<b>Isolated Station</b> (UTM 653726 E, 5591917 N)											
74712	Quatsino	2	<b>Lime Mudstone</b> , medium- to dark-grey weathered, very-dark-grey fresh, cryptocrystalline, conchoidal fracturing, resistant, moderately bedded (5-40 cm), minor well-bedded intervals (laminated), very good reaction with HCl, bedding 160°12° W (variable)	72.96	1.69	20.65	0.70	0.43	1281	179	1464
<b>Section 2010-04</b> (UTM 653676 E, 5591583 N)											
74715	Quatsino	3½	<b>Lime Mudstone</b> , same as 74713	84.28	3.49	10.30	0.50	0.41	1746	100	1852
74714	Quatsino	3 20 offset	<b>Lime Mudstone</b> , same as 74713, dykes noted within 5 m of sample	84.80	8.43	5.21	0.16	0.13	2031	194	2121
74713	Quatsino	2½	<b>Lime Mudstone</b> , medium- to dark-grey weathered, dark- to very-dark-grey fresh, cryptocrystalline, moderate to well-bedded (10 cm to 1 m), conchoidal fracturing, moderate calcite veins and nodules, calcite smear along fractures, abundant dykes in this outcrop (up to 1 m thick) cut across bedding, moderate reaction with HCl, bedding 184°29° SW	95.29	2.05	1.32	0.13	0.10	1965	216	2635
<b>Isolated Station</b> (UTM 649336 E, 5585982 N)											
74716	Quatsino	3½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, very-fine-grained to fine-grained, massive(?), resistant, slightly "cooked", highly fractured, minor calcite veins and fracture fill, heavily jointed and fractured, relatively close to contact with Noomas pluton, very good reaction with HCl, no reliable bedding surface (assume sub-horizontal)	96.88	2.28	0.25	0.02	0.15	526	92	543
<b>Isolated Station</b> (UTM 649594 E, 5585587 N)											
74717	Quatsino	2½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, mixture of lime mud and fine-grained crystalline calcite, looks stretched (low grade metamorphism?), minor calcite veinlets, fetid odour, weakly to moderately "cooked", well-developed fabric (relic bedding?), well bedded(?), moderate reaction with HCl, possible bedding 290°21° N	87.40	2.36	9.20	0.24	0.14	691	151	2149

Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
<b>Isolated Station</b> (UTM 648882 E, 5586283 N)											
74718	Quatsino	2½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, fine-grained to medium-grained and crystalline, sugary texture, massive(?), moderately to strongly fractured, weakly to moderately "cooked", very good reaction with HCl, rubbly outcrop with no reliable bedding	92.47	6.74	0.38	0.04	0.10	418	74	130
<b>Isolated Station</b> (UTM 648892 E, 5586408 N)											
74719	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, very-fine-grained to fine-grained and crystalline, sugary texture, moderately fractured, very minor disseminated sulfides, (chalcopyrite and pyrite), powders when struck, outcrop displays a weak fabric, weakly to moderately "cooked", some blades/needles of calcite oriented horizontally (parallel to fabric), very good reaction with HCl, bedding hard to see	95.50	3.28	0.51	0.06	0.18	430	128	<100
<b>Isolated Station</b> (UTM 648827 E, 5586572 N)											
74720	Quatsino	3½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, very-fine-grained to fine-grained and crystalline, massive(?), resistant, moderately fractured, weak sugary texture, weak fabric, weakly "cooked", good reaction with HCl, strongly jointed, joints 196°82°W	96.27	2.74	0.39	0.03	0.09	533	56	<100
<b>Isolated Station</b> (UTM 648775 E, 5586705 N)											
74721	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey-weathered, medium- to dark-grey fresh, micritic to fine-grained (finely crystalline), massive(?), resistant, moderately to highly fractured, sugary texture, less oriented calcite crystals than previous 2 samples, still weakly "cooked" and foliated, rubbly outcrop, good reaction with HCl	98.22	1.17	0.25	0.04	0.11	470	42	230
<b>Isolated Station</b> (UTM 648729 E, 5586805 N)											
74722	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh, micritic to very-fine-grained, slightly crystalline with sugary texture, massive(?), resistant, moderately fractured, foliation is weak in this outcrop, no calcite needles visible, somewhat rubbly, very good reaction with HCl, strongly jointed, joints 180°76°W	95.04	4.10	0.45	0.03	0.12	416	60	<100
<b>Section 2010-05</b> (UTM 648717 E, 5586862 N)											
74724	Quatsino	3½	<b>Lime Mudstone</b> , same as 74723, slightly darker, less crystalline	93.77	5.31	0.26	0.05	0.12	402	69	<100
74723	Quatsino	3½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh, micritic to very-fine-grained, weakly crystalline with sugary texture, massive(?), resistant, moderately fractured (with calcite smear), minor calcite nodules and veinlets, dyke nearby, weak foliation and recrystallization, very good reaction with HCl, moderately jointed (30 cm to 1 m spacing), joints 034°subvert ical	96.83	2.55	0.17	0.03	0.10	483	61	174

Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
<b>Isolated Station</b> (UTM 648658 E, 5586994 N)											
74725	Quatsino	2½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh, micritic to very-fine-grained, massive(?), resistant, moderately fractured and rubbly, minor calcite veinlets, relatively undisturbed, very little evidence of recrystallization, good to very good reaction with HCl	94.29	4.39	0.51	0.07	0.17	535	119	143
<b>Isolated Station</b> (UTM 648605 E, 5586916 N)											
74726	Quatsino	2½	<b>Lime Mudstone</b> , tan and medium-grey weathered, medium- to dark-grey-brown fresh, micritic to very-fine-grained, weakly crystalline with sugary texture, massive, resistant, weakly fractured, minor calcite veinlets, slight fetid odour, minor conchoidal fracturing, good reaction with HCl	97.82	1.30	0.48	0.03	0.09	623	71	140
<b>Isolated Station</b> (UTM 648461 E, 5586845 N)											
74727	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, dark-grey fresh, micritic (very-minor cryptocrystalline), minor conchoidal fracturing, massive, minor calcite veins and veinlets, fetid odour, very minor disseminated pyrite, good to very good reaction with HCl	86.05	12.36	0.48	0.07	0.15	1382	116	158
<b>Isolated Station</b> (UTM 648391 E, 5586856 N)											
74728	Quatsino	2	<b>Lime Mudstone</b> , medium-grey weathered, light- to medium-grey fresh, micritic (minor) to fine-grained (crystalline), sugary texture, moderately fractured, moderate calcite blades and needles, fetid odour, powders when struck, outcrop seems mildly "cooked", very good reaction with HCl	95.54	2.91	0.82	0.08	0.13	1522	98	<100
<b>Section 2010-06</b> (UTM 648471 E, 5587077 N)											
74730	Quatsino	4	<b>Lime Mudstone</b> , same as 74729	88.01	10.69	0.34	0.03	0.14	3459	108	<100
74729	Quatsino	4	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, micritic, massive, resistant, moderately fractured and rubbly, minor calcite veining and fracture fill, moderate to good reaction with HCl	89.72	9.14	0.44	0.04	0.18	2161	157	<100
<b>Isolated Station</b> (UTM 648486 E, 5587214 N)											
74731	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh, micritic to very-fine-grained, massive(?), very minor calcite veinlets and fracture fill, moderately fractured, white bleaching in some areas (surficial only), very weak recrystallization, very good reaction with HCl, joints 242°86°NW	97.20	1.34	0.30	0.05	0.19	4413	43	<100
<b>Isolated Station</b> (UTM 648533 E, 5587224 N)											
74732	Quatsino	3½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh, micritic to very-fine-grained, massive, resistant, moderate to highly fractured, minor calcite veinlets and fracture fill, some white surficial weathering, good reaction with HCl	97.43	1.26	0.32	0.03	0.11	4865	50	<100

Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
<b>Section 2010-07</b> (UTM 620974 E, 5608150 N)											
74745	Quatsino	4	<b>Lime Mudstone</b> , same as 74744, minor cryptocrystalline, less veining and calcite crystals	97.45	0.29	1.43	0.18	0.22	582	474	817
74744	Quatsino	3	<b>Lime Mudstone</b> , same as 74743, mostly micritic with minor cryptocrystalline, less veining and calcite crystals	96.52	0.27	1.56	0.23	0.25	540	551	779
74743	Quatsino	2½	<b>Lime Mudstone</b> , medium- to dark-brown-grey weathered, medium-brown-grey fresh, micritic to very-fine-grained, massive, resistant, abundant calcite veining and crystals, fetid odour, irregular brown bands, very good reaction with HCl	98.06	0.21	0.98	0.08	0.25	405	507	522
74742	Quatsino	2½	<b>Lime Mudstone</b> , same as 74733, more veining and calcite crystals; <b>dyke zone</b> : rusty-white to light-grey weathered, white-grey fresh, abundant disseminated sulfides and stringers, very-fine-grained to fine-grained, moderate iron staining, black stringers that weather out (silica?/sulfide), has a weak but prolonged reaction with HCl	79.62	0.23	10.10	3.13	1.95	410	574	901
74741	Quatsino	1	<b>Lime Mudstone</b> , same as 74740, no cryptocrystalline, slightly coarser (abundant calcite crystals), some bladed calcite, stronger calcite veining	97.00	0.27	1.85	0.15	0.35	415	595	625
74740	Quatsino	2½	<b>Lime Mudstone</b> , same as 74733, locally more cryptocrystalline, locally abundant calcite crystals	96.50	0.31	1.82	0.42	0.35	645	551	875
74739	Quatsino	3	<b>Lime Mudstone</b> , same as 74733	97.36	0.23	1.50	0.02	0.17	540	444	440
74738	Quatsino	2½	<b>Lime Mudstone</b> , same as 74733, less brown weathering	98.40	0.23	0.73	0.02	0.18	558	422	302
74737	Quatsino	3	<b>Lime Mudstone</b> , same as 74733, less brown weathering, bedding 067°/40°	98.47	0.21	0.49	0.04	0.19	930	453	383
-	-	½ to 1	offset								
74736	Quatsino	3	<b>Lime Mudstone</b> , same as 74733	98.36	0.21	0.77	0.05	0.20	535	448	235
74735	Quatsino	3	<b>Lime Mudstone</b> , same as 74733	98.13	0.23	0.79	0.04	0.11	620	478	<100
74734	Quatsino	3	<b>Lime Mudstone</b> , same as 74733, more micritic and grey	98.22	0.27	0.80	0.06	0.18	559	724	275
74733	Quatsino	3½	<b>Lime Mudstone</b> , dark-brown-grey weathered, light- to medium-grey fresh, micritic to very-fine-grained (minor cryptocrystalline), massive (minor thick-bedded), moderate to strong calcite veining, resistant, some conchoidal fracturing, fetid odour, brown bands/layers are irregular but roughly follow bedding, some small calcite crystals (voids?), very good reaction with HCl, rare bedding surfaces, bedding 1) 042°/33° SE, bedding 2) 047°/40° SE	92.18	0.25	2.92	1.72	1.69	489	792	762
<b>Isolated Station</b> (UTM 620609 E, 5608449 N)											
74746		1¼	<b>Fault Breccia/Altered Limestone</b> , medium- to dark-brown-grey weathered, light- to medium-grey fresh, very-fine-grained to medium-grained, abundant iron staining (alteration), very rusty, large vugs(?) with calcite fill, fetid odour, appears iron and silica rich, weak to absent reaction with HCl	11.82	6.09	21.79	4.18	6.66	747	1913	3058



Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
<b>Section 2010-08</b> (UTM 611074 E, 5608669 N)											
74748	Quatsino	2½	<b>Lime Mudstone</b> , same as 74747, more abundant calcite veinlets	97.34	0.17	1.51	0.07	0.33	360	1074	<100
74747	Quatsino	3¼	<b>Lime Mudstone</b> , light- to medium-grey weathered, dark-grey fresh, micritic to very-fine-grained, thick bedded (2-3 m) to massive, resistant, very rare calcite veining, moderately fractured, good reaction with HCl	95.49	0.21	3.26	0.17	0.37	310	1269	<100
<b>Isolated Station</b> (UTM 644886 E, 5589848 N)											
74749	Quatsino	4½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh, cryptocrystalline to micritic, thickly bedded (1-2 m), resistant, moderate calcite veining, some rusty weathering on fractures, good reaction with HCl, bedding 191°/22°W	96.00	0.84	1.99	0.38	0.29	1057	351	102
<b>Isolated Station</b> (UTM 644882 E, 5589778 N)											
74750	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, micritic to cryptocrystalline, massive(?), resistant and hard, locally abundant calcite veining, rubbly and fractured, good to very good reaction with HCl	97.11	0.63	1.37	0.20	0.13	938	86	114
<b>Isolated Station</b> (UTM 644794 E, 5589689 N)											
74751	Quatsino	4½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh with minor light-brown-grey, cryptocrystalline (minor micritic), massive(?), resistant and hard, some conchoidal fracturing, minor calcite veining, very good reaction with HCl	97.61	0.54	0.83	0.08	0.20	860	78	128
<b>Isolated Station</b> (UTM 644757 E, 5589635 N)											
74752	Quatsino	4	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh with minor light-brown-grey, cryptocrystalline (very minor micritic), massive, resistant and hard, locally very fractured and rubbly, weak to moderate calcite veining, brown bands/zones (bleaching?), very good reaction with HCl	98.00	0.44	0.47	0.04	0.12	1522	73	139
<b>Isolated Station</b> (UTM 644693 E, 5589556 N)											
74753	Quatsino	2½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, micritic (minor cryptocrystalline), massive(?), less resistant than previous outcrops, moderately fractured overall, locally very strongly fractured and rubbly, locally very strong calcite veining (brecciated in places), outcrop has abundant pale-yellow-orange stringers which are very irregular, minor local bleaching, weak to moderate reaction with HCl	98.31	0.48	0.55	0.04	0.09	1059	57	234
<b>Isolated Station</b> (UTM 644707 E, 5589400 N)											
74754	Quatsino	2¾	<b>Lime Mudstone</b> , light- to medium-grey weathered, light- to dark-grey fresh (light-grey - bleaching?), micritic (minor cryptocrystalline), moderately bedded (½ to 1½ m), bedding forms benches, resistant and hard, strong calcite veining and nodules (weather out to form a pockety surface), very good reaction with HCl, bedding 202°/12°W	91.13	6.07	1.35	0.10	0.14	3648	78	153

Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
<b>Isolated Station</b> (UTM 644881 E, 5589321 N)											
74755	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh, cryptocrystalline to micritic, massive(?), resistant and hard, moderate calcite veining (locally strong), some weathered out calcite veins/nodules, minor bleaching (light-grey), very good reaction with HCl	97.00	0.84	1.07	0.12	0.11	1449	75	287
<b>Isolated Station</b> (UTM 644954 E, 5589398 N)											
74756	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, light-grey fresh (minor medium-grey), cryptocrystalline to micritic, massive(?), resistant and hard, moderate to highly fractured, moderate calcite veining, rubbly outcrop, bleached(?), very good reaction with HCl	98.34	0.50	0.46	0.06	0.14	399	117	<100
<b>Isolated Station</b> (UTM 645022 E, 5589433 N)											
74757	Quatsino	3½	<b>Lime Mudstone</b> , light- to medium-grey weathered and fresh, cryptocrystalline to micritic, thickly bedded (1-2 m), hard and resistant, powders when struck, moderate calcite veining, good to very good reaction with HCl, bedding 222°12°NW	98.81	0.46	0.35	0.02	0.11	682	95	<10 0
<b>Isolated Station</b> (UTM 645072 E, 5589454 N)											
74758	Quatsino	4	<b>Lime Mudstone</b> , light- to medium-grey weathered and fresh, cryptocrystalline to micritic, massive, resistant and hard, weakly fractured, weak calcite veining, powders when struck, very good reaction with HCl	98.25	0.65	0.66	0.06	0.24	513	194	<100
<b>Isolated Station</b> (UTM 645145 E, 5589519 N)											
74759	Quatsino	2½	<b>Lime Mudstone</b> , light- to medium-grey weathered, light-grey fresh (minor medium-grey), cryptocrystalline (minor micritic), massive, resistant, minor calcite veining, bleached (light colour), fetid odour, very good reaction with HCl	98.34	0.38	0.13	0.02	0.20	1404	119	<100
<b>Section 2010-09</b> (UTM 645209 E, 5589594 N)											
74764	Quatsino	3	<b>Lime Mudstone</b> , same as 74763, minor bleached zones near top (light-brown-grey colour)	98.70	0.54	0.14	0.02	0.17	1444	74	165
74763	Quatsino	3	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium- to dark-grey fresh, cryptocrystalline to micritic, massive(?), resistant, moderately fractured, coarse calcite veins and nodules, not as bleached/cooked as 74762, weak to moderate reaction with HCl	98.31	0.65	0.19	0.05	0.14	1706	63	229
74762	Quatsino	3½	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh (minor very-light-brown-grey), cryptocrystalline to micritic, locally weakly crystalline with sugary texture, massive(?), resistant, abundant coarse calcite veining, moderately fractured, appears cooked and/or bleached (light colour), good reaction with HCl	98.72	0.40	0.26	0.04	0.19	1884	135	181
74761	Quatsino	3	<b>Lime Mudstone</b> , same as 74760, minor dark grey fresh, thickly bedded (1½ to 2 m), chert not as obvious (less abundant?), no reliable bedding surfaces	97.50	0.69	0.96	0.11	0.21	1123	113	567

