MAR 20110019: LIMESTONE RANGE

Limestone Range - A report on limestone quality near Rocky Mountain House, westcentral Alberta.

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GRAYMONT WESTERN CANADA INC.
877384 ALBERTA LTD.

2011 EXPLORATION AND FIELDWORK WITHIN THE LIMESTONE RANGE METALLIC AND INDUSTRIAL MINERALS PERMITS, WEST-CENTRAL ALBERTA

PART B

Metallic and Industrial Minerals Permits
9398100125, 9305090646 & 9310060379

Geographic Coordinates

51°53' N to 52°04' N
115°11' W to 115°34' W

NTS Sheets 82 O/13 and O/14, 83 B/3 and B/4

Owner:	MAIM Permit 9310060379 877384 Alberta Ltd. 18, 10509 - 81 Avenue Edmonton, Alberta T6E 1X7
Owner and Operator:	MAIM Permits 9398100125 & 9305090646 Graymont Western Canada Inc. 260, 4311 - 12 Street NE Calgary, Alberta T2E 4P9
Consultant:	Dahrouge Geological Consulting Ltd. 18, 10509 - 81 Avenue Edmonton, Alberta T6E 1X7
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Date Submitted:	December 9, 2011

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PART C

1. SUMMARY

During July, 2011, parts of Limestone and Clearwater ranges, west of Rocky Mountain House and within Metallic and Industrial Minerals (MAIM) Permits 9298100125, 9305090646 and 9310060379, were explored for high-quality carbonate rocks. Exploration conducted in 2011 was a follow-up to previous exploration conducted in the area.

Access routes and outcrops were mapped, and a total of 93 rock samples were collected within the Limestone Mountain, Corkscrew West, and Idlewilde Mountain permits, representing approximately 300 m of stratigraphy. Samples were sent to a laboratory for whole-rock analysis.

Throughout this report, attitudes of bedding and other planar features are given as A°/B° SW, where A° is the azimuth of the strike and B° is the amount of dip in the direction indicated (right-hand rule). A magnetic declination of 15°54' east was used. Where bedding was not evident, stratigraphic thicknesses were calculated using orientations from adjacent units. Where more than one bedding orientation was measured, the mean orientation is used.

2. INTRODUCTION

The 2011 exploration within the Limestone Mountain, Corkscrew West and Idlewilde Mountain permits was conducted by Dahrouge Geological Consulting Ltd. (Dahrouge), on behalf of Graymont Western Canada Inc. (Graymont) and 877384 Alberta Ltd. (877384). This assessment report describes the exploration conducted within MAIM Permits 9398100125, 9305090646 and 9310060379, which encompass parts of Clearwater and Limestone ranges of the Alberta Foothills. Bob Robison, exploration manager for Graymont Western U.S. Inc., authorized this work.

The objectives of the 2011 exploration were to expand on the previously explored areas, and to locate and better define carbonate units throughout the property. This report includes information on the geology and quality of carbonates encountered while mapping and sampling outcrops within the permit area.

3. GEOGRAPHIC SETTING AND ACCESS

3.1 LOCATION AND ACCESS

MAIM Permits 9398100125, 9305090646, and 9310060379 encompass areas within Limestone and Clearwater ranges, surrounding and including Limestone Mountain, Idlewilde Mountain, Corkscrew Mountain and Marble Mountain, within west-central Alberta (Fig. 3.1).

Access to the central parts of Clearwater Range is from Rocky Mountain House, approximately

30 km southerly on Highway 22, continuing 30 km westerly on secondary road 591 to a southerly branch of Forestry Trunk Road 734 (Fig. 3.2). This branch of Forestry Trunk Road, located about 5 km east of Burnco Quarry, continues southerly, approximately parallel to Marble Mountain at an average distance of about 3 km. ATV access to Marble Mountain is provided by cut lines running perpendicular to Clearwater Range.

From Burnco Quarry, at the south end of Corkscrew Mountain, Forestry Trunk Road 734 continues northwest along the west flank of Corkscrew Mountain and onward to the junction with Secondary Highway 752, north of Idlewilde Mountain. There it turns west and north away from the property and eventually reaches Nordegg.

Approximately 7 km northwest of Burnco Quarry along Forestry Trunk Road 734, Cutoff Creek Forestry Road heads westerly and provides access to the central part of Limestone Range, between Idlewilde and Limestone mountains. A secondary route to the Limestone Mountain area involves following Forestry Trunk Road 734 south and west from the Secondary Highway 591 intersection, past Marble Mountain, for approximately 45 km. At this point the Limestone Mountain Service Road, which is maintained by Shell Canada Ltd., can be followed north for approximately 30 km to reach the southwestern part of the property.

Clearwater Range can also be accessed from Caroline, by travelling about 35 km west on Secondary Highway 591, and then utilizing Forestry Trunk Road 734.

Access to and throughout the property area is by truck, all-terrain vehicles, helicopter, and extensive hiking. Several logging roads and cut lines spurring off the main roads provide valuable ATV access throughout the property area.

Several creeks, mountains, and other features presently without names on published maps have been assigned informal names in this report to facilitate references to geographic locations.

3.2 INFRASTRUCTURE

Accommodations, food, fuel and other necessary services are available in Caroline and Rocky Mountain House. The local economy is primarily based on agriculture, forestry, and energy-based industries.

Rocky Mountain House, with a population of about 6,500, is accessed by traveling about 67 km west of Red Deer along the David Thompson Highway (Highway 11), and then 12 km north along Highway 22.

The village of Caroline is about 49 km from Rocky Mountain House, 37 km south along Highway 22 and 12 km east along Highway 54. Caroline has a population of about 550.

3.3 TOPOGRAPHY, VEGETATION AND CLIMATE

The Limestone Mountain, Corkscrew West, and Idlewilde Mountain permits are included in the Eastern-Slope Montane Forest Ecological Region, and lie within the Rocky-Clearwater District of the Alberta Forest Reserve. In the subalpine zone, vegetation consists of stunted subalpine fir and Englemann Spruce, and alpine foliage above the treeline. Vegetation in areas of rugged limestone outcroppings is generally sparse, and commonly consists of junipers, other low brush, and grasses. Below treeline, vegetation consists of dense stands of Aspen, Lodgepole Pine, White Spruce, and less frequent stands of Douglas Fir. Areas of lowest relief are covered with dense stands of Black Spruce and thick undergrowth, with local muskegs and swamps.

The property is comprised of a series of northwest-trending ridges and valleys where elevations range from approximately 1,280 m along Clearwater River to about 2,200 m atop Limestone Mountain. The property is cut by a number of creeks and rivers, including Cutoff, Rocky, Limestone, Moose, and Teepee Pole creeks, and Clearwater River.

Climate is sub-alpine with average summer temperatures of 20° to 25°C and winter temperatures of -15° to -20°C, with extremes of 35°C and -40°C. Rainfall averages about 35 cm per year; snowfall averages 35 to 45 cm with the majority falling in December and January.

3.4 FIELD OPERATIONS

Field operations were conducted by a four-person geological crew from Dahrouge Geological Consulting Ltd., based in a hotel in Rocky Mountain House.

Transportation to and from the property was by four-wheel-drive truck. Access throughout the property was by truck and ATV's where possible, and by extensive hiking.

Garmin GPSmap 62S instruments were used to mark outcrop locations and record access information. Compasses were set at a magnetic declination of 15°54' east.

4. PROPERTY, EXPLORATION AND EXPENDITURES

4.1 PROPERTY SUMMARY

In 1998, Graymont (nee: Continental Lime Ltd.) acquired MAIM Permit 9398100125 (Limestone Mountain) to cover Paleozoic limestones adjacent to the Corkscrew Mountain Permit (Fig.'s 3.2 and 4.1). The Limestone Mountain Permit covers the central and southern part of Limestone Range, and the southernmost portions of Clearwater Range. The permit has been reduced from an original area of 8,592 hectares to its current size of 2,416 hectares following exploration conducted prior to 2002.

