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Ministry of Energy, Mines & Petroleum Resources
Mining & Minerals Division
BC Geological Survey

Assessment Report
Title Page and Summary

TYPE OF REPORT [type of survey(s)]: Geological/Geochemical

TOTAL COST: 18,592.34

AUTHOR(S): Patrick Kluczny, P.Geol.
Kelly Krueger, Geol.I.T.

SIGNATURE(S):

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):

YEAR OF WORK: 2014

STATEMENT OF WORK - CASH PAYMENTS EVENT NUMBER(S)/DATE(S): Event No.'s 5501383, 5501385

PROPERTY NAME: MQ Property, Varney Bay Property

CLAIM NAME(S) (on which the work was done): MQ South, MQ 1, MQ 2, MQ West, MQ Central, Tenure 505092

COMMODITIES SOUGHT: Limestone

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: Nanaimo

NTS/BCGS: 92L11, 92L12

LATITUDE: 50 ° 32 ' " **LONGITUDE:** 127 ° 13 ' " (at centre of work)

OWNER(S):
1) Graymont Western Canada Inc.
2)

MAILING ADDRESS:
260, 3025 - 12 Street NE
Calgary, AB. T2E 4P9

OPERATOR(S) [who paid for the work]:
1) Graymont Western Canada Inc.
2)

MAILING ADDRESS:
260, 3025 - 12 Street NE
Calgary, AB. T2E 4P9

PROPERTY GEOLOGY KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude):
Carbonates, limestone, Triasssic, 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, 2012: Ass. Rpt. 34096, 2013: Ass. Rpt. 34609

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TYPE OF WORK IN THIS REPORT	EXTENT OF WORK (IN METRIC UNITS)	ON WHICH CLAIMS	PROJECT COSTS APPORTIONED (incl. support)
GEOLOGICAL (scale, area)			
Ground, mapping	1:10,000, 1:30,000	MQ South, MQ 1-2, Tenure 505092	$17,972.84
Photo interpretation			
GEOPHYSICAL (line-kilometres)			
Ground			
Magnetic			
Electromagnetic			
Induced Polarization			
Radiometric			
Seismic			
Other			
Airborne			
GEOCHEMICAL (number of samples analysed for...)			
Soil			
Silt			
Rock	21 samples analyzed for major oxides	Tenure 505092, MQ West, MQ Central	$619.50
Other			
DRILLING (total metres; number of holes, size)			
Core			
Non-core			
RELATED TECHNICAL			
Sampling/assaying			
Petrographic			
Mineralographic			
Metallurgic			
PROSPECTING (scale, area)			
PREPARATORY / PHYSICAL			
Line/grid (kilometres)			
Topographic/Photogrammetric (scale, area)			
Legal surveys (scale, area)			
Road, local access (kilometres)/trail			
Trench (metres)			
Underground dev. (metres)			
Other			
		TOTAL COST:	$18,592.34

GRAYMONT WESTERN CANADA INC.

2014 EXPLORATION AND FIELDWORK ON THE MQ AND VARNEY BAY PROPERTIES

NORTHERN VANCOUVER ISLAND, BRITISH COLUMBIA
Nanaimo Mining Division

MQ EAST, MQ WEST, MQ CENTRAL, MQHR, MQ SOUTH, MQ 1-2
VARNEY 5, VARNEY 2009 and Tenure 505092

Geographic Coordinates
50°32' N to 50°37' N
127°12' W to 127°32' W

NTS Sheets 92L11/12

Owner and Operator: Graymont Western Canada Inc.
260, 4311 - 12 St. NE
Calgary, Alberta T2E 4P9

Consultant: Dahrouge Geological Consulting Ltd.
Suite 18, 10509 - 81 Ave.
Edmonton, Alberta T6E 1X7

Authors: P. Kluczny, B.Sc., P.Geol.
K. Krueger, B.Sc., Geo.I.T.

Date Submitted: July 23, 2014

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1. INTRODUCTION

Adjacent to Varney Bay on the south shore of Rupert Inlet on northern Vancouver Island, limestone of the Quatsino Formation outcrops along, and south of, two parallel north to northwest trending ridges. The claims which encompass these limestone occurrences were originally acquired by Ecowaste Industries Ltd. in October, 1993. In 1993, Stan Krukowski of Continental Lime Inc. completed a cursory examination of the claims. In 1994, eight holes were drilled within the south-central parts of the property. The property was abandoned, re-staked and surveyed by McElhanney Associates in 1997. An additional claim was staked in 2005, and the existing claims were converted to cell claims.

Following promising exploration results at Varney Bay and Nimpkish Lake, MQ East, MQ West, MQ Central and MQHR claims were staked in 2009 to cover exposures of Quatsino Formation along Highway 19, between Port Hardy and Port McNeill. Dahrouge and Graymont carried out ground magnetic survey and surface sampling programs on the MQ claims in fall 2012 and summer 2013 and in January 2014, Graymont staked MQ 1-2 and MQ South claims to expand the MQ Property.

Dahrouge Geological Consulting Ltd. (Dahrouge) and Graymont Western Canada Inc. (Graymont) carried out a mapping and surface sampling program on the Varney Bay and MQ claims from April 10 to 17, 2014. On the Varney Bay Property, fourteen limestone samples were collected and analyzed to further test the limestone quality. On the MQ Property, seven limestone samples were collected. This report describes the 2014 exploration and provides an interpretation of the results. Appendix 1 details the cost breakdown between the properties; Appendix 2 describes the proportion of expenditures between the Varney Bay and MQ properties. Information such as lithology, limestone quality, structural measurements and other geological observations were recorded. Handheld Garmin GPS instruments were used for mapping. The 2014 exploration was authorized by Bob Robison of Graymont Western Canada Inc.

Two statements of work have been filed with respect to the exploration described in this report (event numbers 5501383 and 5501385).

1.1 GEOGRAPHIC SETTING

1.1.1 Location and Access

The MQ and Varney Bay properties are within the Insular Belt near the northern end of Vancouver Island, south-western British Columbia. The MQ Property lies approximately 19 km west-northwest of Port McNeill and 15 km southeast of Port Hardy to the north and west of Highway 19. The Varney Bay Property is located along the southwest shore of Rupert Inlet about 30 km southwest of the town of Port Hardy and about 30 km west of Port McNeill (Fig. 2.1). Rupert Inlet outlets to the Pacific Ocean through Quatsino Narrows and Quatsino Sound.

From Port McNeill, the MQ Property is accessed by driving westerly on Highway 19 (Island Highway), for about 10 to 15 km, at which point a network of logging roads intersect 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 Property.

From Port Hardy, the Varney Bay Property is reached by driving south on paved Highway 19 for about 22 km and then west on the gravel Rupert Main logging road (Fig. 2.1). At approximately 7 km, there is a junction where the southern Port Hardy Main logging road leads to the Varney Main logging road, which connects to spur road 510. Approximately 2 km along spur road 510 is a disused network of logging roads which provide access to and throughout the property.

The network of logging roads throughout the MQ and Varney Bay properties 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. Caution is necessary while travelling active logging roads, as the passing of large logging trucks commonly requires the use of pull-outs.

1.1.2 Infrastructure

Accommodations, food and other necessary services are available in Port Hardy and Port McNeill.

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 forestry, 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.