Sample	Strat. Unit	Strat. Thick. (m)	Description	CaCO <sub>3</sub> (%)	MgCO <sub>3</sub> (%)	SiO <sub>2</sub> (%)	Al <sub>2</sub> O <sub>3</sub> (%)	Fe <sub>2</sub> O <sub>3</sub> (%)	SrO (ppm)	MnO (ppm)	P <sub>2</sub> O <sub>5</sub> (ppm)
74760	Quatsino	5	<b>Lime Mudstone</b> , light- to medium-grey weathered, medium-grey fresh (minor light-grey - bleaching), cryptocrystalline to micritic, massive, resistant, moderate calcite veining (locally strong), bleached in places, abundant but scattered chert nodules and stringers that stand out on the weathered surface, good reaction with HCl	97.56	0.42	1.30	0.05	0.15	1281	210	321
<b>Section 2010-10</b> (UTM 615425 E, 5608383 N)											
74767	Quatsino	3½	<b>Lime Mudstone</b> , light- to medium-grey-brown weathered, medium- to dark-grey fresh, cryptocrystalline, massive, resistant, minor calcite veining and coarse calcite crystals, good reaction with HCl	98.45	0.25	0.81	0.06	0.21	491	512	<100
74765	Quatsino	4	<b>Lime Mudstone</b> , light-grey weathered, medium-grey fresh, cryptocrystalline to micritic (minor), massive, hard and resistant, powders when struck, very minor coarse calcite, rubbly outcrop, very good reaction with HCl	97.77	0.23	0.82	0.07	0.22	489	545	112
74766	Quatsino	2½	<b>Lime Mudstone</b> , same as 74765, minor sugary texture	98.47	0.15	0.70	0.02	0.20	403	438	<100
<b>Section 2010-11</b> (UTM 612411 E, 5608172 N)											
74772	Quatsino	4	<b>Lime Mudstone</b> , white weathered, medium- to dark-grey fresh, cryptocrystalline, thickly bedded (3-4 m), resistant and hard, moderately fractured, very minor calcite veining, very good reaction with HCl, bedding 097°49° SSW ( wavy)	97.82	0.21	1.08	0.06	0.20	409	547	<100
74771	Quatsino	4	<b>Lime Mudstone</b> , same as 74770, some coarsely crystalline, thickly bedded (3 m), bedding 101°47° SSW (wavy)	98.13	0.15	1.29	0.02	0.21	351	510	<100
74770	Quatsino	3	<b>Lime Mudstone</b> , white- to light-grey weathered, medium- to dark-grey fresh, cryptocrystalline, thickly bedded (2-3 m), hard and resistant, minor calcite veining, some conchoidal fracturing, very good reaction with HCl, bedding 1) 096°52° SSW (wavy), bedding 2) 100°48° SSW (wavy)	98.25	0.15	1.00	0.02	0.24	472	475	<100
74769	Quatsino	3½	<b>Lime Mudstone</b> , same as 74768, light-brown-grey weathered	97.52	0.15	1.78	0.09	0.31	373	504	<100
74768	Quatsino	3	<b>Lime Mudstone</b> , light-grey weathered, medium- to dark-grey fresh, cryptocrystalline (minor coarsly crystalline), massive, hard and resistant, powders when struck, minor calcite veinlets, very minor bleaching (locally), very good reaction with HCl	97.95	0.15	1.12	0.07	0.24	408	463	<100
<b>Section 2010-12</b> (UTM 620107 E, 5608548 N)											
74774	Quatsino	3½	<b>Lime Mudston</b> , same as 74773, more coarsely crystalline calcite, irregular and wavy bedding, possible bedding 265°29° N	98.06	0.25	0.91	0.08	0.27	651	487	334
74773	Quatsino	3½	<b>Lime Mudstone</b> , medium- to dark-grey weathered, dark-grey to light-brown fresh, cryptocrystalline to micritic, massive(?), hard, powders when struck, fetid odour, abundant calcite veining and coarse calcite crystals, possible bedding 280°20° N (wavy)	97.34	0.23	1.33	0.07	0.32	760	481	285
<b>Isolated Station</b> (UTM 648804 E, 5596715 N)											
74775	Quatsino	1½	<b>Lime Mudstone</b> , mottled light- to medium-grey weathered, medium- to dark-grey fresh, micritic, massive, resistant, minor calcite veining, very good reaction with HCl	97.68	0.44	0.59	0.06	0.17	2639	72	<100