MAIM Permit 9305090646 (Corkscrew West) was acquired in 2005 to cover limestones in the central part of Clearwater Range, near Corkscrew Mountain. It was reduced from it's original size of 3,231 hectares to it's current size of 288 hectares following exploration completed in 2008.

MAIM Permit 9310060379 (Idlewilde Mountain) was acquired in 2010 to cover additional limestone exposures in the Limestone Range, and is currently 4,736 hectares in size.

Based on the 2011 exploration, the entirety of the Limestone Mountain, Corkscrew West, and Idlewilde Mountain permits will be retained (Section 4.3, Fig. 4.1).

4.2 2011 EXPLORATION SUMMARY

From July 5 to 14, 2011, Dahrouge Geological Consulting Ltd., on behalf of 877384 Alberta Ltd. and Graymont Western Canada Inc., conducted exploration for carbonate lithotypes within west-central Alberta. The work was undertaken to determine the location and extent of carbonate units in the permit area.

Carbonate outcrops were examined and a total of 93 samples were collected (Fig. 4.2). Geological observations were recorded, including lithologic information, measurements of structural elements, and other pertinent details (Appendix 2). A solution of 6% HCl was used to assess carbonate quality in the field, and rock samples were shipped to Central Lab of Graymont Western U.S. Inc. in Utah for analyses (Appendix 3). In some instances, interval thicknesses were determined by measuring outcrops perpendicular to bedding, where it could be identified. Field maps were completed on 1:20,000 and 1:30,000 scale map sheets and concentrated on areas surrounding and including Limestone Mountain, Corkscrew Mountain, and Idlewilde Mountain, along Clearwater and Limestone ranges.

4.3 EXPLORATION EXPENDITURES

Expenditures for 2011 totaled $43,090.88. The entirety of the Limestone Mountain (MAIM Permit 9398100125), Corkscrew West (MAIM Permit 9305090646), and Idlewilde Mountain (MAIM Permit 9310060379) permits will be retained. The 2011 expenditures are to be assigned to the Corkscrew West and Idlewilde Mountain permits; the Limestone Mountain Permit is included for grouping purposes only.

Expenditures are allocated to MAIM Permits 9398100125, 9305090646 & 9310060379 as follows:

MAIM Permit	Permit Area (ha)	Required Expenditures	Assigned Expenditures	New Expiry Date
9398100125	2,336	$21,936.15[1]	none	Oct. 30, 2012
9305090646	288	$2,879.28[2]	$11,519.28	Sept. 9, 2017
9310060379	4,736	$23,680.00	$31,571.60	June 8, 2014

[1] Calculated from $35,040 - previous credit of $13,103.85

[2] Calculated from $2,880 - previous credit of $0.72

5. REGIONAL GEOLOGY

5.1 STRATIGRAPHY

At Clearwater and Limestone ranges, carbonate lithologies are known to occur within both Paleozoic and Mesozoic sequences (Table 5.1, Fig. 4.2). Paleozoic limestones are described in the Upper Devonian Palliser Formation, Upper Devonian to Lower Carboniferous Banff Formation and the Lower Carboniferous Rundle Assemblage. The Paleozoic limestones encountered within the Limestone Mountain and Idlewilde Mountain permits were from the Turner Valley, Shunda and Pekisko formations of the Rundle Assemblage, the Banff Formation of the Banff Assemblage, and the Palliser Formation. Mesozoic rocks of the Fernie Group have been noted within the permit group area.

TABLE 5.1 GENERALIZED PALEOZOIC STRATIGRAPHY OF FOOTHILLS AND FRONT RANGES, WEST-CENTRAL ALBERTA*

System or Subsystem	Stratigraphic Unit: Assemblage / Group	Formation (S)	Formation (N)
Lower Carboniferous	Rundle Assemblage	Mount Head	
		[1] Livingstone	Turner Valley
			Shunda
			Pekisko
	Banff Assemblage	Banff	
		Exshaw	
Upper Devonian		[1] Palliser	
		Alexo	
	Fairholme Group°	Southesk	Mount Hawk
		Cairn	
Cambrian		Pika	
		Eldon	
		Stephen	
		Cathedral	

*Compiled from MacKenzie (1969), Richards et al. (1994), Switzer et al. (1994), and Holter (1994).
° Fairholme Group of MacKenzie (1969) is partly equivalent to the Woodbend Group (Switzer et al., 1994).
[1] Current limestone production (*from* Holter, 1994)

5.1.1 Palliser Formation

In west-central Alberta, the Upper Devonian Palliser Formation consists mainly of outer shelf and basinal carbonates of the Sassenach Basin (Halbertsma, 1994). The Palliser Formation is divisible into the Morro and overlying Costigan members, which are separated by an unconformity. The Morro Member comprises a lithologic suite dominated by carbonates with significant lateral facies variations. The Costigan Member consists of open-marine fossiliferous limestones and shales, with local evaporitic sedimentation. Within Foothills and Front Ranges of Alberta, limestones of the Palliser Formation vary from less than 180 m to more than 270 m in thickness (Holter, 1976).

The Palliser Formation is overlain by shales of the Exshaw Formation, and siliciclastics and carbonates of the Banff Assemblage.

5.1.2 Banff Assemblage

In west-central Alberta, the Exshaw, Banff and Yohin formations comprise the Banff Assemblage (Richards et al. 1994). Only exposures of the Banff Formation appear within the Clearwater Group permits. The Banff Formation is a heterogeneous association of carbonates and fine-grained siliciclastics deposited on poorly differentiated carbonate platforms. Westward, the uppermost Banff Formation grades laterally into the Rundle Assemblage.

5.1.3 Rundle Assemblage

The Lower Carboniferous Rundle Assemblage extends from MacKenzie Mountains in the Arctic, south through the Peace River Embayment to southeastern British Columbia. In west-central Alberta, it comprises shallow-marine platform and ramp carbonates, which prograded westward over deeper water shales and carbonates of the Banff Assemblage. The lower Rundle Assemblage is subdivided into the transgressive carbonate Pekisko Formation, and two regressive successions of restricted-marine carbonates and subordinate anhydrite assigned to the Shunda and Turner Valley formations (Richards et al. 1994). The Turner Valley Formation extends from east-central British Columbia to southwest Alberta. According to Richards et al. (1994), the Turner Valley Formation thickens to the southwest and for most of its length is 50 m to 120 m thick. The type section near Turner Valley is 152 m thick and divisible into four beds.

Earlier work by Douglas (1958), and MacQueen and Bamber (1968) indicate that the eastern peritidal sequences of the uppermost Pekisko, Shunda and lower Turner Valley grade south and southwestward into the more open-marine sequence of the Livingstone Formation (Table 5.1).

The upper Rundle Assemblage includes the transgressive Mount Head Formation.

5.1.4 Fernie Group

The Fernie Group includes all but the uppermost Jurassic strata of western Alberta and eastern British Columbia. Although treated as a Group, the Fernie is divided into a number of members and informal units with uncertain mutual relations and continuity. The Fernie Group thickens gently and irregularly west and southwest.

Outcrops of the Fernie Group, noted within the Clearwater Group permits, consist of large thicknesses of shale and calcareous sandstones with minor conglomerate.

5.2 STRUCTURE

In Front Ranges and Foothills of west-central Alberta, Paleozoic and Mesozoic strata are repeated along several major thrust faults. Displacements along these faults are interpreted to be tens of kilometres. Within individual thrust sheets, regional-scale folds exhibit a spatial relation to their leading edges.

6. RESULTS

Ten days were spent checking property access and outlining carbonate outcrops in detail. The 2011 exploration concentrated on defining stratigraphic unit locations and contacts within the newly acquired Idlewilde Mountain Property and previously under-explored areas of the Limestone Mountain Property.

Carbonate lithologies of the Rundle Assemblage, Banff Formation and Palliser Formation were examined and sampled within Limestone Range, near Limestone Mountain, Idlewilde Mountain, and along the Cutoff Creek forestry road (Fig. 4.2). A total of 93 discrete intervals were examined and sampled, representing more than 300 m of stratigraphy (Appendix 2). Where bedding could not be identified, stratigraphic measurements were taken based on the previously determined regional trend or deduced from surrounding measurements where possible.

