



**TECHNICAL REPORT ON THE
Palisades Coal Property
ALBERTA, CANADA**

**Prepared for Altitude Resources Inc.
Report for NI 43-101**

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TABLE OF CONTENTS

1	SUMMARY.....	1
1.1	PROPERTY DESCRIPTION	1
1.2	LAND TENURE	1
1.3	GEOLOGY AND MINERALIZATION	1
1.4	EXPLORATION	2
1.5	COAL QUALITY.....	2
1.6	MINERAL RESOURCE ESTIMATES.....	2
1.7	CONCLUSIONS AND RECOMMENDATIONS	4
2	INTRODUCTION	5
3	RELIANCE ON OTHER EXPERTS.....	7
4	PROPERTY DESCRIPTION AND LOCATION	8
4.1	LOCATION.....	8
4.2	ENVIRONMENTAL LIABILITIES.....	11
4.3	REQUIRED PERMITS.....	11
4.4	OTHER SIGNIFICANT FACTORS AND RISKS	11
5	ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY.....	12
5.1	TOPOGRAPHY, ELEVATION, AND VEGETATION	12
5.2	INFRASTRUCTURE AND LOCAL RESOURCES.....	12
5.3	CLIMATE	13
6	HISTORY	14
6.1	PRIOR OWNERSHIP	15
6.2	PREVIOUS EXPLORATION AND DEVELOPMENT.....	15
6.2.1	RIO TINTO EXPLORATION	16
6.2.2	DENISON EXPLORATION.....	18
6.2.3	ALTITUDE RESOURCES EXPLORATION	19
6.3	PRODUCTION.....	22
7	GEOLOGICAL SETTING AND MINERALIZATION	23
7.1	REGIONAL GEOLOGY.....	23

7.2	PROPERTY GEOLOGY.....	26
7.3	STRATIGRAPHY	26
7.4	STRUCTURAL GEOLOGY	28
7.5	MINERALIZED ZONES.....	30
8	DEPOSIT TYPES	32
9	EXPLORATION.....	34
9.1	MAPPING.....	34
9.2	TRENCHING.....	34
10	DRILLING.....	36
10.1	CONVENTIONAL ROTARY DRILLING.....	37
10.2	CORE DRILLING.....	40
11	SAMPLE PREPARATION, ANALYSES, AND SECURITY	41
11.1	CONVENTIONAL DRILL SAMPLING.....	41
11.2	CORE SAMPLING	41
11.3	PETROGRAPHIC SAMPLES	41
11.4	LABORATORY SAMPLE PREPARATION AND ANALYSIS.....	41
11.5	QUALITY CONTROL AND QUALITY ASSURANCE.....	42
12	DATA VERIFICATION	43
13	MINERAL PROCESSING AND METALLURGICAL TESTING.....	45
13.1	COAL QUALITY ASSESSMENT.....	45
13.1.1	COKING COAL QUALITY ASSESSMENT PARAMETERS	45
13.2	COKING COAL QUALITY TESTING RESULTS	47
13.2.1	HISTORIC RESULTS (DENISON).....	47
13.3	2013 AND 2015 RESULTS (ALTITUDE).....	48
13.3.1	2013 REVERSE CIRCULATION SAMPLES.....	48
13.3.2	2013 TRENCH SAMPLES.....	49
13.3.3	2013 SONIC CORE SAMPLES	50
13.4	2015 RESULTS (ALTITUDE)	54
13.4.1	2015 DRILL CHIP SAMPLES	55

13.4.2	2015 - 15 CM (SIX INCH) CORE SAMPLES.....	56
14	MINERAL RESOURCE ESTIMATES	60
14.1	RESOURCE SUMMARY	62
14.2	EXPLORATION TARGET SUMMARY.....	65
15	MINERAL RESERVE ESTIMATES.....	66
16	MINING METHODS.....	67
17	RECOVERY METHODS	68
18	PROJECT INFRASTRUCTURE.....	69
19	MARKETING STUDIES AND CONTRACTS	70
20	ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT	71
21	CAPITAL AND OPERATING COST	72
22	ECONOMIC ANALYSIS.....	73
23	ADJACENT PROPERTIES.....	74
24	OTHER RELEVANT DATA AND INFORMATION	75
25	INTERPRETATION AND CONCLUSIONS	76
26	RECOMMENDATIONS.....	77
27	REFERENCES.....	78
28	DATE AND SIGNATURE PAGE.....	80
29	CERTIFICATE OF QUALIFIED PERSONS.....	81
	LARGE FIGURES	1

LIST OF FIGURES

FIGURE 2-1.	LOCATION OF THE PALISADES COAL PROPERTY.....	6
FIGURE 4-1.	PALISADES COAL PROPERTY MAP.....	9
FIGURE 6-1.	COAL HILL - HISTORIC EXPLORATION AND DRILLING.....	17
FIGURE 6-2.	CENTRAL AREA - HISTORIC EXPLORATION AND DRILLING.....	20
FIGURE 6-3.	SOUTH AREA – HISTORIC EXPLORATION AND DRILLING.....	20
FIGURE 7-1.	STRATIGRAPHIC CORRELATION (MODIFIED FROM LANGENBERG ET AL, 1985).....	23
FIGURE 7-2.	GENERALIZED STRATIGRAPHIC COLUMN IN PALISADES AREA (AFTER DENISON, 1984)...	25
FIGURE 7-3.	REGIONAL GEOLOGY MAP.....	25
FIGURE 7-4.	NORTH PROPERTY GEOLOGY – COAL HILL AREA.....	27
FIGURE 7-5.	CENTRAL PROPERTY GEOLOGY – CENTRAL PALISADES AREA.....	27
FIGURE 7-6.	SOUTH PROPERTY GEOLOGY – SOUTH PALISADES AREA.....	27
FIGURE 7-7.	STRATIGRAPHIC CROSS-SECTION ALONG P-0300 LINE AND THROUGH COAL HILL.....	29
FIGURE 7-8.	CROSS-SECTION (BRULE MINES) SHOWING COAL THICKENING AT FOLD HINGES.....	30
FIGURE 9-1.	2015 PALISADES EXPLORATION.....	34
FIGURE 10-1.	2015 PALISADES DRILLING.....	36
FIGURE 13-1.	RELATIONSHIP BETWEEN RANK (R_0 MAX), PERCENT INERTS, AND COKE STABILITY.....	46
FIGURE 14-1.	PALISADES COAL RESOURCE PROJECTIONS AND EXPLORATION TARGETS.....	62
FIGURE 14-2.	CROSS-SECTION LINE LOCATIONS.....	63
FIGURE 14-3.	CROSS-SECTION A-A’ – COAL HILL (SEE FIGURE 14.2 FOR LOCATION).....	63
FIGURE 14-4.	CROSS-SECTION B-B’ – COAL HILL (SEE FIGURE 14.2 FOR LOCATION).....	63
FIGURE 14-5.	CROSS-SECTION C-C’ – COAL HILL (SEE FIGURE 14.2 FOR LOCATION).....	63
FIGURE 14-6.	CROSS-SECTION D-D’ – NORTH-CENTRAL PALISADES (SEE FIGURE 14.2 FOR LOCATION)	64
FIGURE 14-7.	CROSS-SECTION E-E’ – NORTH-CENTRAL PALISADES (SEE FIGURE 14.2 FOR LOCATION)	64
FIGURE 14-8.	CROSS-SECTION F-F’ - CENTRAL PALISADES (SEE FIGURE 14.2 FOR LOCATION).....	64
FIGURE 14-9.	CROSS-SECTION G-G’ – SOUTH PALISADES (SEE FIGURE 14-2 FOR LOCATION).....	65
FIGURE 26-1.	RECOMMENDED DRILLING.....	77

LIST OF TABLES

TABLE 1-1.	PALISADES IN-PLACE SURFACE-MINEABLE COAL RESOURCES SUMMARY.....	3
TABLE 1-2.	PALISADES IN-PLACE EXPLORATION TARGETS (METRIC TONNES).....	3
TABLE 4-1.	DETAILS OF THE PALISADES COAL PROPERTY CLAIMS.	10
TABLE 6-1.	HISTORIC EXPLORATION SUMMARY FOR THE PALISADES PROPERTY.	16
TABLE 6-2.	RIO TINTO DRILLHOLES – COAL HILL AREA, PALISADES PROPERTY.	17
TABLE 6-3.	PROXIMATE ANALYSIS FOR RIO TINTO HISTORIC 1969 DRILL INTERSECTIONS.	17
TABLE 6-4.	RIO TINTO AND DENISON SURFACE COAL INTERSECTIONS FROM TRENCHES.	18
TABLE 6-5.	DRILLHOLES – PALISADES PROPERTY.....	19
TABLE 6-6.	2013 TRENCH SUMMARY.....	20
TABLE 6-7.	2013 DRILLHOLE SUMMARY.....	21
TABLE 6-8.	2013 PALISADES IN-PLACE SURFACE-MINEABLE COAL RESOURCES SUMMARY.	22
TABLE 6-9.	2013 PALISADES IN-PLACE EXPLORATION TARGETS.....	22
TABLE 9-1.	2015 PALISADES SURVEYED ROAD CUT EXPOSURES.....	35
TABLE 10-1.	2015 PALISADES DRILLING SUMMARY.....	36
TABLE 10-2.	2015 ROTARY DRILLHOLE COAL INTERSECTIONS.....	37
TABLE 10-3.	2015 ROTARY DRILLING COMPOSITE COAL SAMPLES.....	39
TABLE 10-4.	2015-6” (15 CM) CORE COAL SAMPLES.....	40
TABLE 13-1.	2013 REVERSE CIRCULATION COMPOSITE PROXIMATE ANALYSES (AIR DRIED).	48
TABLE 13-2.	2013 TRENCH SAMPLE PROXIMATE ANALYSIS.....	49
TABLE 13-3.	2013 TRENCH SAMPLE PETROGRAPHIC ANALYSIS.....	50
TABLE 13-4.	2013 SONIC CORE COMPOSITE HEAD RAW ANALYSIS (AIR DRIED BASIS).....	51
TABLE 13-5.	2013 SONIC CORE WASHABILITY ANALYSIS.....	52
TABLE 13-6.	2013 SONIC CORE SAMPLES RHEOLOGY.....	53
TABLE 13-7.	2013 SONIC CORE PETROGRAPHIC ANALYSIS.....	53
TABLE 13-8.	2013 SONIC CORE ASH CHEMISTRY.....	54
TABLE 13-9.	2015 CHIP SAMPLE PROXIMATE ANALYSES DRY.....	55
TABLE 13-10.	2015 CHIP SAMPLE PETROGRAPHIC ANALYSIS.....	56
TABLE 13-11.	2015 - 15 CM (SIX INCH) CORE COMPOSITE HEAD RAW PROXIMATE ANALYSIS.	57
TABLE 13-12.	2015 - 15 CM (SIX INCH) CORE WASHABILITY ANALYSIS.....	57
TABLE 13-13.	2015 - 15 CM (SIX INCH) CORE SAMPLE RHEOLOGY.....	58
TABLE 13-14.	2015 - 15 CM (SIX INCH) CORE ASH CHEMISTRY.....	58
TABLE 13-15.	2015 – 15 CM (SIX INCH) CORE PETROGRAPHIC ANALYSIS.....	59

TABLE 14-1. RESOURCE CLASSIFICATION CATEGORIES (HUGHES ET AL., 1989)..... 60

TABLE 14-2. RESOURCE REPORTING CRITERIA FOR SURFACE-MINEABLE RESOURCES. 62

TABLE 14-3. IN-PLACE SURFACE-MINEABLE COAL RESOURCES SUMMARY FOR PALISADES PROPERTY. 62

TABLE 14-4. PALISADES IN-PLACE EXPLORATION TARGETS (MILLION METRIC TONNES)..... 65

TABLE 26-1. PROPOSED 2016 BUDGET. 77

LIST OF ABBREVIATIONS

Abbreviation	Definition	Abbreviation	Definition
μ	Micron	kph	kilometres per hour
°C	degrees Celsius	km²	square kilometre
°F	degree Fahrenheit	kPa	kilopascal
μg	Microgram	kVA	kilovolt-amperes
A	Ampere	kW	kilowatt
A	Annum	kWh	kilowatt-hour
Bbl	Barrels	L	Liter
Bcm	bank cubic metre	L/s	litres per second
Bcy	bank cubic yard	LOM	life of mine
Btu	British thermal units	m	metre
C\$	Canadian dollars	M	mega (million)
Cal	Calorie	m²	square metre
Cfm	cubic feet per minute	m³	cubic metre
Cm	Centimetre	Ma	million years
cm²	square centimetre	MASL	metres above sea level
Cps	counts per second	Mbcm	million bank cubic metres
D	day	min	minute
ddpm	dial divisions per minute	mm	millimetre
dia.	diameter	mph	miles per hour
Dlt	dry long ton	MVA	megavolt-amperes
Dmt	dry metric tonne	MW	megawatt
Dst	dry short ton	MWh	megawatt-hour
Dwt	dead-weight ton	m³/h	cubic metres per hour
FSI	free swelling index	opt, oz/st	ounce per short ton
Ft	Foot	oz	Troy ounce (31.1035g)
ft/s	foot per second	oz/dmt	ounce per dry metric tonne
ft²	square foot	pop.	population
ft³	cubic foot	ppb	part per billion
G	Gram	ppm	part per million
G	giga (billion)	QA	quality assurance
Gal	Imperial gallon	QC	quality control
g/L	gram per litre	RL	relative elevation
g/t	gram per tonne	R_{Max}	Maximum reflectance
Gpm	Imperial gallons per minute	ROM	run of mine
gr/ft³	grain per cubic foot	s	second
gr/m³	grain per cubic metre	st	short ton
Hr	Hour	stpa	short ton per year
Ha	Hectare	t	tonne
Hp	Horsepower	tpa	metric tonne per year
In	Inch	tpd	metric tonne per day
in²	square inch	US\$	United States dollar
J	Joule	USgpm	US gallon per minute
K	kilo (thousand)	V	Volt
Kcal	Kilocalorie	W	Watt
Kg	Kilogram	wmt	wet metric tonne
KJ/kg	kilojoules per kilogram	yd³	cubic yard
Km	Kilometre	yr	year

1 SUMMARY

This Technical Report summarizes coal exploration and drilling conducted on the Palisades Property in the central Alberta foothills, and presents a resource estimate based upon current 2015 and historic drill information and mapping.

1.1 PROPERTY DESCRIPTION

The centre of the Property is located at about 53°28'N, 118°0'W, approximately 35 km northwest of Hinton, AB, Canada (Figure 2-1). The Property can be accessed by road from Hinton via Highway 16, Highway 40 and either the Peppers Lake Road or Rock Lake Provincial Park Road. The Property is comprised of several coal leases in the Category 4 Land Use designation, and one coal lease application in the Category 2 Land Use Designation. A separate property owned by Altitude is located about 25 km northwest of the Palisades Property, spanning Moon Creek and Moberly Creek; this property is not included in the present report. Historical work in this area is reported as the "Hoff Property", first by Rio Tinto (1969) and then Denison Mines (1982-83).

1.2 LAND TENURE

The Property is comprised of six contiguous Alberta Crown Coal leases and one coal lease application which are in Townships 51 and 52, Ranges 27 and 28, west of the 5th Meridian, and Range 01, west of the 6th Meridian. All of the coal leases and the coal lease application are held by Altitude Resources Inc. The total area of the combined leases and lease application is 11,782.4 hectares. The leases are located approximately 12 km west of the Canadian National Railway (CN) that runs to ports on the west coast.

1.3 GEOLOGY AND MINERALIZATION

The Property lies within the North-Central Alberta Foothills near the eastern edge of the Front Ranges of the Canadian Rocky Mountains. It is bounded by the north-trending, west-dipping, Collie Creek thrust sheet in the east, and the Folding Mountain thrust sheet in the west. The rocks underlying the Property are within the predominantly continental Lower Cretaceous Luscar Group (Langenberg and McMechan, 1985), which is equivalent to the Blairmore Group in Southern Alberta and Fort St. John Group in northeastern BC (Figure 7-1). The Luscar Group is overlain by dark gray marine shales of the Shaftesbury Formation. Strata of the Luscar Group are divided into four formations identified in ascending order as the Cadomin, Gladstone, Moosebar and the coal-bearing Gates Formation.

The Gates Formation consists primarily of sandstones, siltstones and coal cyclothems. The base of this Formation is characterized by a massive, medium-grained, 20 to 40 m thick sandstone unit known as the Torrens Member, which conformably overlies the marine shales of the Moosebar Formation. Overlying the Torrens Member is the coal bearing unit, referred to as the Grande Cache Member. The Grande Cache Member consists of fine-grained sandstones, siltstones and mudstones, and continuous coal seams. On the Property, this Member is 85 to 95 m thick and has three distinct identified coal zones. Overlying the Grande Cache Member is the Mountain Park Member, which consists predominantly of thick-bedded, fine- to medium-grained sandstone sequences with distinct siderite grains. This member ranges from 85 to 200 m in thickness and forms prominent ridges on the Property.

Stratigraphy in the Palisades area has been subjected to first and second order thrust faulting, as well as asymmetrical folding. The major faults, the Collie Creek Thrust in the northeast, and Folding Mountain Thrust in the southwest, trend northwest and dip to the southwest. Secondary local thrusts within each thrust sheet also trend northwest, resulting in local structure units or packages affecting the coal seam thickness and occurrence. Major folds include the Moosehorn and Coal Hill Synclines, and the Solomon Creek Anticline, which trend northwest and dip steeply to vertically to the southwest (Denison, 1984).

Three main coal seams, from top to bottom, Moosehorn, Hoff, and Solomon, have been correlated in the Palisades area. The coal is low-volatile bituminous to mid-volatile bituminous with variable but generally moderate ash content, good washability, and good coking properties, similar to that mined at Grande Cache.

1.4 EXPLORATION

This Technical Report presents the results of all exploration drilling and mapping conducted on the Property to date. In 2015, a drilling, trenching and mapping program was conducted on the Property between May and October. Twenty-two rotary-hammer drillholes and three 6" (15 cm) core holes were completed in the Central Palisades (Icewater Creek) and Coal Hill areas. Where possible, existing access was rehabilitated, and new construction was minimized. Constructed drill pads were reclaimed, and access was deactivated at the end of the program pending further work under the coal exploration permit.

Altitude Resources Inc. conducted a limited mapping program in October 2012, and a significant mapping, trenching and drilling program (27 drillholes and three core holes) on the Property in 2013. Significant historical exploration programs on the Property, including drilling, trenching and mapping, were conducted by Rio Tinto Canadian Exploration Ltd., in 1969 (five rotary drillholes), and by Denison Mines Limited in 1982 to 1983 (twenty three core holes).

1.5 COAL QUALITY

The limited core samples collected in 2013 and 2015 confirm the coal rank as low- to medium-volatile bituminous coking coal (Ro 1.33 to 1.53). The clean coal core samples show an average FSI (Free Swelling Index) of 7, Fluidity values of 4 to 47 ddpm, and positive dilatation. Petrographic analysis shows a Reactive/Inert ratio of 70/30 and a predicted ASTM Stability of 61. Ash analysis shows low total alkaline content (10% average) which should contribute to a high CSR value. The phosphorous in coal is 0.014% which is extremely low and highly desirable.

1.6 MINERAL RESOURCE ESTIMATES

The in-place, surface-mineable resources for the Coal Hill/Central Palisades area and the South Palisades area are summarized in Table 1-1. These areas are outlined in Figure 14-1. Assumptions and methodology are provided in Section 14.

Table 1-1. Palisades In-Place Surface-Mineable Coal Resources Summary.

Area	Seam	In-Place Coal Resources (TONNES) Stripping Ratio Cutoff 20:1			
		ASTM Group	Measured	Indicated	Inferred
Coal Hill/Central Palisades	Moosehorn	Mid-Volatile	931,258	300,561	682,506
		Bituminous			
	Hoff	Low-Volatile	2,552,051	1,454,636	2,194,868
		Bituminous			
	Solomon	Low-Volatile	5,218,759	4,423,095	4,034,818
		Bituminous			
South Palisades	Moosehorn	Mid-Volatile	22,316	164,080	114,323
		Bituminous			
	Hoff	Low-Volatile	68,550	157,506	188,911
		Bituminous			
	Solomon	Low-Volatile	211,368	301,693	390,951
		Bituminous			
Total Property			9,004,301	6,801,571	7,606,377

(Note: partings removed, coal bed thickness >0.6 m, upper 8 m oxidised zone removed)

The Property hosts a large exploration target of low- and mid- volatile bituminous coal that requires additional drilling to define a resource. Exploration targets which are in part down-dip projections of the coal resources and in part projections along strike are listed in Table 1-2. These targets are in part conceptual and based on current geological understanding; hence only rounded tonnages are presented. Coal is present in the Grande Cache Member on the limbs of other folds on the Property, but is not included in the exploration target presented below due to lack of information on seam thickness and continuity. The target areas are outlined in Figure 14-1.

Table 1-2. Palisades In-Place Exploration Targets (metric tonnes).

Area	Exploration Target* (TONNES) rounded-down
Coal Hill/Central Palisades	46,000,000
South Palisades	3,000,000
Total Property	49,000,000 (range 47,000,000 to 51,000,000)

*conceptual in-place coal with no stripping ratio cutoff; no depth of weathering

1.7 CONCLUSIONS AND RECOMMENDATIONS

There has been a significant increase in all categories of resources, as well as the exploration target from 2013 to 2015.

The results of the 2013 and 2015 exploration programs show that the three main seams on the Property contain low-to mid-volatile coal with excellent coking characteristics. Previous geological interpretation by Rio (Benkis, 1970) and Denison (1984) in the southern and eastern part of the property were found to be somewhat inaccurate. Areas mapped as Grande Cache and Mountain Park Members of the Gates Formation in the Central and South Palisades are actually the Shaftsbury Formation. The eastern flank of Coal Hill includes a further thrust-repetition of Mountain Park and Grande Cache members which was previously mapped as Moosebar Formation. The overturned anticline in the Central Palisades appears to translate laterally to the southeast into a thrust fault, truncating Grande Cache sediments against the younger Shaftsbury Formation. The Coal Hill Syncline and Coal Hill Anticline are dissected by several splays from the Collie Creek Thrust which increase the thickness of Grande Cache Member rocks and cause numerous seam repeats. Observations through mapping and drilling in 2015 suggest that the coal bearing Grande Cache Member is thickened to the west of Coal Hill in a similar manner. The eastern flank of Coal Hill includes a further thrust-repetition of Mountain Park and Grande Cache members which was previously mapped as Moosebar Formation. Its extent is still to be determined (Figure 7-4).

The conclusions drawn from the 2013 and 2015 exploration programs are that coal seams in the eastern part of the property, while thickened in places by folding, and repeated by thrust faulting, especially in the area of Coal Hill, are generally thinner and contain more partings than was previously thought. Repetition of the Grande Cache member coal seams by imbricate thrusting was confirmed in the western part of the Property. Areas of higher confidence resources remain disconnected in places (**Error! Reference source not found.**). Further drilling is required to fill in these areas. Some amendments to the existing permit would be required.

The modest number of core samples collected in 2013 and 2015 confirm that the Solomon Seam and Hoff Seam are low-volatile hard coking coal. The Hoff and Moosehorn seams appear to be of good quality, but more coring focused upon acquiring more comprehensive coal quality information should be undertaken. Efforts should also include development of constraints on depth of weathering specific to the Property. Wireline coring is recommended to increase the number of intersections and depth of feasible seam intersections.

In the southern part of the property, in the area west of drillholes AP13-005 to AP13-007, some drilling would be useful in extending the resource, if budgets allow, to pursue recommendations from 2013 which are part of the current coal permit. The Palisades extension area north of the Wildhay River is underlain by the Gates Formation, but lacks exposure. Access construction for possible drill testing would provide exposure for coal evaluation. This would also require permit amendment.

A campaign of up to 3,000 m of reverse circulation drilling and up to 500 m of wireline coring in target areas identified by the 2015 program is recommended. The estimated cost of this program would be about \$ 1,425,000 (Figure 26-1; Table 26-1).

2 INTRODUCTION

Dahrouge Geological Consulting Ltd. (“Dahrouge”) has been retained by Altitude Resources Inc. (“Altitude”) to prepare an updated Technical Report on the Palisades Coal Property (“the Property”), located in Alberta, Canada (Figure 2-1). The report was commissioned by Altitude to comply with regulatory disclosure and reporting requirements outlined in Canadian National Instrument 43-101, Standards for Disclosure of Mineral Projects (“NI 43-101”), companion policy NI 43-101CP, and Form 43-101F (“Technical Reports”).

Robert Engler, P. Geol, John Gorham, P. Geol, and William Miller, P. Geo, are the Qualified Persons responsible for preparing this Technical Report on the Property. Mr. Engler is responsible for Section 13 and jointly responsible for Sections 1, 12, 25 and 26. Mr. Gorham is responsible for all sections of this report except section 13. Mr. Miller is jointly responsible for Sections 1, 14, 25 and 26.

The purpose of this report is to review coal exploration on the Property carried out in 2012, 2013 and 2015, and present a resource estimate based upon all drilling completed to date in 2015. Information, conclusions, and recommendations contained in this report are based on field observations as well as published and unpublished data (see Section 27: References).

Mr. Engler visited the Property on June 3-4, September 9-10, September 25, and October 8-9, 2015. Mr. Gorham visited the Property on June 1-15, August 12-14, 17-23, September 1-5, 8-30, and October 1-10, 2015. Mr. Miller did not visit the Property.