**APPENDIX 5: PROPORTION OF EXPENDITURES ASSIGNED TO EACH CLAIM GROUP**

<b>Property Name</b>	<b>Current Size (ha)</b>	<b>New Expiry</b>	<b>Terms Required</b>	<b>Required Expenditures</b>	<b>Days of Work</b>	<b>Actual Expenditures</b>	<b>Excess Expenditures*</b>
<b>Nimpkish</b>	2690.40	December 31, 2011	1	\$ 19,466.04	4.50	\$ 20,458.63	\$ 992.59
<b>Bonanza Lake</b>	1604.50	December 31, 2011	1	\$ 6,451.38	2.00	\$ 9,092.73	\$ 2,641.35
<b>MQ</b>	1619.75	December 31, 2011	2.52	\$ 16,295.08	4.50	\$ 20,458.63	\$ 4,163.55
<b>TOTAL</b>	<b>5914.65</b>	<b>December 31, 2011</b>		<b>\$ 42,212.50</b>	<b>11.00</b>	<b>\$ 50,009.99</b>	<b>\$ 7,797.49</b>

\* Excess expenditures assigned to PAC account

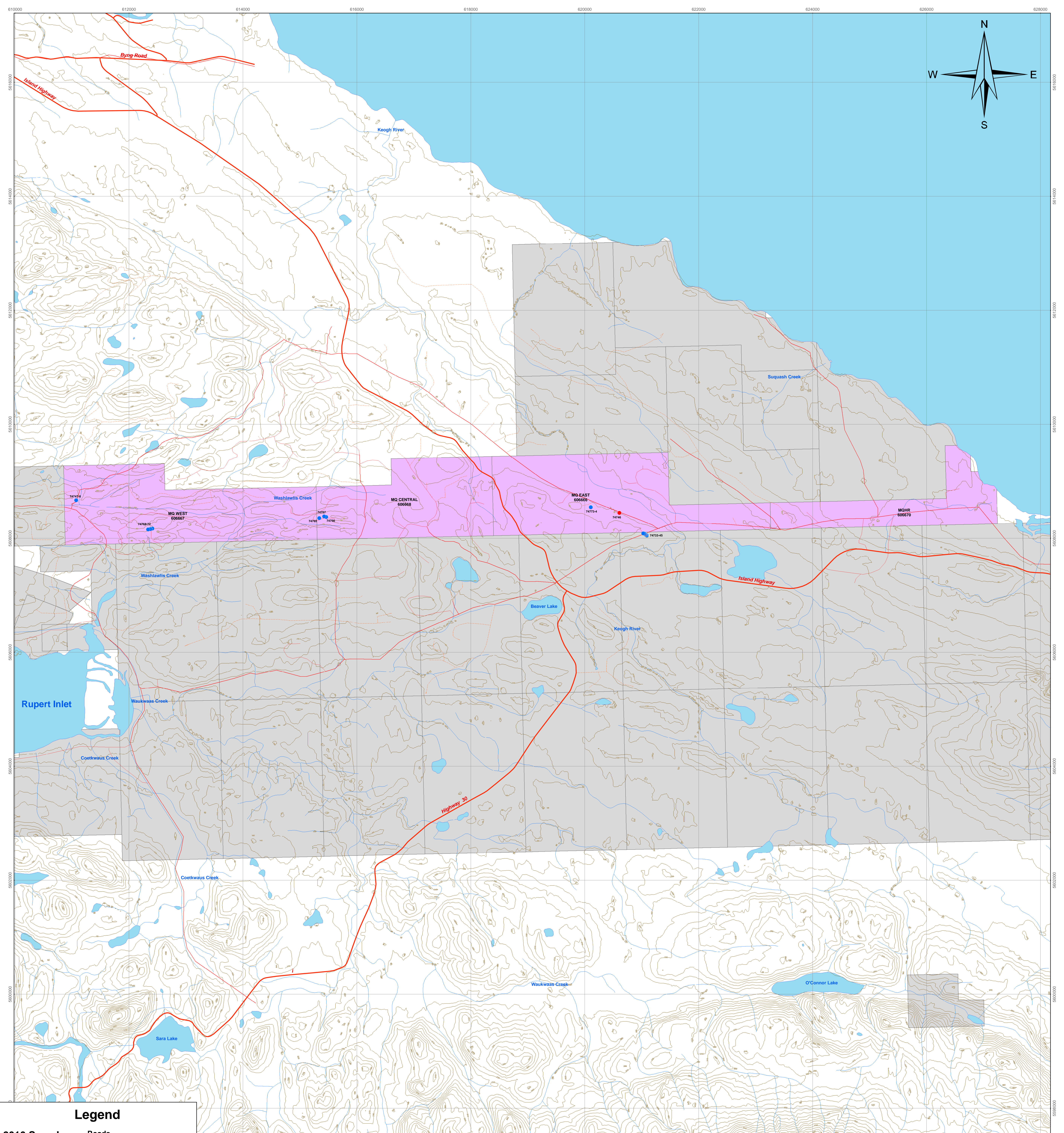
## **APPENDIX 6: STATEMENT OF QUALIFICATIONS**

The field work described in this report was supervised by Patrick Kluczny, P.Geol.