Two intervals of Palliser Formation were examined in 2011, to test the potential for high-calcium limestone (Fig. 4.2). Sample Section 2011-13, located along Clearwater River, averaged 92.85% $CaCO_3$, 3.05% $MgCO_3$, and 2.58% SiO_2 over 51.25 metres. Section 2011-14, located approximately 300 m east of section 2011-13, averaged 94.43% $CaCO_3$, 2.01% $MgCO_3$, and 2.21% SiO_2 over 11.5 metres. Based on these borderline results, Palliser Formation rocks have potential for high-calcium limestone; however, further work is required to fully evaluate their potential in the area.

Several intervals of Banff Formation were examined in 2011, all at the base of larger sample sections of Pekisko Formation limestones. Unsurprisingly, the results from these intervals were poor, such as at the base of Section 2011-01, located along the south bank of Clearwater River (Fig. 4.2). Here, Banff Formation rocks averaged 55.77% $CaCO_3$, 11.26% $MgCO_3$, and 22.91% SiO_2 over 11.25 metres, and consisted of tan-grey, variably dolomitic and/or siliceous lime mudstones to wackestones. The Banff Formation is not considered a unit of interest due to it's low $CaCO_3$ values and high SiO_2 content.

The majority of the outcrops visited in 2011 were within the Pekisko Formation. Analytical

results were variable, presumably due to the fact that different members within the formation were sampled. The best sample interval was within the upper part of Section 2011-03, which averaged 97.18% $CaCO_3$, 2.33% $MgCO_3$ and 0.26% SiO_2 over approximately 18 metres, and was collected above Section 2011-01, along Clearwater River (Fig. 4.2). Several other sample sections and isolated intervals returned values in excess of 95% $CaCO_3$ over several metres; however, $MgCO_3$, and minor SiO_2, impurities were common in many intervals. The high-quality Pekisko intervals generally consist of resistant, thick-bedded to massive, light- to medium-brownish-grey, fine- to coarse-grained crinoidal lime wackestone to grainstone. Lower quality intervals generally consist of less resistant, moderate to well-bedded, medium-brownish-grey, micritic to fine-grained lime mudstone to packstone. Overall, the Pekisko Formation has the greatest high-calcium limestone potential in the area.

The Shunda Formation consists of low-quality, recessive, argillaceous mudstones, and is not considered a unit of interest.

Several outcrops of Turner Valley Formation were examined in 2011 to test for high-quality dolomite potential and the outcrops ranged from high-quality dolomite to locally high-calcium limestone. The best interval of dolomite was in the upper part of Section 2011-06, located above the Cutoff Creek Forestry Road (Fig. 4.2). The interval averaged 44.26% $MgCO_3$ and 0.51% SiO_2 over 20.32 metres and consisted of vuggy, light-tan-grey, fine-grained, dolomitic mudstone to wackestone. Interestingly, the Turner Valley Formation atop Idlewilde Mountain appears to consist of high-calcium limestone. The upper part of Section 2011-12 averaged 98.43% $CaCO_3$, 0.97% $MgCO_3$ and 0.29% SiO_2 over 7.5 metres. The Turner Valley Formation has the greatest potential for high-quality dolomite in the permit area, although more work is required to constrain it's extent and overall quality. The potential high-calcium unit identified atop Idlewilde Mountain should also be investigated further.

7. CONCLUSIONS

Carbonate units of the Palliser, Banff, Pekisko, Shunda, and Turner Valley formations were examined and measured along Limestone Range, near Limestone Mountain, Idlewilde Mountain, and along the Cutoff Creek forestry road, within MAIM Permits 9398100125 and 9310060379. A total of 93 discrete intervals were sampled and described in detail. Based on the samples collected during the 2011 exploration and overall property assessment, the entirety of the Limestone Mountain, Corkscrew West, and Idlewilde Mountain permits will be retained.

Access roads and trails were noted, which provide access to most parts of the properties.

Future exploration will expand on previously conducted work in the area, confirming or redefining past geological interpretations and determining the potential for high-calcium limestone and/or high-quality dolomite within the permit area. Drill-testing of the Pekisko and/or Turner Valley formations would also be beneficial.

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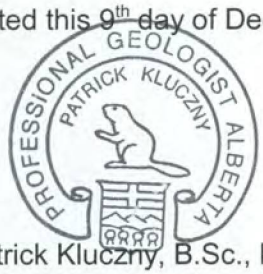
9. STATEMENT OF QUALIFICATIONS

I, Patrick Kluczny, residing at 14815 - 39 Ave., Edmonton, Alberta, do hereby certify that:

- I am a geologist of Dahrouge Geological Consulting Ltd., Suite 18, 10509 - 81 Ave., Edmonton, Alberta, T6E 1X7.
- I am a 2006 graduate of the University of Alberta, Edmonton, Alberta with a B.Sc. in Geology.
- I have practiced my profession as a geologist continuously since 2006.
- I am a registered Professional Geologist with the Association of Professional Engineers, Geologists and Geophysicists of Alberta, member M81985.
- I hereby consent to the copying or reproduction of this Assessment Report following the one-year confidentiality period.
- I am the author of the report entitled "2011 Exploration and Fieldwork within the Limestone Range Metallic and Industrial Minerals Permits, West-Central Alberta" and accept responsibility for the veracity of technical data and results.

Dated this 9th day of December, 2011.



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

APEGGA M81985

APPENDIX 1: COST STATEMENT FOR THE 2011 EXPLORATION WITHIN THE LIMESTONE RANGE PERMITS

a) **Personnel**		$ 23,176.00
b) **Food and Accommodation**		$ 5,395.98
c) **Transportation**		$ 6,212.05
d) **Instrument Rental**		$ 292.31
e) **Drilling**	n/a	$ -
f) **Analyses**		$ 2,743.50
h) **Other** (Software Rental, Data, Field maps, Courier & Shipping)		$ 1,353.68
Total		$ 39,173.53
Administration (10%)		$ 3,917.35
Total + Administration		**$ 43,090.88**

APPENDIX 2: 2011 SAMPLE DESCRIPTIONS AND ASSAY RESULTS FROM THE LIMESTONE RANGE

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 order from stratigraphic top to bottom.
Most samples consist of chips at 30 cm intervals. UTM coordinates are NAD83, Zone 11N. Section locations are shown in Figures 4.2.
Stratigraphy Abbreviations: TV - Turner Valley Formation, Sh - Shunda Formation, Pek - Pekisko Formation, B - Banff Formation, Pal - Palliser Formation

