MAR 20130021: COLISEUM

Coliseum Group - A Report on carbonate rock exploration near Brazeau County, West Central Alberta.

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GRAYMONT WESTERN CANADA INC.
877384 ALBERTA LTD.

2013 EXPLORATION AND FIELDWORK WITHIN THE COLISEUM GROUP METALLIC AND INDUSTRIAL MINERALS PERMITS, WEST-CENTRAL ALBERTA

PART B

Metallic and Industrial Minerals Permits
9308050833, 9312120361 & 9311090602

Geographic Coordinates

52°28' N to 52°32' N
115°58' W to 116°08' W

NTS Sheets 83 B/05, B/12, C/08 and C/09

Owner:	MAIM Permits 9312120361 & 9311090602 877384 Alberta Ltd. 18, 10509 - 81 Avenue Edmonton, Alberta T6E 1X7
Owner:	MAIM Permit 9308050833 Graymont Western Canada Inc. 260, 4311 - 12 Street N.E. Calgary, Alberta T2E 4P9
Operator	MAIM Permits 9308050833, 9312120361 & 9311090602 Graymont Western Canada Inc. 260, 4311 - 12 Street N.E. Calgary, Alberta T2E 4P9
Consultant:	Dahrouge Geological Consulting Ltd. 18, 10509 - 81 Avenue Edmonton, Alberta T6E 1X7
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Date Submitted:	September 10, 2013

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PART C

1. SUMMARY

During June 2013, the northern part of Brazeau Range, north of Nordegg and within Metallic and Industrial Minerals (MAIM) Permits 9308050833, 9312120361 and 9311090602, were explored for high-quality carbonate rocks. Exploration conducted in 2013 was a follow-up to previous exploration conducted in the area.

Access routes and outcrops were mapped, and a total of 70 rock samples were collected, representing approximately 226 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 16°17' 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 2013 exploration within the Coliseum Group 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 9308050833 (Shunda Mountain), 9312120361 (Nordegg East) and 9311090602 (Alexo), which encompass northern parts of Brazeau Range of the Alberta Foothills. Bob Robison, exploration manager for Graymont Western U.S. Inc., authorized this work.

The objectives of the 2013 exploration were to expand on 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 9308050833, 9312120361 and 9311090602 encompass northern parts of Brazeau Range, surrounding and including Shunda Mountain and the western part of Coliseum Mountain, within west-central Alberta (Fig.'s 3.1 & 3.2).

The Shunda Mountain Permit is accessed by traveling north from Highway 11 along Upper Shunda Road, past the Nordegg North subdivision. Upper Shunda Road continues north through the property, within the valley between Shunda and Coliseum mountains. It leads around and up Shunda Mountain to the Baldy Fire Lookout. A gate at the base of Shunda Mountain blocks truck access but ATV's provide excellent access to the top of the mountain. ATV's may also be utilized to explore cut lines that cross-cut and spur off the lower sections of Upper Shunda Road.

The Alexo Permit can be accessed via Upper Shunda Road and then by extensive hiking, or via ATV and hiking trails heading north from Highway 11.

The Nordegg East Permit can be accessed via a road southeast of Nordegg and then via well-maintained ATV trails.

3.2 INFRASTRUCTURE

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

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

The hamlet of Nordegg has a population of about 200 and is accessed from Highway 11, approximately 75 km west of Rocky Mountain House.

3.3 TOPOGRAPHY, VEGETATION AND CLIMATE

The Coliseum Group permit area is included in the Eastern-Slope Montane Forest Ecological Region, and lies within the Rocky-Clearwater District of the Alberta Forest Reserve. In the sub-alpine zone, vegetation consists of stunted sub-alpine fir and Englemann spruce. Above the treeline and along rocky slopes, vegetation is restricted to alpine foliage and grasses. 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.

The property is comprised of northwest-trending ridges cut by north- and northeast-trending valleys and drainages. Elevations range from approximately 1,570 m in the valley between Shunda and Coliseum mountains to about 2,050 m atop Shunda

Mountain. The property is cut by a number of drainages, including spurs of Shunda Creek, and Dog Creek, which trends north and parallels Upper Shunda Road.

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, 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. Several roads and trails of interest were reclaimed and are no longer accessible.

Garmin GPSmap 60Cx instruments were used to mark outcrop locations and record access information. Compasses were set at a magnetic declination of 16°17' east.

4. PROPERTY, EXPLORATION AND EXPENDITURES

4.1 PROPERTY SUMMARY

Graymont Western Canada Inc. acquired MAIM Permit 9308050833 (Shunda Mountain) in the spring of 2008 to cover Paleozoic limestones in the northern part of Brazeau Range, north of Nordegg (Fig.'s 3.2 and 4.1). The Shunda Mountain Permit encompasses 1,232 hectares and is contiguous with the Alexo (9311090602) and Nordegg East (9312120361) permits, which were acquired by 8773784 Alberta Ltd. in late 2011 and 2012, respectively.

The Alexo permit, which encompasses 1,280 hectares, covers Paleozoic limestones east of Coliseum Mountain. The Nordegg East permit, which encompasses 160 hectares, was acquired to cover Paleozoic limestones northeast of Nordegg.

4.2 2013 EXPLORATION SUMMARY

From June 26 to June 30, 2013, Dahrouge Geological Consulting Ltd., on behalf of Graymont, 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 70 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 10% 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 1:10,000 scale map sheets and concentrated on areas surrounding and including Shunda and Coliseum mountains, along the northern part of Brazeau Range.

4.3 EXPLORATION EXPENDITURES

Expenditures for 2013 totaled $20,016.20. The entirety of the Coliseum Group permits (MAIM Permits 9308050833, 9312120361 and 9311090602) will be retained. Excess expenditures are to be assigned to future exploration periods.

Expenditures are allocated to the MAIM permits as follows:

MAIM Permit	Permit Area (ha)	Required Expenditures	Assigned Expenditures	New Expiry Date
9308050833	1,232	$5345.29*	$5345.29	May 22, 2016
9311090602	1,280	$6400.00	$6400.00	September 12, 2015
9312120361	160	$6400.00	$6400.00	December 14, 2020

* calculated from previous credit of $6,975.71

5. REGIONAL GEOLOGY

5.1 STRATIGRAPHY

At Brazeau Range, carbonate lithologies are known to occur within both Paleozoic and Mesozoic sequences (Table 5.1, Fig. 4.2). Paleozoic limestones encountered within the Shunda, Alexo and Nordegg East permits were from the Upper Devonian Palliser Formation, Upper Devonian to Lower Carboniferous Banff Assemblage, and the Turner Valley, Shunda and Pekisko formations of the Lower Carboniferous Rundle Assemblage. Mesozoic rocks of the Fernie Group were also noted within the permit area.