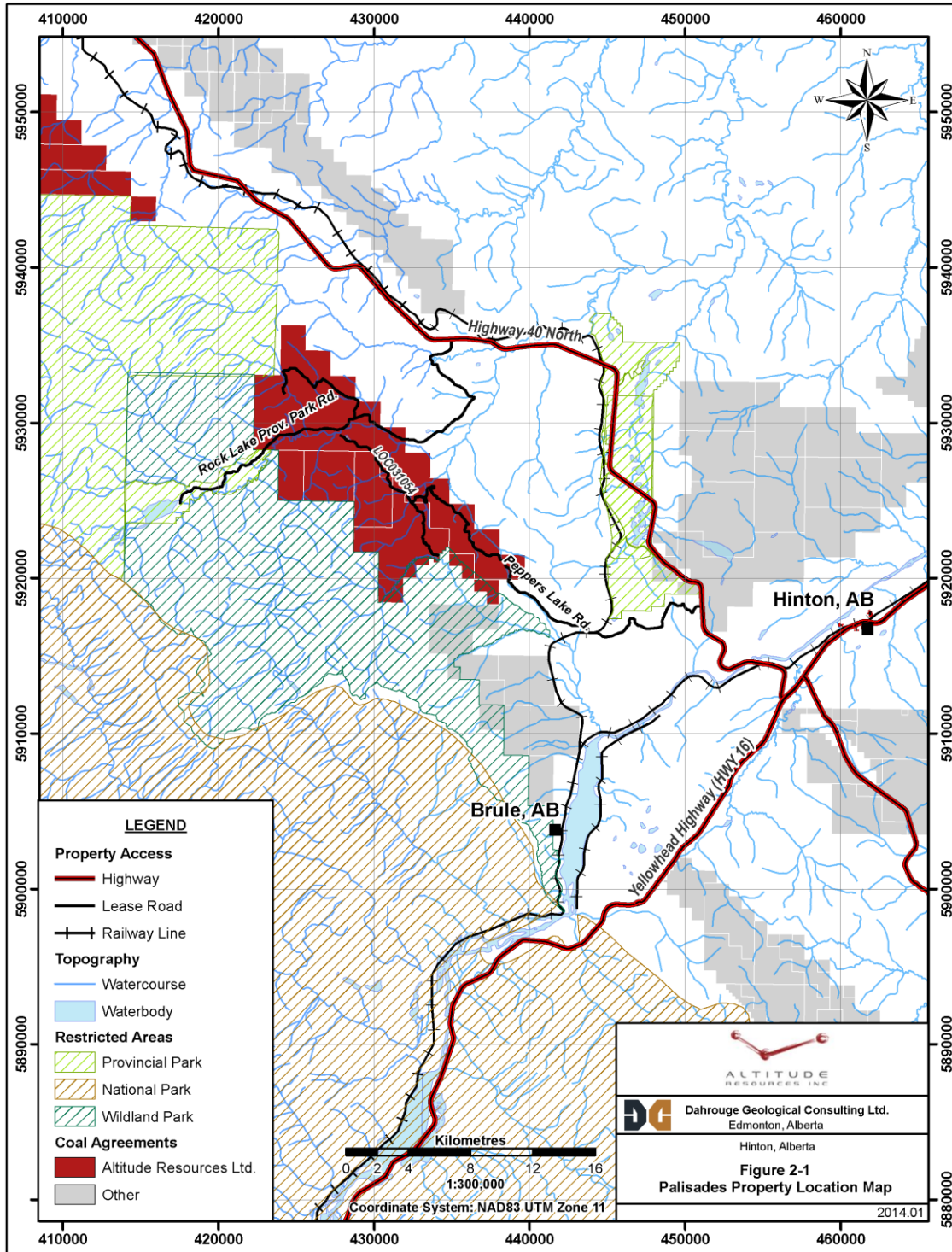


Figure 2-1. Location of the Palisades Coal Property

3 RELIANCE ON OTHER EXPERTS

This report has been prepared by, Robert Engler, P. Geol, of Moose Mountain Technical Services, and John Gorham, P. Geol. and William Miller, P. Geo. of Dahrouge Geological Consulting Ltd. for Altitude Resources Inc. ("Altitude"). The information, conclusions, opinions, and estimates contained herein are based on:

Information available to the authors at the time of preparation of this report,

Assumptions, conditions, and qualifications as set forth in this report, and

Data, reports, and other information supplied by Altitude Resources Inc. or available in the public domain.

The authors have relied upon the professional quality of the historical work reported in various studies. The authors have no reason to believe that the information used in the preparation of this report is false or purposefully misleading, and have relied on the accuracy and integrity of the data referenced in Section 27 of this report.

For the purpose of this report, the authors have relied on ownership information provided by Altitude and verified through the Alberta Government interactive coal tenure map system at:

<https://gis.energy.gov.ab.ca/Geoview/Viewer.aspx?Viewer=StandaloneCoalSLExt>

While title documents were reviewed for this study, it does not constitute, nor is it intended to represent, a legal, or any other opinion as to title.

Some relevant information on the Property presented in this report is based on data derived from reports written by geologists and/or engineers whose professional status may or may not be known in relation to the NI 43-101 definition of a Qualified Person. The authors have made every attempt to accurately convey the content of those files, but cannot guarantee the accuracy or validity of the work contained within those files. However, the authors believe that these reports were written with the objective of presenting the results without any misleading intent. In this sense, the information presented should be considered reliable, unless otherwise stated, and may be used without any prejudice by Altitude Resources Inc. Except for the purposes legislated under provincial securities laws, any use of this report by a third party is at that party's sole risk.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 LOCATION

The centre of the Property is located at about 53°28'N, 118°0'W, approximately 35 km northwest of Hinton, AB, Canada (Figure 2-1) in the foothills of the Rocky Mountains. The Property extends from the Wildhay River in the northwest to Solomon Creek in the southeast over a distance of 12 km. Access to the Property is via the Yellowhead Highway (Highway 16), Highway 40 North and either Peppers Lake Road or Rock Lake Provincial Park Rd. The Property is comprised of six coal leases and one coal lease application totalling 11,782.4 ha (Figure 4-1; Table 4-1). Altitude has four other contiguous coal lease applications (the Moberly Property) located about 28 km northwest of the Palisades Property, as well as five coal lease applications located about 100 km northwest near Grande Cache (the Altitude North Property) which are not the subject of this Technical Report.

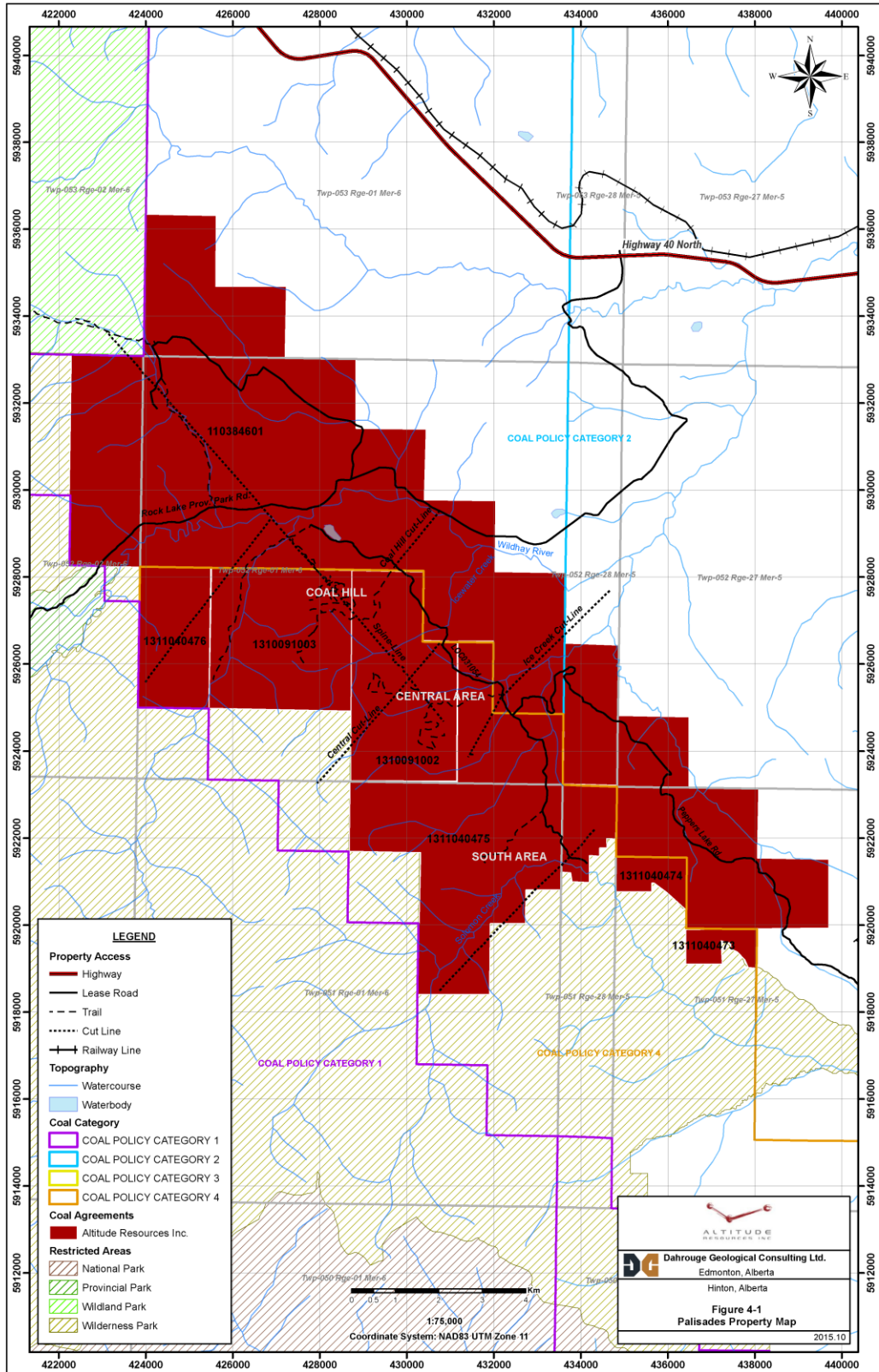


Figure 4-1. Palisades Coal Property Map.

The Property consists of six contiguous coal leases which were acquired through open Public Tender of undisposed Coal Rights in September, 2010, and one coal lease application which was acquired October 17, 2011, encompassing an aggregate area of approximately 11,782.4 ha. Three tenures overlap WPP-0015-02, therefore agreement areas are reduced accordingly by 303 ha. The land that comprises the Property is Crown Land. The six leases and the A13 coal lease application are held by Altitude Resources Inc. and are summarized in Table 4-1. They can be viewed on the Alberta Government Energy Website using the interactive coal map:

<https://gis.energy.gov.ab.ca/Geoview/Viewer.aspx?Viewer=StandaloneCoalSLExt>

Table 4-1. Details of the Palisades Coal Property Claims.

Lease Type	Lease Number	Agreement Area (hectares)	Date Recorded	Renewal Date
A13(application)	110384601	7034	17-Oct-2011	-
013	1310091002	1024	02-Sept-2010	03-Sept-2025
013	1310091003	1024	02-Sept-2010	03-Sept-2025
013	1311040473	50.8	07-Apr-2011	08-Apr-2026
013	1311040474	182.9	07-Apr-2011	08-Apr-2026
013	1311040475	1954.7	07-Apr-2011	08-Apr-2026
013	1311040476	512	07-Apr-2011	08-Apr-2026
Total		11,782.4		

Alberta Crown Coal Leases are granted for a term of 15 years and are renewable for additional terms on application. There are no other obligations on the property other than annual lease rental requirements (\$3.50 per hectare) to the Alberta Government and subsequent Coal Royalty payments after production.

Applications for coal lease agreements (A13) in Alberta must be accompanied by the \$625.00 application fee, the first year's rent (\$3.50 per hectare with a minimum of \$50.00), plus GST as applicable. For a coal lease on a road allowance, the first year's rent is \$50.00. Once received, an application is checked to confirm the requested mineral rights are available. The application is then reviewed with respect to development restrictions or policies, and the appropriate method of disposition. A successful coal lease application may, depending upon the circumstances, lead to an agreement being issued directly to the applicant, or may result in competitive bidding.

Altitude must pay an annual rent of \$3.50/ha to the Alberta government to retain the Property, as well as royalties according to the Coal Royalty Regulation if any production occurs. The current royalty rate for Crown-owned bituminous (Mountain/Foothills) coal is 1% of mine-mouth revenue before mine payout, and 1% of mine mouth revenue plus 13% of net revenue after mine payout.

A coal lease grants the right to explore the land within the boundaries of the lease. A coal lease does not grant surface rights; a surface lease or grant is required. Altitude has not applied for a surface lease on the Property.

The Property falls within the Rocky Mountain Forest Reserve, which is managed by the Alberta Government, and within the West Fraser Mills Forest Management Area. A road use agreement with West Fraser Mills is required for access to the Property.

The six Palisades Property coal leases are wholly within the Coal Development Policy Category 4 land zone, as designated by the 1976 Alberta Coal Policy. This land category allows for coal surface mine development by the lease holder. The application for a coal lease agreement (A13) is wholly within the Coal Development Policy Category 2 land zone. This category allows for limited exploration under strict controls. Approved development is generally restricted to in-situ or underground, as the area is considered to have moderate environmental sensitivity and minimal existing infrastructure.

There are two surface disposition types which may require consultation or restrict certain activities upon public lands. The activity types include Consultative Notation – Provincial Government (CNT) and Protective Notation (PNT). CNT does not impose any land use restriction but indicates that an agency wishes to be consulted prior to any commitment or disposition of the land. A CNT must not prevent the taking of applications or the cancellation of an application. All applications must be referred to the holding agency. The holding agency may request special conditions with respect to proposed disposition. If the holding agency wishes to restrict the proposed land use, the holding agency must apply for a Protective Notation (PNT) that will permit the appropriate level of restriction with respect to the surface disposition. Generally speaking, the purpose of these restrictions is either managing natural hazards (erosion, flood risk, slope stability) or land management (wildlife, grazing, irrigation, watercourse protection). Currently, PNT8890245 (Grazing Lands) has been cancelled, so no notations appear on the Property.

4.2 ENVIRONMENTAL LIABILITIES

The authors are not aware of any environmental liabilities associated with the Property.

4.3 REQUIRED PERMITS

Exploration requires a Coal Exploration Permit from the Alberta Government. As of the effective date of this report, Altitude has applied for and been granted a Coal Exploration Permit (CEP 150001) for exploration drilling activity issued by the Alberta Government. This CEP covers two years of active exploration and a period of reclamation, expiring Aug 6, 2020. The current or future operations of Altitude, including development and commencement of production activities on this property require other permits governed by laws and regulations pertaining to development, mining, production, taxes, labour standards, occupational health, waste disposal, toxic substances, land use, environmental protection, mine safety and other matters, may be required as the Project progresses.

4.4 OTHER SIGNIFICANT FACTORS AND RISKS

The Rock Lake –Solomon Creek Wildland Provincial Park (WPP-0015-02) established December 20, 2000, overlaps parts of coal leases 013-1311040473, 013-1311040474 and 013-1311040475 as well as the two quarter sections (SW29 and SW 31 TWP 51-R27W5 of lease application A13-110384601. This area is currently restricted for any off-highway vehicle access.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, AND PHYSIOGRAPHY

5.1 TOPOGRAPHY, ELEVATION, AND VEGETATION

The Property is situated within the sub-alpine-montane sub-region of the larger Rocky Mountain Natural Region in Alberta. In general, the terrain is steep and mountainous with highly variable elevations characterized by a series of steep rounded hills running northwest-southeast, parallel to the front range of the Rocky Mountains, and is incised by east flowing streams. The topographic elevation on the Property ranges from 1,350 to 2,000 m. The Wildhay River forms the northern boundary of the Property, flowing east from Rock Lake towards the Athabasca River drainage system. The southern boundary is formed by Solomon Creek. Vegetation on the Property is dominated by Engelmann spruce and subalpine fir at higher elevations, and lodgepole pine, balsam fir, alder, willow, black spruce and mixed grasslands at lower elevations.

5.2 INFRASTRUCTURE AND LOCAL RESOURCES

The Property is located approximately 20 km northwest of the town of Hinton, 76 km west of Edson and 300 km west of the city of Edmonton. The Property can be accessed by driving westwards from Hinton for 3.5 km on the Yellowhead Highway (Highway 16), then north on Highway 40 for about 11 km to the junction with Peppers Lake Road. The eastern boundary of the property is 28 km westward on the Peppers Lake Rd, which is a graveled all-weather, gated, forestry road owned by West Fraser Mills. Transport to and from the Property is by 4x4 truck, and on trails and cutlines, it is by ATV or on foot. Alternative road access to the north part of the Property is via the Rock Lake Provincial Park Road which leaves Highway 40 about 41 km from the junction with Highway 60 and runs west along the Wildhay River valley about 18 km to the eastern boundary of the Property.

The Canadian National Railway (CN) rail line runs 12 km parallel to the eastern boundary of the Property. The railway provides direct access for coal delivery to the Port of Vancouver and to the Ridley Island Terminal at Prince Rupert. Paved landing strips are available in both Hinton and Edson for light aircraft.

Hinton, the closest community, with a population of 9,640 (2011 census) is located about 20 km southeast of the Property. It hosts a full range of accommodations, food, fuel and other necessary services. Major employers are Teck Coal, Hinton Pulp, and Hinton Wood Products (West Fraser Mills Ltd.), as well as oil and gas operations. Other communities near to the Property include Grande Cache (pop. 4,319 (2011 census)), about 80 km to the northwest along Hwy 40, and Jasper (pop. 4,051 (2011 census)), about 70 km to the southwest.

Several coal mines are operating in the Hinton area. Teck Resources Limited operates the Cheviot and Luscar mines about 40 km south of Hinton. This operation produces metallurgical coal from the Lower Cretaceous Gates Formation, as does the Grande Cache Coal mine at Grande Cache, about 140 km northwest of Hinton. Coalspur Mines Ltd has been developing its Vista project for thermal coal immediately southeast of Hinton in the Tertiary Coalspur Formation.

There is currently no existing mine infrastructure on the Property.

5.3 CLIMATE

The climate of the region is classified as boreal sub-alpine, characterized by long cold winters and short cool summers. Daily temperatures range from a mean maximum of 9°C to a mean minimum of minus 2.5°C, with a mean daily temperature of 3°C. Extreme temperatures range from a maximum of 30°C in August to a minimum of minus 42°C in January. The average annual number of days with frost is 280.

The mean total precipitation in the region is approximately 500 mm, which includes the rainfall equivalent of a mean snowfall of 119 cm. The average annual number of days with measurable precipitation is 133 (Environment Canada).

6 HISTORY

The first geological investigations of the region were undertaken by the Geological Survey of Canada. The coal deposits of the Foothills region surrounding the Athabasca River were first examined in 1910 and 1911 by D.B. Dowling (Dowling, 1914). In 1914, the Blue Diamond Coal Company commenced commercial underground production on deposits immediately north of Brule Lake, in what is now the Grande Cache member of the Gates Formation. A total of 1,677,500 tonnes were reportedly produced from 2 seams. The underground mines at Brule closed permanently in 1928, the closure attributed to complex structural conditions and faulting which affected production costs. The company also drove exploration tunnels on seams near Rock Lake along the Wildhay River in 1928/29. The Solomon Creek Coal Company produced about 700 tonnes from Sec 31-50-27W5 between 1919 and 1924 (ERCB ST-25, 2010). Several other mines were developed in the area, including Mt. Cavell Collieries Ltd. at Pochontas, and those at the town of Coalspur which operated until the 1950's.

In 1916, the region northwest of Brule, including the Palisades area, was studied by J.M. MacVicar (MacVicar, 1919). In 1927, B.R. McKay made a detailed study of the Brule mining operations and coal deposits extending north to Solomon Creek (McKay, 1928). The purpose was to record in detail the stratigraphy and structure of coal seams at the active mine and assist in extending these deposits northwest towards the area of the Palisades Coal Property.

Between 1943 and 1945, A.H. Lang mapped the Brule and Entrance areas for the Geological Survey of Canada. His work concentrated on establishing nomenclature for the central and northern Foothills, and correlating this stratigraphy with that of the southern Foothills. The original stratigraphic work was done by MacKay (1929a and b; 1930), who established the original formational names for the Lower Cretaceous in the Athabasca Region. Later work was done by Lang (1947), Irish (1965), Thorsteinsson (1952) and J.R. McLean (1982). The stratigraphic nomenclature used in this report is that established by Langenberg and McMechan (1985) of the Alberta Geologic Survey and is based on detailed geological mapping of the region.

The increasing demand for coking coal in the 1960's led to renewed exploration in the Alberta foothills with focus on the Lower Cretaceous Luscar Group. This led to the opening of the Smoky River Mines at Grande Cache, the Cardinal River Mine southeast of Hinton in the early 1970's, and the Gregg River Mine adjacent to Cardinal River in 1983.

Prior to the acquisition of the Palisades coal leases by Altitude Resources, the only significant exploration in the immediate area was undertaken by Rio Tinto Canadian Exploration Ltd. ("Rio") who acquired the property in 1969 and Denison Mines Ltd. ("Denison") who subsequently acquired the property in 1974. Rio conducted basic mapping and trenching, and completed five rotary drillholes (Benkis, 1970). Denison undertook a small reconnaissance and trenching program shortly after the original leases were acquired in 1974. Then between 1982 and 1983, Denison conducted an extensive exploration program including helicopter-supported drilling (Denison, 1984).

The local geological mapping undertaken first by Rio and later expanded by Denison, provided good insight into the predictability of these coal seams within a fold and thrust belt environment. Trenching and drilling results reported by both Rio and Denison identified fold-related coal seam thickening when the seams were intersected within anticline or syncline closures. Both studies carried out laboratory analysis of the coal indicating a low volatile coking coal. During 1969, Rio spent a single season evaluating the continuity of these seams and at the time deemed them uneconomic, primarily due the inability to consistently trace them.

Altitude Resources acquired the coal leases in 2010 and 2011. In 2012, Altitude carried out a small reconnaissance program that involved mapping and trenching of known outcropping seams. In 2013, Altitude Resources conducted an extensive exploration program that included local geological mapping at 1:10,000 scale, trenching, and reverse circulation and core drilling. The mapping resulted in several significant changes to the original geological interpretation by Rio (Benkis, 1970) and Denison (1984). In the central and south Palisades, areas mapped as Grande Cache and Mountain Park Members of the Gates Formation were confirmed to be the Shaftsbury Formation. The overturned anticline crossed by the central drill access road appears to translate laterally into a thrust fault, truncating Grande Cache sediments against the younger Shaftsbury Formation. The Coal Hill Syncline and Coal Hill Anticline are dissected by several splays from the Collie Creek Thrust which increases the thickness of Grande Cache Member and causes numerous seam repeats.

6.1 PRIOR OWNERSHIP

In January of 1969, the Alberta Government announced that Coal Reservations to certain areas to the northwest of the town of Hinton would be sold by a public tender. These lands adjoined, and included, part of the Wilmore Wilderness area. Prior to this sale no coal exploration had been permitted in this area. Rio Tinto Canadian Exploration Ltd. entered bids on two blocks of ground in the designated area. On February 12, 1969, the Alberta Department of Mines and Minerals accepted Rio's tender to certain portions of the lands grouped into three separate blocks, known as the Moon Creek, Rock Lake and Hoff Range properties. The rights to explore for coal on these lands were granted for a period of twelve months. The Moon Creek block comprised part of what is now the Moberly Property. The Rock Lake block along the Moosehorn Range, is now covered by parts of the Rock Lake – Solomon Creek Wildland and Wilmore Wilderness Parks. The Hoff Range block had similar boundaries to the Palisades Property coal leases and comprised 9,324 ha. Rio did not explore after 1970 on the Hoff Range block (Benkis, 1970).

In October 1974 Denison Mines Ltd. acquired a total of 12 coal leases, 8 of which comprised the Hoff Range block, and 4 of which comprised the Moosehorn block. In 1978, 4 coal leases were added to the Hoff block. The 12 coal leases of the Hoff block totalled 7,429.5 ha and were all within land use Coal Development Policy Category 4 (1976 Alberta Coal Policy). These leases covered a similar area to the current Palisades Property. The Moosehorn block (3,303 ha) was approximately similar to Rio's Rock Lake block and was all within the 1976 Alberta Coal Development Policy Category 1 and 2 lands (Denison, 1984).

No additional work was carried out after 1983. Denison Mines focused their efforts on mine development in northeastern BC, and subsequently withdrew from the coal business with the sale of their Quintette Mine to Teck in 1991. The Palisades coal leases were allowed to lapse and reverted to the Alberta Government.

6.2 PREVIOUS EXPLORATION AND DEVELOPMENT

Exploration on the Property was conducted by Rio in 1969, by Denison in 1982 and 1983, and by Altitude in 2012 and 2013. These programs are summarized in Table 6-1 and Figure 6-1 through Figure 6-3.

Data compiled from the Rio Tinto and Denison reports displayed some uncertainties in the drillhole dataset. Historic drillhole locations were extracted from original exploration reports, geological logs, and geophysical logs when available. Local grid locations were converted to a UTM NAD 83 Zone 12N projection format and confirmed against exploration maps. If collar locations were not provided, approximate locations were georeferenced from exploration maps and validated against cross-sections and topography. Rotary and core hole collar information was generally well constrained for X-Y coordinates, but less reliable for Z co-ordinates. Down-hole directional information was limited to inclination and azimuth.

Table 6-1. Historic Exploration Summary for the Palisades Property.

Operator	Campaign	Core Holes	Rotary Holes	Total Depth (m)	Trenches	Total Length	Mapping	Access Trails (km)
Rio Tinto	1969	-	5	1160	11	4900	1:15,840	12.9
Denison	1982	18	-	1782	9	-	1:10,000	-
Mines	1983	5	-	1187	1	-	1:10,000	-
Altitude Resources	2012	-	-	-	-	-	1:10,000	-
	2013	3	27	4580	25	228.1	1:10,000	3.7

6.2.1 Rio Tinto Exploration

Rio Tinto conducted exploration on the Hoff Range block between May and November, 1969 (Benkis, 1970). The Hoff Range covered approximately the same area as the Palisades Property. Initial prospecting and mapping was largely helicopter supported, although some roads and cutlines, including the Rock lake Road, Brule Lake-Rock Lake Road (Peppers Lake Road) and the major northwest-trending seismic line (“Spine Line”) provided some four wheel drive access. Access roads, trenches and drill pads were constructed using bulldozers in the Coal Hill area, and from the Brule Road southwest along the north side of the Solomon Creek valley (Figure 6-1 to Figure 6-3).

Rio’s trenching was concentrated on Coal Hill, where several coal showings (“A” through “N”) were found and exposed (Figure 6-1, Table 6-4). Trenches were also cut across strike along the central and southern roads, exposing two and three seams respectively. Mapping and trenching indicated repetition of coal seams in a number of thrust fault blocks interpreted as splays of the regional Collie Creek Thrust fault. Trench “M” on the north face of Coal Hill exposed a nearly flat-lying seam up to 5.3 m thick bounded by thrust faults. This thickening was interpreted as evidence of an anticlinal hinge.

Five vertical rotary drill holes (Table 6-2) were drilled on Coal Hill to test seam continuity from trenching. All holes were chip-logged and sampled. In HR-3 and HR-4, two intervals were cored at depth in each hole to clarify bedding attitude (Benkis, 1970). HR-1 was collared in the Mountain Park Formation at the top of Coal Hill and drilled to 435 m for stratigraphic control. It had been intended to reach the Cadomin conglomerate, yielding a complete section of the Gates Formation. The depth capacity of the drill was exceeded before the Cadomin was encountered, indicating substantial structural thickening of the Gates Formation.

Table 6-2. Rio Tinto Drillholes – Coal Hill Area, Palisades Property.