1.1.3 Topography, Vegetation and Climate

Within the west-central part of the Varney Bay Property is the northwest trending Varney Ridge, approximately 1,500 m in length. Its northern part is composed of a few knolls, Hill 6 and Hill 8, each up to 200 m across. The western part of the ridge forms a gentle slope to the shore of Rupert Inlet, while its eastern boundary is marked by a steep, cliff-forming slope. East of Varney Ridge are a number of low-lying areas. Elevations range from sea level along the shores of Rupert Inlet to 202 m at the crest of Varney Ridge. About 1 km due east of the south end of Varney Ridge, is the northerly trending Lost Ridge. It exceeds 1,250 m length, reaches approximately 190 m elevation, and its western and eastern boundaries are marked by fairly steep slopes.

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.

Portions of the MQ and Varney Bay properties 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 7 contiguous claims (Table 1.1, Fig. 1.5). MQ East, MQ West, MQ Central and MQHR were staked in June 2009 through the BC Mineral Titles online staking system. Following promising exploration results, MQ South, MQ 1 and MQ 2 were staked in early 2014.

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	2015 12 31	2015 12 31
MQ WEST	606667	2009 06 29	2015 12 31	2015 12 31
MQ CENTRAL	606668	2009 06 29	2016 12 31	2016 12 31
MQHR	606670	2009 06 29	2015 12 31	2016 12 31
MQ SOUTH	1025406	2014 01 23	2015 01 23	2015 12 31
MQ 1	1025407	2014 01 23	2015 01 23	2016 12 31
MQ 2	1025409	2014 01 23	2015 01 23	2016 12 31

The Varney Bay Property consists of 3 contiguous claims (Table 1.2, Fig. 1.6). The Property was originally acquired by Ecowaste Industries Ltd. in October 1993, and consisted of one 4-post claim and seven 2-post claims, Var 1 to 8. Four additional 2-post claims, Var 9 to 12, were staked in June 1994. On April 22, 1997 claims Var 1 to 12 were abandoned and re-staked with four 4-post claims, Varney 1 to 4. Subsequently, Varney 1 to 4 were converted to cell claims in 2005, and claim Varney 5 was acquired. Finally, in 2009, Varney 2009 was staked through the BC Mineral Titles online staking system.

TABLE 1.2: LIST OF VARNEY BAY CLAIMS

Claim Name	Tenure Number	Record Date	Current Expiry Date	Expected Expiry Date
VARNEY 5	504479	2005 03 15	2016 01 21	2016 12 31
	505092	2005 01 28	2014 04 29	2015 12 31
VARNEY 2009	602617	2009 04 14	2014 10 14	2015 12 31

1.3 HISTORY AND PREVIOUS INVESTIGATIONS

The earliest reported examination of the northern part of Vancouver Island dates back to the last century when Dawson (1887) assigned limestone units near Quatsino Sound to the Vancouver Group. Dolmage (1919) assigned the extensive limestone occurrences at Quatsino and Barkley sounds to the Quatsino Formation. Subsequent work by Gunning (1930, 1932, 1938a, 1938b) detailed the stratigraphy of the region and it was proposed that the Vancouver Group be subdivided, as follows: basal Karmutsen Volcanics, middle Quatsino Formation and upper Bonanza Group. The division was subsequently corroborated at other locations on Vancouver Island (Hoadley, 1953; and Jeletzky, 1970, 1976).

The earliest analyses of limestone from the northern part of Vancouver Island were reported by Goudge (1945). Compilation work by Fishl (1992) on limestone and dolomite in British Columbia includes a summary of available information on the northern part of Vancouver Island.

In 1993, Dr. Stanley Krukowski of Continental Lime Inc. examined several limestone prospects within southwestern British Columbia, and collected 23 high-calcium limestone samples. During the latter part of 1993, a group of claims was staked on the south side of Rupert Inlet at Varney Bay. In 1994, 8 drill holes were completed at Varney Bay along Varney Ridge (Krukowski, 1994). In 2002, 224 limestone samples were collected and a 4.5 line-km ground magnetic survey was conducted in order to assist in locating structures and intrusive rocks (Dahrouge, 2003). Prior to 2014, the most recent exploration on the Varney Bay Property was in 2005; it consisted of mapping outcrops and collecting 107 samples for analysis (Dahrouge and Tanton, 2006).

Initial exploration on the MQ Property occurred in 2010, with 26 samples collected and analyzed to test the limestone quality (Kluczny and Miller, 2011). In 2012, a 3.4 line-km ground magnetic survey was completed on the MQ Property to identify Tertiary dykes cross-cutting the property (Kluczny and Krueger, 2013). In 2013, 3 samples were collected and analyzed, and 16 magnetic survey lines totalling 10.75 line-km were completed (Kluczny and Krueger, 2014).

1.4 PURPOSE OF WORK

The 2014 exploration program on the MQ and Varney Bay properties was primarily conducted in order to collect samples for analysis from previously under-explored areas. Mapping outcrops and checking access roads were secondary objectives.

1.5 SUMMARY OF WORK

From April 10 to 17, 2014, Dahrouge collected 21 samples of carbonate lithotypes within and surrounding the MQ and Varney Bay properties. Exploration on both properties consisted of mapping and sampling of outcrops. Initial prospecting of new tenures MQ South, MQ 1 and MQ 2 was also completed.

A total of 7 samples were examined and collected from the MQ Property (Fig. 1.3) and 14 from the Varney Bay Property (Fig. 1.4). 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 (Appendices 5 & 6). A solution of 10% 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 3 and assay results are provided in Appendix 4.

Field maps were completed on 1:10,000 and 1:30,000 scale map sheets and concentrated on the MQ and Varney Bay properties. A magnetic declination of 18° east was used.

Personnel were based in a motel in Port McNeill. Access to and from the properties was by a rented 4X4 vehicle. Access throughout the properties was by truck where possible, and by extensive hiking. 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 north-westerly trending, dextral, transcurrent faults, westerly verging thrust faults, plutonic rocks, and anticlinoria.

Within the Insular Belt of south-western 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).

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 south-eastern 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.

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	-
	Vancouver	Bonanza	volcanics	305 - 5650
Triassic	Vancouver	Harbledown	clastics and tuffs	
		Parsons Bay[1] - Sutton	calcareous clastics and limestone	305 - 710
		Quatsino[1]	limestone	30 - 750
		Karmutsen	volcanics	3000 - 6100
		Sediment Sill Unit	clastics and volcanics	750
Pennsylvanian	Buttle Lake°	Mount Mark (Buttle Lake)	limestone	215

* Modified after Muller et al. (1974) and Fishl (1992)
° Formerly of the Sicker Group (Massey and Friday, 1988)
[1] Equivalent to the Sutton Formation of western Vancouver Island (Jeletzky,1970)
[2] In part, previously mapped as Sutton Formation on southern Vancouver Island and equivalent to the Marble Bay Formation of Texada Island (Fishl, 1992)

2.1.2 Quatsino Formation

The Upper Triassic Quatsino Formation of the Vancouver Group para-conformably 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).

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 south of Alice Lake, within the western belt (Fishl, 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 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 *		
	Lower Part Approx. Thick. (m)	**Upper Part** Approx. Thick. (m)	Description
Western Belt			
Alice Lake	488	302	- immediately south of Alice Lake
Klaskino	25	49	- along north side of Klaskino Inlet (50°18'50", 127°51'50")
Central Nimpkish Belt			
Tsulton Property°	~ 135	-	- opposite halfway Islands on Nimpkish Lake
Eastern Belt			
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)
[1] 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 Fishl (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 18-27 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 north-westerly direction, they form narrow 3-8 km wide north-westerly 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 north-westerly 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 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 (1988) 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 north-westerly 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

During 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, 2012, 2013 or 2014; it is unknown if this is the result of the topography of the area, or if the unit tends to be recessive.