Brief stratigraphic descriptions of the various units are provided herein (Pana and Dahrouge, 1998). A detailed review of the regional stratigraphy is provided by Stott and

Aitken (1993), Mossop and Shetsen (1994), Halbertsma (1994), and Richards et al. (1994).

5.1.1 Palliser Formation

In west-central Alberta, the Lower to Middle Famennian 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, 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 the 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 Formation.

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 Coliseum 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-

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

System or Subsystem	Stratigraphic Unit		
	Assemblage / Group	Formation	
		S	N
Lower Carboniferous	Rundle Assemblage	Mount Head	
		[1] Livingstone	Turner Valley
			Shunda
			Pekisko
		~~	
	Banff Assemblage	Banff	
		Exshaw	
		[1] Palliser	
Upper Devonian		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)

central British Columbia to southwestern 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 relations and continuity. The Fernie Group thickens gently and irregularly west and southwest.

Outcrops of the Fernie Group consist of large thicknesses of shale and calcareous sandstones with minor conglomerate.

5.2 STRUCTURE

In the 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. Near Nordegg, the main structural discontinuity is the northwest- to southeast-trending Brazeau Thrust. The leading edge of the thrust sheet is folded into the asymmetrical to recumbent Brazeau Anticline (Fig. 4.2).

As previously indicated by Pana and Dahrouge (1998; p. 11),

> "North of Nordegg the main structural elements within Brazeau Range include Brazeau Anticline, and Coliseum Fault, which is a splay from the Brazeau Thrust... North of Highway 11 the asymmetrical Brazeau Anticline trends northwesterly; one limb dips gently to moderately to the southwest and the other steeply northeast to overturned. Local faults and folds are present on both limbs."

6. RESULTS

Four and a half days were spent checking property access and mapping carbonate outcrops in detail. The 2013 exploration concentrated on defining stratigraphic unit locations and contacts within previously under-explored areas of the properties.

Carbonate lithologies of the Palliser, Banff, and Pekisko formations were examined and sampled within the Coliseum Group permits, near Shunda and Coliseum mountains (Fig. 4.2). A total of 70 samples were collected, representing more than 226 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.

The majority of the outcrops sampled in 2013 were identified as Palliser Formation. The analyses were quite variable, as samples were collected from various members of the formation. Outcrops of the upper Palliser generally consisted of high-calcium limestone, whereas outcrops of the lower/middle Palliser were dolomitic. Sample results from the lower/middle Palliser indicate variable dolomite content, ranging from 22.51% to 44.12% $MgCO_3$, and consistently low silica values no higher than 2.64% SiO_2. Intervals of the lower/middle Palliser were generally medium-grey to brown, very fine-grained to fine-grained, well-bedded, vuggy dolomitic mudstones. Section 2013-05, located northwest of Coliseum Mountain's summit, returned values of 59.98% $CaCO_3$, 38.30% $MgCO_3$, and 1.28% SiO_2 over 23 m (Fig. 4.2).

The upper Palliser was sampled from three locations during the 2013 program and consisted of light-grey to medium-brown, micritic to cryptocrystalline, slightly-dolomitic lime mudstones. Section 2013-09, located along a steep cliff east of Coliseum Mountain, averaged 80.52% $CaCO_3$, 14.56% $MgCO_3$ and 3.85% SiO_2 over 28 m (Fig. 4.2).

A single interval of Banff Formation was examined in 2013. Results from this interval were poor, with 70.97% $CaCO_3$ and 13.87% SiO_2 over 9.5 m. The interval consisted of medium-grey to dark-grey, micritic to cryptocrystalline mudstones with chert lenses. The Banff Formation is not a high quality carbonate unit of interest due to its low $CaCO_3$ values and high SiO_2 content.

Several intervals of Pekisko Formation were also examined in 2013. Analytical results were variable, presumably due to the fact that different members within the formation were sampled. The highest-quality section was Section 2013-18, which was collected from the base of a resistant cliff near the top of Coliseum Mountain (Fig. 4.2).

The interval consisted of medium-grey fresh, micritic to fine-grained, lime mudstone to wackestone and returned values of 97.22% $CaCO_3$, 1.45% $MgCO_3$ and 0.77% SiO_2 over 10.5 m (Fig. 4.2).

The Pekisko was also examined in Section 2013-07, which was dolomitic and returned values of 81.66% $CaCO_3$ and 17.10% $MgCO_3$ over 17.5 m (Fig. 4.2).

7. CONCLUSIONS

Carbonate units of the Pekisko, Banff, and Palliser formations were examined and measured along the northern part of Brazeau Range near Coliseum and Shunda mountains. A total of 70 samples were collected and described in detail. Roads and trails on/near the property were noted, which provide excellent access within the central parts of the property. Based upon the results of the 2013 exploration, the entirety of the Coliseum Group will be retained.

Future exploration will expand on work already conducted 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. Future drill-testing of the Palliser and Pekisko formations is also recommended.

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9. STATEMENT OF QUALIFICATIONS

I, Patrick Kluczny, residing at [redacted] 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 and Geoscientists 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 "2013 Exploration and Fieldwork within the Coliseum Group Metallic and Industrial Minerals Permits, West-Central Alberta" and accept responsibility for the veracity of technical data and results.

Dated this 10th day of September, 2013.

Patrick Kluczny, B.Sc., P.Geol.
APEGA M81985

APPENDIX 1: COST STATEMENT FOR THE 2013 EXPLORATION AT THE COLISEUM GROUP PERMITS

a) **Personnel**		$ 8,682.00
b) **Food and Accommodation**		$ 3,484.53
c) **Transportation**		$ 3,489.59
d) **Instrument Rental**		$ 198.59
e) **Drilling**	n/a	$ -
f) **Analyses**		$ 2,065.00
h) **Other** (Misc. supplies, Software rental, Field maps)		$ 276.85
Total		$ 18,196.55
Administration (10%)		$ 1,819.65
Total + Administration		**$ 20,016.20**

[redacted]

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

Edmonton, Alberta
September 10, 2013

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DAHROUGE GEOLOGICAL CONSULTING LTD.