P. Kluczny is a geological consultant with Dahrouge Geological Consulting Ltd. based in Edmonton, Alberta. He obtained a degree in Geology from the University of Alberta, Edmonton in 2006 and has been employed in the mineral exploration industry since. He is registered as a P.Geol. with the Association of Professional Engineers, Geologists, and Geophysicists of Alberta.

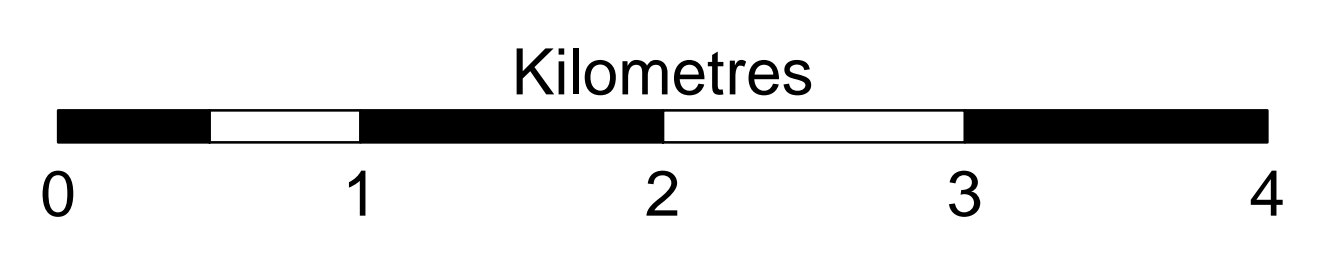
W. Miller is a geological consultant with Dahrouge Geological Consulting Ltd. based in Edmonton, Alberta. He obtained a degree in Geology from the University of Alberta, Edmonton in 2009 and has been employed in the mineral exploration industry since. He is registered as a Geol. I.T. with the Association of Professional Engineers, Geologists, and Geophysicists of Alberta.





**Legend**

<b>2010 Samples</b>	<b>Roads</b>
● 97-100	— Highway
● 95-97	— Main Forestry Road
● 90-95	— Secondary Forestry Road
● <90	— Trail
— Contours (20 m)	<b>Mineral Tenures</b>
— Rivers/Creeks	■ MQ Property
■ Lakes	■ Other



Coordinate System: UTM NAD83, Zone 9N

**GRAYMONT WESTERN CANADA INC.**

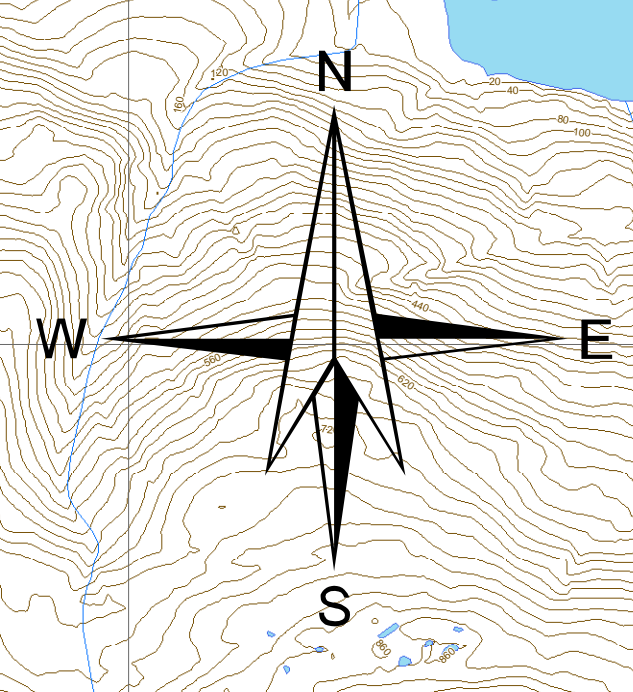
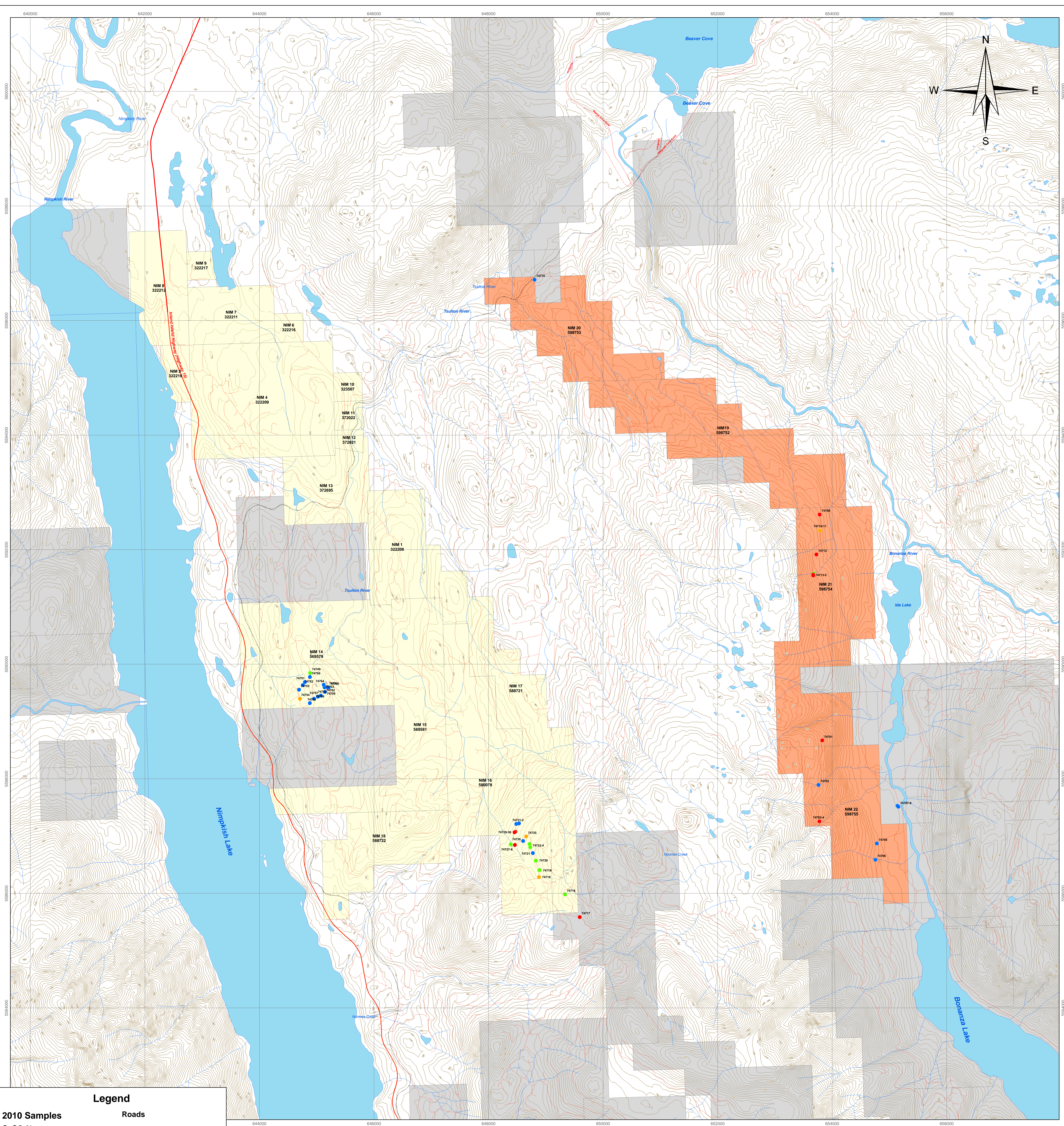
**DG Dahrouge Geological Consulting Ltd.**  
Edmonton, Alberta