At least three unique lithological units are recognizable at the Varney Bay Property, including volcanic rocks of the Karmutsen Formation, and carbonate lithotypes of the upper and lower Quatsino Formation.

The Karmutsen Formation comprises incompletely metamorphosed basaltic and andesitic flows, tuffs, agglomerates, and breccias, with minor inter-bedded limestone (Hoadley, 1953). The high-quality limestone occurrences on/near the MQ and Varney Bay properties are part of the Quatsino Formation of the Vancouver Group. The Parson's Bay Formation was sampled on the MQ Property during the 2014 exploration, to confirm its low potential for high-quality limestone. The following is a brief summary of the limestone units encountered near the MQ and Varney Bay properties.

3.1.1 Karmutsen Formation

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 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 north-easterly 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. Therefore, 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 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, unconsolidated sediments may be tens of metres thick. It appears that much of the MQ and Varney Bay properties are 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 several limestone and dyke units on the properties (Appendix 5 & 6). 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 2014 EXPLORATION

The 2014 exploration program on the MQ and Varney Bay properties was primarily conducted in order to determine limestone quality in previously under-explored areas. Mapping outcrops and checking access roads were secondary objectives.

The majority of the work on each of the properties involved collecting samples of high-calcium Quatsino Formation for analysis. The 2014 exploration on the MQ Property concentrated on/near the claims MQ 1-2, MQ WEST and MQ CENTRAL, and was the fourth exploration program for the property (Fig. 1.3). Samples were collected at seven different locations on or near the MQ property. Exploration of the Varney Bay Property was concentrated on tenure 505092 (Fig. 1.4). Here, limestone outcrops were examined and sampled at fourteen different locations.

All samples from the 2014 program were shipped to Graymont's lab in Salt Lake City, Utah for preparation and analyses by standard ICP techniques, and LOI (Appendices 3 and 4). The five Quatsino Formation samples from the MQ Property were similar in quality, ranging from 95.63% to 98.54% $CaCO_3$, 0.15% to 0.48% $MgCO_3$, and 0.45% to 2.71% SiO_2. The Parson's Bay Formation samples ranged from 11.08% to 16.33% $CaCO_3$, 6.26% to 15.19% $MgCO_3$, and 26.35% to 33.58% SiO_2. In total, 15 m of Quatsino Formation and 6 m of Parson's Bay Formation were sampled on the MQ Property. The fourteen Quatsino Formation samples from the Varney Bay Property were also similar in quality, ranging from 95.02% to 98.52% $CaCO_3$, 0.73% to 3.14% $MgCO_3$, and 0.11% to 0.96% SiO_2. Eleven of the fourteen samples collected from the Varney Bay Property returned values of greater than 97% $CaCO_3$. In total, 40.50 m of Quatsino Formation were sampled on the Varney Bay Property, with the best sample section averaging 98.58% $CaCO_3$, 0.73% $MgCO_3$ and 0.20% SiO_2 over a 5 m thickness.

5. DISCUSSION AND CONCLUSIONS

A total of seven surface samples were collected from the MQ Property and fourteen from the Varney Bay Property. 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 two properties were examined with an attempt to identify new access routes and outcrop locations that had previously been unexplored.

Surface sampling of outcrops on both the Varney Bay and MQ properties continue to return high-quality results, often in excess of 95% $CaCO_3$ with relatively minor amounts of $MgCO_3$ and SiO_2, except for where major structures and/or intrusives are present. Overall, minimal intrusives have been observed on the Varney Bay Property.

The excellent quality and ideal logistical location of Quatsino Formation carbonates within the MQ and Varney Bay properties warrant further examination. The MQ Property is located along a major highway, and within a few kilometres of potential loading terminals along the coast. The Varney Bay Property is located on an inlet with direct access to the Pacific Ocean.

The next phase of exploration on the MQ and Varney Bay properties should consist of additional detailed geologic mapping, limestone sampling, geophysical surveying and possibly diamond drilling.

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

K. Krueger, B.Sc., Geo. I.T.

Edmonton, Alberta
2014 07 23

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LEGEND

- Provincial capital
- Other populated places
- Trans-Canada Highway
- Major road
- Ferry route
- International boundary
- Provincial boundary

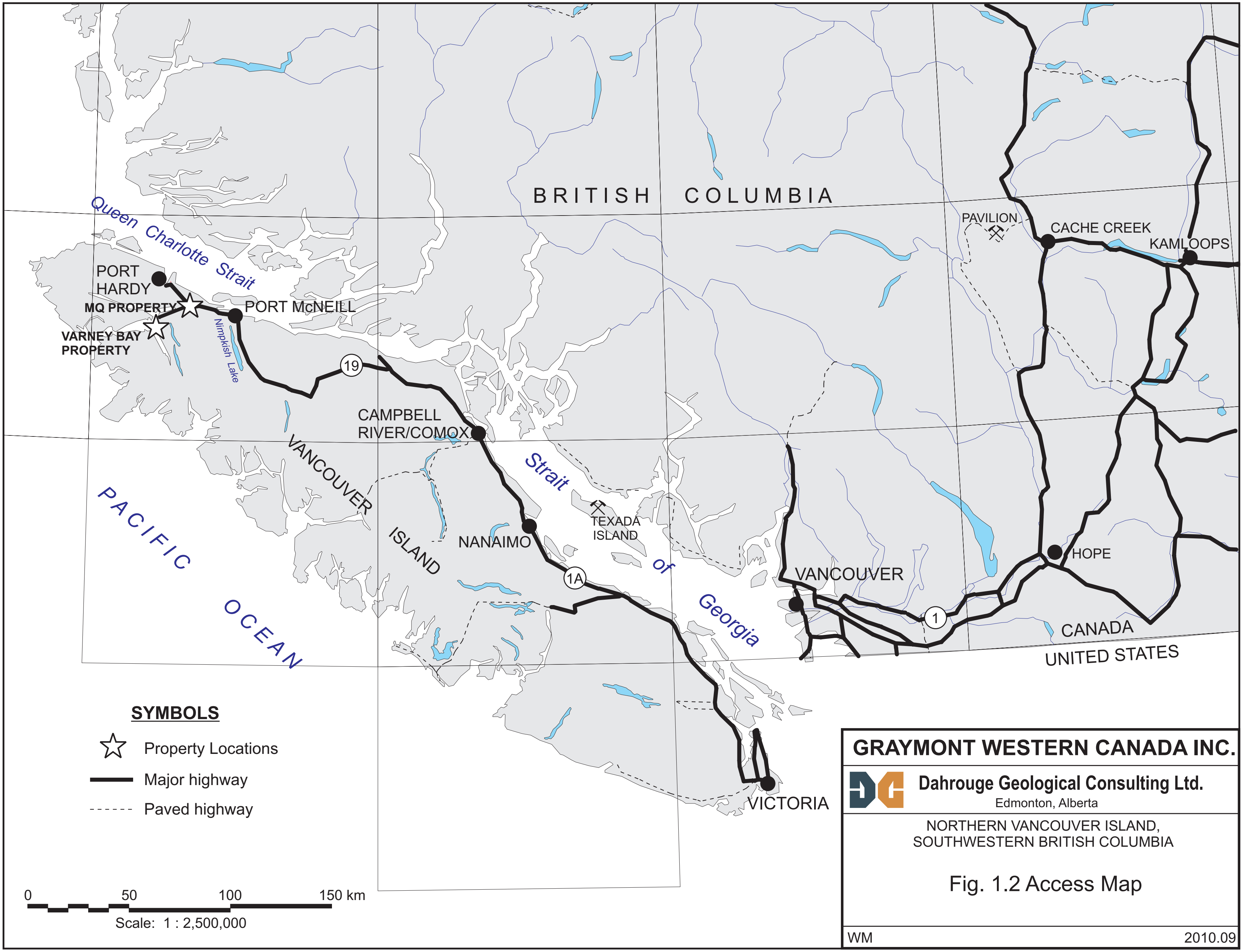
GRAYMONT WESTERN CANADA INC.

Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

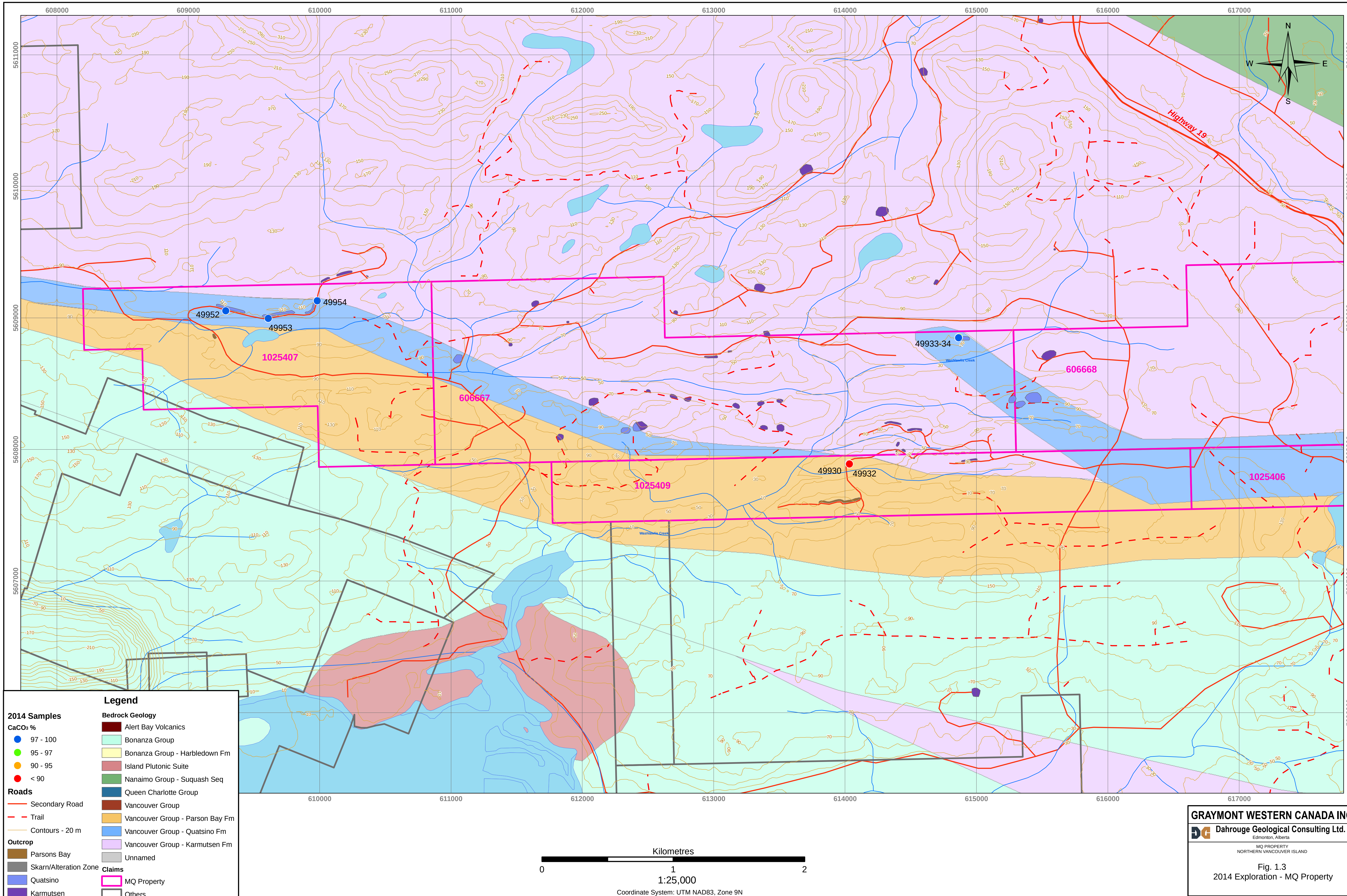
NORTHERN VANCOUVER ISLAND,
SOUTHWESTERN BRITISH COLUMBIA

Fig. 1.1 Location Map

KK 2014.07


BRITISH COLUMBIA
Queen Charlotte Strait
PORT HARDY
MQ PROPERTY
VARNEY BAY PROPERTY
PORT McNEILL
Nimpkish Lake
19
CAMPBELL RIVER/COMOX
VANCOUVER ISLAND
NANAIMO
1A
Strait of Georgia
TEXADA ISLAND
PACIFIC OCEAN
VANCOUVER
1
VICTORIA
HOPE
PAVILION
CACHE CREEK
KAMLOOPS
CANADA
UNITED STATES
SYMBOLS
Property Locations
Major highway
Paved highway
0 50 100 150 km
Scale: 1 : 2,500,000
GRAYMONT WESTERN CANADA INC.
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta
NORTHERN VANCOUVER ISLAND, SOUTHWESTERN BRITISH COLUMBIA
Fig. 1.2 Access Map
WM
2010.09

F2



Legend
2014 Samples
CaCO3 %
97 - 100
95 - 97
90 - 95
< 90
Roads
Secondary Road
Trail
Contours - 20 m
Outcrop
Parsons Bay
Skarn/Alteration Zone
Quatsino
Karmutsen
Bedrock Geology
Alert Bay Volcanics
Bonanza Group
Bonanza Group - Harbledown Fm
Island Plutonic Suite
Nanaimo Group - Suquash Seq
Queen Charlotte Group
Vancouver Group
Vancouver Group - Parson Bay Fm
Vancouver Group - Quatsino Fm
Vancouver Group - Karmutsen Fm
Unnamed
Claims
MQ Property
Others
49952
49953
49954
49933-34
49930
49932
1025407
606667
1025409
606668
1025406
Highway 19
Kilometres
0
1
2
1:25,000
Coordinate System: UTM NAD83, Zone 9N
GRAYMONT WESTERN CANADA INC.
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta
MQ PROPERTY
NORTHERN VANCOUVER ISLAND
Fig. 1.3
2014 Exploration - MQ Property
KK
2013.08