Sample	Strat. Unit	Strat. Thick. (m)	Description	$CaCO_3$ (%)	$MgCO_3$ (%)	SiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)	SrO (ppm)	MnO (ppm)	P_2O_5 (ppm)
Section 2011-01: (603149 E; 5764517 N)											
77531	Pek	4	**Lime Grainstone**, light to medium-grey weathered, light-grey fresh, fine to medium-grained, minor dark-grey mudstone near top, crinoid ossicles and shell fragments, thickly bedded, resistant, fetid odour, very good reaction with HCl	90.47	2.38	6.20	0.255	0.180	598	111	204
77530	Pek	2½	**Lime Mudstone with minor Grainstone**, tan and light-grey weathered, light-grey (grainstone) to dark-grey (micritic) fresh, micritic to medium-grained, medium-grained crinoid ossicles and shell fragments, moderate to well-bedded, resistant, but breaks easily, locally fetid odour, good to very-good reaction with HCl	87.56	4.81	5.73	0.689	0.316	1013	116	239
77529	B	3	**Lime Mudstone to Wackestone**, light-grey and tan weathered, medium-grey to medium-brown-grey fresh, dark-grey (micritic) fresh near top, micritic to fine-grained, crinoid ossicles and shell fragments, moderate to thickly bedded (up to 1m), locally well-bedded, massive, resistant, very minor calcite veining, good reaction with HCl	73.44	9.29	13.68	1.161	0.412	985	235	272
77528	B	3½	**Siliceous Lime Mudstone to Wackestone**, light-grey and tan weathered, medium-grey to medium-brown-grey fresh, micritic to fine-grained, crinoid ossicles and shell fragments, moderate to thickly bedded (up to 1m), locally well-bedded, massive, resistant, very minor calcite veining, good reaction with HCl, bedding 165/18°W	54.67	11.59	23.90	2.094	1.010	303	506	136
-	B	5	**offset**	-	-	-	-	-	-	-	-
77527	B	2¾	**Siliceous Lime Mudstone**, tan and light-grey weathered, medium-grey fresh, micritic to very-fine-grained, homogeneous, very rare bioclasts: fine to very-fine-grained crinoid ossicles?, ooids?, thickly bedded (1/2 - 1m), locally thinly bedded, massive, resistant, very minor calcite veinlets, good reaction with HCl	46.39	11.97	27.91	2.724	1.341	386	676	261
77526	B	2	**Siliceous Lime Mudstone**, tan and light-grey weathered, medium-grey fresh, micritic to very-fine-grained, homogeneous, thickly bedded (1/2 - 1m), massive, resistant, very minor calcite veinlets, weak to moderate reaction with HCl, bedding 163/21°W	44.10	12.66	28.14	2.768	1.374	381	692	382
Section 2011-02: (603151 E; 5764447 N)											
77537	Pek	3½	**Lime Packstone**, same as 77534, more bioclasts	93.51	5.82	0.49	0.071	0.031	285	19	<100
-	Pek	3	**offset**	-	-	-	-	-	-	-	-
77536	Pek	3¾	**Lime Packstone**, same as 77534, more bioclasts	98.56	0.96	0.16	0.042	0.072	282	27	<100

77535	Pek	5	**Lime Packstone**, same as 77534, more bioclasts	98.57	0.98	0.20	0.042	0.038	287	25	<100
77534	Pek	5¾	**Lime Packstone**, light-grey weathered, light-grey fresh, minor medium-grey, very-fine to fine-grained, locally mud-rich, crinoid ossicles and shell fragments?, thickly bedded (>1m), fetid odour, very good reaction with HCl	97.31	2.26	0.23	0.060	0.040	320	36	<100
-	Pek	6¾	**offset**	-	-	-	-	-	-	-	-
77533	Pek	3	**Lime Wackestone to Packstone**, light-grey weathered, medium-brown-grey fresh, micritic to very-fine-grained, minor very-fine-grained bioclasts, crinoid ossicles?, thickly bedded, resistant, minor rusty weathering along fractures, moderate to good reaction with HCl	90.08	1.30	6.00	0.809	0.413	607	224	395
77532	B	5½	**Dolomitic Mudstone**, light-grey and tan weathered, medium to dark-grey fresh, micritic to very-fine-grained, moderate to well-bedded, hard but breaks easily, minor weak oxide alteration, very weak reaction with HCl	48.96	26.19	17.66	1.856	0.547	149	176	281
Isolated Sample: (603332 E; 5764289 N)											
77538	B	1½	**Dolomitic Lime Mudstone**, light-tan-grey weathered, very-light-grey fresh, very-fine-grained, possibly some very-fine-grained bioclast fragments, thinly bedded, moderate calcite veins/nodules, weak fetid odour, weak to moderate reaction with HCl, bedding 222?11°NW (possibly slightly slumped)	70.09	28.70	0.53	0.129	0.079	153	84	<100
Section 2011-03: (603332 E; 5764288 N)											
77543	Pek	2¼	**Lime Packstone to Grainstone**, same as 77542, strongly jointed, good reaction with HCl	98.22	1.13	0.27	0.059	0.050	315	22	<100
-	Pek	4½	**offset**	-	-	-	-	-	-	-	-
77542	Pek	2	**Lime Packstone to Grainstone**, light to medium-grey weathered, light to medium-grey fresh, fine to medium-grained, abundant crinoid ossicles and shell fragments, massive, resistant, moderate to good reaction with HCl	97.66	1.84	0.24	0.045	0.031	261	24	<100
77541	Pek	4¼	**Lime Packstone to Grainstone**, light to medium-grey weathered, light to medium-grey fresh, medium to coarse-grained, crinoid ossicles and shell fragments, thickly bedded?, massive, resistant, good reaction with HCl	97.81	1.63	0.17	0.047	0.043	324	27	<100
77540	Pek	4½	**Lime Packstone**, light to medium-grey weathered, light-grey fresh, very-fine to fine-grained, crinoid ossicles and shell fragments, thickly bedded, resistant, minor calcite veins, good reaction with HCl, possible bedding 174?19°W	91.94	6.67	0.53	0.116	0.100	246	50	<100
-	B?	12	**offset**	-	-	-	-	-	-	-	-
77539	B	2	**Dolomitic Lime Mudstone**, light-grey and tan weathered, medium-brown-grey fresh, very-fine-grained, moderately bedded, resistant, moderate to good reaction with HCl, possible bedding 030?22°SW (slumped?)	52.69	24.94	15.98	2.006	0.635	173	185	178
Isolated Sample: (603307 E; 5764248 N)											
77544	Pek	4	**Lime Packstone to Grainstone**, same as 77542, mostly medium-grey fresh	97.93	1.26	0.27	0.059	0.032	304	18	<100
Isolated Sample: (603318 E; 5764242 N)											
77545	Pek	3	**Lime Packstone to Grainstone**, same as 77542, crinoid ossicles and brachiopods, good reaction with HCl, bedding 142?12°SW (definitive)	87.88	10.79	0.71	0.102	0.047	275	28	467

Isolated Sample: (603302 E; 5764204 N)												
77546	TV	1½	**Dolomitic Mudstone**, light to medium-grey weathered, light-grey to tan fresh, very-fine to medium-grained, crinoid ossicles, massive, weak reaction with HCl when powdered	58.01	41.19	0.54	0.086	0.090	85	113	<100
Isolated Sample: (603299 E; 5764183 N)												
77547	TV	grab	**Dolomitic Mudstone**, same as 77546, local calcite veining	56.11	43.37	0.32	0.052	0.076	99	116	<100
Isolated Sample: (603713 E; 5763278 N)												
77548	Pek	2	**Lime Packstone**, light-grey and tan weathered, medium-grey fresh, very-fine to medium-grained, moderate shell fragments, moderately bedded, resistant, fetid odour, good reaction with HCl, possible bedding 206°15°NW	96.91	2.66	0.20	0.045	0.032	256	28	<100
Isolated Sample: (603688 E; 5763256 N)												
77549	Pek	4½	**Dolomitic Lime Packstone to Grainstone**, same as 77548, dolomitic interbeds (40 cm thick), bedding 152°30°SW, 167°23°W, joint s 320°73°NE (well developed)	80.07	17.78	1.37	0.156	0.064	252	33	470
Section 2011-04: (603647 E; 5762643 N)												
77551	Pek	3½	**Lime Wackestone to Packstone**, light to medium-grey weathered, medium-grey fresh, very-fine to medium-grained (crinoid ossicles?), moderate to thickly bedded, resistant, local minor calcite veins, rare vugs, good reaction with HCl	94.99	4.46	0.36	0.051	0.046	244	34	<100
77550	Pek	3	**Lime Wackestone**, light to medium-grey weathered, medium-grey fresh, very-fine to medium-grained (crinoids?), moderate to thickly bedded, resistant, good reaction with HCl, bedding 347°08°E (wavy)	98.09	1.34	0.12	0.044	0.029	284	25	<100
Section 2011-05: (603194 E; 5762880 N)												
77553	Pek	1¾	**Dolomitic Lime Mudstone to Wackestone**, light-tan-grey weathered, medium-grey fresh, very-fine to medium-grained, minor crinoid ossicles, fine to thickly bedded, resistant, minor rusty stringers, moderate calcite veins, good reaction with HCl, bedding 343°09°NE (definitive)	71.11	22.24	5.07	0.765	0.261	553	64	191
77552	Pek	3¼	**Dolomitic Lime Mudstone**, tan to medium-grey weathered, medium- to dark-grey fresh, very-fine to fine-grained, fine to moderately bedded, resistant, moderate calcite veining, good reaction with HCl, bedding 342°04°NE (definitive)	81.19	16.21	1.80	0.303	0.111	206	49	<100
Isolated Sample: (603198 E; 5762891 N)												
77554	Pek	4½	**Lime Mudstone**, same as 77552, bedding 320°16°NE	91.99	6.99	0.70	0.101	0.085	362	38	<100
Section 2011-06: (603175 E; 5762995 N)												
77562	TV	4¾	**Dolomitic Mudstone**, same as 77561, more tan-grey	54.56	44.04	0.93	0.150	0.125	109	326	<100
-	TV	14	**offset**	-	-	-	-	-	-	-	-