Year	Drillhole	Easting	Northing	Elevation (m)	Azimuth (°)	Inclination (°)	Depth (m)
1969	HR-1	428627	5927365	1662.71	Vertical	-90	434.34
1969	HR-2	428292	5927585	1650.77	Vertical	-90	213.36
1969	HR-3	428344	5927678	1619.72	Vertical	-90	185.93
1969	HR-4	428398	5927711	1602.48	Vertical	-90	235.00
1969	HR-5	428322	5927782	1588.99	Vertical	-90	91.44

Figure 6-1. Coal Hill - Historic Exploration and Drilling.

(See end: Large Figures, P-1)

Three major seams were identified in the Palisades area. Rio noted more seams in the Coal Hill area and interpreted thrust fault repetition of the Grande Cache member of the Gates Formation on splays of the Collie Creek Thrust. Rio did not attempt to assign seam identification at this stage of early exploration. As coal exposed in trenching was oxidized, cuttings from drillholes HR-1 to HR-4 were sent for proximate analysis to Cyclone Engineering Sales Ltd. of Edmonton, AB (Table 6-3). Samples were mainly low-volatile bituminous coal with variable F.S.I. due in part to contamination, wet seams and near-surface oxidation.

Historic drillhole intersection results were compiled using available geological logs, geophysical logs, and reported coal intersection summary logs. Historic coal intersections were reconciled to geophysical logs where available.

Table 6-3. Proximate Analysis for Rio Tinto Historic 1969 Drill Intersections.

Drillhole	Interval	Width	Ash %	Volatile Matter %	Residual Moisture %	Fixed Carbon %	F.S.I.
HR-1	425'-430'	5.0'	51.52	13.69	0.63	34.16	2, 2, 2½
HR-1	435'-441'	5.0'	20.04	17.67	0.57	61.72	5, 5½, 5½
HR-2	148'-151'	3.0'	31.95	15.75	0.63	51.67	6, 5½, 5½
HR-2	556'-562.5'	6.5'	57.57	11.81	0.86	29.66	1, 1, 1
HR-3	18'-20'	2.0'	50.66	13.74	1.15	35.45	N.A.
HR-3	20'-25'	5.0'	22.49	17.16	0.72	59.63	1, 1, 1
HR-3	25'-30'	5.0'	5.80	18.27	0.69	75.24	3, 3½, 3½
HR-3	30'-36'	6.0'	11.55	18.59	0.54	69.32	6½, 6½, 6½
HR-3	46.9'-52'	5.1'	22.56	17.56	0.54	59.34	5½, 5½, 5½
HR-3	72.5'-78.2'	5.7'	12.55	19.48	0.53	57.44	9, 9, 9
HR-4	8.7'-11'	2.3'	35.83	31.51	3.96	28.70	N.A.
HR-4	11'-15'	4.0'	12.86	20.41	2.15	64.58	N.A.
HR-4	15'-17.5'	2.5'	12.52	1.02	1.02	73.85	½, ½, ½

(after Benkis, 1970)

Table 6-4. Rio Tinto and Denison Surface Coal Intersections from Trenches.

Name	Easting	Northing	Elevation (m AMSL)	Length (m)	Seam	Company	Year	Area
TR-RIO-B	428134	5928024	1531	86.0	Solomon	Rio Tinto	1969	Coal Hill
TR-RIO-D	428452	5927816	1577	30.1	Solomon	Rio Tinto	1969	Coal Hill
TR-RIO-E	428380	5927802	1589	7.0	Hoff	Rio Tinto	1969	Coal Hill
TR-RIO-F	428741	5927493	1617	17.5	Hoff	Rio Tinto	1969	Coal Hill
TR-RIO-M	428311	5927699	1613	45.3	Solomon	Rio Tinto	1969	Coal Hill
TR-RIO-N	428307	5927659	1627	9.1	Hoff	Rio Tinto	1969	Coal Hill
TR-RIO-C	428327	5927875	1569	11.3	Stray	Rio Tinto	1969	Coal Hill
WT-02	427936	5926851	1700	2.0	Moosehorn	Denison	1984	Coal Hill
WT-03	427945	5926873	1697	1.5	Solomon	Denison	1984	Coal Hill
WT-04	427958	5926909	1702	2.5	Solomon	Denison	1984	Coal Hill

6.2.2 Denison Exploration

In 1974, Denison carried out a small reconnaissance and trenching program. A detailed assessment of the Palisades Coal lease area over a 24 month period was undertaken beginning in early 1982 (Denison, 1984) which included:

- Geologic Mapping and Air Photo Interpretation on a 1:10,000 scale
- Trenching and mapping ten coal subcrop locations
- Geophysics: ground magnetometer and ground resistivity profiles
- Diamond drilling: 23 helicopter supported core drilling sites.

The mapping and air photo interpretation identified the major formation boundaries and large scale structural configuration of the Palisades area. Significant differences from the Rio mapping were noted in some areas, but the scarcity of good exposures required some generalization of interpretation. Trenching included re-opening of some Rio trenches as well as new excavation. Nine resistivity test lines totalling 8,050 m were run both along and across structural grain. A single magnetic survey was run to map concealed lithology along resistivity line 3 (2,500 m) across the entire central part of the property. No contrast in magnetic response was noted. The resistivity test line over two exposed seams demonstrated a response and depth of penetration of about 7 to 10 m. An adjacent line about 100 m northwest yielded a similar, more muted response. The rest of the resistivity lines were not successful in identifying subsurface traces of the coal seams.

The helicopter supported diamond drilling program included 18 holes drilled in 1982, many of which were shallow holes, and five holes drilled in 1983 (Table 6-5). Only 10 of the 23 holes intersected coal seams and samples from these were analyzed at General Testing Laboratories in Vancouver, BC to determine coal rank, quality, washability and rheological data.

Table 6-5. Drillholes – Palisades Property.

Year	Drillhole	Easting	Northing	Elevation (m)	Azimuth (°)	Inclination (°)	Depth (m)
1982	WH001DA	430366	5925918	1420	Vertical	-90	9.10
1982	WH002DA	430356	5925998	1427	Vertical	-90	30.80
1982	WH003DA	430403	5926053	1430	Vertical	-90	30.50
1982	WH004DA	430485	5926150	1406	Vertical	-90	30.63
1982	WH005DA	430606	5926078	1397	Vertical	-90	31.09
1982	WH006DN	430615	5923950	1544	41	-60	355.70
1982	WH007DA	429278	5924667	1561	Vertical	-90	30.48
1982	WH008DA	429737	5925281	1596	Vertical	-90	27.43
1982	WH009DA	429707	5925246	1590	Vertical	-90	15.24
1982	WH010DA	429615	5925147	1553	Vertical	-90	30.17
1982	WH011DN	430301	5925980	1426	40	-70	359.05
1982	WH012DA	429373	5924868	1563	Vertical	-90	27.58
1982	WH013DA	429374	5924869	1564	40	-60	29.41
1982	WH014DA	430293	5924334	1485	Vertical	-90	28.50
1982	WH015DN	428331	5927705	1611	Vertical	-90	303.00
1982	WH016DA	430255	5924270	1478	Vertical	-90	24.23
1982	WH017DA	427983	5926878	1699	220	-60	23.77
1982	WH018DN	428829	5926205	1480	220	-70	398.35
1983	WH019DN	427974	5927175	1671	Vertical	-90	271.95
1983	WH020DN	431520	5921750	1615	Vertical	-90	298.78
1983	WH021DN	429362	5924700	1535	Vertical	-90	296.03
1983	WH022DA	428521	5924775	1554	Vertical	-90	138.11
1983	WH023DN	425750	5926242	1382	Vertical	-90	182.01

Denison identified three distinct coal seam horizons: Solomon, Hoff and Moosehorn (from lowest to highest in section). A resource estimate was made for the Hoff lease block using a cross-sectional method and an estimated specific gravity from laboratory determinations. Denison estimated that the total in-place coal to 500 m depth for the three coal seams on the property was 139,216,000 tonnes.

Denison found that coal from the three seams was at the boundary of ASTM rank classification for low- and medium-volatile bituminous coal. Mean reflectance values (R_o) varied from 1.39% to 1.51%. Sulphur ranged from 0.40 to 0.65%. FSI values ranged from 6.5 to 9. Hardgrove Grindability index exceeded 100. All seams exhibited good swelling properties. One sample from the Solomon seam yielded a fluidity parameter of 111 ddpm and a dilation parameter of 48%. Other samples had poor dilation (Denison, 1984).

6.2.3 Altitude Resources Exploration

In 2012, Altitude conducted a small reconnaissance program that included mapping exposed coal seams, exposing and sampling historic trenches, and ground-truthing historic work by Denison. The information from this program was used to plan the 2013 exploration program.

In 2013, Altitude carried out mapping, trenching, access rehabilitation and construction, and drilling on the Palisades property. Initially, a small property-wide mapping program was conducted. The mapping results, along with trenches were used to target drillhole locations and orientations. A total of 25 trenches intersecting coal, were excavated in 2013 (Table 6-6; Figure 6-1, Figure 6-2 and Figure 6-3). Some of the exposed seams were marked, measured and surveyed by a Differential GPS to control surface expression for modelling. Selected trenches with clean coal intersections were sampled at 1.0 m maximum true thickness and sent to Birtley Laboratories in Calgary for proximate analysis.

Figure 6-2. Central Area - Historic Exploration and Drilling.

(See end: Large Figures, P-2)

Figure 6-3. South Area – Historic Exploration and Drilling.

(See end: Large Figures, P-3)

Table 6-6. 2013 Trench Summary

Trench	Easting	Northing	Elevation (m AMSL)	Length (m)	Seam	Company	Year	Area
TR-AP13-001	430658	5924322	1589	12.1	Carb. Shale	Altitude	2013	Central
TR-AP13-002	430625	5924328	1590	6.7	Carb. Shale	Altitude	2013	Central
TR-AP13-003	430621	5924142	1572	5.0	Stray	Altitude	2013	Central
TR-AP13-004	430465	5924109	1511	7.9	Stray	Altitude	2013	Central
TR-AP13-005	430277	5924301	1479	14.6	Moosehorn	Altitude	2013	Central
TR-AP13-006	430300	5924360	1479	11.9	Hoff	Altitude	2013	Central
TR-AP13-007	430319	5924492	1475	29.4	Solomon	Altitude	2013	Central
TR-AP13-008	431766	5921480	1553	19.2	Solomon	Altitude	2013	South
TR-AP13-009	431773	5921523	1548	11.4	Solomon	Altitude	2013	South
TR-AP13-010	427758	5927463	1613	11.1	Moosehorn	Altitude	2013	Coal Hill
TR-AP13-011	427781	5927471	1604	7.6	Stray	Altitude	2013	Coal Hill
TR-AP13-012	427918	5927492	1588	13.4	Solomon	Altitude	2013	Coal Hill
TR-AP13-013	427950	5927531	1593	4.9	Stray	Altitude	2013	Coal Hill
TR-AP13-014	427962	5927543	1589	3.7	Hoff	Altitude	2013	Coal Hill
TR-AP13-015	427994	5927547	1584	3.3	Stray	Altitude	2013	Coal Hill
TR-AP13-016	428022	5927551	1582	12.5	Solomon	Altitude	2013	Coal Hill
TR-AP13-017	428067	5927616	1573	4.9	Hoff	Altitude	2013	Coal Hill
TR-AP13-018	428238	5927853	1542	3.1	Solomon	Altitude	2013	Coal Hill
TR-AP13-019	428252	5927855	1546	5.1	Solomon	Altitude	2013	Coal Hill
TR-AP13-020	428263	5927937	1555	5.1	Solomon	Altitude	2013	Coal Hill
TR-AP13-021	428218	5927929	1536	2.6	Moosehorn	Altitude	2013	Coal Hill
TR-AP13-022	428429	5927857	1583	6.4	Solomon	Altitude	2013	Coal Hill
TR-AP13-023	428419	5927585	1609	6.7	Solomon	Altitude	2013	Coal Hill
TR-AP13-024	431799	5921433	1564	8.5	Solomon	Altitude	2013	South
TR-AP13-025	431790	5921417	1563	11.0	Solomon	Altitude	2013	South

A total of 27 rotary drillholes and 3 sonic core holes, were drilled during the 2013 exploration program (Table 6-7; Figure 6-1, Figure 6-2 and Figure 6-3). The RC drilling chips were collected and logged lithologically. Coal intersections greater than 0.5 m were sampled in cloth bags at 0.5 or 1.0 m intervals, and composited in the field. Composites were sent to Loring Laboratories of Calgary, AB for proximate analysis.

The sonic core holes were drilled to intersect coal as close to true thickness as possible. Expected coal intervals were drilled dry to reduce potential washout. Core was extruded into plastic liners and placed in wooden boxes. Lithologies were logged and photographed, and coal and coaly shale partings and transitional beds were sampled in their entirety, and placed in sealed plastic bags. Some coal intervals were dry, and others wet due to formational water. Partial washout of a seam in both APC13-007 and APC13-016 was suspected. Thrusting and adjacent drag folding displaced and removed part of the Solomon seam in APC13-016, which was intersected in AP13-016.

Drill collars and access were surveyed by Foothills Surveys Ltd. of Hinton, AB using a Differential GPS. Down-hole deviation surveys and borehole geophysics (density, guard resistivity and single-arm caliper) were conducted by DGI Geoscience Inc. of Toronto, ON, on all rotary holes. Several holes had either partial or no open-hole logs due to blockage or collapse. Seven inch casing was set and removed following downhole logging. Each hole was cemented and collars were marked with treated 4x4" posts set into the concrete and marked with metal tags. Sonic core holes were surveyed by chain and compass from adjacent rotary pilot holes.

Table 6-7. 2013 Drillhole Summary.

Drillhole	Easting	Northing	Elevation (m AMSL)	Depth (m)	Azimuth	Inclination	Area	Type
AP13-001	430560	5924778	1499.9	175	50	-60	Central	Rev. Circ.
AP13-002	430272	5924221	1477.7	180.9	50	-60	Central	Rev. Circ.
AP13-003	430291	5924353	1477.52	202.2	50	-60	Central	Rev. Circ.
AP13-004	430842	5925141	1410.21	211.8	230	-60	Central	Rev. Circ.
AP13-005	431925	5921199	1481.7	212	50	-60	South	Rev. Circ.
AP13-006	432043	5921370	1501.87	185	50	-60	South	Rev. Circ.
AP13-007	431828	5921425	1563.33	105	24	-60	South	Rev. Circ.
AP13-008	432484	5922020	1433.26	157.5	Vertical	-90	South	Rev. Circ.
AP13-009	428207	5927932	1533.54	230.7	Vertical	-90	Coal Hill	Rev. Circ.
AP13-010	428251	5927999	1563.14	212.4	50	-55	Coal Hill	Rev. Circ.
AP13-011	428366	5927870	1574.9	185	50	-60	Coal Hill	Rev. Circ.
AP13-012	428371	5927871	1574.93	160.5	Vertical	-90	Coal Hill	Rev. Circ.
AP13-013	428170	5927816	1534.7	166.5	50	-60	Coal Hill	Rev. Circ.
AP13-014	428166	5927814	1534.66	218.5	Vertical	-90	Coal Hill	Rev. Circ.
AP13-015	428011	5927787	1550.14	233.8	Vertical	-90	Coal Hill	Rev. Circ.
AP13-016	428012	5927788	1550.3	178.6	50	-60	Coal Hill	Rev. Circ.
AP13-017	427747	5927472	1609.61	153.5	50	-60	Coal Hill	Rev. Circ.
AP13-018	427945	5927539	1588.63	120.9	40	-60	Coal Hill	Rev. Circ.
AP13-019	428567	5927733	1531.1	102.6	50	-70	Coal Hill	Rev. Circ.
AP13-020	428501	5927674	1556.35	96.5	Vertical	-90	Coal Hill	Rev. Circ.
AP13-021	428498	5927673	1556.35	111.75	240	-70	Coal Hill	Rev. Circ.
AP13-022	428433	5927574	1598.04	160.5	Vertical	-90	Coal Hill	Rev. Circ.
AP13-023	428361	5927511	1663.33	163.8	Vertical	-90	Coal Hill	Rev. Circ.
AP13-024	428362	5927512	1663.39	148.5	50	-60	Coal Hill	Rev. Circ.
AP13-025	428101	5927823	1530.29	151.4	Vertical	-90	Coal Hill	Rev. Circ.
AP13-026	428046	5927660	1564.3	148.3	Vertical	-90	Coal Hill	Rev. Circ.
AP13-027	428046	5927660	1564.3	93.5	50	-70	Coal Hill	Rev. Circ.
APC13-007	431767	5921438	1562	33.54	Vertical	-90	Coal Hill	Sonic Core
APC13-016	428012	5927788	1550.3	50.31	50	-60	Coal Hill	Sonic Core
APC13-020	428501	5927674	1556.35	32.01	50	-50	Coal Hill	Sonic Core

The in-place, surface-mineable resources for the Coal Hill area and regional Palisades Property area were estimated in 2013 using drill and trench data from the 2013 Altitude Palisades exploration program as well as historic drill and trench data. These results are summarized in Table 6-8. These results were divided into the Coal Hill area, where most of the drilling was done in 2013 (Figure 6-1), and the Central-South Palisades area where limited drilling was done (Figure 6-2 and Figure 6-3).

Table 6-8. 2013 Palisades In-Place Surface-Mineable Coal Resources Summary.

Area	In-Place Coal Resources (TONNES) Stripping Ratio Cutoff 20:1			
	ASTM Group	Measured	Indicated	Inferred
Coal Hill	Low-Volatile Bituminous	4,164,026	794,575	158,380
Central-South Palisades	Low-Volatile Bituminous	1,850,685	2,679,647	4,418,511
Total Property*		6,014,711	3,474,222	4,576,891

(* partings removed, average 8 m oxidised zone removed)

Owing to large gaps in the locations of the drilling program, which restricted the correlation of seams along strike, a large exploration target of low-volatile bituminous coal was determined to be an exploration target, requiring additional drilling to define a resource. Exploration targets for 2013 which are in part down-dip projections of the coal resources and in part projections along strike, are listed in Table 6-9. These targets were in part conceptual and based on current geological understanding; hence only rounded tonnages were calculated. Coal is present in the Grande Cache Member on the limbs of other folds on the Property, but is not included in the exploration target presented below due to lack of information on seam thickness and continuity. The target areas are outlined in

Figure 14-1.

Table 6-9. 2013 Palisades In-Place Exploration Targets.

Area	Exploration Target* (TONNES)
Coal Hill	1,000,000
Central-South Palisades	31,000,000
Total Property	32,000,000

*conceptual in-place coal with no stripping ratio cutoff

6.3 PRODUCTION

To the knowledge of the authors, no production has taken place on the Palisades Property.

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 REGIONAL GEOLOGY

The Palisades Coal Property is located on the eastern margin of the inner foothills of the Rocky Mountain thrust belt in west central Alberta. The rocks underlying the property occur within the predominantly continental Lower Cretaceous Luscar Group (Langenberg and McMechan, 1985) which is equivalent to the Blairmore Group in Sothern Alberta and Fort St. John Group in northeast B.C. (Figure 7-1). The Group is overlain by dark gray marine shales of the Shaftesbury Formation.

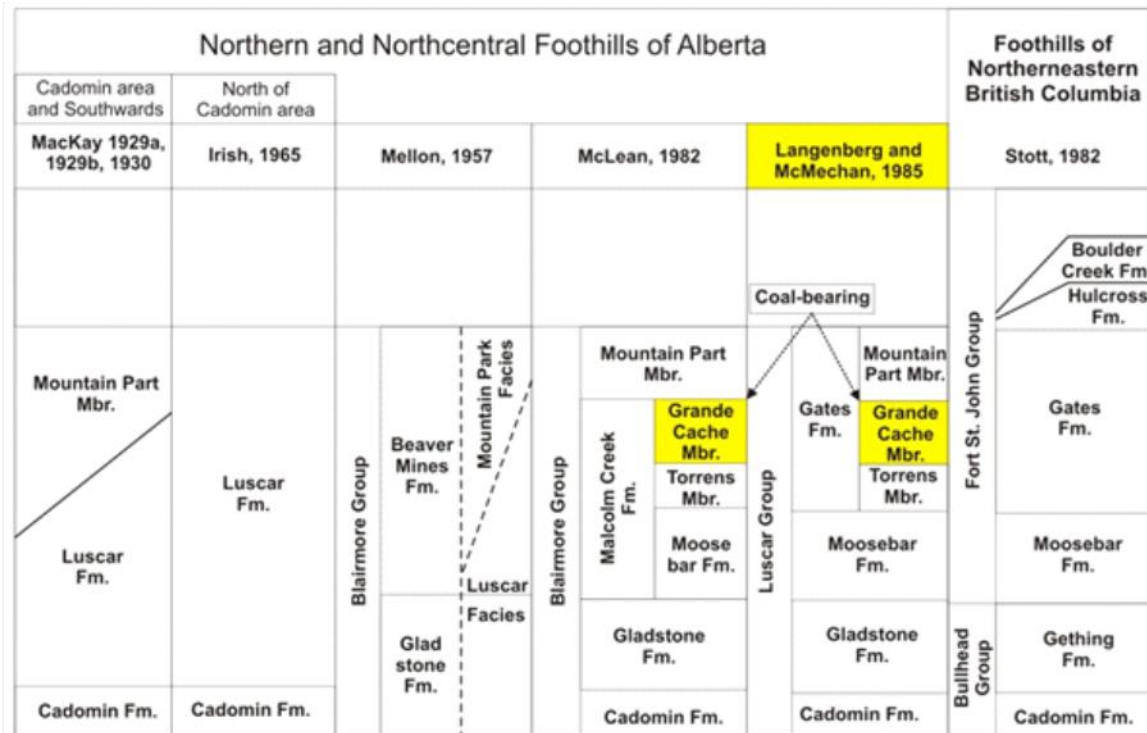


Figure 7-1. Stratigraphic Correlation (Modified from Langenberg et al, 1985).

Strata of the Luscar Group are divided into four Formations identified in ascending order as the Cadomin, Gladstone, Moosebar and Gates Formations. The Cadomin Formation consists of a very hard pebble conglomerate ranging from 5 to 10 m in thickness. It forms a resistant marker in the section but has only been identified in outcrop on property north of the Wildhay River. The Gladstone Formation consists of a fining upward sequence of fine-grained sandstone, shale and minor carbonaceous stringers. The lower part of the formation is interpreted to be braided stream deposits while the upper part appears to be of marine-estuarine origin. The formation ranges from 80 to 100 m in thickness on the Property. The Moosebar Formation consists predominantly of dark gray marine shales conformably overlying the Gladstone. The base of the formation is a distinctive glauconite-rich sandy or pebbly mudstone. The formation is 35 to 55 m thick, ranging to over 60 m in the Grande Cache area (Langenberg et al, 1987) and presents a distinct marker for mapping in the area.

The Gates Formation contains the coal-bearing sequence in the Luscar Group, and consists primarily of sandstones, siltstones and coal cyclothems. The base of the Gates Formation is characterized by a massive medium-grained sandstone unit known as the Torrens Member, which conformably overlies the marine shales of the Moosebar Formation. The Torrens Member ranges from 20 to 40 m in thickness. Overlying the Torrens Member is the coal-bearing unit referred to as the Grande Cache Member. This Member consists of fine sandstones, siltstones and mudstones, and continuous coal seams. The Grande Cache Member is 85 to 95 m thick on the property, and within it, three distinct coal seams have been identified. The Grande Cache Member is overlain by the Mountain Park Member which consists predominantly of thick-bedded, fine- to medium-grained sandstone sequences with distinct siderite grains. This Member ranges from 200 to 250 m in thickness, and forms prominent ridges on the property.

The three distinct coal seam horizons identified in the Grand Cache Member, are the Solomon, Hoff and Moosehorn seams. The lowermost seam, the Solomon, is the most persistent and typically occurs directly above the Torrens Member sandstones. The Hoff seam occurs approximately 25 to 50 m above the Solomon Seam and is only locally identified on the central and north part of the Property. Elsewhere the Hoff seam thins out and grades into carbonaceous mudstone. The uppermost Moosehorn seam occurs approximately 26 m above the Hoff Seam, at or near, the top of the Grande Cache Member. The relative position of these coal seams is shown on Figure 7-2.

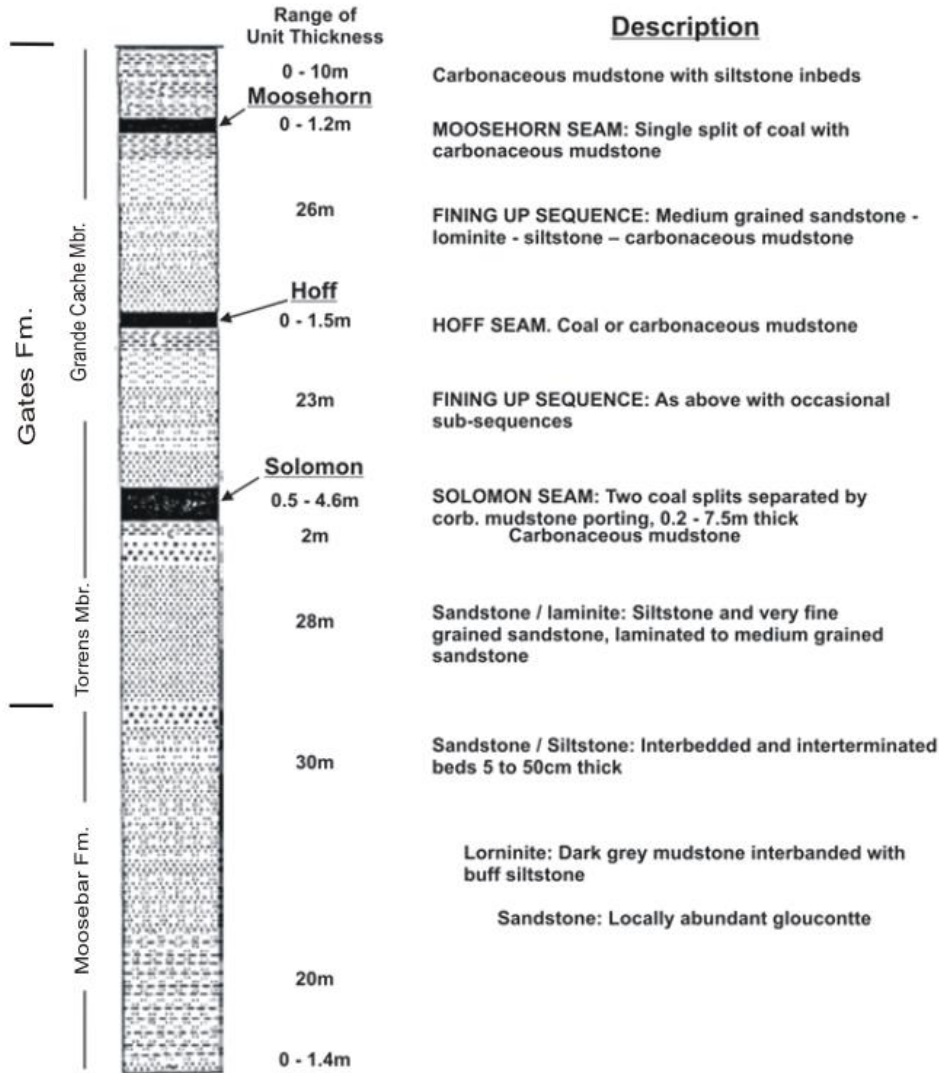


Figure 7-2. Generalized Stratigraphic Column in Palisades Area (after Denison, 1984)

Structural geology in the Foothills area of the Rocky Mountain Thrust Belt is characterized by west-dipping sub-parallel thrust faults of varying displacement, with generally northwest-southeast traces (Figure 7-3). These are accompanied by asymmetrical to overturned folds often with steep west to southwest-dipping axial planes which also trend northwest-southeast. Coal-bearing sediments of the Luscar Group are exposed in a northwest-trending belt bounded by over-thrust Paleozoic or Jurassic Fernie Group sediments to the southwest, and younger mid to upper Cretaceous marine sediments of the Shaftsbury, Dunvegan and Kaskapau Formations to the northeast (Langenberg et al, 1987).