F3

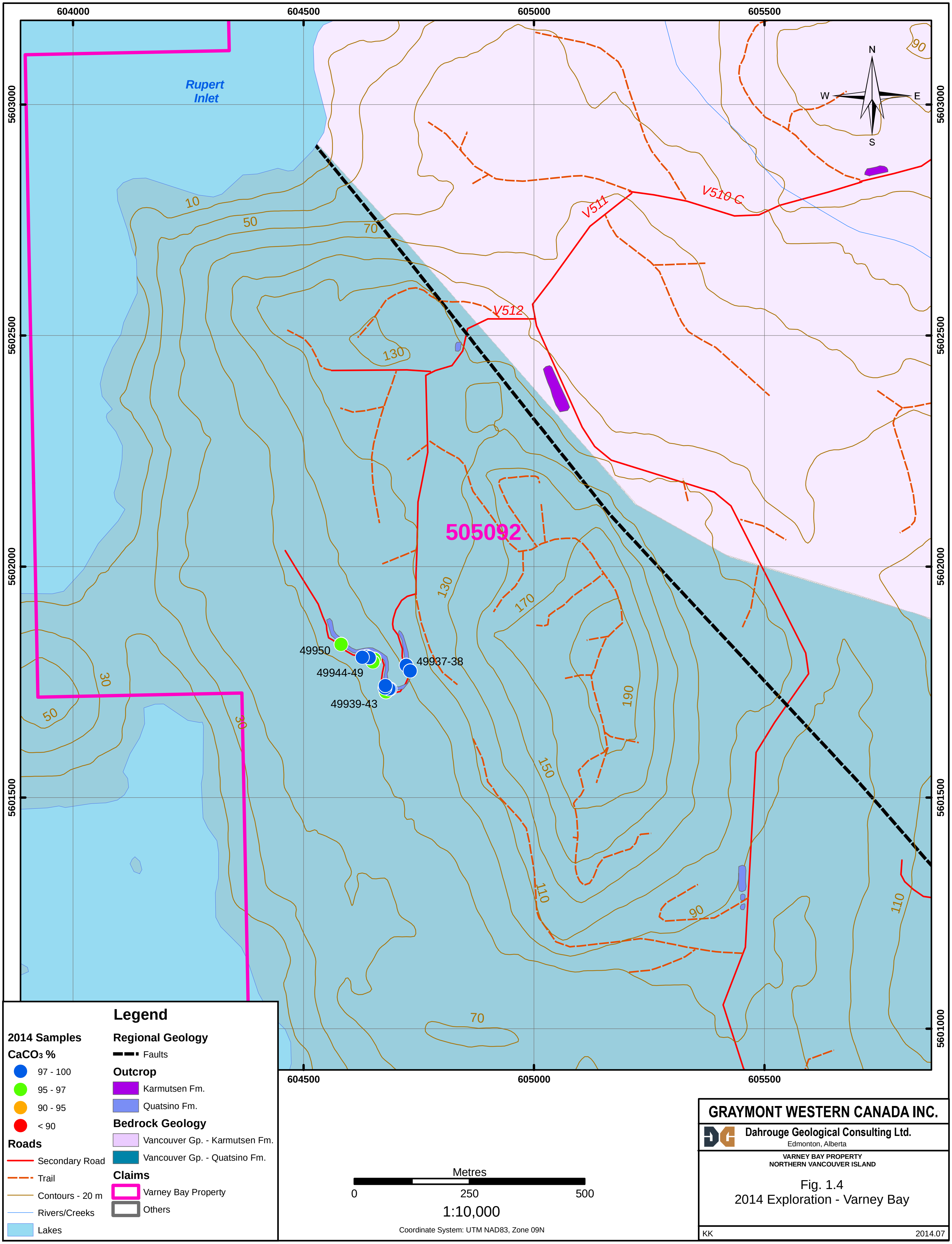
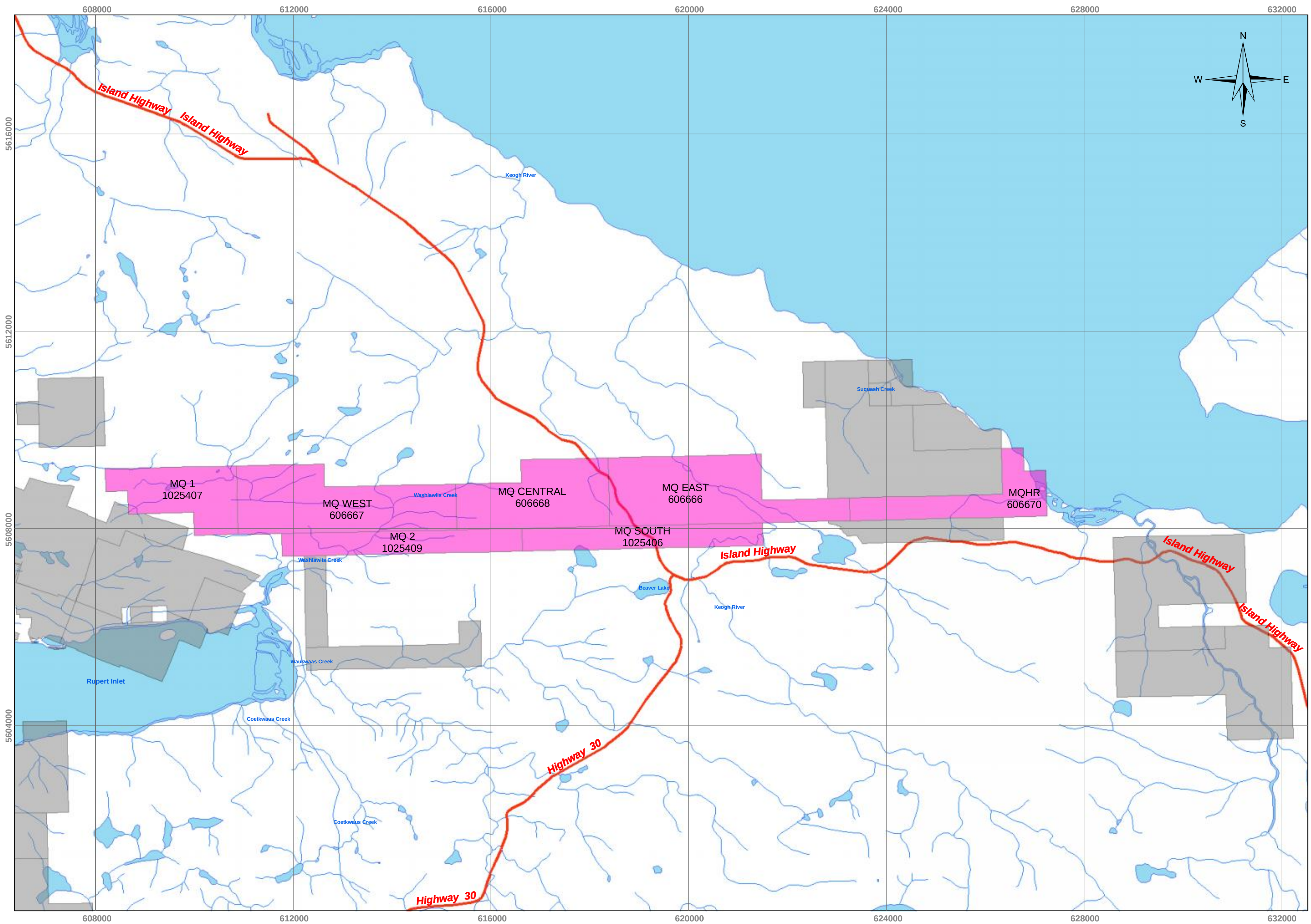


Fig. 1.4
2014 Exploration - Varney Bay



Legend

- Railway
- Major Road
- Creek/stream
- Waterbody

Claims

- MQ Property
- Others

Kilometres

0 1 2 3 4

1:100,000

Coordinate System: UTM NAD83, Zone 9N

GRAYMONT WESTERN CANADA INC.