77561	TV	5	**Dolomitic Mudstone to Wackestone**, same as 77558, minor crinoid ossicles, colonial corals and shell fragments	54.88	44.54	0.39	0.053	0.062	76	106	<100
77560	TV	4½	**Dolomitic Mudstone to Wackestone**, same as 77558	54.97	44.43	0.38	0.057	0.070	84	107	<100
77559	TV	4	**Dolomitic Mudstone to Wackestone**, same as 77558, bedding 342°17°	55.06	44.46	0.32	0.049	0.054	80	106	<100
77558	TV	2	**Dolomitic Mudstone to Wackestone**, light-grey to tan weathered, very-light-tan-grey fresh, very-fine to fine-grained, minor bioclasts, minor vugs (mm scale), weak reaction with HCl when powdered	56.01	43.33	0.44	0.084	0.046	83	98	<100
-	TV	0½	**offset**	-	-	-	-	-	-	-	-
77557	TV	4½	**Dolomitic Lime Mudstone to Wackestone**, light-grey to tan weathered, light to medium-grey fresh, very-fine to fine-grained, crinoid ossicles?, moderate to finely-bedded, rubbly outcrop, weak to moderate reaction with HCl	80.51	16.88	1.76	0.399	0.152	185	88	<100
77556	TV	3¼	**Lime Mudstone to Wackestone**, same as 77555	95.49	2.26	1.67	0.264	0.132	220	84	<100
-	TV	3½	**offset**	-	-	-	-	-	-	-	-
77555	TV	4¼	**Lime Mudstone to Wackestone**, light-grey to tan weathered, light to medium-grey fresh, very-fine to fine-grained, finely-bedded, moderate calcite veins, rare vugs, rubbly outcrop with rusty weathering, moderate to good reaction with HCl	96.00	2.53	0.95	0.202	0.118	271	95	105
Isolated Sample: (603174 E; 5763091 N)											
77563	TV	1½	**Dolomitic Mudstone**, same as 77562	49.96	45.56	2.46	0.481	0.209	130	261	<100
Section 2011-07. (599974 E; 5762568 N)											
77565	Pek	3	**Lime Wackestone to Packstone**, light to medium-grey weathered, light to medium-grey fresh, crinoid ossicles and shell fragments, moderate to thickly bedded, resistant, minor vugs, moderate to good reaction with HCl, bedding 330°28°NE (wavy)	98.36	1.05	0.19	0.043	0.084	292	37	<100
77564	Pek	3	**Lime Wackestone to Packstone**, light-grey weathered, light to medium-grey fresh, very-fine to medium-grained, crinoid ossicles and shell fragments, thickly bedded, resistant, locally vuggy, good reaction with HCl, bedding 324°20°NE (wavy)	96.84	2.30	0.31	0.077	0.061	279	34	300
Isolated Sample: (599989 E; 5762556 N)											
77566	Pek	2	**Lime Wackestone**, light to medium-grey weathered, light to medium-grey fresh, fine to medium-grained, minor bioclasts, moderately bedded, resistant, minor calcite veins, good reaction with HCl	98.24	1.03	0.09	0.031	0.059	314	31	<100
Isolated Sample: (600002 E; 5762532 N)											
77567	Pek	1½	**Lime Grainstone**, light to medium-grey weathered, light-grey to tan fresh, medium to coarse grained, crinoid ossicles and shell fragments, thin to moderately bedded, resistant, minor calcite veins, scattered outcrop, very good reaction with HCl, bedding 307°28°NE	98.66	0.86	0.20	0.042	0.063	283	25	<100

Isolated Sample: (599987 E; 5762487 N)												
77568	Pek	3	**Lime Packstone to Grainstone**, light to medium-grey weathered, light-grey fresh, fine to coarse grained, crinoid ossicles and shell fragments, thinly to moderately bedded, resistant, possible repeat of stratigraphy from 77567, very good reaction with HCl, bedding 331°23°NE (wavy)	98.56	0.84	0.12	0.033	0.083	279	28	<100
Isolated Sample: (599816 E; 5762764 N)												
77569	Pek	3	**Lime Packstone**, light to medium-grey weathered, medium to light-grey fresh, micritic medium-grained, crinoid ossicles, shell fragments and rare rugose corals and brachiopods, thin to moderately bedded, resistant, good reaction with HCl, bedding 320°23°NE (definitive)	89.56	5.73	4.02	0.072	0.055	303	23	<100
Section 2011-08: (599642 E; 5762923 N)												
77579	TV	2½	**Dolomitic Mudstone**, same as 77576, locally strongly vuggy, moderate calcite nodules and fracture fill	52.37	46.34	0.93	0.114	0.108	110	281	<100
77578	TV	5	**Dolomitic Mudstone**, same as 77576, fewer bioclasts, locally somewhat limey, weak reaction with HCl, bedding 284°21°N (wavy)	49.28	44.41	4.62	0.155	0.117	114	120	172
-	TV	6	**offset**	-	-	-	-	-	-	-	-
77577	TV	6	**Dolomitic Mudstone**, same as 77576, fewer bioclasts	48.48	43.35	7.07	0.248	0.166	128	100	233
77576	TV	4¾	**Dolomitic Mudstone to Wackestone**, light-grey and tan weathered, light-brown-grey fresh, very-fine to fine-grained, rare rugose and shell fragments, moderately bedded, hard, less resistant, rare chert nodules and blebs, vuggy (<mm and open), rusty along fractures and vugs, fetid odour, very weak reaction with HCl	49.12	43.91	5.60	0.303	0.152	114	80	<100
77575	TV	5¾	**Dolomitic Mudstone to Packstone**, light-grey and tan weathered, light-brown-grey to medium-grey fresh, very-fine to medium-grained, crinoid ossicles, shell fragments, moderately bedded, resistant, rare chert beds/nodules, vuggy (very fine and open), moderate reaction with HCl, bedding 287°21°N (wavy)	52.83	45.88	0.84	0.081	0.096	117	93	<100
77574	TV	5	**Dolomitic Wackestone to Packstone**, same as 77573, some chert nodules and blebs, bedding 281°42°N (very wavy and approximate)	55.90	42.57	0.95	0.068	0.089	376	67	115
-	TV	7¾	**offset**	-	-	-	-	-	-	-	-
77573	TV	4¼	**Dolomitic Wackestone to Packstone**, light-grey and tan weathered, light-brown-grey fresh, very-fine to medium-grained, crinoid ossicles, shell fragments, rugose, colonial coral, moderate to thickly bedded, resistant, hard, rare calcite nodules, locally vuggy (<1mm and open), very weak reaction with HCl	56.49	41.57	0.98	0.085	0.092	439	60	<100
77572	TV	5	**Dolomitic Packstone**, same as 77570, colonial coral beds, solitary rugose, more dolomitic, weak to moderate reaction with HCl	58.58	40.21	0.30	0.057	0.072	278	53	<100
77571	TV	4	**Dolomitic Packstone**, same as 77570, locally colonial coral pockets or interbeds	60.65	38.45	0.21	0.064	0.070	154	55	<100
77570	TV	4¾	**Calcareous Dolomitic Packstone**, light-grey and tan weathered, light-brown-grey fresh, very-fine to medium grained, crinoid ossicles, shell fragments, moderate to thickly bedded, resistant, rare calcite nodules, moderate reaction with HCl, strong sub-vertical jointing (rubbly)	66.06	32.89	0.34	0.062	0.078	234	48	<100