Figure 7-3. Regional Geology Map.
 (See end: Large Figures, P-4)

7.2 PROPERTY GEOLOGY

Detailed geology of the Coal Hill area south of the Wildhay River is presented in Figure 7-4. The geology of the central and south Palisades Property is presented in Figure 7-5 and Figure 7-6 respectively. Exposure on the Property is generally limited to road cuts and along creeks, due to the recessive nature of much of the stratigraphic section, although more resistant sandstones of the Mountain Park and Torrens Members, as well as the chert-pebble conglomerate of the Cadomin Formation do outcrop locally on hillsides.

7.3 STRATIGRAPHY

The lowest observed strata on the property are quartzitic sandstones of the Late Jurassic to Early Cretaceous Nikanassin Formation which underlie the Cadomin Formation. The Cadomin conglomerate is composed of abundant well-cemented rounded chert pebbles and interbedded sandstone. It forms a distinctive marker unit. Nikanassin and Cadomin strata are exposed along the Rock Lake and Collie Creek roads, as well as along the southwest edge of the Property.

The Gladstone Formation consists of grey-brown weathered, interbedded sandstones and mudstones with minor thin coal seams. These sediments are bioturbated and contain pelecypod shells and fragments. Its upper contact with the Moosebar Member is placed at a thin layer of glauconite-rich pebble conglomerate. Exposures of the Gladstone Formation are found along Moosehorn Creek northwest of Coal Hill, the P-0300 Line trail and southeastwards along the ridge to Icewater Creek.

The Moosebar Formation is about 60 m thick. It consists of a lower laminated dark-grey siltstone or very fine-grained sandstone unit, overlain by interbedded siltstone and very fine-grained sandstone. The upper part of the formation is sandstone-dominant and grades into the Torrens Member above. Bioturbation and slump features are common. Due to its recessive nature, outcrop is poor. Moosebar is exposed along the P-0300 Line trail, P-0700 Line trail and Central Drill access trail.

The Torrens Member of the Gates Formation is 25 to 28 m thick in the Palisades area. It is dominantly fine- to coarse-grained, grey to grey-green, well-cemented sandstone. The sandstone beds are up to 2 m thick and can be cross-bedded, with subordinate interbedded or interlaminated siltstone and mudstone. Generally the upper contact is picked at the base of the lowest coal seam (Solomon) of the Grande Cache Member; however, in the Coal Hill-Icewater Creek area of the Property, 8 to 10 m of interbedded siltstone, shale and thin sandstone characteristic of Grande Cache were noted between the Torrens sandstones and the lowest coal seam. This occurred both in an exposure along the Central Drill access road and in drill intersections. Torrens is exposed along the P-0300 Line trail, P-0700 Line trail, P-0800 Line trail and Central Drill access trail.

The Grande Cache Member of the Gates Formation ranges from 74 to 92 m thick (based on drilling by Denison) on the Palisades Property. Substantial thickening through folding and thrusting, particularly in the Coal Hill area, has increased this to as much as 450 m. In other studies, the base of the Grande Cache is placed at the base of the Solomon seam, or the carbonaceous mudstone below it. The transition from Torrens Member to Grande Cache Member on the Property appears gradational. The upper contact of the Grande Cache is placed at the base of the first massive sandstone above the upper Moosehorn seam.

In the central part of the Property about 22 m of sandstones interbedded with siltstone and coaly shale characteristic of the Grande Cache overlie the Moosehorn seam, although it is roofed by about three metres of massive to cross-bedded sandstone. A similar section is exposed on the P-0800 Line. In the Coal Hill area at drillhole AP13-017, about 5 m of interbedded siltstone, shale and minor sandstone, overlie the Moosehorn seam. Denison (1984) observed fining-upwards cycles between the Solomon, Hoff and Moosehorn seams north of WH-006 in the central Palisades area. These cycles grade from clean, light-grey medium- to coarse-grained sandstone exhibiting a sharp contact with the underlying coal seam, through siltstone to carbonaceous mudstone and finally coal. In the area immediately north of Solomon Creek (AP13-007, and trenches TR-AP13-024 and TR-AP13-025), sandstones containing chert grit or pebble conglomerate were observed above the Solomon seam.

The Mountain Park Member of the Gates Formation is defined by a distinct grey-green, fine- to medium-grained, thick-bedded to massive sandstone that is often cross-bedded and resistant. Consistently across the property, it shows three main fining-upwards sandstone sequences separated by mudstone. Each sandstone unit contains laminations of siltstone and sandstone near the top, and can contain thin, discontinuous coal seams and pieces of plant remnants. The base of Mountain Park is generally taken at the first major sandstone unit above the Moosehorn seam and the top placed at a thin (~½ m to 3 m) chert-pebble conglomerate at the base of the Shaftsbury Formation. The Mountain Park Member ranges from 87 to 165 m in thickness on the Palisades Property, but is thicker regionally.

The Shaftsbury Formation is at least 175 m thick in the Palisades area. It subcrops extensively on the southern and eastern parts of the Property. It is mainly a recessive dark-grey mudstone, with subordinate interbedded siltstone and sandstone. The basal chert-pebble conglomerate is a distinctive marker observed along the most southerly branch of Icewater Creek, and above Collie Creek along the 'Spine Line' on the North Palisades extension. It is well exposed along the eastern limb of the Moosehorn Syncline to the southwest of AP13-007.

Figure 7-4. North Property Geology – Coal Hill Area

(See end: Large Figures, P-5)

Figure 7-5. Central Property Geology – Central Palisades Area.

(See end: Large Figures, P-6)

Figure 7-6. South Property Geology – South Palisades Area

(See end: Large Figures, P-7)

7.4 STRUCTURAL GEOLOGY

The Luscar Group sediments on the Palisades Coal Property are exposed in a northwest to southeast trending fold belt bounded on both margins by major thrust faults (Figure 7-3). The southwest boundary is marked by the Folding Mountain Thrust Fault which over-thrusts carbonate rocks of the Jurassic Period onto much younger Cretaceous strata. The northeast boundary is marked by the Collie Creek Thrust Fault which over-thrusts the Luscar Group strata onto younger Upper Cretaceous formations.

Bounded by these two thrusts are several large-scale structures including, from west to east, the Moosehorn Syncline, Solomon Creek Anticline and Coal Hill Syncline/Anticline. The south west limb of the Moosehorn Syncline is nearly vertical, to slightly overturned towards the northeast. The axial hinge of this fold runs parallel to the Folding Mountain Thrust, suggesting deformation took place at the time this thrust fault was active. The Solomon Creek Anticline appears to be asymmetric as well, with the northeast dipping limb inclined at higher angles than the southwest dipping limb. There is also some evidence that this fold is faulted locally along the axial hinge line by a steeply southwest dipping thrust fault (Figure 7-4). The adjacent Coal Hill Syncline is also asymmetric, dipping more steeply on the southwest limb. This asymmetry is mirrored in smaller folds and reflects the northeastward regional compression (Figure 7-7).

The Collie Creek Thrust marks the north-eastern boundary of the Property and is sub-parallel to the axial hinges of the fold structures, suggesting this major dislocation was subsequent to and not contemporaneous with initial deformation events. Smaller splays above the Collie Creek Thrust dissect the folding and stack the Gates Formation, particularly in the area of Coal Hill. One of these splays brings the Grande Cache Member over the Mountain Park Member on the east side of Coal Hill. Trenching and road-cuts exposed tight drag folding adjacent to faults in several locations on Coal Hill. Repetition of coal seams some in drillholes (e.g. AP13-007, AP13-016) appears to be the result of tight folding.

Mapping and drilling in 2015 focussed on the area west and south of Coal Hill where the northern extension of the Solomon Creek anticline was cut by three drill sections (P-0300, P-0700, and P-0800). The anticline is asymmetrical, and is cut by several west-dipping thrusts which repeat parts of the Gates Formation as at Coal Hill. On the southwest limb of the anticline, the entire Grand Cache section, sitting on the Torrens Member, is thrust over two partial repeat sections along the P-0300 line. This repeat section is consistent southeastward to the P-0700 and P-0800 lines (Figure 7-5). These thrust faults are associated with smaller scale drag folds. Another thrust splay was identified east of Coal Hill during the 2015 mapping which brings the Grande Cache Member to subcrop (Figure 7-7).

There is apparent over-thickening, local thinning, and repetition of the coal section which supports a model of severe deformation and faulting in high compression zones at or near the axial hinges of these folds (see Figure 7-7; Figure 14-3 to Figure 14-9).

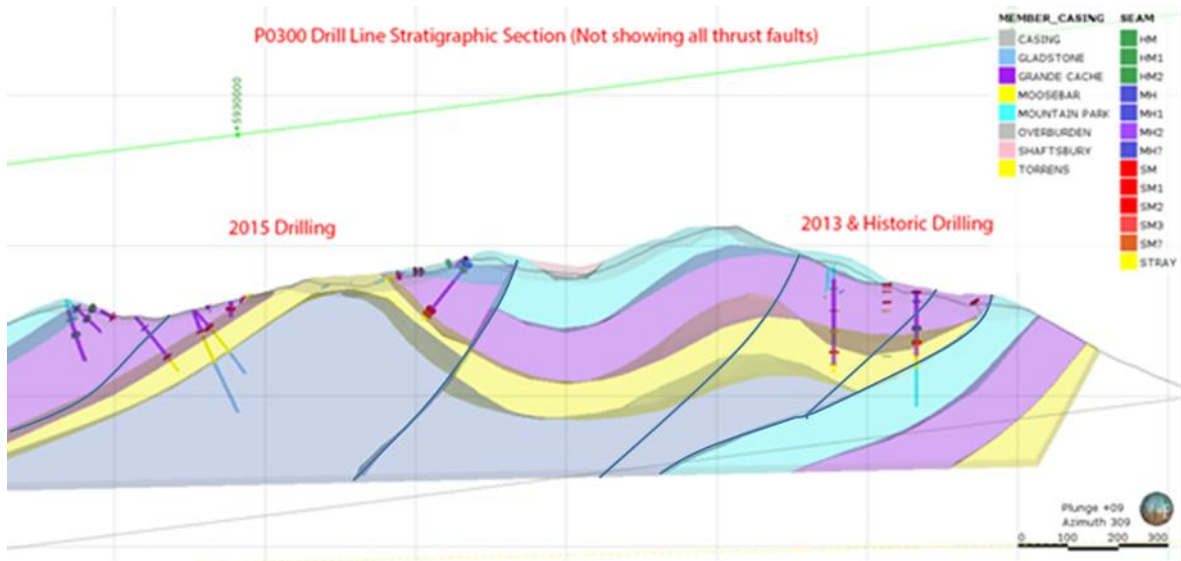


Figure 7-7. Stratigraphic Cross-section along P-0300 line and through Coal Hill.

Mapping of the workings at the old underground mines at Brule adjacent to the southeast (McKay, 1927) shows plastic deformation and over-thickening of the coal seams in anticline crowns and syncline hinges (Figure 7-8). A similar thickening of the Moosehorn seam was observed in the road cut near drillhole AP15-014. This style of deformation is related to the mechanical nature of the Gates Formation. Effectively, the relatively weak coal-bearing Grande Cache Member is sandwiched between the Torrens Member sandstone and the massive Mountain Park Member sandstone. During severe folding events, weaker shale and coal units will detach and compress along bedding planes and flow towards hinge axes. This type of deformation, along with moderate displacement accommodating thrusts, appears to be dominant on the Property.

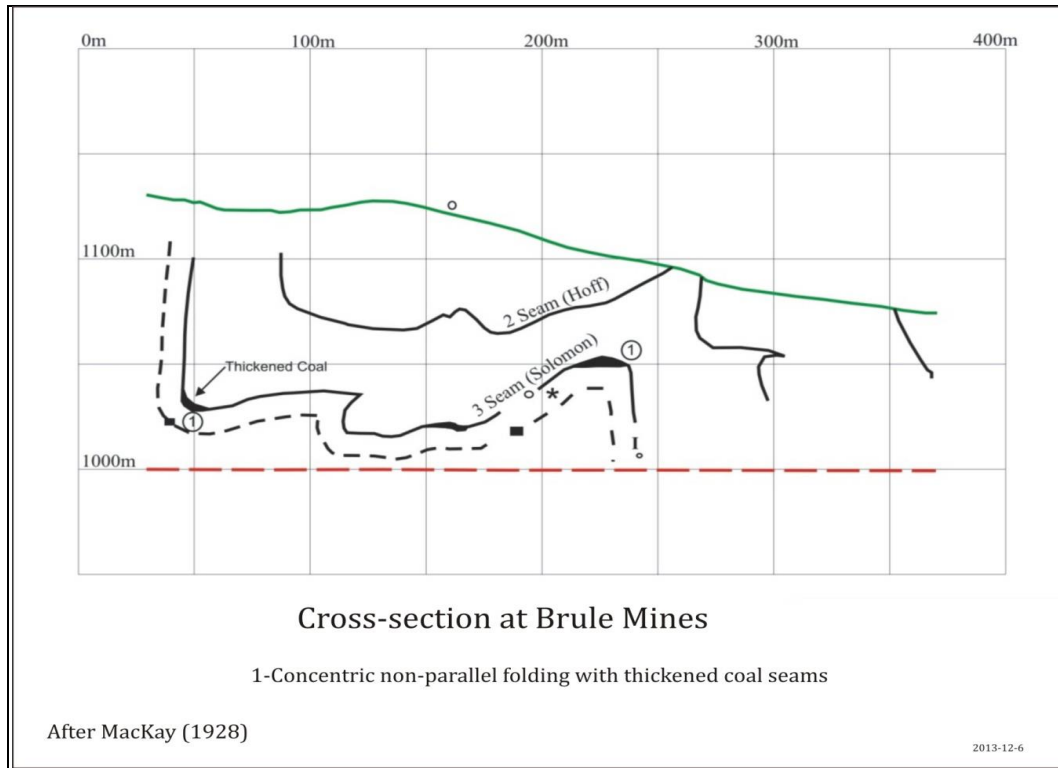


Figure 7-8. Cross-Section (Brule Mines) showing coal thickening at fold hinges.

7.5 MINERALIZED ZONES

The terminology used for identifying coal zones and individual seam plies has been adopted from Denison. Figure 7-2 shows a composite section of the Grande Cache Member including the main coal zones on the Property.

There are three coal zones recognized within the Grande Cache Member, identified in ascending order as the Solomon, Hoff, and Moosehorn. While these individual zones maintain relative stratigraphic position in the Palisades area, the thickness of individual seams and proportion of coal plies to rock partings in each zone is variable. The variation is both depositional and in some cases caused by structural distortion. Coal zones are often sheared and appear to be preferred loci for thrust faulting. It should be noted that observations regarding the continuity and character of these zones is based on very limited drill data spaced over a wide area, except in the Coal Hill area.

The Solomon Zone is the best developed coal zone on the property. It was intersected in twelve 2015 drillholes, twenty 2013 drillholes, and ten historic drillholes. Typically, it lies directly above the Torrens Member sandstone and consists of two major sub-seams separated by a carbonaceous mudstone parting. In the central and northern parts of the Property, there appears to be 8 to 10 m of interbedded siltstone, shale and sandstone below the seam. Seam thickness varies from hole to hole. In the southeast, (drillhole WH020DN), the zone contains 1.07 m of coal. In AP13-007, intersections of 2.7 and 4.4 m on opposite limbs of an anticline were oblique and not representative of true thickness. In trench TR-AP13-024, coal splits of 0.7 and 2.9 m were observed but are affected by thickening in the hinge of the anticline. In TR-AP13-025 the splits are 0.8 and 0.9 m which are likely close to true thickness. In the central area (drillhole WH021DN) the seam thins to 0.53 m. Drillholes AP13-002 and AP13-003 cut split seams of about 1.1 and 0.3 m true thickness. In the northwest (drillhole WH023DN) the seam is 0.65 m thick. The maximum development occurs in the Coal Hill area along the hinge of the Solomon Creek Anticline where seam thickness averages over 3 m (drillhole AP15-005, WH019DN, WH015DN and WH018DN and HR-3, HR-4). The thickest intersection is in WH015DN, at 4.6 m; this is likely showing the effect of structural thickening. In 2013 drilling, aggregate thicknesses for the Solomon seam of up to 4 m were intersected in AP13-009, AP13-014, AP13-015, AP13-016, AP13-026, AP13-027, but these included many shaley partings. In 2015 drilling, similar thicknesses were intersected in AP15-005, AP15-011 and AP15-019. A thick Solomon seam is also recorded in drillholes WH006DN and WH014DA where the seam averages over 2 m in thickness. Again this follows the crown of the Solomon Creek Anticline.

An unnamed stray seam, approximately 1 m thick, was intersected about 10 m below the Hoff seam in AP13-002 and AP13-003. This may correlate with the banded coal and coaly shale units intersected below the Hoff seam at Coal Hill (TR-AP13-013, TR-AP13-015 and AP13-017). A similar unit below the Moosehorn seam (TR-AP13-011, AP13-017) is also observed at Coal Hill.

The Hoff Zone occurs approximately 50 m above the Solomon Zone where no structural thickening is observed. The zone consists of a single seam which was only intersected in two historic drillholes in the central part of the Property: WH006DN (1.5 m thick) and WH019DN (0.9 m thick). The Hoff Zone was also intersected in AP13-002 (4.6 m thick, probably over-thickened) and AP 13-003 (2.3 m thick). In the Coal Hill area and to the west, the Hoff seam was intersected in several drillholes in 2013 and 2015, and appears to split into two seams (estimated true thicknesses of <1.5 m and <2.2 m) separated by about 1-3 m of siltstone and shale parting. The Hoff seam was well exposed in the P-0300 line access road in 2015.

The upper most coal zone, the Moosehorn Zone, is approximately 25 m above the Hoff Zone. It is typically a single coal seam ranging from 0.9 to 1.2 m in thickness. It thickens to over 4 m at the crest of an anticline near AP15-014 (Figure 7-5). In the Coal Hill area where there is significant fault repetition of the Grand Cache Member, the upper part containing the Moosehorn Zone is missing in some sequences.

8 DEPOSIT TYPES

A coal deposit, unlike most mineral deposits, is a distinct entity. As such, its characteristics are not defined by mineralization type, distribution and grade. Key characteristics contributing to the classification of a coal seam, or multiple seams, as a coal deposit, include seam thickness, seam continuity and correlation, and coal quality. Deposit type will also refer to the probable extraction method (i.e. surface or underground) and to the ultimate use for the coal (i.e. metallurgical or thermal), due to the fact that physical coal properties, such as the potential to coke, will restrict end use.

Coal deposit types are defined in Geological Survey of Canada (GSC) Paper 88-21, a core reference for coal deposits as specified in NI 43-101. Four categories are proposed:

- 1) 'surface mineable' - extracted by removing overburden from surface using dragline, truck and shovel, or other techniques;
- 2) 'underground mineable' - extracted using room-and-pillar, longwall, shortwall, hydraulic or other techniques from surface drivages;
- 3) 'non-conventional' - deposits too deep or inaccessible by first two methods, requiring in situ gasification or other techniques;
- 4) 'sterilized' - unavailable for mining due to legislative, environmental or other restrictions. Section 2.2 of the NI 43-101 requires the disclosure of coal resources or reserves to follow the categories set out in CIM Definition Standards (2010), although the framework of GSC Paper 88-21 can be used for development and characterization of estimates which must then be converted to equivalent CIM Definition categories.

GSC Paper 88-21 also refers to geology types, which define the amount of geological complexity, usually imposed by the structural complexity of the area. This classification helps determine the approach to be used for resource estimation methodology, as well as limits to be applied to certain key estimation criteria. Four classes are provided:

- 1) 'low' - essentially flat-lying deposits of the Alberta plains type with low tectonic disturbance (deposits of Ravenscrag and Judith River Formations);
- 2) 'moderate' - characterized by broad folds and homoclines (wavelength >15 km, dips <30°) typical of outer foothills (Obed, Marsh, McLeod River, Ram River, Bullmoose deposits);
- 3) 'complex' - high tectonic disturbance, tight, steep, sometimes overturned folds, fault offsets present but individual fault-bounded plates (Harmer, Fording River, Grassy Mountain, Smokey River deposits);
- 4) 'severe' - extreme tectonic disturbance, tight, overturned folds, large-displacement faults, stratigraphic discontinuities, structurally thickened or thinned coal seams (Byron Creek Deposit, parts of Grassy Mountain Deposit).

The Property contains low- to medium- volatile bituminous coal suitable for metallurgical uses. Potential for both surface and underground-mineable resources exist. Resources are considered to be in the 'complex' category for purposes of this report. Section 14 of this report provides the details of current resource estimation criteria.

Defining resources in a 'complex' coal deposit requires close-spaced drilling. Typically, Measured Resources require cross-sectional drilling lines 150 m apart, Indicated Resources require lines 300 m apart, and Inferred Resources require lines 600 m apart. Drillhole data along these lines should be at a mean spacing of 100 m, 200 m and 400 m, respectively. In this report, radial distances from known data points are used (Table 14-1). Pit design requires measured and indicated resources at minimum in order to estimate tonnage and potential recovery.

9 EXPLORATION

This technical report presents results of Altitude's 2015 exploration program on the Property (Figure 9-1). Site visits by the authors are described in Section 12. Details of the historic exploration programs on the Palisades Property are presented in Sections 6.

Work completed in 2015 on the Property included:

- Geological mapping at 1:10,000 scale was completed in areas of natural exposure, including 2015 reopened and constructed trail, exposed near-surface rock outcroppings and some coal seams (Figure 7-4 to Figure 7-7).
- Conventional air hammer drilling: 22 holes totalling 2,735 m (Details in Section 10)
- Diamond core drilling: 3 holes totalling 62 m. A fourth did not intersect coal due to faulting (Details in Section 10)

9.1 MAPPING

Geological mapping across the property was undertaken by four geologists for 3 weeks in June 2015. Additional mapping was carried out by site geologists as additional exposure was created by access construction. The focus of this effort was to verify and expand upon previous mapping, with particular attention to areas of proposed drilling. The mapping included collecting detailed descriptions (structural measurements; rock types and stratigraphic units) of select road-cuts and surveying them with an RTK-GPS in order to assist with interpretation and subsurface geological modelling.

Observations of bedding attitudes and such structural information as cleavage, lineation and fault traces were made using a Brunton compass and hand-held Garmin 60CSx GPS units. Outcrop is generally sparse on the Property except along creeks or where resistant sandstone units outcrop along ridge-tops. Coal-bearing units are recessive and seldom exposed except during access construction. A total of 420 stations were taken, primarily in the north (Coal Hill) and central areas of the property (Figure 7-4 to Figure 7-6). Some work was done in the south area of the property which helped constrain the axial trace of the Moosehorn Syncline and basal contact of the Shaftesbury Formation. Traverses on the Palisades extension north of the Wildhay River and west of Collie Creek confirmed the subcrop of the Gates Formation through stratigraphy, but there is limited exposure.

9.2 TRENCHING

No trenching was conducted in 2015. Exposures of coal in road cuts were measured and surveyed (Figure 9-1, Table 9-1). These intersections were incorporated in geological interpretation and modeling. Good exposure of the Moosehorn seam thickened in an anticlinal hinge was observed near AP15-014 along the P-0700 access (TRAP15-022, -023). A good exposure of the split Hoff seam was measured in TRAP15-003 on the P-0300 access road. Good exposure of the Solomon seam was observed in both TRAP15-004/005 and TRAP15-009, also along the P-0300 access road.