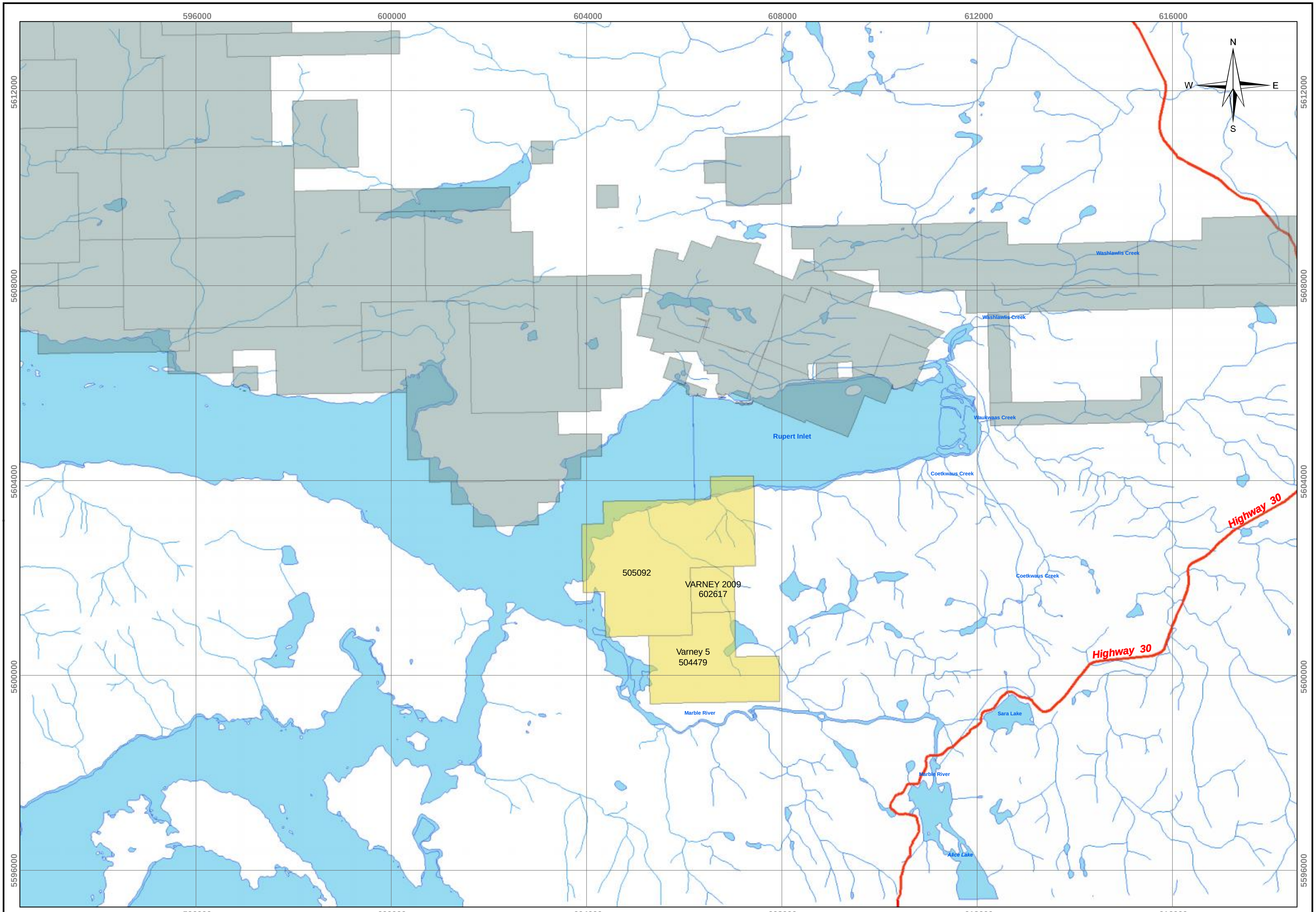
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

MQ PROPERTY
NORTHERN VANCOUVER ISLAND

Fig. 1.5
Claim Map - MQ Property

KK 2014.05

F5



Legend

- Railway
- Major Road
- Creek/stream
- Waterbody

Claims

- Varney Bay Property
- Others

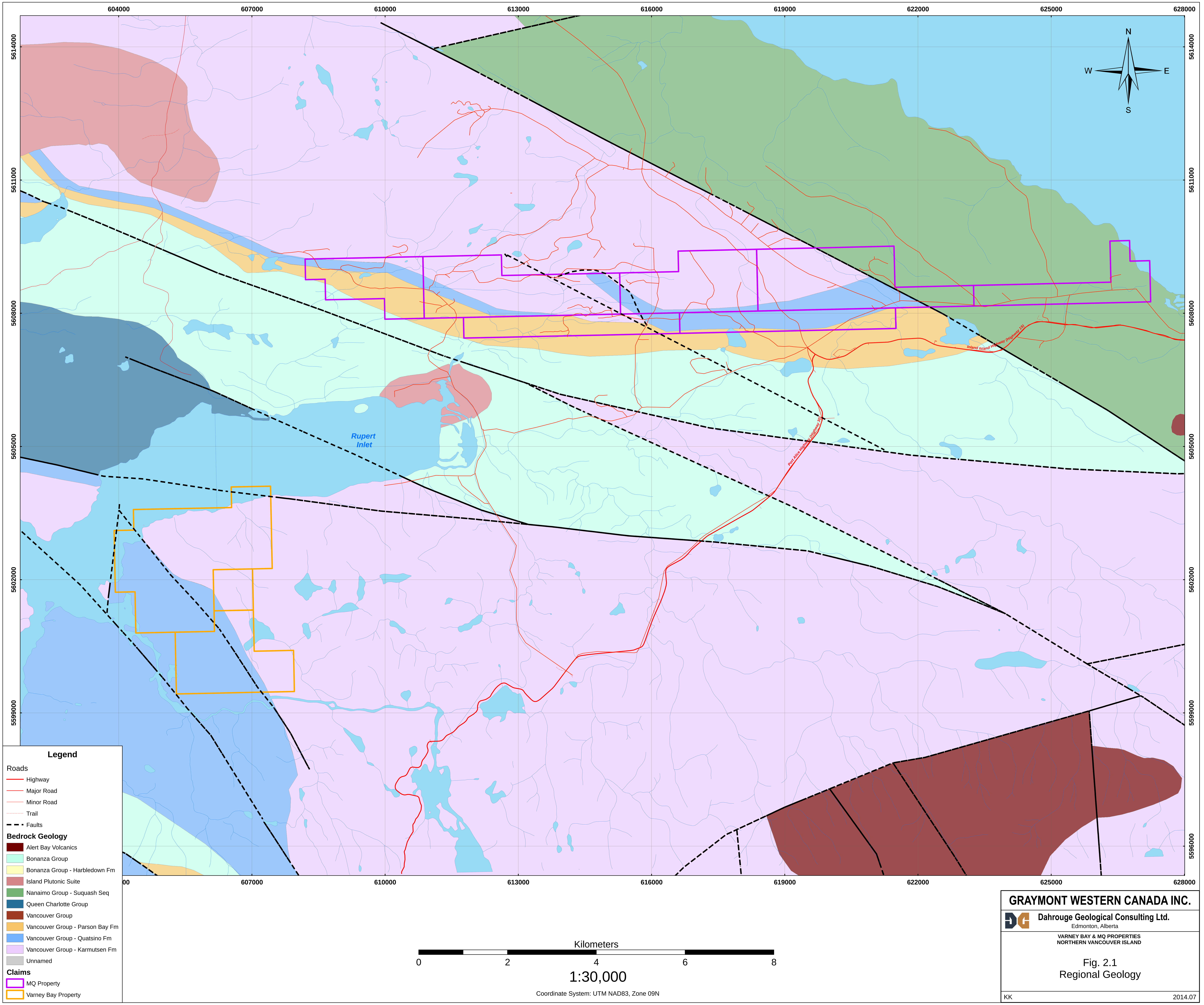
Kilometres
0 1 2 3 4
1:100,000
Coordinate System: UTM NAD83, Zone 9N