APPENDIX 2: SAMPLE DESCRIPTIONS AND ASSAY RESULTS FROM THE COLISEUM GROUP PERMITS

GRAYMONT

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 11N. Section locations are shown in Figure 4.2. Stratigraphy Abbreviations: Dpa - Devonian Palliser Formation; Mbf - Mississippian Banff Formation; Mpk - Mississippian Pekisko Formation; Msh - Mississippian Shunda Formation; Mtv - Mississippian Turner Valley 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											
77253	Dpa	3	**Dolomitic Lime Mudstone**, medium grey weathered, medium grey to dark grey fresh, micritic to micritic, moderately-bedded, resistant, weak fetid odour, moderate HCl reaction, structure(s): bedding (undulatory) 180/19 W	92.58	5.40	1.80	0.085	0.073	246	21	50
77258	Dpa	0.5	**Dolomitic Mudstone**, light tan-grey weathered, tan-grey fresh, resistant, vuggy, weak fetid odour, very weak HCl reaction, structure(s): bedding (definite) 110/15 SW	55.47	43.28	0.72	0.212	0.116	80	41	50
77271	Dpa		**Lime Mudstone**, medium grey to dark grey weathered, dark grey fresh, weak fetid odour, strong HCl reaction, structure(s): calcite vein weak; bedding (possible) 301/40 NE	93.83	4.85	0.99	0.103	0.082	285	25	50
77288	Mpk	3.5	**Lime Grainstone**, light grey weathered, medium grey fresh, fossils: solitary rugose coral; fragment (indeterminate); crinoid stem, abundant; crinoid ossicle, abundant; brachiopod, resistant, very strong HCl reaction, structure(s): calcite vein weak; bedding (possible) 90/32 S	88.28	5.73	3.95	0.664	0.571	859	368	670
77291	Mbf	3	**Lime Mudstone**, medium grey weathered, medium grey to dark grey fresh, cryptocrystalline to micritic, slightly resistant, strong HCl reaction, structure(s): bedding (definite) 111/50 SW	51.28	11.53	28.10	0.402	0.300	248	192	560
77306	Dpa	4	**Dolomitic Lime Mudstone**, light grey weathered and fresh, micritic to micritic, resistant, weak HCl reaction, structure(s): calcite vein weak; bedding (definite) 108/9 SW	68.04	28.14	2.64	0.451	0.233	187	176	50
77326	Mbf	2.5	**Lime Grainstone**, medium grey to light grey weathered, medium grey to medium brown-grey fresh, medium-grained to coarse-grained, fossils: crinoid ossicle, massive, resistant, hard, vuggy, weak fetid odour, weak HCl reaction	66.14	33.72	0.50	0.072	0.095	127	48	50
77331	Mpk	3	**Lime Grainstone**, light grey to light brown-grey weathered, medium brown-grey to dark brown-grey fresh, fossils: crinoid ossicle; brachiopod, rare, thinly-bedded to moderately-bedded, resistant, hard, strong HCl reaction, structure(s): bedding (definite) 104/20 S	65.72	33.16	1.09	0.148	0.092	150	43	50
77332	Mpk	0.5	**Lime Grainstone**, light grey to medium grey weathered, medium grey to dark grey fresh, medium-grained, fossils: crinoid ossicle, very abundant; brachiopod, rare, very strong HCl reaction	57.85	40.15	1.38	0.189	0.151	143	53	50
77336	Mpk	1.5	**Lime Mudstone**, light grey weathered, medium brown-grey fresh, micritic to very fine-grained, thinly-bedded to moderately-bedded, structure(s): bedding (definite) 114/19 SW	75.78	23.68	0.56	0.053	0.093	149	33	50
Section 2013-02 (UTM 566225E, 5816348N)											
77254	Dpa	2.5	**Dolomitic Mudstone**, light tan-grey to light grey weathered, tan to medium brown fresh, micritic to micritic, thickly-bedded to massively-bedded, resistant, vuggy, very weak HCl reaction, structure(s): bedding (undulatory) 160/25 SW	56.58	42.13	0.81	0.164	0.103	76	35	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)
77255	Dpa	3	**Dolomitic Mudstone**, light tan-grey to light grey weathered, tan to medium brown fresh, micritic to micritic, thickly-bedded to massively-bedded, resistant, vuggy, weak fetid odour, very weak HCl reaction	54.99	44.12	0.54	0.092	0.079	66	37	50
Section 2013-03 (UTM 566002E, 5816710N)											
77256	Dpa	4.25	**Dolomitic Mudstone**, light tan-grey weathered, medium grey to tan fresh, micritic to micritic, thickly-bedded to massively-bedded, resistant, vuggy, weak fetid odour, very weak HCl reaction, structure(s): bedding (undulatory) 130/28 SW	55.38	43.49	0.68	0.186	0.109	78	37	50
77257	Dpa	1.75	**Dolomitic Mudstone**, light grey to tan weathered, tan to medium grey fresh, micritic to micritic, thickly-bedded to massively-bedded, resistant, vuggy, weak fetid odour, very weak HCl reaction	55.65	43.07	0.73	0.222	0.128	79	38	50
Section 2013-04 (UTM 565977E, 5816840N)											
77259	Dpa	1.25	**Dolomitic Mudstone**, medium grey weathered, tan-grey fresh, massive, resistant, vuggy, alteration: oxide, fracture-related, very weak HCl reaction	55.54	43.12	0.70	0.216	0.117	82	36	50
77260	Dpa	2.25	**Dolomitic Mudstone**, medium grey weathered, tan-grey fresh, massive, resistant, vuggy, alteration: oxide, fracture-related, very weak HCl reaction, structure(s): bedding (definite) 130/14 SW	55.35	43.39	0.68	0.200	0.106	84	40	50