Figure 9-1. 2015 Palisades Exploration
(See end: Large Figures, P- 8)

Table 9-1. 2015 Palisades Surveyed Road Cut Exposures

Road Cut	Easting	Northing	Elevation (m)	Length (m)	Azimuth	Dip	Rock Type	Seam	Seam Interval (m)	Area
TRAP15-001	427958	5926903	1688	8.24	13	-11	Coal	Moosehorn	2.00	P-0300-LINE
TRAP15-002	427958	5926903	1688	7.92	13	-4	Coal, Coaly Shale	Moosehorn	4.52	P-0300-LINE
TRAP15-003	427948	5926882	1686	11.00	210	-23	Coal	Hoff 1-2	3.84	P-0300-LINE
TRAP15-004	427913	5926812	1670	27.00	14	-4	Coal	Solomon 1	1.66	P-0300-LINE
TRAP15-005	427899	5926800	1666	69.00	208	-10	Coal	Solomon 2	3.00	P-0300-LINE
TRAP15-006	427842	5926711	1651	4.90	230	-37	Sandstone	-	-	P-0300-LINE
TRAP15-007	427806	5926682	1644	17.60	220	-20	Siltstone	-	-	P-0300-LINE
TRAP15-008	427712	5926564	1624	14.48	220	-11	Sandstone	-	-	P-0300-LINE
TRAP15-009	427700	5926541	1618	5.20	40	-30	Coal	Solomon	2.00	P-0300-LINE
TRAP15-010	427675	5926470	1604	10.70	40	-5	Coal	Hoff	0.60	P-0300-LINE
TRAP15-011	427560	5926294	1600	33.40	40	-25	Coal, Coaly Shale	Solomon	3.30	P-0300-LINE
TRAP15-012	427534	5926290	1605	15.67	80	-28	Coal	Hoff 1-2	1.17	P-0300-LINE
TRAP15-013	427489	5926282	1619	18.80	80	-15	Sandstone, Siltstone	-	-	P-0300-LINE
TRAP15-014	429351	5925491	1585	9.88	194	-23	Coal	Moosehorn	1.49	P-0800-LINE
TRAP15-015	429355	5925446	1586	22.94	190	-12	Coal	Hoff 1-2	3.80	P-0800-LINE
TRAP15-016	429350	5925404	1586	5.88	218	-11	Shaley Coal	Stray	1.60	P-0800-LINE
TRAP15-017	429343	5925379	1590	8.20	235	-10	Shaley Coal	Stray	1.00	P-0800-LINE
TRAP15-018	429343	5925379	1590	21.19	1	-18	Coal	Solomon	0.60	P-0800-LINE
TRAP15-019	429186	5925352	1619	31.00	56	-9	Sandstone, Shale Coaly Shale	-	-	P-0800-LINE
TRAP15-020	429131	5925457	1568	8.43	35	-20	Coal, Coaly Shale	Solomon 1-2	1.97	P-0700-LINE
TRAP15-021	429031	5925423	1576	7.73	65	-22	Coal	Stray	0.20	P-0700-LINE
TRAP15-022	429242	5925765	1541	17.60	340	-20	Coal	Moosehorn	9.10	P-0700-LINE
TRAP15-023	429227	5925800	1538	6.40	330	-15	Coal	Moosehorn	2.40	P-0700-LINE
TRAP15-024	428295	5927214	1699	7.62	40	-15	Coaly Shale	Stray	0.40	West-Trail

10 DRILLING

A total of 22 conventional rotary air hammer drillholes and three 6" core holes were drilled during the 2015 exploration program (Table 10-1; Figure 10-1). In addition, 30 drillholes and 25 trenches from the 2013 Palisades program as well as 28 historic drillholes and 10 historic trenches (Table 6-1 to Table 6-7) were used for geologic interpretation and modelling. Drill collars and access were surveyed using a Differential GPS unit, and down-hole deviation surveys and borehole geophysics were conducted on all rotary holes. Data from the 2013 program was collected using similar methods.

Data compiled from the historic reports displayed some uncertainties in the drillhole dataset. Historic drillhole locations were extracted from original exploration reports, geological logs, and geophysical logs when available. Local grid locations were converted to a UTM NAD 83 Zone 12N projection format and confirmed against exploration maps. If collar locations were not provided, approximate locations were georeferenced from exploration maps and validated against cross-sections and topography. Rotary and core hole collar information was generally well constrained for X-Y co-ordinates, but less reliable for Z co-ordinates. Down-hole directional information was limited to inclination and azimuth.

Table 10-1. 2015 Palisades Drilling Summary

Drillhole	Easting	Northing	Elevation (m AMSL)	Depth (m)	Azimuth	Inclination	Area	Type
AP15-001	427989.37	5926895.40	1692.79	165.00	249	-49	North	Air Hammer
AP15-002	427671.74	5926442.50	1600.75	230.00	34	-73	North	Air Hammer
AP15-003	427672.92	5926443.87	1600.82	165.00	30	-49	North	Air Hammer
AP15-004	427619.99	5926046.36	1612.76	158.50	35	-85	North	Air Hammer
AP15-005	427620.97	5926047.48	1612.69	195.00	34	-61	North	Air Hammer
AP15-006	427609.41	5926343.16	1590.36	141.00	33	-50	North	Air Hammer
AP15-007	427731.55	5927212.60	1671.00	98.00	28	-49	North	Air Hammer
AP15-008	427501.12	5926254.05	1620.94	134.00	34	-78	North	Air Hammer
AP15-009	427502.31	5926255.46	1620.82	98.00	30	-46	North	Air Hammer
AP15-010	427842.78	5927287.01	1650.97	62.00	34	-49	North	Air Hammer
AP15-011	427698.43	5926516.55	1614.78	33.50	Vertical	-90	North	Air Hammer
APC15-011	427698.91	5926514.24	1614.67	18.80	Vertical	-90	North	6" Core
APC15-011a	427697.89	5926518.73	1614.60	16.80	Vertical	-90	North	6" Core
AP15-012	429187.68	5925364.20	1615.11	116.00	35	-55	Central	Air Hammer
AP15-013	429345.70	5925431.73	1581.21	98.00	214	-59	Central	Air Hammer
AP15-014	429244.45	5925792.68	1544.98	104.20	Vertical	-90	Central	Air Hammer
AP15-014a	429230.69	5925780.54	1541.00	43	Vertical	-90	Central	Air Hammer
AP15-014b	429233.04	5925761.64	1543.00	24	Vertical	-90	Central	Air Hammer
APC15-014	429248.69	5925788.78	1545.05	34.75	Vertical	-90	Central	6" Core
APC15-014a	429233.59	5925759.24	1543.00	10	Vertical	-90	Central	6" Core
AP15-015	429406.63	5925642.92	1608.27	110.00	8	-88	Central	Air Hammer
AP15-016	429404.74	5925640.97	1608.37	208.00	237	-51	Central	Air Hammer
AP15-017	429234.73	5925674.96	1532.96	147.00	Vertical	-90	Central	Air Hammer
AP15-018	429236.39	5925676.99	1532.89	140.00	33	-49	Central	Air Hammer
AP15-019	429151.60	5925480.14	1566.16	159.00	31	-48	Central	Air Hammer
AP15-020	429038.83	5925436.42	1572.82	104.00	39	-48	Central	Air Hammer

Figure 10-1. 2015 Palisades Drilling
(See end: Large Figures, P-9)

10.1 CONVENTIONAL ROTARY DRILLING

Rocky Mountain Drilling Inc, Hinton, AB were contracted to provide two truck-mounted Atlas Copco TH60 conventional air hammer rotary drill rigs for the 2015 program. Drilling began September 8th, and ended October 10th, 2015. Twenty-two 4¾" (120 mm) diameter holes totalling 2,733.2 m were drilled. Depths ranged from 24 to 230 m. Seven-inch (178 mm) casing was set and removed following downhole logging. Each hole was cemented. Collars were marked with squared wooden posts set into the concrete and marked with metal tags.

Drillhole collar locations were surveyed by using Differential GPS methods. Downhole azimuth and deviation surveys using a Reflex multishot system were run in rods, by Century Wireline Services of Red-Deer, AB. Borehole geophysical logging tools for density and natural gamma were initially run in rods, and density, natural gamma, resistivity and caliper were also run in the open hole. Several holes had partial open-hole logs due to blockage or collapse.

Drilling chips were collected from the collar splitter and were logged lithologically. Coal intersections are presented in Table 10-2. Not all were true thickness, owing to practical limitations upon drillhole inclination and variation in dips. Coal intersections greater than 0.5 m were sampled in cloth bags at 0.5 m intervals, and later composited. Thirteen composites were sent to Birtley Coal and Minerals Testing Division in Calgary, AB, for proximate analysis (Table 10-3).

Table 10-2. 2015 Rotary Drillhole Coal Intersections

Drillhole	From (m)	To (m)	Length (m)	Total Seam Interval * (m)	Rock Type	Seam
AP15-001	6.00	7.60	1.60	1.80	Coal	Moosehorn
AP15-001	11.80	12.00	0.20		Coal	Moosehorn
AP15-001	22.20	22.50	0.30	2.10	Coal	Hoff
AP15-001	24.10	24.30	0.20		Coal	Hoff
AP15-001	24.30	24.80	0.50		Coaly Shale	Hoff
AP15-001	24.80	25.90	1.10		Coal	Hoff
AP15-001	131.37	132.28	0.91		Possibly repeat interval- no geophysics at depth	Coal
AP15-001	132.89	133.81	0.92	Coal		Solomon
AP15-001	134.42	139.90	5.49	Coal		Solomon
AP15-001	146.61	149.66	3.05	Coal		Solomon
AP15-002	45.72	46.20	0.48	0.88	Coaly Shale	Solomon
AP15-002	46.20	46.60	0.40		Coal	Solomon
AP15-003	44.20	45.00	0.80	2.60	Coaly Shale	Solomon
AP15-003	45.00	46.00	1.00		Coal	Solomon
AP15-003	47.60	48.40	0.80		Coal	Solomon
AP15-004	114.46	115.10	0.64	0.79	Coaly Shale	Moosehorn
AP15-004	115.10	115.25	0.15		Coal	Moosehorn
AP15-004	137.10	138.20	1.10	3.30	Coal	Hoff
AP15-004	138.20	139.90	1.70		Coaly Shale	Hoff
AP15-004	141.90	142.40	0.50		Coal	Hoff
AP15-005	79.86	80.47	0.61		0.61	Coal
AP15-005	110.40	111.50	1.10	1.90	Coal	Hoff
AP15-005	116.50	117.30	0.80		Coal	Hoff
AP15-005	161.10	162.30	1.20	4.97	Coal	Solomon
AP15-005	173.13	176.50	3.37		Coal	Solomon
AP15-005	177.60	178.00	0.40		Coal	Solomon
AP15-006	30.00	31.20	1.20		1.20	Coal
AP15-006	102.30	102.90	0.60	1.50	Coaly Shale	Solomon
AP15-006	103.20	103.90	0.70		Coaly Shale	Solomon
AP15-006	104.70	104.90	0.20		Coal	Solomon

Drillhole	From (m)	To (m)	Length (m)	Total Seam Interval * (m)	Rock Type	Seam
AP15-008	42.50	43.59	1.09	1.09	Coal	Moosehorn
AP15-008	71.10	73.10	2.00		Coal	Hoff
AP15-008	73.10	73.40	0.30	3.40	Coaly Shale	Hoff
AP15-008	77.10	78.20	1.10		Coal	Hoff
AP15-009	26.90	27.10	0.20		Coaly Shale	Moosehorn
AP15-009	27.10	28.90	1.80	2.00	Coal	Moosehorn
AP15-009	53.30	54.20	0.90		Coal	Hoff
AP15-009	54.20	55.00	0.80	2.60	Coaly Shale	Hoff
AP15-009	59.00	59.90	0.90		Coal	Hoff
AP15-011	12.84	13.60	0.76		Coal	Solomon
AP15-011	13.60	14.20	0.60	3.46	Coaly Shale	Solomon
AP15-011	14.20	15.20	1.00		Coal	Solomon
AP15-011	17.65	18.75	1.10		Coal	Solomon
AP15-012	0.00	0.50	0.50	More coal above drill collar	Coal	Solomon
AP15-012	23.80	24.00	0.20	0.50	Coaly Shale	Stray
AP15-012	45.72	46.02	0.30		Coaly Shale	Stray
AP15-012	71.40	72.60	1.20	1.60	Coal	Solomon
AP15-012	74.30	74.70	0.40		Coal	Solomon
AP15-013	0.00	0.20	0.20	More coal above drill collar	Coal	Hoff
AP15-013	0.90	1.10	0.20		Coal	Hoff
AP15-013	1.70	2.30	0.60		Coal	Hoff
AP15-013	25.20	25.80	0.60	1.10	Coaly Shale	Solomon
AP15-013	26.30	26.50	0.20		Coaly Shale	Solomon
AP15-013	27.00	27.30	0.30		Coaly Shale	Solomon
AP15-013	44.80	45.40	0.60	0.60	Coaly Shale	Stray
AP15-013	61.00	61.50	0.50	0.90	Coal	Stray
AP15-013	61.50	61.90	0.40		Coaly Shale	Stray
AP15-014	3.30	5.40	2.10	4.50	Coal	Moosehorn
AP15-014	5.40	7.80	2.40		Coal	Moosehorn
AP15-014	30.70	33.60	2.90	2.90	Coal	Hoff
AP15-014b	5.49	7.32	1.83	1.83	Coal	Moosehorn
AP15-016	115.82	117.90	2.08	7.28	Coaly Shale	Moosehorn
AP15-016	117.90	120.00	2.10		Coal	Moosehorn
AP15-016	120.80	123.90	3.10		Coal	Moosehorn
AP15-016	183.90	186.80	2.90	6.10	Coal	Hoff
AP15-016	187.10	190.30	3.20		Coal	Hoff
AP15-017	108.51	109.70	1.19	1.79	Coal	Hoff
AP15-017	116.60	117.20	0.60		Coal	Hoff
AP15-018	36.58	37.90	1.32	1.32	Coal	Moosehorn
AP15-018	61.30	62.20	0.90	2.75	Coal	Hoff
AP15-018	63.00	64.85	1.85		Coal	Hoff
AP15-018	126.80	128.30	1.50	1.50	Coal	Solomon
AP15-019	65.70	66.90	1.20	2.40	Coal	Solomon
AP15-019	68.90	70.10	1.20		Coal	Solomon
AP15-019	91.85	92.00	0.15	0.15	Coal	Stray
AP15-020	38.20	39.00	0.80	0.80	Coal	Stray
AP15-020	47.00	48.00	1.00	2.30	Coal	Solomon
AP15-020	48.50	49.20	0.70		Coal	Solomon
AP15-020	50.10	50.70	0.60		Coal	Solomon

* Coal intersections are not necessarily true thickness due to drillhole inclination and dip angles

Table 10-3. 2015 Rotary Drilling Composite Coal Samples

Sample	Drill Hole	From (m)	To (m)	Length (m)	Seam
AP15-001-01	AP15-001	22.20	25.90	3.70	Hoff
AP15-003-01	AP15-003	45.00	48.40	3.40	Solomon
AP15-009-01	AP15-009	27.10	28.90	1.80	Moosehorn
AP15-009-02	AP15-009	53.30	54.20	0.90	Hoff
AP15-009-03	AP15-009	59.00	59.90	0.90	Hoff
AP15-012-01	AP15-012	71.40	72.60	1.20	Solomon
AP15-014-01	AP15-014	5.40	7.80	2.40	Moosehorn
AP15-014-02	AP15-014	30.70	33.60	2.90	Hoff
AP15-016-01	AP15-016	117.90	123.90	6.00	Moosehorn
AP15-016-02	AP15-016	183.90	190.30	6.40	Hoff
AP15-018-01	AP15-018	36.58	37.90	1.32	Moosehorn
AP15-018-02	AP15-018	61.30	64.85	3.55	Hoff
AP15-020-01	AP15-020	47.00	49.20	3.70	Solomon

Drilling in the north area of the property along lines P-0200, P-0300, and P-0400 was planned to test seams within the Grande Cache member on both limbs of the major anticline west of Coal Hill (Figure 7-4). Historic drillhole WH017DA and several seams originally exposed by previous road construction were located on the eastern limb of the anticline. At several sites, a vertical and an incline hole were drilled in an effort to constrain dips and true thickness of coal seams (Figure 10-1, Table 10-1). Drillhole AP15-001 was located on the steeply dipping east limb near WH017DA to intersect the seams exposed along the P-0300 access. Drillholes AP15-002 through 006 and 008/009 were drilled on the more gently dipping west limb. Holes AP15-004/005 and 008/009 were drilled from just above the Mountain Park- Grande Cache contact and intersected a complete section of the Grande Cache Member above a west-dipping thrust fault (Figure 7-7). AP15-006 intersected only the Moosehorn seam in a partial section above another thrust fault splay. AP15-002/003 and 001 were drilled in the lowest fault slice within the Grande Cache. AP15-001 was the pilot hole to intersect the Solomon seam prior to coring (APC-011 and 011a (Table 10-3)). Drillholes AP15-007 and 010 were started in Mountain Park, to cut down into the Grande Cache, but failed to intersect coal.

Drilling in the central area of the Property along lines P-0700 and P-0800 was planned to test seams in the nose of the same anticline drilled in the north. AP15-012, 019 and 020 were drilled on the west limb and encountered only the Solomon seam before crossing a west-dipping thrust. AP15-014 was drilled on the crest of a smaller anticline on the east limb, which had been exposed in the building of the P-0700 access road. It cut both the Moosehorn seam which showed a thickened exposure of over 4 m in the cut bank, and the Hoff seam at depth. It was targeted for a core hole for the Hoff seam (APC-014) but a fault cut the seam off and no sample was taken. An offset hole to the west to cut the Moosehorn seam (APC14-014a) encountered oxidized coal (Table 10-3). AP15-015/016 were drilled from the Mountain Park to intersect the Grand Cache and cut the Moosehorn and Hoff seams exposed in the P-0800 access road. AP15-015 was lost before the Grande Cache was intersected. AP15-016 cut both the Moosehorn and Hoff seams (Table 10-2).

10.2 CORE DRILLING

Coring was carried out by Rocky Mountain Drilling with one of the truck-mounted Atlas Copco TH60 air hammer rotary drill rigs used in the conventional drilling program. Holes were drilled with a 12" (30.5cm) rotary bit to set six metres of 10¾" (27.3 cm) casing which was later recovered. Drilling to core point was 8" (20.3 cm) rotary, and coring through designated seams was done with a ten foot non-wireline core barrel lined with plastic tubing, producing 6" (15 cm) diameter core.

Four core holes were drilled at two locations (Table 10-3). APC15-011 was drilled adjacent to AP15-011 to test the Solomon seam which had two splits. APC15-011a was drilled with about a 2 m offset to attempt better recovery by leaving a short rock plug above the seam, unlike APC15-011 which was cored directly from the top of the coal. It was determined that this approach did not yield better recovery as only 61 cm of coal was recovered from nearly two metres of intersection. Core hole APC15-014 was drilled with about a 2.5 m offset from AP15-014 to target the Hoff seam, but did not encounter coal at 31 m depth as planned. The seam was faulted out, therefore no coring took place and the hole was abandoned. The rig was repositioned to the road immediately northwest of APC15-014 (Figure 10-1) and two short pilot holes were drilled to determine the fault geometry. AP15-014a did not intersect the Hoff seam. AP15-014b which was drilled some 20 m to the southwest of AP15-14a intersected the Moosehorn seam at 8 m. As the seam was dry and below a tight sandstone cap it was decided to core the Moosehorn seam. Top of the seam was at 7.3 m depth but the coal proved to be oxidized (Table 13-11).

Table 10-4. 2015-6" (15 cm) Core Coal Samples

Sample	Drill Hole	From (m)	To (m)	Length (m)	Seam
APC15-011-01	APC15-011	13.87	15.30	1.43	Solomon
APC15-011-02	APC15-012	17.40	18.80	1.40	Solomon
APC15-014a-01	APC15-014a	7.32	8.23	0.91	Moosehorn

11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

Coal samples were collected during the 2015 exploration program from conventional drilling and core drilling. Different protocols were used for sampling and analysis. They are described below.

11.1 CONVENTIONAL DRILL SAMPLING

For each drillhole, lithologic chip samples were collected by the driller's helper, from the sample stream several times for each 3 m run. They were rinsed and placed in a chip tray with the drillhole number and interval marked. Trays were collected by the site geologist and logged. Coal chip samples were collected by members of the drill crew from the cyclone sampling output stream under supervision of a site geologist. The driller was instructed to stop drilling at first signs of coal, circulate and drill at 0.5 m intervals. Each interval was bagged separately in a cloth bag to allow wet samples to drain. Each bag was marked and tagged with the appropriate interval at the drill. Samples were collected by the site geologist from the drill, taken to camp, allowed to drain and inspected. Seam samples under 0.5 m were rejected, as they were dominantly shale samples. Samples were sorted and composited for each seam, and packed in sealed labeled plastic bags. The bags were placed in sealed plastic pails and shipped via courier to the Birtley Coal and Mineral Testing Division of GWIL Industries Inc. in Calgary, AB (Table 13-9). Subsamples were forwarded to David E. Pearson and Associates Ltd., in Victoria, BC, for petrographic analysis.

11.2 CORE SAMPLING

Core was removed from the core barrel in 6" plastic liners in nominal 10 ft (3.04 m) lengths for logging and photographing by the site geologist. Coal intervals were sampled separately and placed immediately into sealed plastic bags with sample number and interval marked. The site geologist transported the samples to camp, where they were sealed in plastic pails. Samples were transported by the site geologist back to the Dahrouge office in Edmonton, AB, and shipped via courier to the Birtley Coal and Mineral Testing Division of GWIL Industries Inc. in Calgary, AB (Table 13-11). Subsamples were forwarded to David E. Pearson and Associates Ltd., in Victoria, BC, for petrographic analysis.

11.3 PETROGRAPHIC SAMPLES

Petrographic analysis was conducted on thirteen composite washed rotary chip samples and three washed core samples to ascertain coal rank and composition. The samples were prepared and analyzed by David Pearson and Associates in Victoria, BC (Table 13-10, Table 13-15).

11.4 LABORATORY SAMPLE PREPARATION AND ANALYSIS

Composited conventional drilling chip samples were sent to Birtley Coal and Mineral Testing Division of GWIL Industries Inc. in Calgary, AB. Upon receipt, samples were weighed and air-dried. Samples were crushed to minus 9.5 mm if required, and a representative split of about 500 g was selected for float/sink analysis. The clean float samples were subjected to full proximate analysis, as well as sulphur, and FSI (Free Swelling Index). HGI (Hardgrove Grindability Index) was not determined as samples were too fine (Table 13-9). These results are discussed in Section 13.

Core samples were sent via courier to Birtley Coal and Mineral Testing in Calgary, AB (Birtley). Samples were weighed and air-dried. Prior to crushing, an apparent relative density determination was made to aid in determining recovery and composite choices. Samples were then crushed to pass minus 12.5 mm if required, and screened to ± 0.25 mm. Subsamples of $\frac{1}{4}$ or less, depending upon mass, were taken and a raw coal head sample was assayed for proximate analysis, sulphur, FSI (free swelling index) and LT% (light transmittance) to determine level of oxidation (Table 13-11). The retained split for unoxidized samples was screened to ± 0.25 mm. On the plus 0.25 mm fraction, a float sink test was conducted at 1.40, 1.50 and 1.60 SG and the fractions assayed for proximate analysis, sulphur, and FSI. For the minus 0.25 mm fraction, a modified starvation release froth method was employed, and the fractions again assayed for proximate analysis, sulphur, and FSI. The clean coal composite was run for full proximate analysis, sulphur, FSI, fluidity, dilatation, phosphorus in coal and mineral analysis of the ash. A split of the clean coal was sent directly to David E. Pearson and Associates Ltd., in Victoria, BC, for petrographic analysis.

These results are discussed in Section 13.

11.5 QUALITY CONTROL AND QUALITY ASSURANCE

Laboratories used for coal analysis during the Palisades program have established industry experience. 2015 Palisades coal samples were analyzed by Birtley using ASTM D2013, D 3302, D3173, D3174, D3175, D4239, D720, D5263, D5515, D2639, D3682, D2795, and D4371 procedures. Birtley adhere to ASTM and ISO preparation and testing specifications and have quality control processes in place. They have participated in the International Canadian Coal Laboratories Round Robin Series (CANSPEX) since its inception. They are also part of the ISO Technical Committee for Canada for TC27 and its associated subcommittees for coal preparation and coal testing. Pearson Coal Petrography has provided services in Victoria since 1981. They operate to ISO standards, undertake routine calibration of photometers and potentiometers, and employ two methods of vitrinite reflectance as a means of quality assurance. They also perform a monthly internal round robin check between their four labs worldwide. Vitrinite reflectance was employed in part to provide an independent valuation of coal rank.

Conventional drilling and core intervals containing coal were sampled in 2015 using project-defined procedures, processed as raw and clean coal samples, and analysed as described. The major issues affecting coal quality analyses during the program were:

The imprecise nature of conventional drilling sampling (thin coal intersections were poorly recovered or over-contaminated with out-of-seam rock in the open hole) as reflected by the high ash content (typically greater than 50%) and the fine size of the material which cannot be qualified as truly representative of the insitu coal seam. As such the value of this sample information is primarily limited to the determination of coal rank only (expressed as R_0 Max).

The six inch coring program was somewhat limited by recovery problems due to the extremely sheared nature of the coal seams. Overall coal seam recoveries at the two sampling sites were 60% and 84% respectively.

The results are discussed in Section 13.

12 DATA VERIFICATION

Author Robert Engler visited the Property on June 3-4, September 9-10, September 25, and October 8-9, 2015. He reviewed geology and stratigraphy, drilling and sampling methodology, as well as core sampling and methodology. Mr. Gorham visited the Property on June 1-15, August 12-14, 17-23, September 1-5, 8-30, and October 1-10, 2015. He reviewed geology and mapping, and supervised drill site location, and sampling, as well as shipping and security of samples. Mr. Miller did not visit the Property.

Historical data including mapping, geophysical logs, location data and coal intersections were reviewed and verified for consistency in 2013, and re-evaluated in 2015. As mentioned in the previous section, original logs and analytical data were not always available. The authors have relied on the professional quality of the historic work. The authors have concluded that work completed by Rio Tinto and Denison was completed in a professional manner that was consistent with the data collection and reporting standards of the time, and can therefore be incorporated in interpretation for modelling purposes.

Some limitations to the data set generated during the program were noted. The regularity with which chips were retrieved, sieved, and washed was generally consistent. A 0.5 m sample interval for coal seams was chosen to minimize contamination while being practical for drilling rates. It must be assumed that some part of the top of a seam would be lost, as the driller must react quickly to an increase in penetration rates and stop drilling, circulate to observe cuttings for coal and initiate coal sampling. Similarly, the last sample of a given seam has potential to include some of the floor rock before the driller can react and stop cutting. As the sample interval approaches the actual seam thickness, under-reporting and rock contamination increase. It must be assumed that this was a factor in the Palisades program.

Lithologic chip sampling during rotary drilling is by its nature imprecise, as circulation return time varies with depth. Some depth correction, especially for sharp lithologic changes such as coal seams, can be achieved with downhole geophysical logs, which provide more accurate depth picks and thicknesses for seams. Of the 22 conventional rotary holes drilled in the 2015 program, two short pilot holes (AP15-014a, and AP15-014b) had no down-hole geophysical logs as their purpose was to define coal intersection for coring. AP15-001 had only a partial open-hole electrologs due to collapse when rods were pulled. Five holes (AP13-003, AP13-005, AP13-006, AP13-014 and AP13-018) had only partial open-hole logs due to blockages after rods were pulled. Seam and lithologic picks for these holes were therefore incomplete.

Selected historic drillhole and trench information from programs by Rio Tinto and Denison was used to support geologic interpretation from the 2013 and 2015 drilling information. This integrated interpretation was used in the current resource estimation. Altitude and Dahrouge were not involved in the historic coal quality sampling programs. Original logs and analytical information for the historic drilling and trenching were not available. Although the Rio Tinto program employed conventional theodolite surveying of collars and trenches in the Coal Hill area, details for Denison program were unavailable, therefore collar locations were georeferenced. The authors acknowledge some uncertainty, especially in elevations for this information. Reliance on seam picks and thickness was based on the assumption of employment of best practices on the part of geological professionals for both companies.