MQ PROPERTY  
NORTHERN VANCOUVER ISLAND

Fig. 1.3  
2010 Exploration - MQ Claims

WM 2010.09





**Legend**

**2010 Samples CaCO<sub>3</sub>%**

- 97-100
- 95-97
- 90-95
- <90

**Roads**

- Highway
- Major Road
- Minor Road
- Trail
- Forestry Roads
- Railway

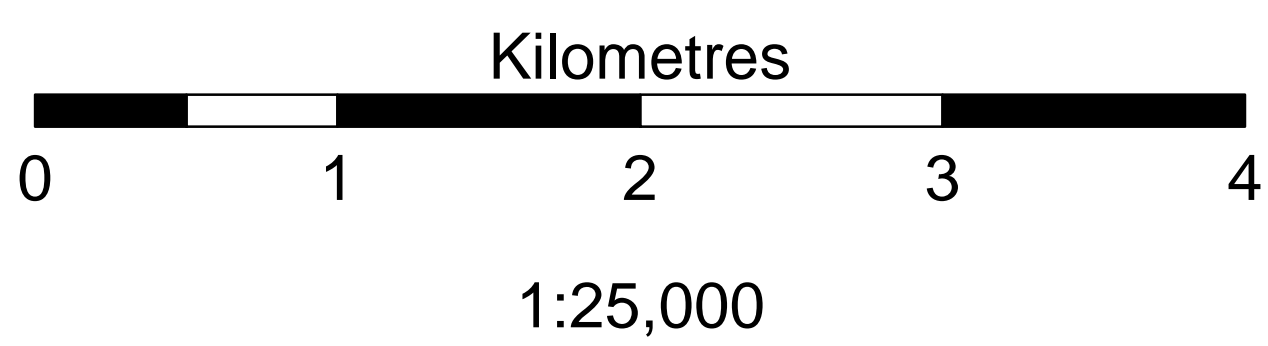
**Mineral Tenures**

- Bonanza Lake Property
- Nimpkish Property
- Other

— Topographic Contours (20 m)