GRAYMONT WESTERN CANADA INC.
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta
MQ PROPERTY
NORTHERN VANCOUVER ISLAND

Fig. 1.6
Claim Map - Varney Bay Property

KK 2014.05

F6



604000
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5599000
5596000
N
S
W
E
Rupert Inlet
Legend
Roads
Highway
Major Road
Minor Road
Trail
Faults
Bedrock Geology
Alert Bay Volcanics
Bonanza Group
Bonanza Group - Harbledown Fm
Island Plutonic Suite
Nanaimo Group - Suquash Seq
Queen Charlotte Group
Vancouver Group
Vancouver Group - Parson Bay Fm
Vancouver Group - Quatsino Fm
Vancouver Group - Karmutsen Fm
Unnamed
Claims
MQ Property
Varney Bay Property
Kilometers
0
2
4
6
8
1:30,000
Coordinate System: UTM NAD83, Zone 09N
GRAYMONT WESTERN CANADA INC.
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta
VARNEY BAY & MQ PROPERTIES
NORTHERN VANCOUVER ISLAND
Fig. 2.1
Regional Geology
KK
2014.07

APPENDIX 1: ITEMIZED COST STATEMENT FOR THE 2014 EXPLORATION - MQ/VARNEY BAY

a) Personnel

P. Kluczny, geologist

3.0	days		Project planning, supervision				
3.0	days	@	$	725.00	$	2,175.00	

K. Krueger, geologist

8.0	days		Field work and travel (Apr 10-17)				
3.0	days		Project planning & preparations, reporting				
11.0	days	@	$	460.00	$	5,060.00	

A. Mullan, geologist

8.0	days		Field work and travel (Apr 10-17)				
3.0	days		Project preparations, data entry				
11.0	days	@	$	460.00	$	5,060.00	

A. Gory, receptionist

1.0	hours		Office work, logistics, shipping				
1.0	hours	@	$	40.00	$	40.00	
							$ 12,335.00

FIELD WORK SUMMARY:

MQ & Varney Bay Mapping and Sampling (Apr 10-17)

Claims MQ South, MQ 1, MQ 2, MQ West, MQ Central, Tenure 505092

21 rock samples collected, map outcrop exposures & access

Field Personnel: K. Krueger, A. Mullan

b) Food and Accommodation

14	man-days	@	$	113.95	Accommodations	$	1,595.30	
16	man-days	@	$	60.50	Meals	$	968.00	
								$ 2,563.30

c) Transportation

Flights:	Airfare to/from Comox	$	1,161.22	
Vehicles:	Truck Rental	$	735.41	
	Mileage	$	-	
	Taxi	$	160.00	
	Fuel	$	261.44	
				$ 2,318.07

d) Instrument Rental

Software (ArcGIS)	$	200.00	
Satellite Phone (1)	$	120.00	
GPS Rental (2)	$	80.00	
			$ 400.00

e) Drilling n/a

f) **Analyses**			Central Lab of Graymont Western U.S. Inc. (21 rock samples)				
21	samples	@	$	4.50	Preparation fee	$ 94.50	
21	samples	@	$	25.00	Sample analysis	$ 525.00	
							$ 619.50
g) **Other**							
			Courier and Shipping			$ 78.43	
			Disposable Supplies			$ 218.04	
			Prints/copies			$ -	
			Plots			$ 60.00	
							$ 356.47
Total							$ 18,592.34

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

Edmonton, Alberta
July 23, 2014

APPENDIX 2: PROPORTION OF EXPENDITURES ASSIGNED TO EACH PROPERTY

Property Name	Current Size (ha)	New Expiry	Required Expenditures	Days of Work	Actual Expenditures	Excess Expenditures*
Varney Bay	1231.76	December 31, 2015	$ 9,053.78	4.00	$ 9,592.42	$ 538.64
MQ	2337.42	December 31, 2015	$ 8,283.56	4.00	$ 8,999.92	$ 716.36
TOTAL	**3569.18**	**December 31, 2015**	**$ 17,337.34**	**8.00**	**$ 18,592.34**	**$ 1,255.00**

* Excess expenditures assigned to PAC account

APPENDIX 3: ANALYTICAL LABORATORY INFORMATION AND TECHNIQUES

Name and Address of the Lab:

Graymont Western US Inc., Central Laboratory
670 East 3900 South, Suite 205
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 120ºC. 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^{th} 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.

Lab ID	Sample Date	Plant	Lab Owner	Sample Type	Remarks	CaCO3 %	MgCO3 %	Fe2O3 %	Al2O3 %	SrO ppm	MnO ppm	SiO2 %	BaO ppm	K2O ppm	Na2O ppm	P2O5 ppm	TiO2 ppm	ICP Total %	Sulfur %	LOI(1000) %
2014039664	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49930	11.08	6.26	4.48	7.77	521	930	33.58	537	3209	16874	6142	2980	66.3	0.47	3.77
2014039665	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49932	16.33	15.19	8.64	8.78	665	1694	26.35	302	2069	17177	1564	6108	78.2	0.32	3.14
2014039666	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49933	95.63	0.29	0.30	0.20	421	655	2.71	7	147	219	629	218	99.4	0.03	42.78
2014039667	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49934	97.75	0.23	0.21	0.14	444	608	1.04	5	92	112	402	114	99.6	0.03	43.66
2014039668	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49937	98.50	0.73	0.07	0.07	579	67	0.20	3	32	95	396	28	99.7	0.01	43.61
2014039669	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49938	98.52	0.73	0.08	0.07	612	52	0.22	3	32	68	152	35	99.7	0.01	43.59
2014039670	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49939	97.66	0.92	0.16	0.09	462	75	0.96	3	48	63	396	33	99.9	0.02	43.3
2014039671	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49940	97.54	1.82	0.10	0.06	482	95	0.33	3	24	68	728	61	100.0	0.02	43.74
2014039672	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49941	97.00	2.24	0.17	0.08	473	125	0.49	3	21	67	560	87	100.1	0.01	43.68
2014039673	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49942	98.09	1.09	0.13	0.07	513	102	0.68	2	27	60	380	37	100.2	0.01	43.38
2014039674	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49943	98.50	0.88	0.12	0.07	506	106	0.49	3	12	62	677	56	100.2	0.01	43.52
2014039675	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49944	96.99	2.32	0.12	0.06	373	120	0.21	2	27	63	<100	31	99.8	0.02	43.8
2014039676	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49945	95.02	4.39	0.15	0.04	384	132	0.12	3	28	50	<100	34	99.8	0.03	44.03
2014039677	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49946	95.97	3.14	0.17	0.04	392	122	0.11	3	20	50	<100	28	99.5	0.03	43.91
2014039678	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49947	98.45	0.92	0.11	0.09	484	86	0.25	3	15	61	313	89	99.9	0.01	43.55
2014039679	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49948	98.52	1.00	0.10	0.10	500	87	0.28	4	35	54	202	43	100.1	0.01	43.48
2014039680	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49949	97.06	0.61	0.18	0.08	340	176	1.48	2	46	64	987	73	99.6	0.01	43
2014039681	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49950	95.63	1.67	0.15	0.15	520	147	1.61	3	46	95	1343	77	99.4	0.03	43.15
2014039682	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49952	98.54	0.25	0.26	0.09	765	630	1.06	3	99	46	345	28	100.4	0.09	43.19
2014039683	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49953	97.52	0.48	0.19	0.17	806	213	1.09	4	112	79	250	122	99.6	0.03	43.32
2014039684	4/22/2014	202	202	Limestone	Dahrouge_Varney_Bay_49954	98.50	0.15	0.21	0.09	446	564	0.45	4	32	20	<100	41	99.5	0.07	43.98