77261	Dpa	0.5	**Dolomitic Lime Mudstone**, medium grey weathered, medium brown-grey fresh, micritic to micritic, resistant, vuggy, strong HCl reaction, structure(s): bedding (definite) 140/12 SW	55.81	43.01	0.66	0.179	0.099	83	38	50
77262	Dpa	7	**Dolomitic Lime Mudstone**, medium grey weathered, medium brown-grey fresh, micritic to micritic, moderately-bedded, resistant, vuggy, weak fetid odour, strong HCl reaction	55.79	42.99	0.72	0.194	0.123	80	43	50
77263	Dpa	1.25	**Dolomitic Mudstone**, medium grey weathered, fresh, moderately-bedded, weak fetid odour, very weak HCl reaction, structure(s): bedding (undulatory) 129/12 SW	55.45	43.24	0.79	0.199	0.109	88	48	50
77264	Dpa	1.5	**Dolomitic Mudstone**, medium grey weathered, fresh, moderately-bedded, weak fetid odour, very weak HCl reaction, structure(s): bedding (undulatory) 129/12 SW	55.26	43.22	0.92	0.215	0.112	86	46	50
77265	Dpa	1.75	**Dolomitic Mudstone**, medium grey weathered, fresh, moderately-bedded, alteration: oxide, weak fetid odour, very weak HCl reaction, structure(s): bedding (definite) 128/12 SW	55.36	42.99	1.03	0.221	0.158	90	63	50
77266	Dpa	0.25	**Dolomitic Lime Mudstone**, weathered and fresh, micritic to micritic, moderately-bedded to thickly-bedded, resistant, vuggy, strong HCl reaction, structure(s): calcite vein weak; bedding (definite) 140/10 SW	55.13	43.05	1.23	0.253	0.130	87	56	50
77267	Dpa	1	**Carbonaceous Dolomitic Mudstone**, medium grey weathered, light tan-grey fresh, moderately-bedded, weak HCl reaction, structure(s): calcite vein	55.69	41.90	1.62	0.340	0.161	88	48	50
77268	Dpa	2.75	**Dolomitic Lime Mudstone to Dolomitic Mudstone**, light grey to medium grey weathered, medium grey to tan fresh, cryptocrystalline to micritic, moderately-bedded to massively-bedded, resistant, vuggy, weak HCl reaction, structure(s): bedding (definite) 130/20 SW	56.10	41.80	1.38	0.305	0.204	94	52	50
77269	Dpa	4	**Dolomitic Lime Mudstone to Dolomitic Mudstone**, light grey to medium grey weathered, medium grey to tan fresh, cryptocrystalline to micritic, moderately-bedded to massively-bedded, resistant, vuggy, weak HCl reaction	55.49	42.51	1.34	0.251	0.110	86	45	50
77270	Dpa	2.25	**Dolomitic Lime Mudstone to Dolomitic Mudstone**, light grey to medium grey weathered, medium grey to tan fresh, cryptocrystalline to micritic, massive, resistant, vuggy, very weak HCl reaction	55.45	43.66	0.52	0.098	0.086	85	49	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)
Section 2013-05 (UTM 561322E, 5819845N)											
77272	Dpa	4.5	**Dolomitic Mudstone to Lime Mudstone**, tan-grey weathered, tan to dark grey fresh, micritic, thickly-bedded to massively-bedded, resistant, alteration: oxide, weak fetid odour, strong HCl reaction	74.98	22.51	1.69	0.377	0.154	189	32	50
77273	Dpa	5	**Dolomitic Mudstone**, weathered and fresh, cryptocrystalline to micritic, resistant, vuggy, structure(s): calcite vein	56.02	42.99	0.60	0.126	0.075	74	79	50
77274	Dpa	5.5	**Dolomitic Mudstone**, weathered and fresh, cryptocrystalline to micritic, resistant, vuggy, weak fetid odour	56.11	41.23	2.36	0.106	0.076	91	53	50
77275	Dpa	2	**Dolomitic Mudstone**, weathered and fresh, cryptocrystalline to micritic,	55.54	43.16	1.03	0.108	0.085	85	58	50
77276	Dpa	3.5	**Dolomitic Mudstone**, weathered and fresh, cryptocrystalline to micritic, vuggy, very weak HCl reaction, structure(s): vein	55.13	44.06	0.46	0.086	0.069	69	58	50
77277	Dpa	2.5	**Dolomitic Mudstone**, weathered and fresh, cryptocrystalline to micritic, resistant, vuggy, structure(s): calcite vein	59.76	38.91	0.90	0.142	0.098	70	43	50
Section 2013-06 (UTM 561378E, 5819723N)											
77278	Dpa	2.5	**Dolomitic Mudstone**, medium grey to tan weathered, medium brown to tan fresh, cryptocrystalline, banded, nodular, weak fetid odour, weak HCl reaction, structure(s): bedding (definite) 146/4 SW	58.72	39.46	1.25	0.239	0.116	93	64	50
77279	Dpa	3.75	**Dolomitic Mudstone**, medium grey to tan weathered, medium brown to tan fresh, cryptocrystalline, moderately-bedded to thickly-bedded, resistant, hard, vuggy, banded, weak fetid odour, very weak HCl reaction	64.47	34.27	0.75	0.124	0.095	90	99	50
77280	Dpa	3.5	**Dolomitic Mudstone**, medium grey to tan weathered, medium brown to tan fresh, cryptocrystalline, resistant, hard, banded, vuggy, weak fetid odour, moderate HCl reaction	56.58	41.46	1.24	0.271	0.142	75	126	50
77281	Dpa	3.75	**Dolomitic Mudstone**, medium grey to tan weathered, medium brown to tan fresh, cryptocrystalline, moderately-bedded to thickly-bedded, vuggy, banded, weak fetid odour, weak HCl reaction	56.13	41.11	1.94	0.307	0.168	84	73	50
77282	Dpa	4	**Dolomitic Mudstone**, medium grey to tan weathered, medium brown to tan fresh, cryptocrystalline, moderately-bedded to thickly-bedded, vuggy, banded, weak fetid odour, weak HCl reaction	56.35	41.36	1.52	0.275	0.163	110	69	50