— Creek/stream

■ Waterbody



Coordinate System: UTM NAD83, Zone 9N

**GRAYMONT WESTERN CANADA INC.**

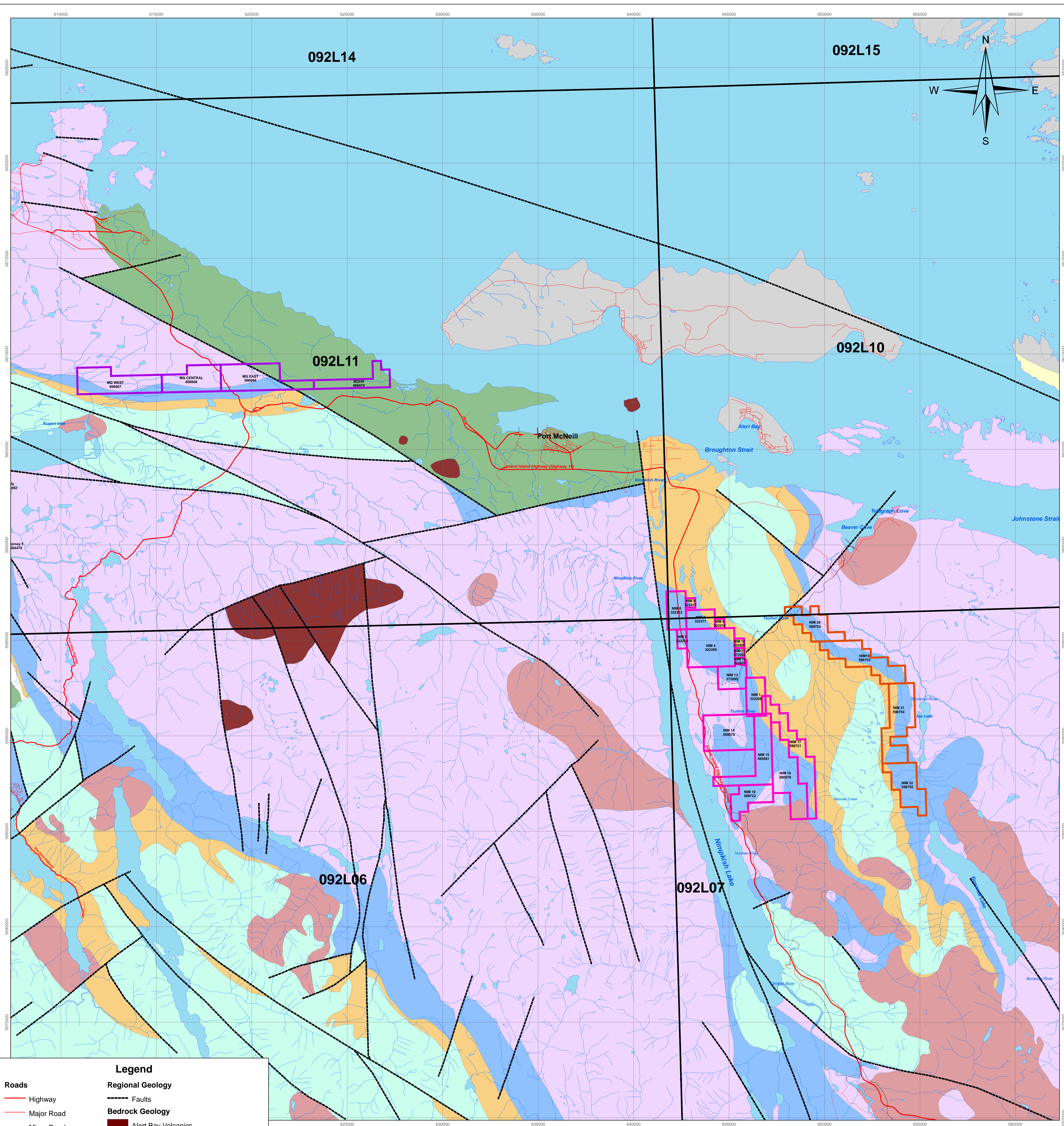
**DG Dahrouge Geological Consulting Ltd.**  
Edmonton, Alberta

**NIMPKISH AND BONANZA LAKE PROPERTIES  
NORTHERN VANCOUVER ISLAND**

**Fig. 1.4  
2010 Exploration - Nimpkish and  
Bonanza Lake Claims**

WM 2010.08





**Legend**

**Roads**

- Highway
- Major Road
- Minor Road
- Trail
- Railway
- Creek/stream
- Waterbody
- NTS Grid

**Mineral Tenures**

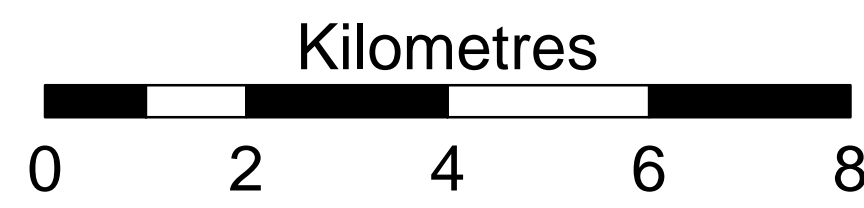
- MQ Property
- Nimpkish Property
- Bonanza Lake Property

**Regional Geology**

- Faults

**Bedrock Geology**

- Alert Bay Volcanics
- Bonanza Group
- Bonanza Group - Harbledown Formation
- Island Plutonic Suite
- Nanaimo Group - Suquash Sequence
- Vancouver Group
- Vancouver Group - Karmutsen Formation
- Vancouver Group - Parson Bay Formation
- Vancouver Group - Quatsino Formation
- Unnamed



1:75,000

Coordinate System: UTM NAD83, Zone 9N

Regional geology data from GeoFile 2005-02: Digital Geology Map of British Columbia

**GRAYMONT WESTERN CANADA INC.**

**DG Dahrouge Geological Consulting Ltd.**  
Edmonton, Alberta

MQ, NIMPKISH AND BONANZA LAKE PROPERTIES  
NORTHERN VANCOUVER ISLAND

**Fig. 2.1**  
**Regional Geology**