Isolated Sample: (599644 E; 5762991 N)											
77580	TV	grab	**Dolomitic Lime Mudstone**, same as 77576, fewer bioclasts, 1m of scattered outcrop, bedding 294°19°NE	53.26	41.92	3.52	0.162	0.186	151	398	<100
Isolated Sample: (604695 E; 5765931 N)											
77581	TV	grab	**Lime Mudstone (upper) to Dolomitic Wackestone (lower)**, light to medium-grey weathered, light to dark-grey fresh, very-fine to medium-grained, massive, no visible bedding, resistant, strong calcite veining in lower half, local fetid odour, faint to good reaction with HCl	74.30	22.57	2.20	0.447	0.173	209	120	<100
Isolated Sample: (604206 E; 5766265 N)											
77582	TV	1½	**Dolomitic Mudstone**, white to grey weathered, light-grey fresh, very-fine-grained, moderately bedded, breaks easily, moderate to strong calcite veinlets, locally limey, very weak reaction with HCl, bedding 315°07°NE	53.79	43.14	2.17	0.367	0.253	91	387	111
Isolated Sample: (604049 E; 5766570 N)											
77583	TV	2½	**Dolomitic Mudstone**, very-light-grey to tan weathered, light-brown-grey fresh, very-fine-grained, organic content, moderately bedded, strongly vuggy filled with crystalline calcite, fetid odour, very weak to moderate reaction with HCl, bedding 290°15°N (wavy)	57.56	40.40	0.89	0.153	0.082	90	138	<100
Isolated Sample: (604113 E; 5766423 N)											
77584	TV	2	**Dolomitic Mudstone**, same as 77583, very weak to weak reaction with HCl, bedding 147°20°SW (wavy)	56.26	41.42	1.14	0.154	0.081	107	172	<100
Section 2011-09: (604176 E; 5762833 N)											
77588	Pek	1½	**Lime Packstone**, same as 77586	98.43	1.00	0.16	0.050	0.029	239	27	<100
77587	Pek	1	**Lime Packstone**, same as 77586	92.49	7.03	0.25	0.067	0.078	216	46	<100
77586	Pek	3	**Lime Wackestone to Packstone**, medium to light-grey and tan weathered, medium-grey to light-brownish-grey fresh, fine to coarse-grained, crinoid ossicles shell fragments and brachiopod moulds, moderately bedded, resistant, rusty weathered spots on fresh surface, very good reaction with HCl, bedding 130°38°SW	93.42	2.30	2.77	0.485	0.312	426	99	314
77585	B	2½	**Dolomitic Lime Mudstone**, medium-grey to tan weathered, medium-grey to light-grey fresh, very-fine to fine-grained, moderately bedded, resistant, moderately fractured with calcite infill, weakly vuggy, very good reaction with HCl, bedding 120°36°SW	74.44	16.34	7.03	0.971	0.400	233	131	<100
Section 2011-10: (604049 E; 5762855 N)											
77593	Pek	4¼	**Lime Grainstone**, medium-grey with minor tan weathered, medium to light-grey and tan fresh, medium to coarse-grained, crinoid ossicles and shell fragments, moderately bedded, resistant, not hard, minor red rusty weathering, rubbly, very good reaction with HCl	96.06	2.80	0.26	0.060	0.055	220	29	<100

77592	Pek	4	**Lime Mudstone to Grainstone**, medium to light-grey and tan weathered, medium to light-grey and tan fresh, very-fine to coarse-grained, crinoid ossicles and shell fragments, moderately bedded, resistant, minor red weathering in patches, some brown weathered patched, weak to good reaction with HCl	95.13	3.35	1.14	0.213	0.083	264	47	105
77591	B	4	**Lime Mudstone**, light to medium-grey and tan weathered, medium-grey and tan-brown-grey fresh, very-fine to medium-grained, moderately bedded, resistant, rusty weathering and rusty stringers, rubbly, very good reaction with HCl	86.24	1.30	9.10	1.388	0.482	532	118	548
-	B	1¼	**offset**	-	-	-	-	-	-	-	-
77590	B	4½	**Slightly Dolomitic Lime Mudstone**, medium-grey to light-tan weathered, light to medium-grey fresh, very-fine-grained with minor coarse-grained, moderately bedded, resistant, minor rusty weathering, rubbly, good reaction with HCl	81.07	11.92	5.19	0.808	0.273	276	112	<100
77589	B	3¼	**Siliceous Dolomitic Mudstone**, medium-grey to brown-tan weathered, medium-grey with brown bits fresh, very-fine-grained, moderately bedded. Resistant, hard, rubbly, very weak to absent reaction with HCl	42.10	27.84	22.05	2.481	0.527	127	199	462
Section 2011-11: (607299 E; 5757508 N)											
77600	Pek	5½	**Dolomitic Lime Mudstone to Packstone**, light to medium-grey with minor tan weathered, medium-grey with minor brown fresh, very-fine/fine to coarse-grained, crinoid ossicles and shell fragments, moderately bedded, minor local yellow spots, minor calcite veinlets, rubbly, good reaction with HCl	82.96	16.00	0.50	0.092	0.073	239	32	<100
77599	Pek	3¾	**Slightly Dolomitic Lime Wackestone to Packstone**, light-grey with minor tan and white-grey weathered, light to medium-grey fresh, very-fine to coarse-grained, crinoid ossicles and shell fragments, moderately bedded, resistant, very minor local yellow-black spots, very rubbly, weak to good reaction with HCl	89.60	9.18	0.79	0.094	0.056	252	27	<100
77598	Pek	3½	**Calcareous Dolomitic Mudstone to Wackestone**, light-grey with minor tan and white-grey weathered, light to medium-grey fresh, very-fine to coarse-grained, minor crinoid ossicles?, moderately bedded, resistant, rubbly, weak too good reaction with HCl	66.93	31.71	0.76	0.146	0.107	157	49	153
77597	Pek	3¾	**Slightly Dolomitic Lime Packstone**, same as 77594, medium to light-grey weathered, very minor brown patches fresh	84.65	14.73	0.25	0.060	0.056	190	35	<100
77596	Pek	3¼	**Lime Packstone**, same as 77594, bedding 342/60°NE	98.70	0.82	0.17	0.052	0.051	257	28	<100
77595	Pek	3	**Lime Packstone**, same as 77594, fine to coarse-grained, well develcped joint sets, good reaction with HCl	97.91	1.55	0.20	0.057	0.034	237	28	<100
77594	Pek	8½	**Lime Packstone**, medium-grey weathered, medium-grey with minor brown patches fresh, very-fine to coarse grained, crinoid ossicles and shell fragments, moderately bedded, resistant, rubbly, very good reaction with HCl	97.47	2.09	0.22	0.086	0.069	295	30	<100
Section 2011-12: (603841 E; 5766634 N)											
77605	TV	3	**Lime Mudstone to Packstone**, same as 77603, more bioclasts	98.50	0.88	0.21	0.041	0.064	414	22	<100
77604	TV	3½	**Lime Mudstone to Packstone**, same as 77603, more bioclasts, very good reaction with HCl	98.50	1.03	0.27	0.041	0.044	390	18	<100