77283	Dpa	1.75	**Dolomitic Mudstone**, medium grey to tan weathered, medium brown to tan fresh, cryptocrystalline, moderately-bedded to thickly-bedded, vuggy, banded, weak fetid odour, very weak HCl reaction	56.49	41.67	1.19	0.240	0.153	110	68	50
Section 2013-07 (UTM 565395E, 5818244N)											
77284	Mpk	3	**Calcareous Dolomitic Mudstone to Calcareous Dolomitic Packstone**, tan weathered, medium brown-grey fresh, cryptocrystalline, fossils: solitary rugose coral, abundant; fragment (indeterminate); crinoid ossicle, thickly-bedded to massively-bedded, resistant, vuggy, weak fetid odour, moderate HCl reaction, structure(s): fracture moderate; calcite vein weak	63.38	34.69	1.26	0.269	0.165	166	48	50
77285	Mpk	4.75	**Carbonaceous Dolomitic Mudstone to Calcareous Dolomitic Wackestone**, tan weathered, medium brown to medium grey fresh, cryptocrystalline to cryptocrystalline, fossils: solitary rugose coral, abundant; fragment (indeterminate); crinoid ossicle, thickly-bedded to massively-bedded, resistant, vuggy, weak fetid odour, moderate HCl reaction, structure(s): fracture moderate	80.74	18.03	0.74	0.122	0.128	222	39	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)
77286	Mpk	3.75	**Lime Grainstone**, medium grey weathered and fresh, fossils: crinoid stem, abundant; crinoid ossicle, abundant, massive, resistant, very strong HCl reaction	81.40	17.55	0.64	0.103	0.120	219	39	50
77287	Mpk	6	**Lime Grainstone**, medium grey weathered and fresh, fossils: crinoid stem, abundant; crinoid ossicle, abundant, massive, resistant, very strong HCl reaction, structure(s): bedding (undulatory) 40/31 SE	91.70	7.28	0.65	0.086	0.094	286	45	50
Section 2013-08 (UTM 565314E, 5818200N)											
77289	Mbf	3.75	**Dolomitic Lime Mudstone**, tan to medium grey weathered, medium grey fresh, laminated to moderately-bedded, mottled, moderate HCl reaction, structure(s): bedding (definite) 110/61 SW	66.04	14.08	14.66	1.756	1.068	649	294	626
77290	Mbf	5.75	**Dolomitic Mudstone to Lime Packstone**, medium grey weathered and fresh, laminated, mottled, no HCl reaction, structure(s): bedding (definite) 121/71 SW	74.19	8.85	13.35	1.367	0.697	976	295	509
Section 2013-09 (UTM 565230E, 5818156N)											
77292	Dpa	2	**Lime Mudstone**, light grey to medium grey weathered, medium grey fresh, massive, resistant, very strong HCl reaction	70.77	7.15	20.61	0.254	0.212	240	295	50
77293	Dpa	1.75	**Dolomitic Lime Mudstone**, light grey to medium grey weathered, medium grey fresh, micritic to micritic, fossils: fragment (indeterminate); brachiopod, alteration: oxide, fracture-related, very strong HCl reaction, structure(s): calcite vein weak	85.78	7.24	4.71	1.022	0.428	358	718	410
77294	Dpa	3.75	**Argillaceous Dolomitic Mudstone to Argillaceous Lime Mudstone**, tan weathered, light grey fresh, moderately-bedded, strong HCl reaction, structure(s): bedding (definite) 112/87 SW	83.15	9.79	4.76	1.028	0.510	318	391	258
77295	Dpa	2.75	**Argillaceous Dolomitic Mudstone to Argillaceous Lime Mudstone**, tan weathered, light grey fresh, fossils: fragment (indeterminate), rare, moderately-bedded, strong HCl reaction	91.76	6.00	1.51	0.267	0.193	311	160	50
77296	Dpa	2.75	**Lime Mudstone**, light grey weathered, medium grey fresh, micritic to micritic, thickly-bedded to massively-bedded, strong HCl reaction	95.45	1.86	2.21	0.154	0.187	321	180	50
77297	Dpa	3.25	**Dolomitic Lime Mudstone**, light grey to medium grey weathered and fresh, micritic to micritic, moderately-bedded to massively-bedded, resistant, moderate HCl reaction, structure(s): calcite vein moderate; bedding (definite) 113/89 SW	87.08	10.88	1.33	0.225	0.149	281	144	50
77298	Dpa	2.75	**Dolomitic Lime Mudstone**, light grey to medium grey weathered and fresh, micritic to micritic, massive, weak HCl reaction, structure(s): calcite vein moderate	65.57	31.74	2.22	0.186	0.104	139	159	50
77299	Dpa	9	**Dolomitic Lime Mudstone**, light grey to medium grey weathered and fresh, micritic to micritic, moderately-bedded, resistant, weak HCl reaction, structure(s): calcite vein moderate; bedding (definite) 110/76 SW	74.77	22.18	2.19	0.316	0.146	204	122	50
Section 2013-10 (UTM 565189E, 5818101N)											
77300	Dpa	7.5	**Dolomitic Mudstone**, tan to light grey weathered, light brown fresh, moderately-bedded, resistant, vuggy, weak HCl reaction	56.04	40.81	2.13	0.385	0.192	103	75	50
77301	Dpa	7	**Dolomitic Mudstone**, medium brown-grey weathered and fresh, resistant, weak HCl reaction, structure(s): calcite vein weak; bedding (definite) 119/64 SW	58.26	39.66	1.48	0.215	0.125	90	112	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)
Section 2013-11 (UTM 565153E, 5818053N)											
77302	Dpal	3	**Dolomitic Mudstone**, medium grey to tan weathered, medium grey to dark grey fresh, resistant, alteration: oxide, weak HCl reaction, structure(s): fracture; calcite vein	56.11	41.67	1.63	0.183	0.106	74	124	50