The authors note that air blast drilling techniques in open holes likely contributed to some of the relatively high ash contents observed in some reverse circulation samples. The lack of open-hole geophysical logs in three drillholes, and the partial blockage of other holes reduced the ability to interpret subsurface geology and seam correlation, reducing somewhat the robustness of the geological model upon which resource estimation is based. The lack of outcrop in many areas of the Property also hampers geological and structural interpretation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 COAL QUALITY ASSESSMENT

This section deals with an assessment of coal quality for the Palisades Property based on previous work Reported by Denison Mines Ltd in 1983 and the results of coring and sampling undertaken by Altitude during the 2013 and 2015 exploration campaigns.

13.1.1 COKING COAL QUALITY ASSESSMENT PARAMETERS

The main analytical criteria for coking coal evaluation are:

Coal Rank and Petrographic Composition

Coking coals only occur within a certain coal rank window as measured by vitrinite reflectance (R_0 Max). The range is from R_0 1.0 to 1.6 (high-volatile to low-volatile bituminous). Palisades coking coals are typically low-volatile bituminous (R_0 1.33 to 1.55).

As a general statement, the value of a particular coking coal is related its ability to form a hard coke product during carbonization. The mechanical strength of produced coke is measured by its resistance to abrasion. The ASTM coke stability test places 3 inch lump coke in a tumbler drum and screens the coal on a 1 inch screen after 1,400 revolutions. The amount remaining on the screen (expressed as a percent of total sample) is the Stability Index. In general, results over 55% are good, 60 to 65% are excellent. The Japanese run a similar test; the JIS drum Index D1 30/15; where 50 mm top size coke is rotated for 30 revolutions and the percentage of -15 mm is measured. Both tests do essentially the same thing and the results from one can be "translated" into the other format.

The strength of coke produced can be determined by the petrographic composition of the organic elements of the coal, called macerals. These are divided into reactive macerals (those that melt during coke making) and inert macerals (those that don't). It is important to have the right ratio of reactives to inerts to produce a strong coke.

Research conducted by US Steel proved that the ASTM coke stability Index could be predicted with a high degree of accuracy using petrographic (microscopic) analysis to determine two key criteria:

- coal rank as determined by the reflectance of vitrinite in a coal sample (R_0 Max)
- the amount of inert (non-melting) macerals within a coal sample.

The advantage to this technique is that it allows for a very accurate, cost effective test without the expense of having to physically produce a coke sample.

The following chart produced by David Pearson and Associates shows this fundamental relationship between rank, inerts and coke stability:

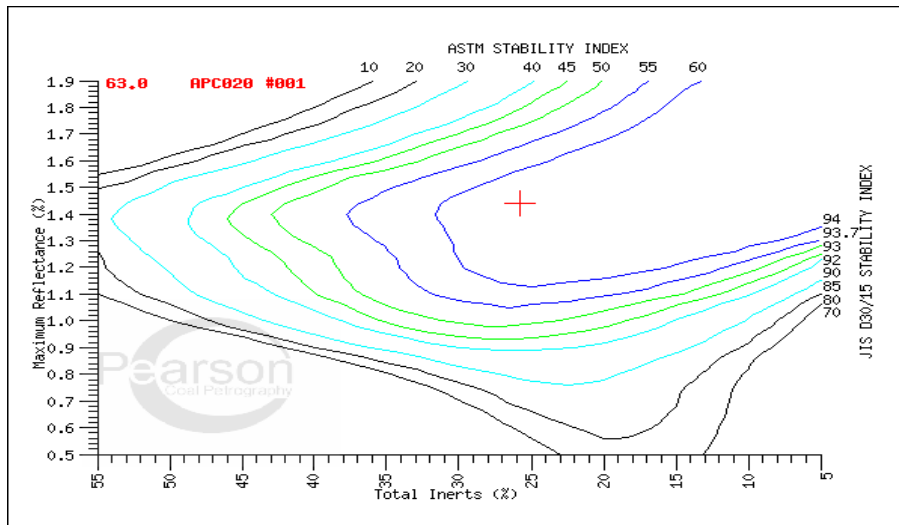


Figure 13-1. Relationship between Rank (R_0 Max), percent Inerts, and Coke Stability

The diagram shows that plotting the petrographic indices for rank (R_0 Max) and total inerts for any coal sample will allow a prediction of coke stability. In this particular example the plotted red cross is a sample from the Solomon seam (Sonic core APC13-020); with a stability of 63, which is excellent. One may also observe that if the level of inerts increases or the R_0 value starts to go up, the stability decreases.

The breakdown of coal macerals into reactives and inerts is based on whether they melt during the carbonization process. The reactives melt; the inerts as the name implies do not. Reactive macerals are typically vitrinite, half of the semifusinite, and exinite. Inert macerals are half of the semifusinite, fusinite (which is charcoal), micrinite and mineral matter. The relative proportion of these maceral types is determined by the composition of the original source materials.

Free Swelling Index (FSI)

This test measures the caking/swelling property of a coal sample when heated in a crucible in the absence of air. The resulting coke button is measured for expansion on a scale of 1 to 9. A good coking coal will have an FSI greater than 5. This is an easy test to perform and is used as an initial screening tool.

Rheology

The Gieseler Fluidity and Arnu Dilatation tests measure the plastic properties of coking coal through the heating cycle from initial melting temperature through to final solidification temperature. The fluidity test measures the viscosity of the coal when melted in a fluid state (measured in ddpm) and the dilatometer measures expansion and contraction during devolatilization. Coals with higher fluidity properties are good for blending, and low-pressure expansion and contraction on final coking are desirable in coke ovens.

Ash Chemistry

In addition to the stability index, coke stability after reaction (CSR) is an important evaluation parameter for evaluating a coking coal type.

When coke descends in the blast furnace, it is subjected to reaction with countercurrent carbon dioxide (CO₂), and abrasion. These concurrent processes weaken the coke and chemically react with it to produce excess fines that can decrease the permeability of the blast furnace burden.

The CRI/CSR test measures coke reactivity in carbon monoxide at elevated temperatures and its strength after reaction by tumbling. In the test, 200g of +19 x -22 mm sized coke is reacted in a vessel with CO₂ gas for 2 hours at 1,100°C. The weight loss after the reaction equals the CRI. The reacted coke is then tumbled in an I-shaped tumbler for 600 revolutions at 20 rpm and then weighed. The weight percent of the + 10mm coke equals the CSR. Most blast furnaces will require a coke with a CSR greater than 60 and CRI less than 25.

Research has shown that ash chemistry is a key factor in determining CSR values. The presence of alkaline elements such as Fe, Ca, Na and K has a catalytic effect on the reaction of CO₂ with coke, resulting in an accelerated breakdown in the blast furnace. Consequently, coals with low alkaline content will have the highest, most desirable CSR characteristics.

Nippon Steel and Kobe Steel have developed formulas to predict CSR and CRI values. The input parameters are coal rank (R₀), fluidity and ash chemistry.

The other evaluation aspect that warrants consideration is the phosphorous content of the coke. The acceptable maximum limit is 0.27% P₂O₅ in coke; which means the coal should have less than 2.5% P₂O₅ in the ash.

13.2 COKING COAL QUALITY TESTING RESULTS

13.2.1 HISTORIC RESULTS (DENISON)

The historic Denison work conducted in 1981/82 was summarized in the Technical Report *Resource Estimate for the Palisades Coal Property* (Engler and Morris, 2011) filed on SEDAR. The report concluded:

- The coal underlying the Palisades Coal Property is low-volatile bituminous coking coal as defined by ASTM D-388 and confirmed by an average R₀ value of 1.51.
- The raw, in situ coal ash content varied from 48.24 to 11.41% with an average value of 29.8%. Limited washability testing showed that a clean coal product in the 10% ash range could be produced at a 1.50 SG cut-point.
- The clean coal had a volatile matter content of 19 to 20% dry basis and a sulphur content averaging 0.50%. The phosphorous level in coal was low, ranging from a high of 0.085% to a low of 0.005%. FSI values ranged from 7 to 9, indicating good coking capacity.
- The coal had low fluidity values and acceptable dilatation values.
- Petrographic analysis indicated a good predicted stability factor of plus 50 at a reactivities/inerts ratio of 70%/30%.

The primary historic data was based upon 10 HQ diamond drillholes. The recovery was poor in general due to the friable nature of these coals and as such only ten of the twenty seven cored sections could be considered representative.

13.3 2013 AND 2015 RESULTS (ALTITUDE)

The 2015 program was designed to extend the known quality information of the Palisades deposit from the northern Coal Hill prospect area, where most of the 2013 work by Altitude previous historic data was concentrated, southward and westward. Coal quality confirmation was to be achieved by coring (which has minimal contamination risk) and additional petrographic analysis of chips of selected seams from conventional drillholes. As only a limited number of intersections of suitable depth and attitude were encountered from which to collect representative seam cores, the 2015 data set is small, therefore combined 2013 and 2015 results are presented below.

13.3.1 2013 Reverse Circulation Samples

Reverse circulation chip samples were collected from each coal intersection encountered. In almost all cases, these samples were high in ash content, suggesting considerable rock contamination. The raw samples were floated at 1.60 SG and both proximate analysis and FSI were conducted on the floats. The results are shown on the following Table 13-1.

Table 13-1. 2013 Reverse Circulation Composite Proximate Analyses (air dried).

Sample	Seam	% Moisture	% Ash	% Volatiles	% DAF Volatiles	% Fixed Carbon	1.60 float Ash	1.60 float FSI	% Sulphur
AP003-001	Solomon	7.2	65.56	10.78	17.76	23	29.58	3.5	0.43
AP003-002	Solomon	13.1	59.45	12.06	18.25	27.69	21.01	7.5	0.36
AP007-001	Solomon	15.2	54.97	13.14	16.66	30.88	17.25	2.5	0.3
AP009-001	Solomon	16	54.98	12.82	18.85	31.51	15.2	5	0.33
AP014-002	Solomon	16.3	34.94	16.98	19.70	47.47	16.84	4	0.76
AP014-003	Moosehorn	12.4	65.52	12.69	27.03	21.03	31.71	7	0.34
AP014-004	Hoff	11.9	60.57	12.01	16.64	26.67	26.39	6.5	0.3
AP014-005	Hoff	11.8	60.37	11.33	18.88	27.5	16.8	8.5	0.32
AP014-006	Solomon	12.8	44	13.75	19.01	41.62	16.89	7	0.53
AP015-001	Hoff	8.7	45.23	13.27	17.17	40.76	26.47	2.5	0.44
AP016-001	Solomon	10.5	58.06	12.32	15.11	28.56	33.82	0	0.28
AP016-002	Solomon	12.3	56.79	12.7	15.75	29.77	30.65	3.5	0.69
AP017-001	Hoff	7.7	70.89	10.7	17.45	17.66	29.41	4.5	0.31
AP017-002	Solomon	3.8	59.24	12.64	18.14	27.54	18.94	6.5	1.09
AP020-001	Solomon	9.7	31.28	16.68	20.07	51.6	12.86	7	0.4
AP021-001	Solomon	6.4	47.28	14.19	20.38	37.88	17.14	8.5	0.4
AP024-001	Hoff	12.2	53.81	12.79	18.79	32.8	22.79	3.5	0.3
AP024-002	Solomon	17.7	50.02	13.84	15.72	35.55	40.68	2	0.33
AP026-001	Solomon	15.6	50.11	13.68	16.22	35.52	27.89	3.5	2.54
AP026-002	Solomon	14.8	53.36	13.56	18.31	32.32	26.29	7.5	1.57
AP026-003	Solomon	15.8	54.19	14.09	17.37	30.97	26.08	5	1.91

Most of the samples fall in the low-volatile bituminous rank on a dry, ash-free (DAF) volatile matter basis (average 18.5% volatiles). One sample, (AP014-003) falls into the mid-volatile category. Ash content is generally high, with 16 of 21 samples containing over 50% ash on an air dried basis. The 1.60 float separation did not achieve a good ash separation due to the fine particle size of the material and therefore should not be considered representative of washing performance. Sulphur values are low, generally below 0.5% and FSI values range from 2 to 8.5, with an average of 5. The low-volatile

rank determination by DAF volatile matter is the key parameter of values from these chip samples as it is the least affected by bias in this imperfect sampling technique.

13.3.2 2013 Trench Samples

Seven full seam trench samples were excavated on the property, five in the Coal Hill area and two in the south near Solomon Creek. As these were all near-surface samples, the coal was oxidized and therefore had no rheological properties (FSI, fluidity, and dilatation). As these sampled sections are complete in terms of recovery, they are useful in characterizing the in situ ash content and petrographic makeup of the coal. Proximate analysis and sulphur content was conducted on the raw and 1.60 SG clean coal material. The results are shown in the following table.

Table 13-2. 2013 Trench Sample Proximate Analysis

Sample	Thickness (m)	Raw Ash% dry basis (db)	Clean Coal Proximate Analysis 1.60 SG float					
			Yield %	Ash % db	VM % db	VM% daf	S % db	FSI
Solomon Seam								
TRAP012-001 Coal Hill	1.2	22.75	77.14	13.39	27.81	32.11	0.44	0
TRAP012-002 Coal Hill	2.4	10.05	100	10.05	26.46	29.42	0.43	0
TRAP019-001 Coal Hill	1.4	7.56	100	7.56	29.99	32.44	0.43	0
TRAP023-001 Coal Hill	1.3	30.75	61.24	11.76	25.34	28.72	0.49	0
TRAP024-001 South	2	24.16	52	13.58	26.52	30.69	0.39	0
TRAP025-001 South	1.8	28.43	45.5	14.64	24.78	29.03	0.37	0
Moosehorn Seam								
TRAP010-001 Coal Hill	1.4	29.44	47.2	10.96	29.32	32.93	0.42	0

The results show that the surface trench samples are lower in ash content than the contaminated reverse circulation samples. The raw coal in situ ash content ranges from 7.56% to 30.75%. The 1.60 SG yield values are encouraging but should not be regarded as definitive. The volatile matter and FSI results are distorted by oxidation and should be disregarded.

In order to establish coal rank, these samples were analyzed for petrographic composition. The results are shown in the Table 13-3.

Table 13-3. 2013 Trench Sample Petrographic Analysis

Sample	Trench Samples Petrographic Analysis, Clean Coal									
	Reflectance		Reactive Macerals			Inert Macerals			Mineral Matter	Total Inerts
	Ro Max	Vitrinite	Semi-Fusinite	Total Reactives	Semi-Fusinite	Fusinite	Inerts	Macrinite		
Solomon Seam										
TRAP012-001 Coal Hill	1.35	68.6	7.9	76.5	7.9	2.3	6		7.3	23.5
TRAP012-002 Coal Hill	1.47	60.8	11.9	72.7	11.9	4.5	5.1	0.2	5.6	27.3
TRAP019-001 Coal Hill	1.49	58.4	14.2	72.6	14.2	7.3	1.7		4.2	27.4
TRAP023-001 Coal Hill	1.37	71.1	8.4	79.5	8.4	3.2	2.4		6.5	20.5
TRAP024-001 South	1.5	53.5	15	68.5	15	5.2	3.5	0.4	7.4	31.5
TRAP025-001 South	1.49	50.4	14.9	65.3	14.9	8.3	2.8	0.7	8	34.7
Moosehorn Seam										
TRAP010-001 Coal Hill	1.34	71.6	7.9	79.5	7.9	3.4	3.2		6	20.5

The results show Ro Values ranging from 1.34 for the Moosehorn seam, to 1.50 for the Solomon seam near the southern boundary of the property. It is not surprising to see a rank of 1.34 for the Moosehorn as it is stratigraphically at the top of the section and should have a lower rank (in this case mid-volatile) than the lower Solomon seam. What is surprising is the two mid-volatile Ro values for the Solomon seam (1.35 and 1.37 respectively) and it may be possible these seams are misidentified in this complex structural regime. The compositional ratio of reactives to inerts averages 72%/28% which is excellent and should result in a high ASTM stability coke product, with a predicted value of 64.

13.3.3 2013 Sonic Core Samples

Three sonic core holes were completed on the property, two in the northern Coal Hill area, and one near a large trench exposure in the south near Solomon Creek with mixed results. In drillhole APC13-020, a relatively clean 1.26 m Solomon seam was collected with excellent recovery.

Drillhole, APC13-016 intersected five fault-repeats, or in some cases splits of the Solomon seam. The initial split seam was intersected at 16.6 m with poor recovery and oxidised coal (Sample 001). The next intersection from 18.5 to 19.5 m was also oxidized and high ash (Samples 004 and 005). The third section from 32 to 34.4 m was a mixture of coal and shaley coal (Samples 006 to 010). The fourth section, from 36.3 to 37.8 m was a full 1.50 m of coal (Sample 012). The final section was recovered from 42.0 to 43.9 m. This section was predominantly shaley coal (Samples 014 to 016).

The third hole, APC13-007 was drilled near trench TRAP13-024 where a 2 m thick Solomon intersection was measured. The sonic hole intersected this same zone at 50 m, but the recovered 2.2 m section was almost entirely shaley coal.

As a consequence of this, only drillhole APC13-020 and sample interval 012 from drillhole APC13-016 could be considered "coal sections". The remaining samples had a large amount of shaley coal. The results of the raw coal proximate analysis are shown in the following table:

Table 13-4. 2013 Sonic Core Composite Head Raw Analysis (air dried basis).

Seam	Sample	Moisture %	Ash %	Volatiles %	F.C.%	S %	FSI*
Solomon Coal Hill	APC020-001	0.41	*16.66	18.65	64.28	0.49	7
			+16.73	18.73	64.54	0.49	
Solomon Coal Hill	APC016-001	0.38	*37.77	13.29	48.56	0.35	0
			+37.91	13.34	48.75	0.35	
Solomon Coal Hill	APC016-004 to 005	0.58	*47.96	12.48	38.98	0.28	0
			48.24	12.55	39.21	0.28	
Solomon Coal Hill	APC016-006 + 008 to 010	1.2	*52.45	12.42	33.93	0.49	0
			+53.09	12.57	34.34	0.5	
Solomon Coal Hill	APC016-012	1.73	*43.17	12.48	42.62	0.88	1
			+43.93	12.7	43.37	0.9	
Solomon Coal Hill	APC016-014 to 016	0.97	*47.41	13.16	38.46	0.54	1
			47.87	13.29	38.84	0.55	
Solomon South	APC007-001 to 005	0.8	*63.13	9.67	26.4	0.27	0
			+63.64	9.75	26.61	0.27	

*adb: air dried basis

+ db: dry basis

In order to assess the potential clean coal coking characteristics of these sonic core samples, the raw samples were washed at 1.60 SG and if required, 1.50 SG in an attempt to produce a 10% ash clean product (Table 13-5).

Table 13-5. 2013 Sonic Core Washability Analysis

Sample	Thickness (m)	Raw Ash % db	Float SG	Clean Coal Proximate Analysis					FSI
				Yield %	Ash % *db	VM % *db	VM% *daf	S % *db	
Solomon Seam									
APC13-020 Coal Hill	1.26	16.73	1.6	82.25	8.67	17.03	18.65	0.53	8
APC13-016 001 Coal Hill	0.31	37.91	1.5	27.85	12.5	17.08	19.52	0.53	0
APC13-016 004-005 Coal Hill	0.8	48.28	1.5	11.6	10.75	17.56	19.68	0.48	0
APC13-016 006, 008-010 Coal Hill	1.45	53.09	1.5	17.21	8.75	20.03	21.95	0.75	8.5
APC13-016 012 Coal Hill	1.5	43.17	1.5	28	11.05	17.41	19.57	0.64	4.5
APC13-016 014-016 South	1.61	47.87	1.6	28.3	9.92	19.94	22.14	0.68	9
APC13-007 South	2.23	63.64	1.5	3.47	13.94	17.33	20.14	0.52	0.5

* db = dry basis

+daf = dry, ash-free

The results show an excellent yield, clean product ash and high FSI value of 8 for APC13-020. Lower yields were expected from the high ash samples of APC13-016 and the 0 FSI value in the upper section of the hole confirms that these samples are oxidized. The lower section samples show good FSI and ash values. The sample from sonic core hole APC13-007 is mostly shale and the small amount of clean coal recovered at 1.50 SG is only useful in determining rank by reflectance. The low FSI also confirms oxidation in this seam.

These clean coal samples were analyzed for fluidity and dilatation to get some values for the plastic properties of this coal. The results of these test is shown in Table 13-6. These same samples were analysed for petrographic composition (Table 13-7).

The results show low fluidity values ranging from 7 to over 40 which is typical of western Canadian low volatile coal. The dilatation test shows these coals are contracting (-22% average) and have positive dilatation, both of which are good for coke-making. The oxidized samples exhibit no plastic properties at all.

Table 13-6. 2013 Sonic Core Samples Rheology

Sonic Core Samples Rheology										
Sample	Gieseler Fluidity					Dilatation				
	Initial Soft (°C)	Max. Fluidity (°C)	Solidification (°C)	Range (°C)	Max. Ddpm*	Soft Temp °C	Max. Contr. Temp °C	Max. Dil. Temp °C	Contraction	% SD 2.5
						T1	T2	T3	%	
APC13-020	445	469	494	49	6.9	400	463	487	23	5.7
APC13-016 001	Oxidized									
APC13-016 004-005	Oxidized									
APC13-016 006,008-010	438	475	500	62	40.5	421	451	484	21	38
APC13-016 012	450	475	501	51	3.7	400	500	-	23	-
APC13-016 014-016	436	466	497	61	47.3	406	445	476	21	51.1
APC13-07 South	Oxidized									

* Ddpm = dial divisions per minute

Table 13-7. 2013 Sonic Core Petrographic Analysis

Sonic Core Petrographic Analysis, Clean Coal											
Solomon Seam	Reflectance	Reactive Macerals			Inert Macerals					Total Inerts	Pred. Stab.
	R ₀ Max	Vitrinite	Semi-Fusinite	Total Reactives	Semi-Fusinite	Fusinite	Inerts	Macrinite	M.M.*		
APC13-020	1.44	61.1	13.1	74.2	13.1	6.3	1	0.6	4.8	25.8	63
APC13-016 001	1.47	53.4	15.8	69.2	15.8	5.4	1.5	1.1	7	30.8	60
APC13-016 004-005	1.49	45.7	20.1	65.8	20.1	5.8	2.1	0.2	6	34.2	56
APC13-016 006,08-010	1.49	92.2	0.8	93	0.8	1	0.4		4.8	7	65
APC13-016 012	1.49	47.3	18.6	65.9	18.6	6.9	1.3	1.1	6.2	34.1	56
APC13-016 014-016	1.52	80.7	4	84.7	4	4	1.5	0.4	5.4	15.3	65
APC13-007 south	1.53	67.8	10.2	78	10.2	3.3	0.4	0.06	7.5	22	63

*M.M. = Mineral Matter

The results show a consistent trend in rank increasing slightly from R₀ 1.44 in the north to 1.53 in the south. This is a relatively consistent rank for the Solomon Seam and agrees with trench sample petrography and historic Denison results. The relatively clean seam in drillhole APC13-020 shows an excellent ratio of reactivities/inerts of 74/26 and an excellent predicted stability of 63. The lower stability in the two samples from APC13-016 (samples 004-005, and 012) are attributed to low vitrinite content in these same samples. The drillhole APC13-007 sample shows similar reactivities/inerts composition to drillhole APC13-020 and the same excellent predicted stability of 63.

The last phase of lab testing was for the determination of coal ash chemistry. The results for the ten element ash analysis conducted on the clean sonic core samples are shown in Table 13-8.

Table 13-8. 2013 Sonic Core Ash Chemistry

Sample Solomon Seam	Sonic Core Petrographic Analysis, Clean Coal											
	Acid Elements			Basic Elements								
	SiO ₂	Al ₂ O ₃	TiO ₂	CaO	BaO	SrO	Fe ₂ O ₃	MgO	Na ₂ O	K ₂ O	P ₂ O ₅	
APC13-020	61.41	27.68	1.37	1.02	0.3	0.09	2.56	0.88	0	1.49	0.52	0.57
APC13-016 001	68.24	22.47	1.95	0.38	0.17	0.03	1.83	0.7	0.08	1.47	0.26	0.05
APC13-016 004-005	67.49	20.82	1.27	0.57	0.13	0.01	5.1	1.21	0.97	1.72	0.33	0.05
APC13-016 006,008-010	60.47	24.26	2.51	0.59	0.39	0.03	4.3	1.89	0.35	2.82	0.29	0.1
APC13-016 012	70.27	19.27	1.25	0.7	0.17	0.03	3.77	0.75	0.18	0.92	0.22	0.3
APC13-016 014-016	61.26	26.02	1.97	0.43	0.19	0.03	3.63	1.66	0.42	2.72	0.28	0.12
APC13-007 south	61.41	27.68	1.37	1.02	0.3	0.09	2.56	0.88	0	1.49	0.52	0.57
Average Value	64.86	23.42	1.72	0.62	0.23	0.04	3.53	1.18	0.33	1.86	0.32	0.2
STD	4.28	3.18	0.51	0.23	0.1	0.03	1.18	0.5	0.35	0.76	0.11	0.2

The results shown very low alkaline element content, averaging 7.8% with a maximum of 10.4%. The base/acid ratio averages 0.010 ± 0.002 which is excellent and should produce a coke with high CSR values of at least 70. The Phosphorous level is extremely low. Expressed on a whole coal basis as Phosphorous in Coal, the value is 0.014 ± 0.003 . Both the low alkaline and phosphorous content are very positive attributes for steel making coking coals

13.4 2015 RESULTS (ALTITUDE)

The 2015 program was designed to extend the 2013 quality information from the northern Coal Hill area southwest into a previously unexplored area. The plan was to initially drill the area and then follow up with large diameter coring in confirmed areas where good coal intersections had been discovered.

Sonic coring used in 2013 was unsatisfactory in recovering good samples. The process pulverizes the coal section into powder and significant loss due to washouts was experienced. Large diameter six inch coring (15 cm) has proven to be an effective sampling technique in western Canada when dealing with highly friable coals and the hope was this method would be successful at Palisades. Due to time and budget constraints only two drill sites were cored (APC15- 011 and APC15-014).

Chip samples were also collected from thirteen drill holes to provide samples for rank determination. While these samples can't be truly considered representative of the actual coal intersections, the rank can be determined by vitrinite reflectance which is not compromised by this poor sampling technique. As a consequence, only a relatively small sample set was collected (Table 13-9).

13.4.1 2015 Drill Chip Samples

Drill chip samples were collected from each coal intersection and sampled in sealed plastic bags by the site geologist. These were washed at Birtley labs at 1.60 SG to produce a clean coal proxy for further analysis. The first step was proximate analysis (Table 13-9). The FSI results showed that samples AP15-14-01 and AP15-14-02 were oxidized. Sample splits were then sent to Pearson Petrographics for analysis (Table 13-10).