77603	TV	1	**Lime Mudstone to Packstone**, light to medium-grey and tan weathered, medium to dark-grey fresh, very-fine to fine-grained, moderately bedded, minor rusty weathering, good reaction with HCl	97.97	1.05	0.59	0.046	0.064	376	20	<100
77602	Sh?	2	**Argillaceous Mudstone**, light to medium-grey weathered, dark-grey fresh, very-fine to fine-grained, finely to moderately bedded, moderately fractured, minor calcite veining, minor rusty weathering, weak to moderate reaction with HCl, bedding 176°12W, (definitive)	16.79	4.31	36.39	0.335	0.148	115	31	2031
77601	Sh?	3¾	**Argillaceous Mudstone**, light to medium-grey and tan weathered, medium to dark-grey fresh, very-fine to fine-grained, finely to moderately bedded, minor rusty weathering, weak reaction with HCl, bedding 182°16°W (definitive)	30.54	8.45	42.34	0.449	0.198	178	44	3092
Section 2011-13: (605702 E; 5761388 N)											
77616	Pal	1	**Slightly Dolomitic Lime Wackestone**, same as 77614, fewer bioclasts, very good reaction with HCl	82.48	12.97	2.70	0.548	0.275	349	124	434
-	Pal	0½	**offset**	-	-	-	-	-	-	-	-
77615	Pal	4¾	**Lime Wackestone**, same as 77614	93.86	2.97	1.95	0.406	0.211	583	93	278
77614	Pal	4½	**Lime Wackestone**, tan and light-red-grey weathered, dark-grey fresh, micritic, rare fine to coarse-grained bioclasts, shell fragments, brachiopods, rugose, moderately bedded, resistant, locally fissile, minor calcite veining, good reaction with HCl, bedding 160°19°SW	95.00	2.38	1.46	0.413	0.207	700	100	215
77613	Pal	4	**Lime Mudstone**, medium-grey weathered, dark-grey fresh, micritic, minor fine to coarse-grained bioclasts, rare crinoid ossicles, shell fragments and gastropods, moderate to thinly bedded, resistant, locally fissile, moderate calcite veining, good reaction with HCl	92.74	2.95	2.86	0.642	0.268	586	122	414
77612	Pal	4½	**Lime Mudstone to Wackestone**, same as 77606, very rare, gastropod shells, no iron concretions	93.59	2.70	2.52	0.526	0.223	547	121	362
77611	Pal	4	**Lime Mudstone to Wackestone**, same as 77606, rare brachiopod (or bivalve) shells, no iron concretions	85.17	8.49	4.59	0.805	0.427	429	200	607
77610	Pal	5¾	**Lime Mudstone to Wackestone**, same as 77606, no iron concretions	91.52	3.12	3.50	0.753	0.327	530	190	487
77609	Pal	5½	**Lime Mudstone to Wackestone**, same as 77606, rare shell fragments, no iron concretions, bedding 186°21°W (definitive)	93.68	1.80	2.62	0.612	0.363	513	214	529
77608	Pal	7½	**Lime Mudstone to Wackestone**, same as 77606, no iron concretions	95.49	1.38	1.72	0.450	0.207	490	201	293
-	Pal	2¾	**offset**	-	-	-	-	-	-	-	-
77607	Pal	4½	**Lime Mudstone to Wackestone**, same as 77606, fewer iron concretions	92.92	2.72	2.78	0.630	0.416	415	371	662
77606	Pal	5¼	**Lime Mudstone to Wackestone**, tan and medium-grey weathered, dark to very-dark-grey fresh, micritic, minor fine-grained bioclasts, rare crinoid ossicles, moderately bedded, resistant, moderate to strong calcite veining, minor iron concretions (vug fill?), moderately fractured, good reaction with HCl	94.13	1.92	2.42	0.595	0.433	434	321	445
Section 2011-14: (605940 E; 5761522 N)											
77618	Pal	5½	**Lime Mudstone to Wackestone**, same as 77617, bedding 160°21°SW (wavy)	95.74	1.34	1.91	0.425	0.247	509	264	341
-	Pal	1½	**offset**	-	-	-	-	-	-	-	-

77617	Pal	6	**Lime Mudstone to Wackestone**, tan and medium-grey weathered, dark to very-dark-grey fresh, micritic, rare fine-grained bioclasts, crinoid ossicles, shell fragments, moderate to thickly bedded, resistant, moderate calcite veining (up to 1cm wide), good reaction with HCl	93.22	2.62	2.49	0.550	0.309	445	362	707	

APPENDIX 3: 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^{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.

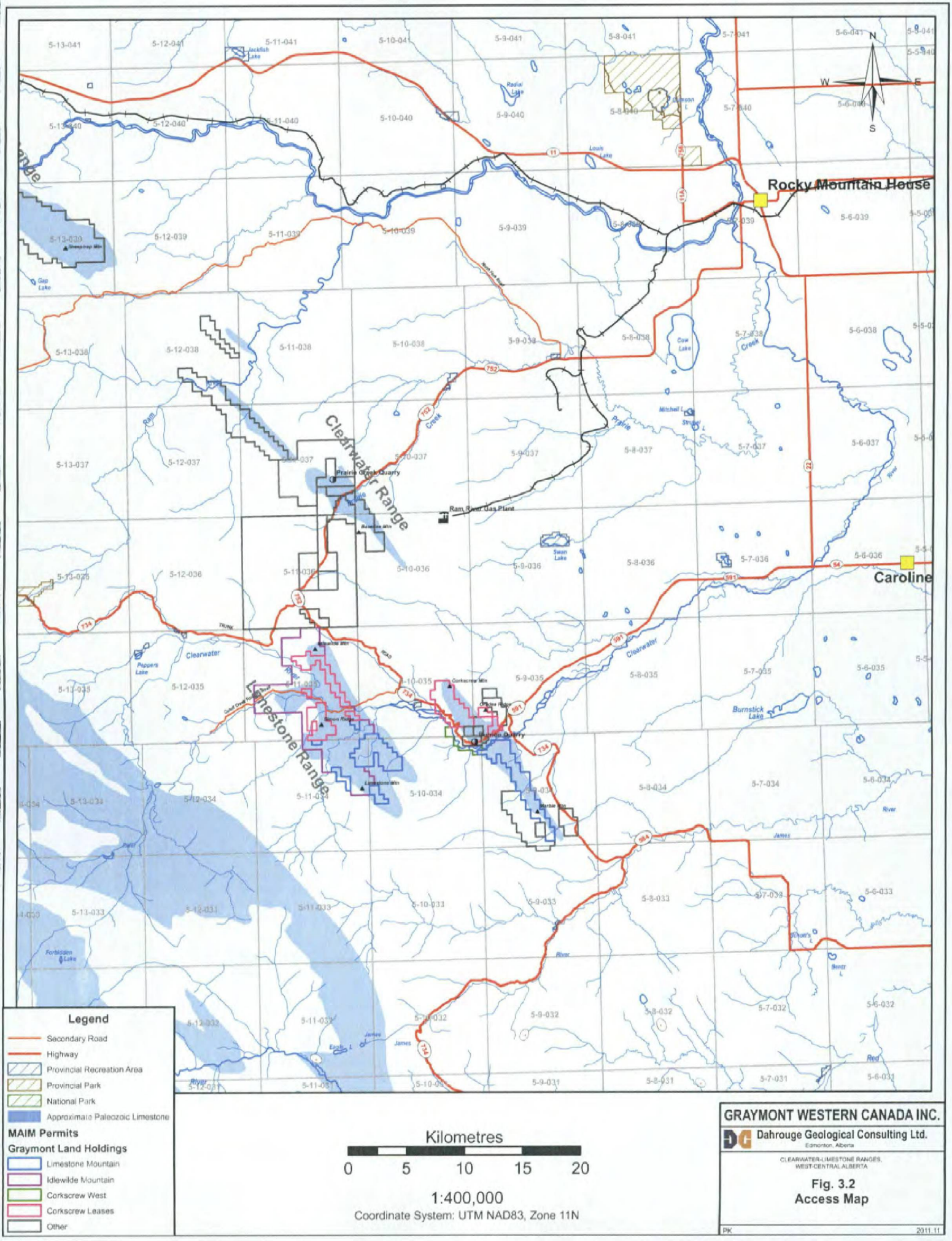
GRAYMONT WESTERN CANADA INC.

Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

CLEARWATER-LIMESTONE RANGES,
WEST-CENTRAL ALBERTA

Fig. 3.1
Property Location

PK 2011.11



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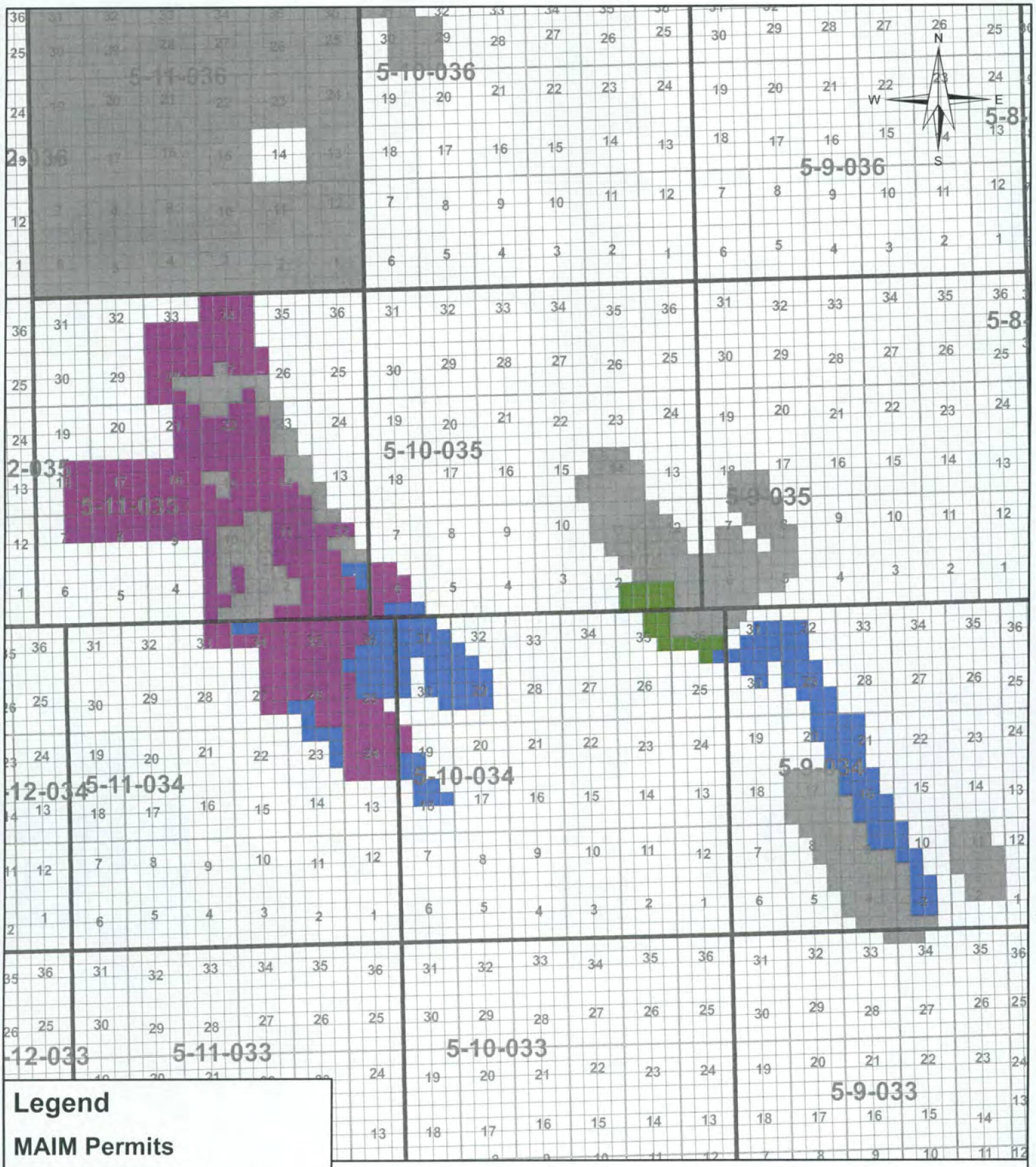
Edmonton, Alberta

CLEARWATER-LIMESTONE RANGES,
WEST-CENTRAL ALBERTA

Fig. 3.2
Access Map

PK 2011.11



Legend

MAIM Permits

Graymont Land Holdings

- Permit # 9398100125 (2336 Ha)
- Permit # 9305090646 (288 Ha)
- Permit # 9310060379 (4736 Ha)
- Other Claims

Kilometres

0 2 4 6 8

1:150,000

Coordinate System: UTM NAD83, Zone 11N

GRAYMONT WESTERN CANADA INC.

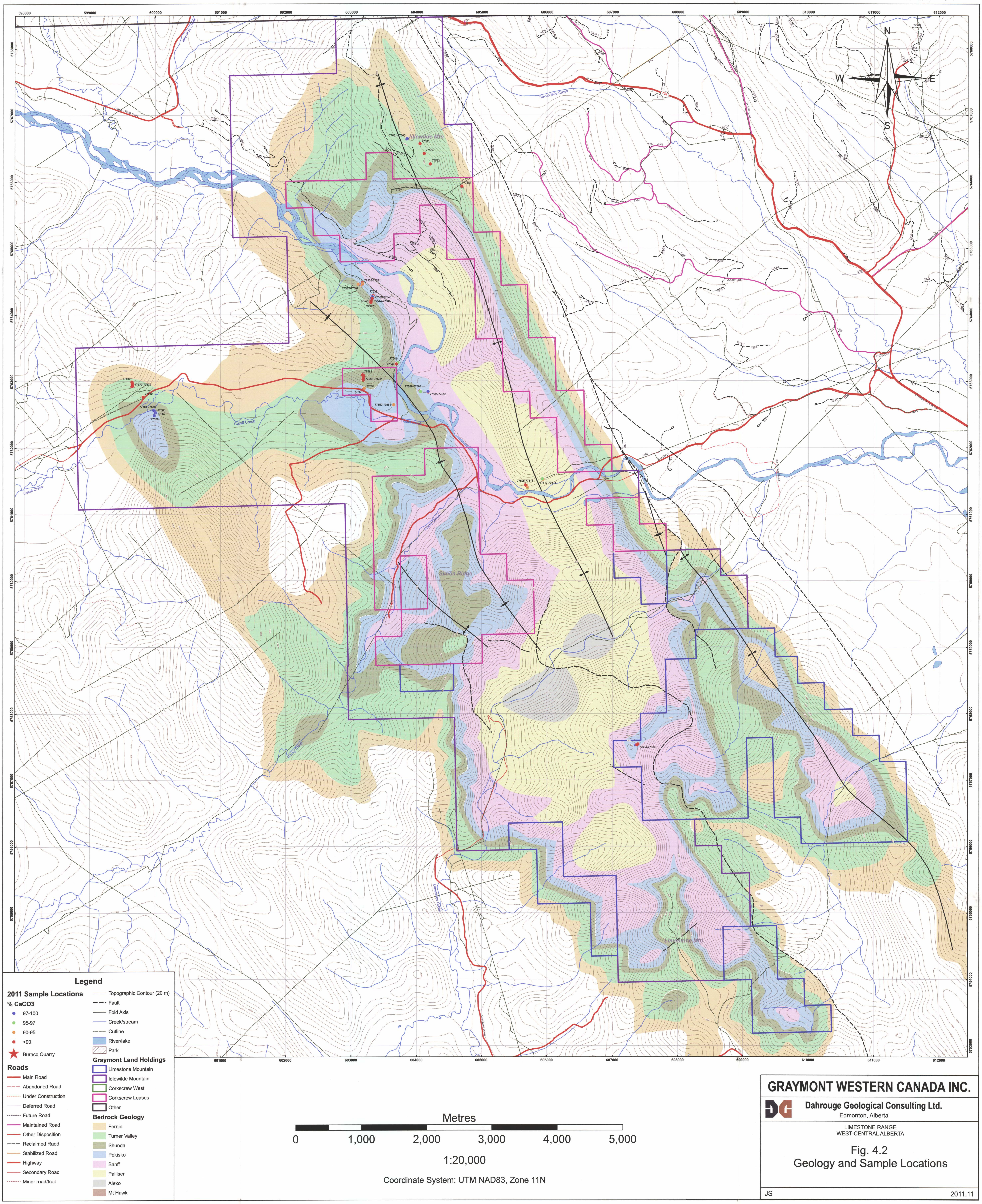
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

LIMESTONE & CLEARWATER RANGES
WEST-CENTRAL ALBERTA

Fig. 4.1
Permit Map

JS 2011.11

20110019



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Edmonton, Alberta

LIMESTONE RANGE
WEST-CENTRAL ALBERTA

Fig. 4.2
Geology and Sample Locations

JS 2011.11