77303	Dpal	4.25	**Dolomitic Mudstone**, medium grey to tan weathered, medium grey to dark grey fresh, thinly-bedded to moderately-bedded, vuggy, alteration: oxide, weak fetid odour, weak HCl reaction, structure(s): fracture; calcite vein	56.17	42.66	0.74	0.129	0.080	71	109	50
77304	Dpa	3.75	**Lime Mudstone**, medium grey to tan weathered, medium grey to dark grey fresh, thinly-bedded to moderately-bedded, resistant, pockety, alteration: oxide, fracture-related, weak HCl reaction, structure(s): fracture weak; calcite vein weak; bedding (definite) 144/4 SW	55.88	42.15	1.33	0.246	0.136	80	74	50
77305	Dpa	4	**Dolomitic Mudstone**, weathered and fresh, weak HCl reaction, structure(s): bedding (possible) 120/6 SW	54.81	41.97	2.25	0.382	0.174	101	62	50
Section 2013-14 (UTM 563229E, 5818239N)											
77324	Mbf	1	**Lime Grainstone**, medium grey to light grey weathered and fresh, fossils: solitary rugose coral; crinoid ossicle; brachiopod, resistant, hard, weak fetid odour, very strong HCl reaction, structure(s): bedding (definite) 111/26 SW	90.13	9.58	0.41	0.054	0.088	223	33	50
77325	Mbf	1	**Lime Grainstone**, medium grey to light grey weathered, medium grey to medium brown fresh, fossils: crinoid ossicle, abundant, thickly-bedded to massively-bedded, resistant, hard, weak fetid odour, very strong HCl reaction, structure(s): bedding (possible) 104/38 SW	64.27	35.69	0.43	0.051	0.132	106	57	50
Section 2013-15 (UTM 563298E, 5818322N)											
77327	Mpk	4	**Lime Grainstone**, light grey to light tan-grey weathered, medium brown-grey fresh, medium-grained to coarse-grained, fossils: crinoid ossicle, abundant; brachiopod, rare, moderately-bedded to thickly-bedded, resistant, hard, weak fetid odour, moderate HCl reaction, structure(s): bedding (definite) 121/38 SW	93.77	5.75	0.33	0.048	0.095	258	33	50
77328	Mpk	6.5	**Lime Grainstone**, light grey to light tan-grey weathered, medium brown-grey fresh, fossils: crinoid ossicle, abundant; brachiopod, rare, moderately-bedded to thickly-bedded, resistant, hard, weak fetid odour, strong HCl reaction, structure(s): bedding (definite) 123/32 SW	91.17	8.14	0.33	0.043	0.069	227	29	50
Section 2013-16 (UTM 563328E, 5818340N)											
77329	Mpk	3.5	**Lime Grainstone**, light grey to medium brown-grey weathered, medium grey to medium brown-grey fresh, fine-grained to coarse-grained, massive, resistant, hard, moderate HCl reaction	60.97	38.10	0.99	0.153	0.082	128	42	50
77330	Mpk	3.5	**Lime Grainstone**, light grey to medium grey weathered, light brown-grey to medium brown-grey fresh, fine-grained to coarse-grained, fossils: solitary rugose coral, rare; colonial coral, abundant; brachiopod, rare, massive, resistant, hard, strong HCl reaction	74.21	24.06	1.05	0.136	0.100	169	42	131
Section 2013-17 (UTM 563330E, 5818487N)											
77333	Mpk	0.5	**Lime Grainstone**, light grey to light brown-grey weathered, medium grey to medium brown-grey fresh, fine-grained to coarse-grained, fossils: solitary rugose coral, rare; crinoid ossicle, very abundant; brachiopod, rare, thinly-bedded, vuggy, very strong HCl reaction, structure(s): bedding (definite) 117/12 SW	87.15	11.32	0.81	0.078	0.115	224	31	50
77334	Mpk	4	**Lime Grainstone**, light grey to light brown-grey weathered, medium brown-grey fresh, fine-grained to coarse-grained, fossils: crinoid ossicle, abundant; brachiopod, rare, very strong HCl reaction, structure(s): bedding (definite) 122/21 SW	87.49	11.38	0.64	0.066	0.100	237	28	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)
77335	Mpk	6.75	**Lime Grainstone**, light grey weathered, medium grey to medium brown-grey fresh, fine-grained to very coarse-grained, fossils: solitary rugose coral, rare; crinoid ossicle, very abundant; brachiopod, moderately-bedded, very strong HCl reaction, structure(s): bedding (definite) 110/7 SW	88.12	10.71	0.56	0.056	0.091	247	30	50
Section 2013-18 (UTM 563384E, 5818598N)											
77337	Mpk	1.5	**Lime Grainstone**, light grey to light brown-grey weathered, medium brown-grey fresh, fine-grained to coarse-grained, moderately-bedded to thickly-bedded, very strong HCl reaction, structure(s): calcite veinlet weak; calcite vein; bedding (definite) 109/11 SW	97.41	1.65	0.26	0.029	0.046	300	18	50
77338	Mpk	6.25	**Lime Wackestone**, very-light grey weathered, medium grey to medium brown-grey fresh, micritic to fine-grained, fossils: fragment (indeterminate), rare; crinoid ossicle, rare, very strong HCl reaction, structure(s): bedding (definite) moderate, 128/17 SW	97.20	1.36	0.94	0.089	0.095	312	35	50
77339	Mpk	2.75	**Lime Mudstone**, very-light grey weathered, medium grey to dark grey fresh, micritic to very fine-grained, thinly-bedded, resistant, hard, structure(s): calcite veinlet weak; bedding (definite) 141/17 SW	97.16	1.55	0.66	0.037	0.045	271	18	50