Table 13-9. 2015 Chip sample Proximate Analyses dry.

Sample	Seam	% Raw Ash	%Yield	1.60 float Ash	1.60 float Volatiles	% DAF Volatiles	% Sulphur	FSI
AP15-001-01	Hoff	35.87	40.85	9.91	19.19	21.3	0.57	5.5
AP15-003-01	Solomon	28.7	66.44	7.85	18.18	19.73	0.55	7
AP15-009-01	Moosehorn	21.31	70.91	10.74	17.41	19.5	0.56	5.5
AP15-009-02	Hoff	45.62	41.34	8.98	18.63	20.47	0.65	8
AP15-009-03	Hoff	33.07	60.66	6.05	17.31	18.21	0.53	5
AP15-012-01	Solomon	43.25	37.12	11.48	20.31	22.94	0.66	9
AP15-014-01	Moosehorn	26.26	58.43	7.98	18.87	20.51	0.52	0
AP15-014-02	Hoff	29.92	48.41	9.78	19.91	22.07	0.66	1.5
AP15-016-01	Moosehorn	24.66	62.93	7.83	20	21.7	0.54	9
AP15-016-02	Hoff	28.68	56.64	8.38	20.8	22.7	0.61	9
AP15-018-01	Moosehorn	46.69	38.38	13.13	19.51	22.46	0.55	7.5
AP15-018-02	Hoff	52.63	24.5	12.57	19.97	22.84	0.6	9
AP15-020-01	Solomon	67.47	7.62	15.4	18.1	21.39	0.65	9

The R_0 Max results for chip samples were compared to the known rank range for the three coal seams from the 2013 program. The three Solomon Seam results ranged from R_0 1.50 to R_0 1.51 which is consistent with previous results. The six Hoff Seam samples showed a wide variation from R_0 1.35 to R_0 1.55. Discounting these two outliers, the remaining four samples had a tighter range from R_0 1.39 to R_0 1.46 which is in the expected range for this seam. The four Moosehorn Seam Samples range from R_0 1.38 to R_0 1.47. This is above the expected R_0 1.35 average value for this seam. The 15 cm (6") core recovered at the APC 15-14-01 site had an R_0 of 1.33 as compared to the chip sample value of R_0 1.41.

The conclusion from these results is that, due primarily to the imprecise method of sampling an open hole chip stream, coal chips may be contaminated from other seams and therefore do not provide reliable results.

Table 13-10. 2015 Chip Sample Petrographic Analysis

Sample	Seam	R _o Max	Reactive Macerals			Inert Macerals						
			Vitrinite	Semi-Fusinite	Total Reactives	Semi-Fusinite	Fusinite	Inerts	Macrinite	M.M.*	Total Inerts	Pred. Stab.
AP15-001-01	Hoff	1.39	69.2	9.1	78.3	9.1	4	2.8	0.4	5.4	21.7	65
AP15-003-01	Solomon	1.51	64.2	12.6	76.8	12.6	2.1	3.4	0.4	4.5	23.2	63
AP15-009-01	Moosehorn	1.47	48.9	16.9	65.8	16.9	7.9	2.3	1.1	6	34.2	57
AP15-009-02	Hoff	1.46	77.1	5.9	83	5.9	3	3		5.1	17	65
AP 15-009-03	Hoff	1.55	55.1	14.9	70	14.9	8.1	3.5	0.2	3.3	30	56
AP15-012-01	Solomon	1.51	88.4	0.9	89.3	0.9	0.9	2.2	0.2	6.5	10.7	65
AP15-014-01	Moosehorn	1.41	61.9	11.3	73.2	11.3	7.1	3.8	0.2	4.4	26.8	63
AP15-014-02	Hoff	1.39	53.9	15.9	69.8	15.9	4.3	3.6	0.9	5.5	30.2	61
AP15-016-01	Moosehorn	1.41	56.8	11.3	68.1	11.3	11.9	3.4	1	4.3	31.9	60
AP15-016-02	Hoff	1.35	59.3	13.2	72.5	13.2	7.4	1.5	0.8	4.6	27.5	63
AP15-018-01	Moosehorn	1.38	50.5	16.1	66.6	16.1	5.9	2.4	1.7	7.3	33.4	58
AP15-018-02	Hoff	1.41	67	8.4	75.4	8.4	7.1	1.9	0.4	6.8	24.6	64
AP15-020-01	Solomon	1.5	82.9	3.1	86	3.1	1.1	1.1	0.2	8.5	14	65

*M.M. = Mineral Matter

13.4.2 2015 - 15 cm (six inch) Core Samples

The APC 15-11 core hole intersected a split Solomon Seam at a depth of 12 m. The combined coal thickness was 3.4 m. The upper and lower seam plies were collected separately (samples APC15-11-01 and APC 15-11-02). Overall recovery was 1.87 m or approximately 60% due to the very friable nature of the coal seam. The APC 15-14 core hole intersected the Moosehorn Seam at a depth of 7.33 m. The single seam was 91 cm thick of which 76 cm was retrieved, for an overall recovery of 84%.

The core intervals were logged on site and immediately sealed in plastic bags for transshipment to Birtley Labs. The samples were weighed and analyzed for raw proximate analysis, light transmittance (LT) and FSI (Table 13-11). LT tests are used to determine oxidation values below 92 indicate the onset of oxidation. As can be seen, the LT values show that the Moosehorn seam in the APC 15-14-01 sample is oxidized and has lost its FSI properties. The Solomon Seam samples (11-01 and 11-02) are unoxidized. The lower seam 11-02 sample is extremely high in ash content which is not consistent with the E-Log record; suggesting significant out-of-seam contamination in this sample.

Table 13-11. 2015 - 15 cm (six inch) Core Composite Head Raw Proximate Analysis.

Seam	Sample	Moisture %	Ash %	Volatiles %	F.C.%	LT %	FSI*
Solomon Upper	APC 15-11-01	0.76	*38.98 +39.28	*13.99 +14.10	*46.27 +46.62	99.8	3
Solomon Lower	APC 15-11-02	0.88	*56.21 +60.00	*10.40 +11.10	*27.08 +28.90	99.5	0.5
Moosehorn	APC 15-14 01	2.70	*34.06 +35.01	*17.52 +18.01	*45.72 +46.99	58.4	0

*adb: air dried basis

+ db: dry basis

A washability test program was undertaken to assess the characteristic of a clean coal product. The raw samples were screened at 12.5 mm and the plus 12.5 mm fraction was washed at three specific gravities (1.40, 1.50 and 1.60 sg). The minus millimetre fraction was treated by froth floatation. The objective was to produce a clean coal product in the 10% ash range. The test work showed an optimum yield was achieved at 1.50 sg for the Solomon samples. Due to oxidation, the Moosehorn Seam sample would not froth so a clean proxy was created from the 12.5 mm 1.60 float. The clean coal samples were analyzed for proximate analysis, sulphur, FSI, fluidity, dilatation, and mineral analysis of ash (Table 13-12 to Table 13-14). A representative split of each sample was sent for petrographic analysis (Table 13-15).

Table 13-12. 2015 - 15 cm (six inch) Core Washability Analysis

Sample	Thickness (m)	Raw Ash% *db	Float SG	Clean Coal Proximate Analysis				FSI
				Yield %	Ash % *db	VM % *db	S % *db	
APC 15-11-01	1.0	39.28	1.5	27.78	10.86	18.81	0.72	9
APC 15-11-02	1.0	60.00	1.5	21.75	9.99	17.35	0.61	2.5
APC 15-14-01	0.8	35.0	1.6	31.71	8.37	20.57	0.54	0

* db: dry basis

The washability results show poor yields from the APC-11 samples due to the high ash content of the raw coal. The upper 11-01 sample has an excellent FSI of 9, while the lower 11-02 sample is 2.5 which is likely due to a difference in petrographic components between the two. The 14-01 sample is oxidized so none of the minus 0.25 mm material would float. This of course contributes to the low yield number for this sample.

These clean coal samples were analyzed for fluidity and dilatation to get some understanding for the plastic properties of this coal (Table 13-13).

The results show low fluidity values ranging from 0.7 to over 16 for the Solomon Seam sample. The dilatation test shows this coal is contracting (-22%) and has positive dilatation, both of which are good for coke-making. The oxidized samples exhibit no plastic properties at all. These results are consistent with the 2013 data.

Table 13-13. 2015 - 15 cm (six inch) Core Sample Rheology

Sample	Gieseler Fluidity					Dilatation				
	Initial Soft (°C)	Max. Fluidity (°C)	Solidification (°C)	Range (°C)	Max. Ddpm*	Soft Temp °C	Max. Contr. Temp °C	Max. Dil. Temp °C	Contraction %	% Dil
						T1	T2	T3		
APC15-11-01	450	480	505	55	16	406	450	485	22	33
APC15-11-02		470			0.7	418	499		11	nil
APC15-14-01	Oxidized									

* Ddpm = dial divisions per minute

The last phase of lab testing was for the determination of coal ash chemistry. The results for the ten element ash analysis conducted on the clean 15 cm (six inch) core samples are shown in Table 13-14. They are very similar to the 2013 samples, with very low alkaline element content (Table 13-8).

Table 13-14. 2015 - 15 cm (six inch) Core Ash Chemistry

Sample	Acid Elements			Basic Elements								
	SiO ₂	Al ₂ O ₃	TiO ₂	CaO	BaO	SrO	Fe ₂ O ₃	MgO	Na ₂ O	K ₂ O	P ₂ O ₅	SO ₃
APC15 - 11-01	55.12	31.58	1.16	0.76	0.20	0.07	3.12	1.43	0.42	3.54	0.20	0.35
APC15-11-02	59.89	30.76	1.17	0.99	0.26	0.10	1.80	0.55	0.31	0.94	0.73	0.10
APC15-11-01	62.55	21.47	1.31	3.30	0.35	0.11	4.29	1.13	0.22	0.78	0.26	2.00

These same samples were analysed for petrographic composition (Table 13-15). The results show a marked contrast in composition between the upper and lower Solomon seam plies in APC 15-11. The upper ply is 89.6% Vitrinite which explains the high FSI (9) and fluidity values. The lower ply is only 45.5% Vitrinite resulting in a much lower FSI (2.5) and almost no fluidity. The combination of these two plies should result in a more balanced composition (reactives/inert ratio) and good coking characteristics. The R₀ Max value (1.45-1.52) confirms a low volatile rank. The APC 15-14 sample has an excellent composition (72.50% reactives/27.50% inerts) which should produce excellent coking characteristics. Unfortunately, the coking properties could not be tested due to oxidation. The R₀ Max value of 1.33 confirms a mid-volatile rank which is consistent with other Moosehorn Seam samples.

Table 13-15. 2015 – 15 cm (six inch) Core Petrographic Analysis

	Petrographic Analysis, Clean Coal										
	Reflectance	Reactive Macerals			Inert Macerals						
	R ₀ Max	Vitrinite	Semi-Fusinite	Total Reactives	Semi-Fusinite	Fusinite	Inerts	Macrinite	M.M.*	Total Inerts	Pred. Stab.
APC15-11-01	1.52	89.6	1.5	91.10	1.50	0.80	0.40	0.20	6.00	8.90	65.00
APC15-11-02	1.45	45.5	20.4	65.90	20.40	2.60	5.30	0.20	5.60	34.10	58.00
APC15-14-01	1.33	62.20	10.30	72.50	10.30	5.50	6.30	0.80	4.60	27.50	63.00

*M.M. = Mineral Matter

The relatively small population of samples collected in 2013 and 2015 and make it difficult to characterize the quality attributes of the Palisades coal on a definitive basis. However the results achieved are consistent and as such are considered indicative of the expected coking coal that could be produced from the property. In summary:

1. The rank of the lower Solomon Seam coal has been confirmed as low-volatile bituminous coking coal. The DAF volatile matter content averages 18.2% and the R₀ Max values range from 1.44 to 1.53
2. The Hoff Seam appears to be slightly lower in rank in the R₀ 1.45 +/- 0.2 range.
3. The upper most Moosehorn Seam has a rank of Mid Volatile Bituminous with R₀ values ranging from 1.34 to 1.37
4. The coal can be washed to a 10% clean product with FSI values ranging from 7 to 9, the sulphur content is low, averaging 0.5%
5. The fluidity values are low ranging from 7 to 40 which is typical of western Canadian low volatile coal. The dilatation test shows these coals are contracting (17% average) and have positive dilatation, both of which are good from a coke making perspective
6. Petrographic analysis shows an average maceral composition of 70% reactives/30% inerts which results in a predicted stability value of 61 which is excellent
7. Ash analysis shows a very low total alkaline content of 10% ± 2%. The expectation based on this chemistry is for a high CSR value.
8. The coal has an extremely low phosphorous content, averaging 0.014% on a whole coal basis

All of the foregoing would confirm this is a very good low-volatile hard coking coal (HCC) which would be ranked with the first tier international brands in terms of market value.

14 MINERAL RESOURCE ESTIMATES

Mineral resource estimates for the Palisades Property in this report are based on historical drill and trench information and the 2013 and 2015 Altitude programs. Parameters in the current resource estimates remain the same as those presented for the 2013 program (Engler et al, 2014). The grouping of resource areas in this report was modified from Coal Hill and Regional (Central and South areas combined) in 2013, to Coal Hill/Central Palisades, where drilling was done in 2015, and South Palisades where no further drilling took place in 2015.

Geological Classification

As the stratigraphic and structural complexity of a coal deposit increases, a greater number of data points are required to assign the coal to measured, indicated, or inferred resource categories. Data points are defined as locations where a coal seam, or a marker horizon indicating the proximity to a coal seam, is exposed. Valid data points were obtained from drillhole intersections, trenches, and surface outcrop. Table 14-1 outlines the resource classification criteria for different geology types. Figure 14-3 through Figure 14-9 present cross-sections through various parts of the property. These are indexed to geology in Figure 14-2.

Table 14-1. Resource Classification Categories (Hughes et al., 1989).

Geology Type	Resource Classification (Distance from Point)		
	Measured	Indicated	Inferred
Moderate	0-450 m	450-900 m	900-2,400 m
Complex	0-100 m	100-200 m	200-400 m
Severe	0-50 m	50-100 m	100-200 m

A **moderate geology** type occurs where the deposit has only been subjected to limited tectonic deformation. This may include faults with displacements of less than 10 m, although these should be uncommon. Homoclines and broad open folds with wavelengths less than 1.5 km may also be present and bedding should not exceed 30°.

A **complex geology** type occurs where a deposit has been subjected to relatively high levels of tectonic deformation. Fault bounded blocks within this deposit type generally retain their normal stratigraphic sequence and seams will have only rarely been modified from their pre-deformational thickness. Tight folds with steeply dipping or overturned limbs can be present and offsets by faults are common.

A **severe geology** type occurs where extreme tectonic deformation has occurred. The stratigraphic sequence is commonly disturbed and difficult to ascertain, whereas coal seams are often structurally thickened and thinned from their pre-deformational state. Tight folds, steeply inclined and overturned beds, and large displacement faults are common.

Density

Rotary drilling and core samples taken in 2013 and 2015 were too fine for meaningful density determinations. Historic density information for deposits on the Property is limited to determinations from whole core made by Denison. The bulk density values compare reasonably to estimates suggested in GSC Paper 88-21, which shows low volatile bituminous coal with bulk densities ranging from 1.52 g/cm³ to 1.66 g/cm³ having ash contents of 25% to 35%.

A lower bulk density value of 1.52 g/cm³ was used as a conservative estimate, although ash contents determined from coal samples taken in 2013 and 2015 suggest that higher densities for some seam intersections could be supported.

Geological Interpretation and Block Modelling

The modelling methodology used for the resource estimation for all areas of the Property consisted of the following steps:

- Import data into the mining software package (Maptek Vulcan 9.1™).
- Database validation and error checking.
- Import fault surface triangulations from Leapfrog.
- Create area data subsets and blank fault block triangulations.
- Correlate drillholes, trenches, and surface exposures on or directly adjacent to the Property.
- Create final fault blocks by applying a Boolean Test to a blank fault block solid using the fault surface triangulations.
- Grid the topography and base of weathering triangulation surfaces (10 m). Base of weathering was created at a depth of 8 m below topography.
- Run FixDHD on each sub area to create Mapfile Databases.
- Create seam grids (10 m in Coal Hill/Central Palisades and 25 m in South Palisades) and triangulations in Model Stratigraphy using the FixDHD Mapfile Databases, topography grid, and base of weathering grid. Seam grids were cropped against the base of weathering grid to remove oxidized coal. Fault blocks were modelled using a hybrid method and a variety of trending types.
- Create HARP (Horizon Adaptive Rectangular Prism) block models for each sub area using the parting and thickness grids as qualities. Blocks were 20 x 20 m with a sub-blocking of 2 (x and y directions) in the Coal Hill/Central Palisades area, and 50 x 50 m with a sub-blocking of 2 in the South Palisades area.
- Classify block confidence using the distance of the block centroid to the nearest data point based on the criteria in Table 14-1.
- Determine the cumulative stripping ratio for each block of coal within the model (total volume of waste/total tonnage of product).
- Apply a parting factor (coal thickness/aggregate seam thickness).
- Calculate the coal resources for each sub area based on the criteria in Table 14-2.
- Constrain resource estimation by the current Altitude lease boundaries.
- Constrain resource estimation to coal bed thickness greater than 0.6 m for measured, indicated, and inferred classification.

Table 14-2. Resource Reporting Criteria for Surface-Mineable Resources.

Area	Resource Criteria			Geology Type
	Coal Bed Thickness	Partings	Stripping Ratio	
Coal Hill/Central Palisades	> 0.6 m	Not Included	< 1:20	Complex
South Palisades	> 0.6 m	Not Included	< 1:20	Complex

Probable Method of Extraction

For the purpose of resource classification in this report, only surface minable resources were considered. Surface resources were considered to be those with a cumulative stripping ratio of less than 1:20 (tonne coal to cubic metre of waste) and coal bed thicknesses greater than 0.6 m.

14.1 RESOURCE SUMMARY

The in-place resources for the Coal Hill and regional areas of the Palisades Property are summarized in Table 14-3. These areas are outlined in Figure 14-1. Seam thickness was adjusted to exclude partings. An average estimated depth of oxidization of 8 m was used as this is the depth of weathering determined at the nearby Grande Cache Coal mine (van Eendenburg et al, 2011). The effect of depth of weathering on these estimates is significant, reducing the resource by 5 to 20%. Future drilling and quality evaluation should include efforts to constrain depth of weathering for the Property. Sample APC15-014-01 at 7.32-8.23 m was found to be oxidized.

Table 14-3. In-Place Surface-Mineable Coal Resources Summary for Palisades Property.

Area	Seam	In-Place Coal Resources (TONNES) Stripping Ratio Cutoff 20:1			
		ASTM Group	Measured	Indicated	Inferred
Coal Hill/Central Palisades	Moosehorn	Mid-Volatile Bituminous	931,258	300,561	682,506
	Hoff	Low-Volatile Bituminous	2,552,051	1,454,636	2,194,868
	Solomon	Low-Volatile Bituminous	5,218,759	4,423,095	4,034,818
South Palisades	Moosehorn	Mid-Volatile Bituminous	22,316	164,080	114,323
	Hoff	Low-Volatile Bituminous	68,550	157,506	188,911
	Solomon	Low-Volatile Bituminous	211,368	301,693	390,951
Total Property			9,004,301	6,801,571	7,606,377

(Note: partings removed, coal bed thickness >0.6 m, average 8 m oxidised zone removed)

Figure 14-1. Palisades Coal Resource Projections and Exploration Targets.

(See end: Large Figures, P-10)

Figure 14-2. Cross-section Line Locations.
(See end: Large Figures, P-11)

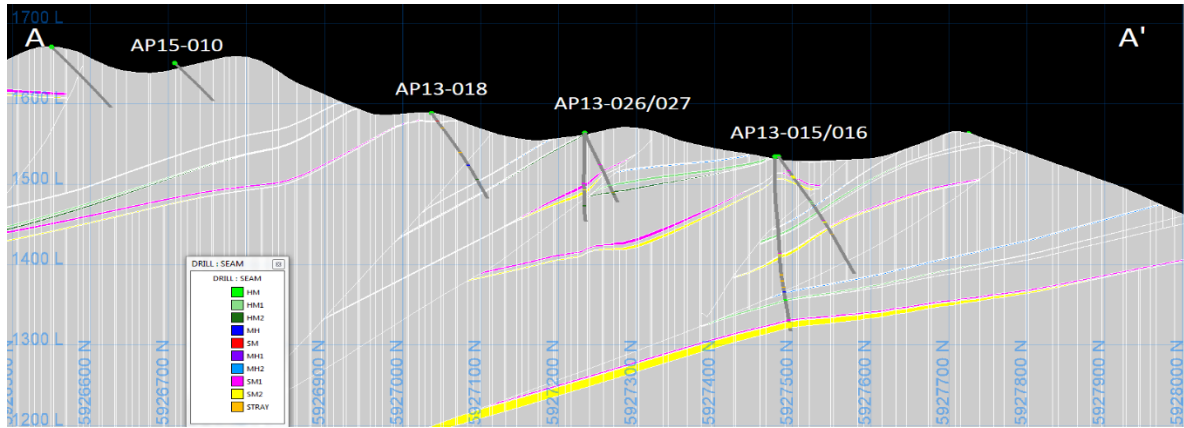


Figure 14-3. Cross-Section A-A' – Coal Hill (see Figure 14.2 for location)

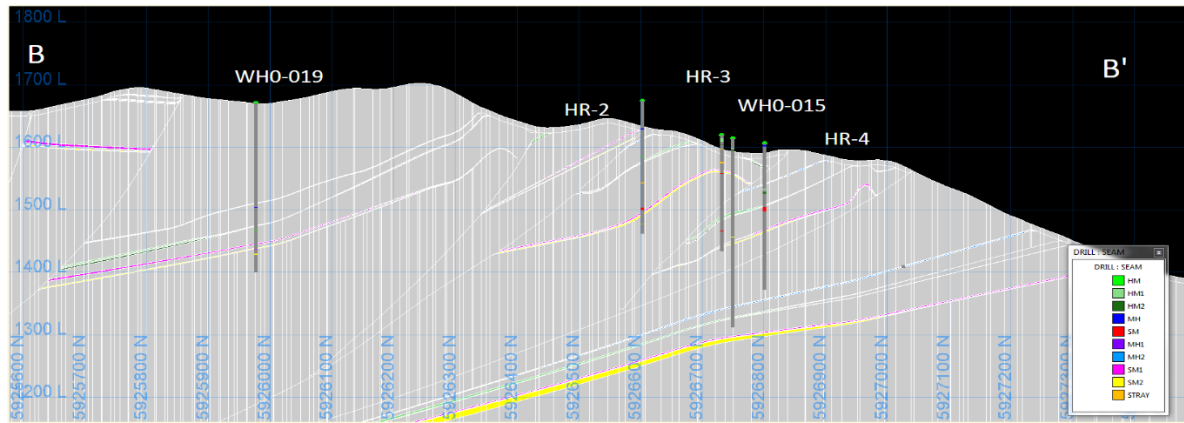


Figure 14-4. Cross-Section B-B' – Coal Hill (see Figure 14.2 for location)

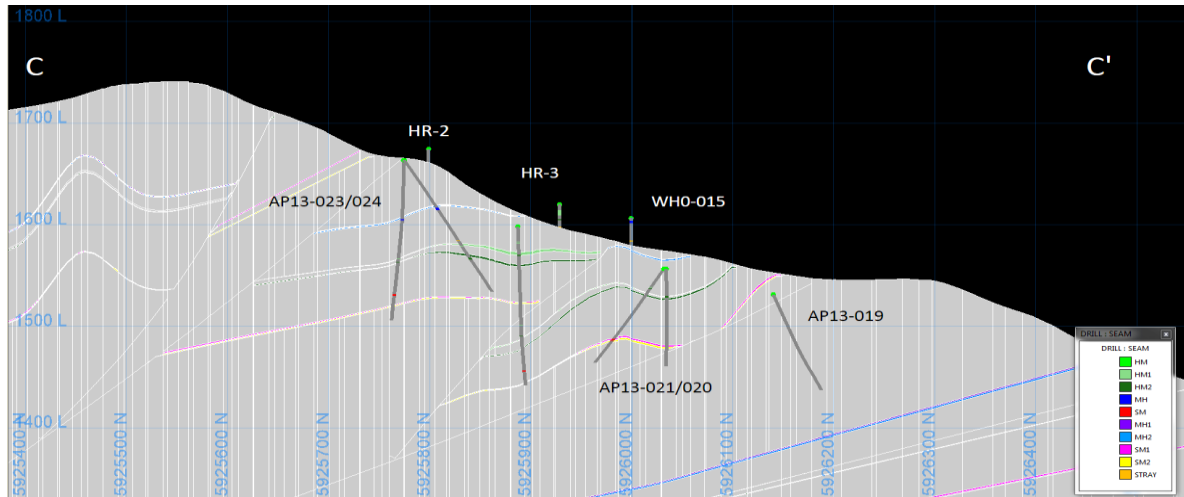


Figure 14-5. Cross-Section C-C' – Coal Hill (see Figure 14.2 for location)

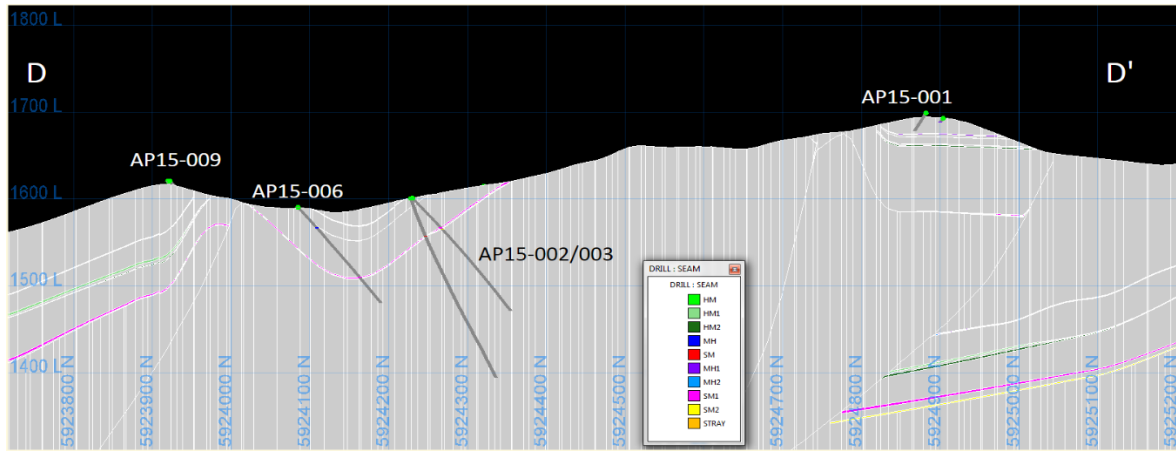


Figure 14-6. Cross-Section D-D' - North-Central Palisades (see Figure 14.2 for location)