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Notes: Stratigraphic thicknesses are based on measured attitudes of bedding listed below, with appropriate interpolations. Attitudes are strike and dip (right-hand rule). Sections are listed in numerical order of samples, which does not necessarily represent stratigraphic order. Most samples consist of chips at 30 cm intervals. UTM coordinates are NAD83, Zone 9N. Section locations are shown in Figure 1.3. Stratigraphy Abbreviations (Tq - Triassic Quatsino Formation; Tpb - Triassic Parsons Bay Formation)

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
Isolated Samples											
49930	Tpb	2	**Shale/Mudstone to Lime Mudstone,** rust weathered, dark brown to black fresh, very fine-grained to medium-grained, fossils: fragment (indeterminate), abundant, laminated to thin-beddedly-bedded, recessive, soft, fissile, argillaceous, alteration: oxide, pervasive, strong intensity, no HCl reaction, structure(s): bedding (definite) 109/27 S	11.08	6.26	33.58	7.770	4.480	521	930	6142
49932	Tpb	4	**Mudstone,** medium grey to tan weathered, medium grey fresh, micritic to medium-grained, fossils: fragment (indeterminate); crinoid ossicle, resistant, hard, alteration: calcite, fracture-related, weak intensity, very weak HCl reaction, structure(s): fracture, outcrop-scale, weak; contact (sharp), outcrop-scale	16.33	15.19	26.35	8.780	8.640	665	1694	1564
49952	Tq	3.5	**Lime Mudstone,** dark grey weathered, medium grey to dark grey fresh, cryptocrystalline to micritic, slightly resistant, soft, cherty, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak	98.54	0.25	1.06	0.090	0.260	765	630	345
49953	Tq	3	**Lime Mudstone,** dark grey weathered, medium grey to dark grey fresh, cryptocrystalline, resistant, hard, homogeneous, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak; bedding (undulatory), outcrop-scale, 88/42 S	97.52	0.48	1.09	0.170	0.190	806	213	250
49954	Tq	1.5	**Lime Mudstone,** dark grey weathered, medium grey to dark grey fresh, cryptocrystalline, resistant, hard, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak	98.50	0.15	0.45	0.090	0.210	446	564	50
Section 2014-01 (UTM 614865E, 5608854N)											
49933	Tq	3	**Lime Mudstone to Packstone,** light grey weathered, light grey to medium grey fresh, cryptocrystalline to medium-grained, fossils: crinoid ossicle, resistant, hard, alteration: oxide, fracture-related, weak intensity, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak; bedding (possible), outcrop-scale, 116/5 S	95.63	0.29	2.71	0.200	0.300	421	655	629
49934	Tq	4	**Lime Mudstone to Lime Grainstone,** weathered, medium grey to dark grey fresh, cryptocrystalline to fine-grained, fossils: gastropod, abundant; crinoid ossicle, common, resistant, hard, cherty, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, moderate	97.75	0.23	1.04	0.140	0.210	444	608	402

APPENDIX 6: SAMPLE DESCRIPTIONS AND ASSAY RESULTS FROM THE VARNEY BAY PROPERTY

Notes: Stratigraphic thicknesses are based on measured attitudes of bedding listed below, with appropriate interpolations. Attitudes are strike and dip (right-hand rule). Sections are listed in numerical order of samples, which does not necessarily represent stratigraphic order. Most samples consist of chips at 30 cm intervals. UTM coordinates are NAD83, Zone 9N. Section locations are shown in Figure 1.4. Stratigraphy Abbreviations (Tq - Triassic Quatsino Formation)

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
Isolated Samples											
49950	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak	95.63	1.67	1.61	0.150	0.150	520	147	1343
Section 2014-02 (UTM 604723E, 5601787N)											
49937	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, thinly-bedded, resistant, hard, homogeneous, moderate HCl reaction, structure(s): calcite veinlet, outcrop-scale, moderate; bedding (approximate), outcrop-scale, 2/80 E	98.50	0.73	0.20	0.070	0.070	579	67	396
49938	Tq	2	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, thinly-bedded, resistant, hard, homogeneous, moderate HCl reaction, structure(s): calcite veinlet, outcrop-scale	98.52	0.73	0.22	0.070	0.080	612	52	152
Section 2014-03 (UTM 604688E, 5601736N)											
49939	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, homogeneous, moderate HCl reaction, structure(s): calcite veinlet, outcrop-scale, moderate; bedding (approximate), outcrop-scale, 0/80 E	97.66	0.92	0.96	0.090	0.160	462	75	396
49940	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, homogeneous, moderate HCl reaction, structure(s): calcite veinlet, outcrop-scale, moderate	97.54	1.82	0.33	0.060	0.100	482	95	728
49941	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, homogeneous, strong HCl reaction, structure(s): calcite vein, outcrop-scale, moderate	97.00	2.24	0.49	0.080	0.170	473	125	560
49942	Tq	2.5	**Lime Mudstone,** tan-grey weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, homogeneous, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, moderate	98.09	1.09	0.68	0.070	0.130	513	102	380
49943	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, homogeneous, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, moderate	98.50	0.88	0.49	0.070	0.120	506	106	677
Section 2014-04 (UTM 604653E, 5601800N)											
49944	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak; bedding (approximate), outcrop-scale, 4/72 E	96.99	2.32	0.21	0.060	0.120	373	120	50
49945	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak	95.02	4.39	0.12	0.040	0.150	384	132	50
49946	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak	95.97	3.14	0.11	0.040	0.170	392	122	50

Sample	Strat Unit	Strat Tkns (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
49947	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak; bedding (approximate), outcrop-scale, 5/78 E	98.45	0.92	0.25	0.090	0.110	484	86	313
49948	Tq	3	**Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, strong HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak	98.52	1.00	0.28	0.100	0.100	500	87	202
49949	Tq	3	**Dolomitic Lime Mudstone to Lime Mudstone,** tan weathered, light brown-grey fresh, cryptocrystalline, resistant, hard, weak HCl reaction, structure(s): calcite veinlet, outcrop-scale, weak; bedding (approximate), outcrop-scale, 7/72 E	97.06	0.61	1.48	0.080	0.180	340	176	987

APPENDIX 7: 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 and Geoscientists of Alberta.

K. Krueger is a geological consultant with Dahrouge Geological Consulting Ltd. based in Edmonton, Alberta. She obtained a degree in Geology from the University of Alberta, Edmonton in 2012 and has been employed in the mineral exploration industry since. She is registered as a Geo. I.T. with the Association of Professional Engineers and Geoscientists of Alberta.