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.

Location of MAIM Permits 9308050833, 9311090602 & 9312120361

LEGEND

- ✱ **Provincial capital**
- • **Other populated places**
- **Trans-Canada Highway**
- **Major road**
- **International boundary**
- **Provincial boundary**

Scale

75 0 75 150 225 km

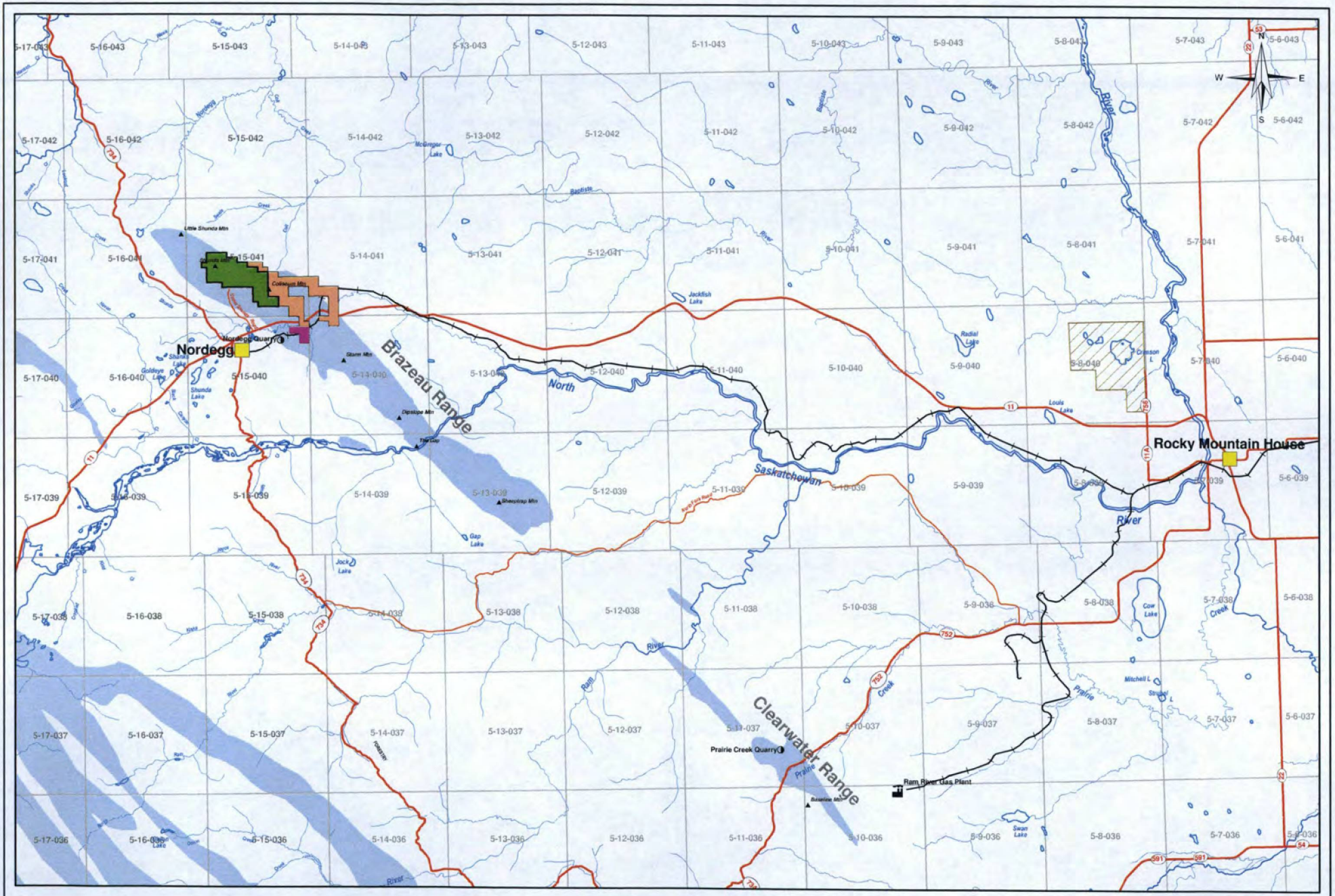
GRAYMONT WESTERN CANADA INC.

Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

WEST-CENTRAL ALBERTA

Fig. 3.1
Property Location

PK 2013.08



Legend

- Secondary Road
- Highway
- Provincial Park
- National Park
- Approximate Paleozoic Limestone

Coliseum Group Permits

- Shunda Mountain (9308050833)
- Alexo (9311090602)
- Nordegg East (9312120361)

Kilometres

0 10 20 30

1:400,000

Coordinate System: UTM NAD83, Zone 11N

GRAYMONT WESTERN CANADA INC.

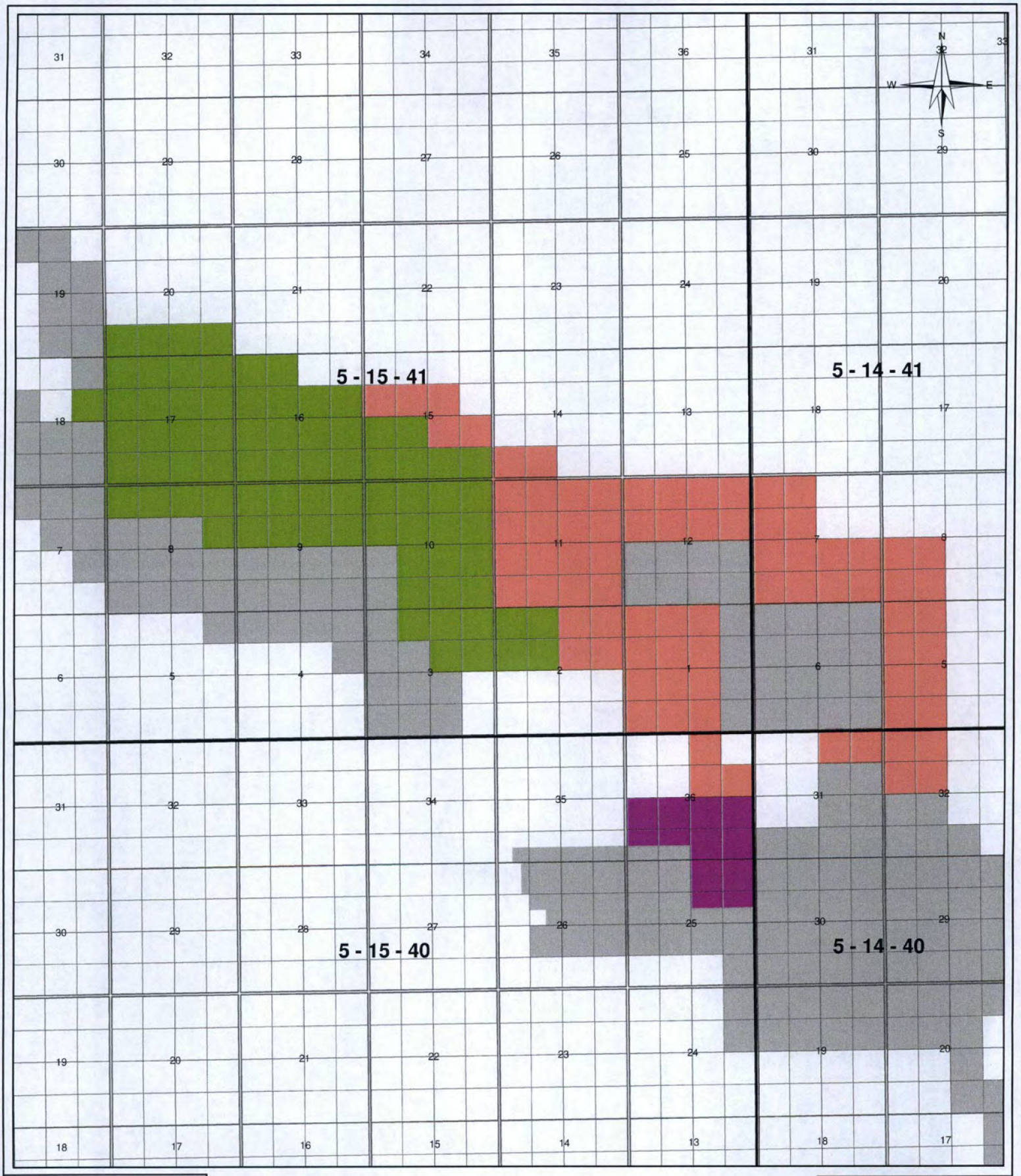
Dahrouge Geological Consulting Ltd.
Edmonton, Alberta

WEST-CENTRAL ALBERTA

Fig. 3.2
Access Map

PK 2013.08

C9



Legend

MAIM Permits

- Permit #9308050833 (1,232 ha)
- Permit #9311090602 (1,280 ha)
- Permit #9312120361 (160 ha)
- Others

Kilometres

0 1 2 3

1:60,000

Coordinate System: UTM NAD83, Zone 11N

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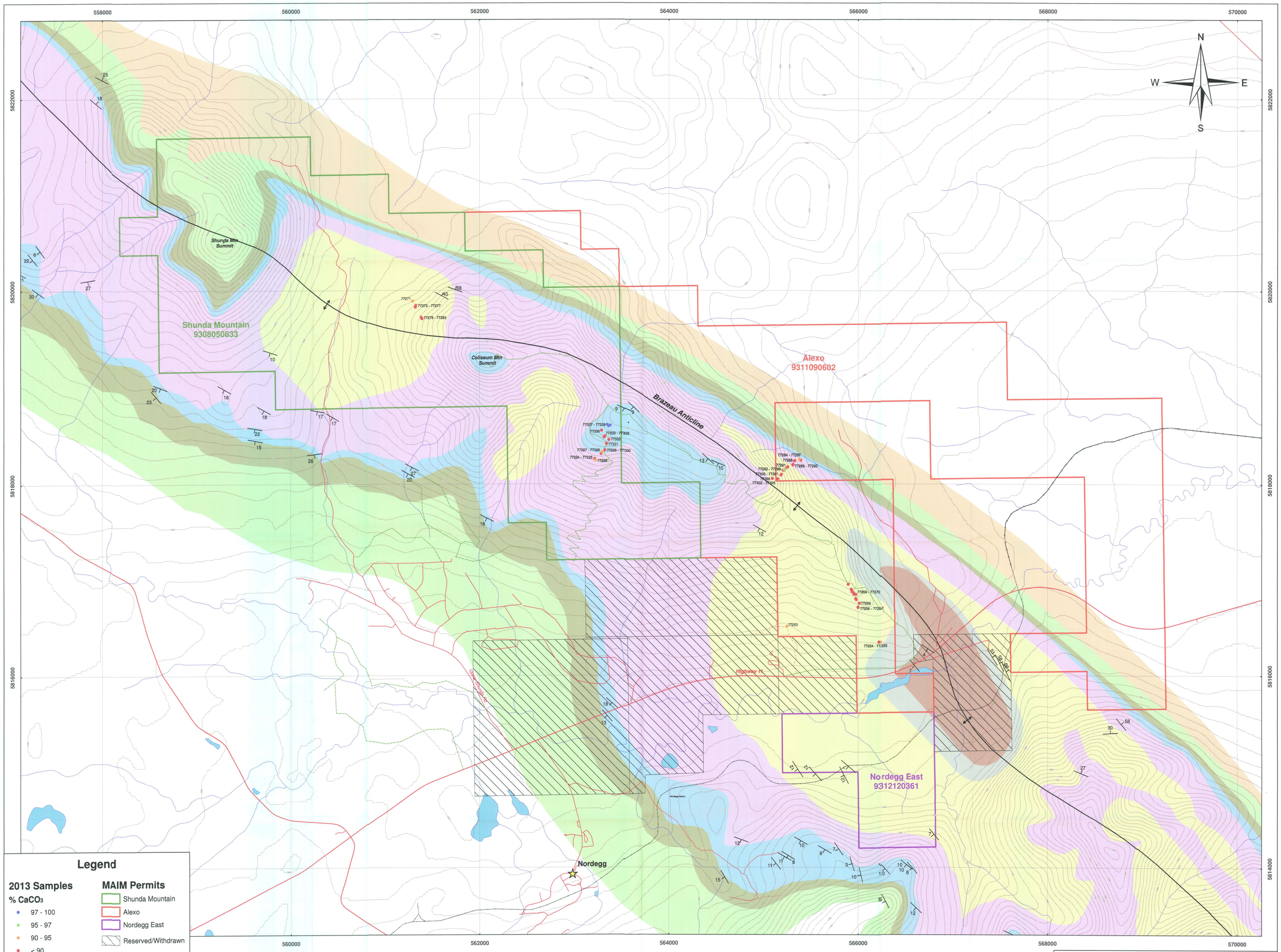
Edmonton, Alberta

COLISEUM GROUP PERMITS
WEST-CENTRAL ALBERTA

Fig. 4.1
Permit Map

KK 2013.03



Legend

2013 Samples

% $CaCO_3$

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

Roads

- Highway
- Secondary Road
- Minor road/trail
- Hiking trail
- Topography (20m)
- Creek/Stream
- River/Lake

MAIM Permits

- Shunda Mountain
- Alexo
- Nordegg East
- Reserved/Withdrawn

Bedrock Geology

- Fernie
- Turner Valley
- Shunda
- Pekisko
- Banff
- Palliser
- Alexo
- Mt Hawk

Kilometres

0 1 2 3 4

1:15,000

Coordinate System: UTM NAD83, Zone 11N

GRAYMONT WESTERN CANADA INC.

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Edmonton, Alberta

WEST-CENTRAL ALBERTA

Fig. 4.2
Geology and Sample Locations

KK 2013.09