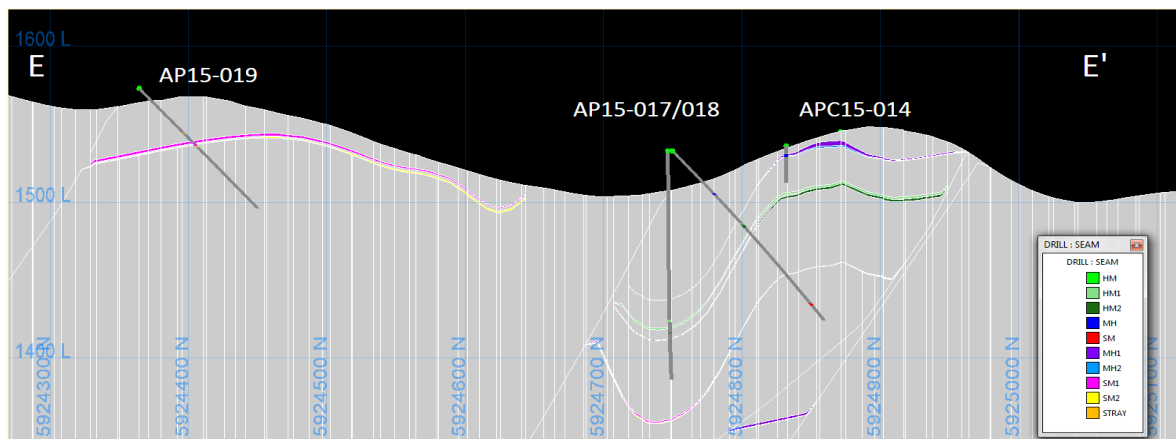


Figure 14-7. Cross-Section E-E' - North-Central Palisades (see Figure 14.2 for location)

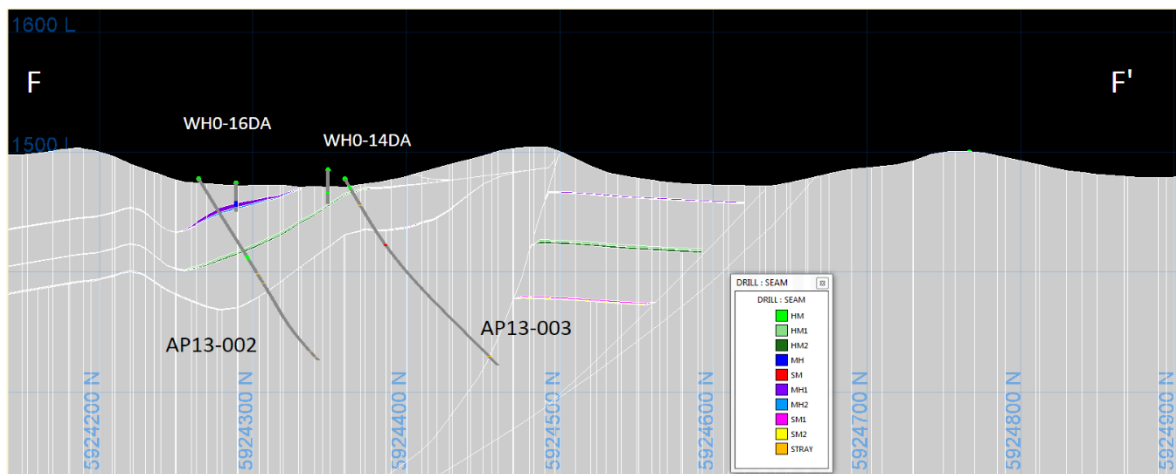


Figure 14-8. Cross-Section F-F' - Central Palisades (see Figure 14.2 for location)

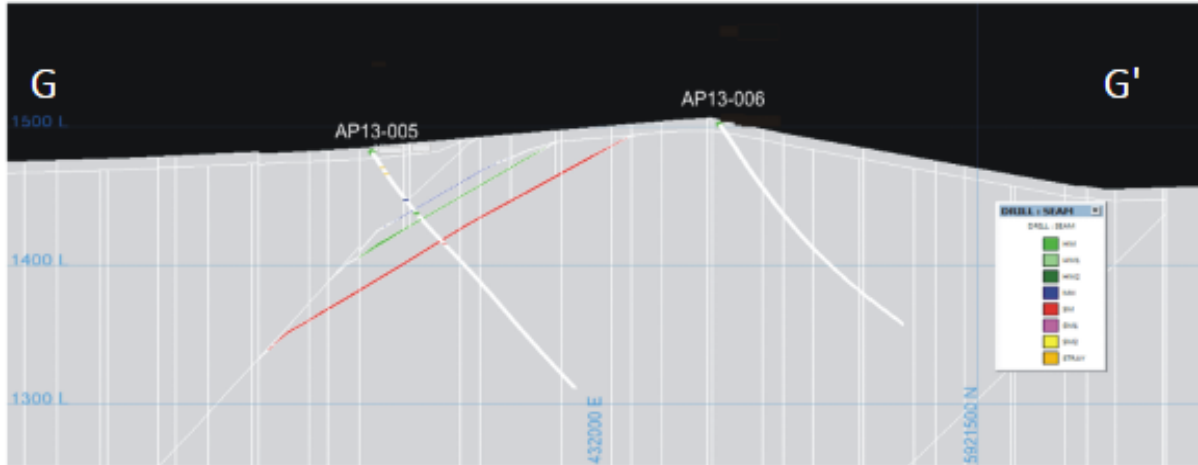


Figure 14-9. Cross-Section G-G' – South Palisades (see Figure 14-2 for location)

*note AP13-007 is out of section to north between AP13-005 and AP13-006)

14.2 EXPLORATION TARGET SUMMARY

The exploration targets for the Palisades Property are summarized in Table 14-4 and Figure 14-1. Coal was classified as exploration target if it was between 400 and 1,000 m from data point intersections. These targets remain conceptual in nature, as seam thickness and quality have not been constrained. Consequently seam thickness was not adjusted to remove partings and no stripping ratio limit was used in defining the exploration targets. It is uncertain whether further exploration would delineate a resource. As noted for the resource estimates, the division of target areas has changed from 2013 to reflect 2015 exploration.

Table 14-4. Palisades In-Place Exploration Targets (million metric tonnes)

Area	Exploration Target* (TONNES) <i>rounded-down</i>
Coal Hill/Central Palisades	46,000,000
South Palisades	3,000,000
Total Property	49,000,000 (range 47,000,000 to 51,000,000)

*conceptual in-place coal with no stripping ratio cutoff; no depth of weathering

15 MINERAL RESERVE ESTIMATES

There are no mineral reserves, as defined by NI 43-101 criteria, on the Property at this time.

16 MINING METHODS

Given the stage of exploration on the Property, mining methods have not yet been considered.

17 RECOVERY METHODS

Given the stage of exploration on the Property, recovery methods have not yet been considered.

18 PROJECT INFRASTRUCTURE

Given the stage of exploration on the Property, project infrastructure requirements have not yet been considered.

19 MARKETING STUDIES AND CONTRACTS

Given the stage of exploration on the Property, marketing studies and contracts have not yet been considered.

20 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

Given the stage of exploration on the property, environmental studies, permitting and social or community impact have not yet been considered.

21 CAPITAL AND OPERATING COST

Given the stage of exploration on the Property, capital and operating cost have not yet been considered.

22 ECONOMIC ANALYSIS

Given the stage of exploration on the Property, an economic analysis has not been performed.

23 ADJACENT PROPERTIES

The Palisades Coal Property is directly adjacent to the north of Teck Corporation's Brule Property. The Brule Property was developed by the Blue Diamond Coal Company as an underground mine and operated continuously over the period 1914 through 1928, producing a total of 1.8 million tonnes. The Geologic Survey of Canada conducted a detailed survey of the Brule Property in 1927 during active operations and established the stratigraphy and seam nomenclature which extends north into the Palisades Coal Property.

There are currently two active mining operations which are collectively the Cardinal River Operations of Teck Resources Limited. These are the Luscar Mine 62 km to the southeast, and the Cheviot Mine 78 km to the southeast of the Palisades Property. Both produce metallurgical coal from the same Gates Formation. The Grande Cache Mine, 90 km to the northwest of the Property has announced a shutdown for December 24th, 2015, citing current market conditions. Other than an estimate for depth of weathering, information from these properties has not been used to complete the resource estimate for the Palisades Property.

24 OTHER RELEVANT DATA AND INFORMATION

The authors are unaware of any other relevant information.

25 INTERPRETATION AND CONCLUSIONS

There has been a significant increase in all categories of resources, and in the exploration target from 2013 to 2015. The results of the 2013 and 2015 exploration programs showed that previous geological interpretation by Rio (Benkis, 1970) and Denison (1984) in the southern and eastern part of the property required modification. Areas mapped as Grande Cache and Mountain Park Members of the Gates Formation in the central Icewater Creek area and the area north of Solomon Creek are actually Shaftsbury Formation. The overturned anticline in the Icewater Creek N. area appears to translate laterally into a thrust fault, truncating Grande Cache sediments against the younger Shaftsbury Formation. The Coal Hill Syncline and Coal Hill Anticline are dissected by several splays from the Collie Creek Thrust which increase the thickness of Grande Cache Member rocks and cause numerous seam repeats. Observations through mapping and drilling in 2015 suggest that the coal bearing Grande Cache Member is thickened to the west of Coal Hill in a similar manner. The eastern flank of Coal Hill includes a further thrust-repetition of Mountain Park and Grande Cache members which was previously mapped as Moosebar Formation. Its extent is still to be determined.

The conclusions drawn from the 2015 exploration program are that coal seams in the northern and central part of the Property, while thickened in places by folding, and repeated by thrust faulting, especially in the area of Coal Hill, are generally thinner and contain more partings than was previously thought. Areas of higher confidence resources remain disconnected in places (**Error! Reference source not found.**). Drill sections recommended along the P2016-001 through P2016-006 lines would close these gaps and significantly increase the resources along strike. Most of these are currently permitted. Some (notably the holes on the northeast end of lines P2016-001 and P2016-002) would need to be part of a permit amendment.

The modest number of core samples collected in 2013 and 2015 confirm that the Solomon Seam is a high quality, low-volatile hard coking coal, justifying further work. The Hoff and Moosehorn seams appear to be of good quality, but more coring focused upon acquiring more comprehensive coal quality information should be undertaken. Efforts should also include development of constraints on depth of weathering specific to the Property. Wireline coring is recommended to increase the number of intersections and depth of feasible seam intersections.

Constraints of the modeling software mean that the anisotropy of the structure on the Property cannot be respected. This means that the inferred resources in particular cannot be joined along stratigraphic traces in the manner which geological interpretation would suggest, and hence are likely underestimated.

26 RECOMMENDATIONS

A continuation of the permitted drilling program initiated in 2015 on the Palisades Property is recommended. This program would use existing access constructed in 2015, with some additional construction to reach new drill sections. The program should focus on more coal quality information and better recovery using wireline drilling techniques.

In the north-central part of the Property further infill drilling is recommended in between the defined North area resource, and the area south and west of Denison drillhole WH018DN to investigate the Grande Cache Member along the major anticline and which would connect and expand the current resource (**Error! Reference source not found.**). Drilling between the central cut line and the Central rea should be completed as well. These areas were included in drilling plans for 2015 but were not completed due to budget constraints.

Drilling of the repeated Grande Cache Member on the east side of Coal Hill which was identified by 2015 exploration is also recommended. This would require an amendment to the current coal exploration permit, which should be applied for in a timely manner to allow incorporation in a 2016 drilling program.

In the southern part of the property, in the area west of drillholes AP13-005 to AP13-007, some drilling would be useful in extending the resource, if budgets allow, to pursue recommendations from 2013 which are part of the current coal permit. The Palisades extension area north of the Wildhay River is underlain by the Gates Formation, but lacks exposure. Access construction for possible drill testing would provide exposure for coal evaluation. This would also require permit amendment.

Continued exploration of the North Palisades Extension is recommended to evaluate projected extension of the Grande Cache Member north of the Wildhay River.

The recommended program would consist of up to 3,000 m reverse circulation drilling and up to 500 m of wireline coring if justified (Figure 26-1). A proposed budget is presented in Table 26-1.

Table 26-1. Proposed 2016 Budget.

Item	Estimated Cost
Planning and new Access Layout	\$50,000
Access Constructions and Reclamation	\$500,000
Mapping/Trenching-N. Palisades Extension	\$25,000
RC Drilling	\$200,000
Coring	\$200,000
Geological Supervision	\$125,000
Geophysical Logging	\$80,000
Drill Site Survey	\$10,000
Laboratory, Coal Testing	\$175,000
Geological 3-D Modelling	\$30,000
Data Compilation / Final Reports	\$30,000
Total Estimate	\$1, 425,000

Figure 26-1. Recommended Drilling.

(See end: Large Figures, P-12)

27 REFERENCES

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28 DATE AND SIGNATURE PAGE

This report entitled "Technical Report on the Palisades Coal Property, Alberta Canada" with an effective date of December 14th, 2015, was prepared on behalf of Altitude Resources Inc. and is signed by the authors Robert Engler, John Gorham, and William Miller.



Robert F. Engler, P. Geol.

28 Hummingbird Road

Sherwood Park, Alberta

December 14th, 2015



John H. Gorham, P. Geol.

Suite 18 - 10509 81st Avenue

Edmonton, Alberta

T6E 1X7

December 14th, 2015



William S. Miller, P. Geo.

Suite 18 - 10509 81st Avenue

Edmonton, Alberta

T6E 1X7


December 14th, 2015

29 CERTIFICATE OF QUALIFIED PERSONS

I, Robert F. Engler, of 28 Hummingbird Road, Sherwood Park, Alberta do hereby certify that:

- I, Robert F. Engler, P. Geol. am a Principal of Moose Mountain Technical Services.
- This certificate applies to the Technical Report titled "Technical Report on the Palisades Coal Property, Alberta Canada" with an effective date of December 14th, 2015 (the "Technical Report").
- I graduated with a B.Sc. from the University of Alberta in 1974.
- I am a member of the Association of Professional Engineers, Geologists and Geophysicists of Alberta. (#M24009).
- I have worked as a geologist for a total of forty-one years since my graduation from university. My past experience includes work with all of the coal mines in Alberta, Saskatchewan and British Columbia as well as exploration projects in western Canada, and western US, Mexico, Mongolia, and China. I also held senior marketing positions for fifteen years with Luscar Ltd, a major Canadian coal producer.
- I have read the definition of "qualified person" set out in NI 43-101 and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfill the requirements to be a "qualified person". I am independent of Altitude Resources Ltd in accordance with section 1.5 of NI 43-101.
- I inspected the Property on June 3-4, September 9-10, September 25, and October 8-9, 2015. I have worked extensively on nearby Sherritt-owned mining operations. I work as a geological consultant to the mining industry.
- I am responsible for Section 13 and jointly responsible for Sections 1, 12, 25 and 26 of this Technical Report.
- I am independent of the issuer of this report, Altitude Resources Inc. as defined by Section 1.5 of NI 43-101.
- I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
- As of the effective date of this report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

"Signed and sealed"




Robert F. Engler, B.Sc., P.Geol.
Dated: December 14th, 2015

I, John Gorham, of #18- 10509 81st Avenue, Edmonton, Alberta, hereby certify that

- I, John Gorham, P.Geol, am employed as a Senior Geologist with Dahrouge Geological Consulting Ltd.
- This certificate applies to the Technical Report titled "Technical Report on the Palisades Coal Property, Alberta Canada" with an effective date of December 14th, 2015 (the "Technical Report").
- I graduated from the University of Calgary, Canada with a B.Sc. degree in Geology in 1976.
- I am a Professional Geoscientist in the Provinces of Alberta, British Columbia and the Northwest Territories, Canada.
- I have practiced my profession for 39 years since graduation. I have been directly involved in green fields and brown fields exploration, and consulting, with experience in gold, base metals, precious and rare metals and rare earth deposits, coal, industrial and precious gem minerals.
- As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101).
- I inspected the Property on June 1-15, August 12-14, 17-23, September 1-5, 8-30, and October 1-10, 2015.
- I am jointly responsible for Sections 1 to 13, and 15 to 27 of this Technical Report.
- I am independent of the issuer of this report, Altitude Resources Inc. as defined by Section 1.5 of NI 43-101.
- I have no prior involvement with the Palisades Coal Property.
- I have read NI-43-101 and this report has been prepared in compliance with this Instrument.
- As of the effective date of this report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

'Signed and Sealed'





John Gorham, P. Geol

Dated: December 14th, 2015

I, William Miller, of #18- 10509 81st Avenue, Edmonton, Alberta, hereby certify that

- I, William Miller, P.Geo, am employed as a Project Geologist with Dahrouge Geological Consulting Ltd.
- This certificate applies to the Technical Report titled “Technical Report on the Palisades Coal Property, Alberta Canada” with an effective date of December 14th, 2015 (the “Technical Report”).
- I graduated from the University of Alberta, Canada with a B.Sc. degree in Geology in 2009.
- I am a Professional Geoscientist in the Province of Alberta, Canada.
- I have practiced my profession for 6 years since graduation. I have been directly involved in green fields and brown fields exploration, and consulting, with experience including industrial minerals, phosphate, gold, nickel-PGEs, rare earths and coal.
- As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).
- I have not visited the Palisades Coal Property.
- I am jointly responsible for Sections 1, 14, 25 and 26 of this Technical Report.
- I am independent of the issuer of this report, Altitude Resources Inc. as defined by Section 1.5 of NI 43-101.
- I have no prior involvement with the Palisades Coal Property.
- I have read NI-43-101 and this report has been prepared in compliance with this Instrument.
- As of the effective date of this report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

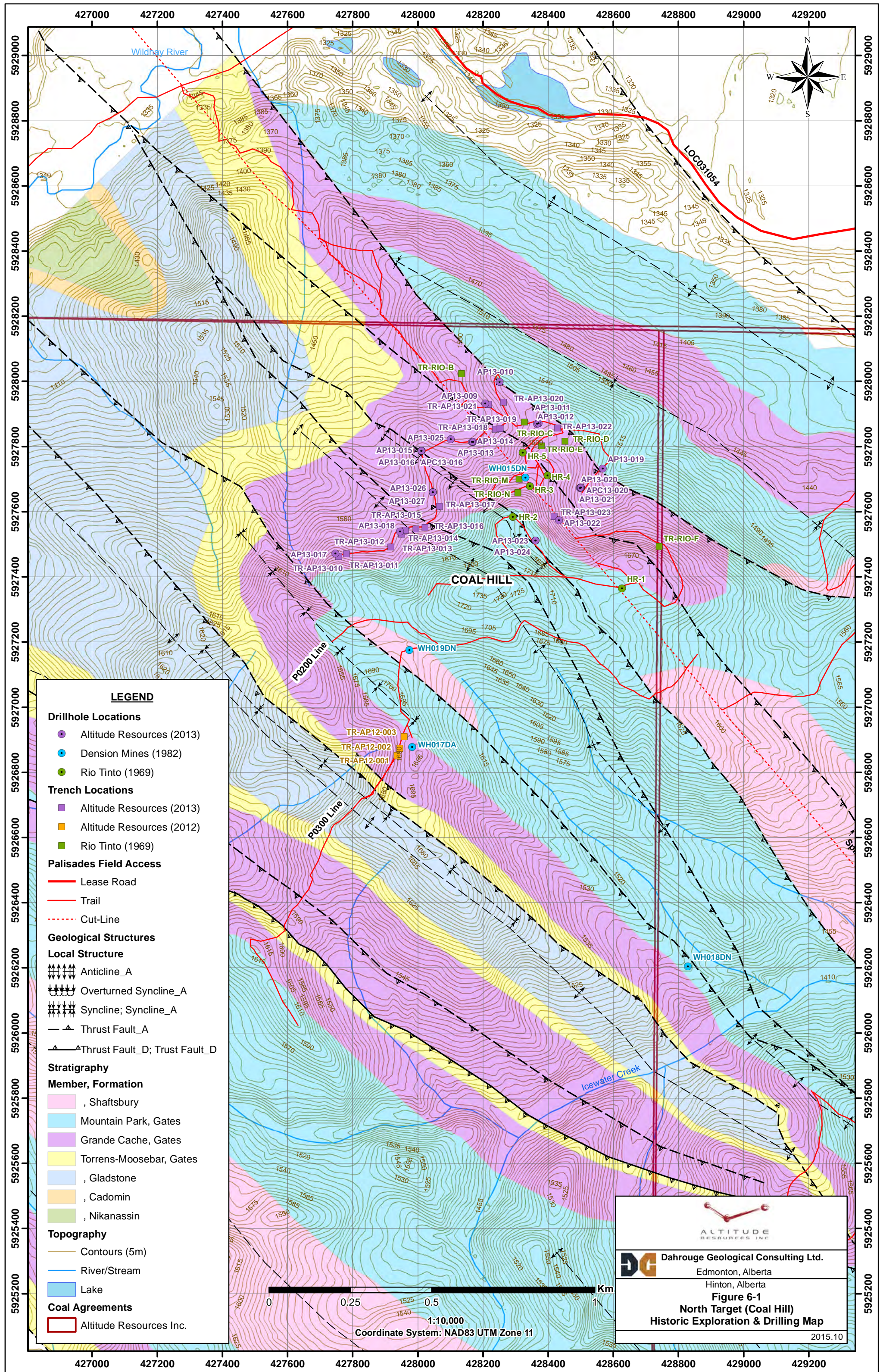
‘Signed and Sealed’



William Miller, P. Geo

Dated: December 14th, 2015

LARGE FIGURES



LEGEND

Drillhole Locations

- Altitude Resources (2013)
- Dension Mines (1982)
- Rio Tinto (1969)

Trench Locations

- Altitude Resources (2013)
- Altitude Resources (2012)
- Rio Tinto (1969)

Palisades Field Access

- Lease Road
- Trail
- Cut-Line

Geological Structures

Local Structure

- Anticline_A
- Overtuned Syncline_A
- Syncline; Syncline_A
- Thrust Fault_A
- Thrust Fault_D; Trust Fault_D

Stratigraphy

Member, Formation

- Shaftsbury
- Mountain Park, Gates
- Grande Cache, Gates
- Torrens-Moosebar, Gates
- Gladstone
- Cadomin
- Nikanassin

Topography

- Contours (5m)
- River/Stream
- Lake

Coal Agreements

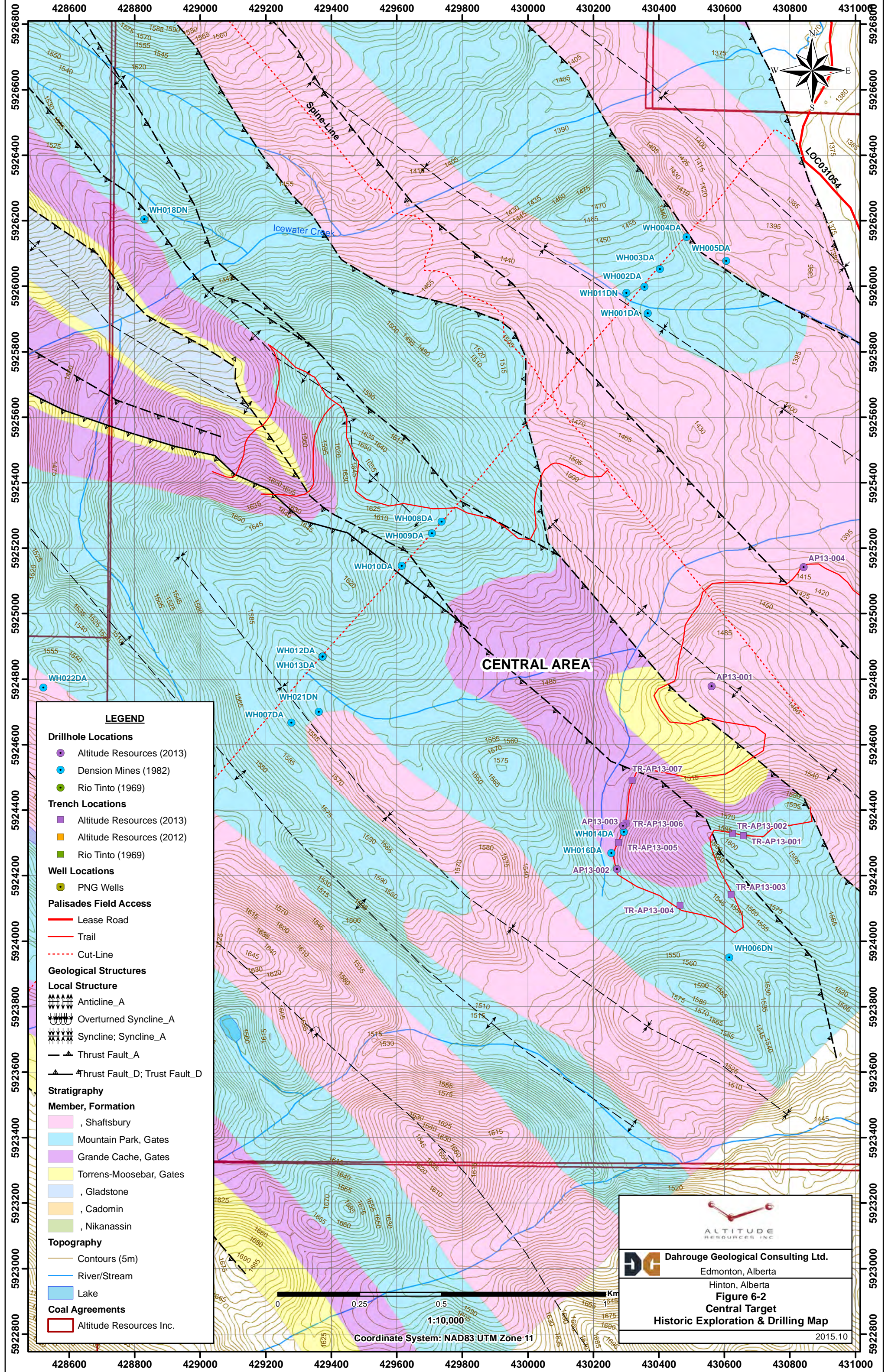
- Altitude Resources Inc.

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Edmonton, Alberta
Hinton, Alberta

Figure 6-1
North Target (Coal Hill)
Historic Exploration & Drilling Map

2015.10



LEGEND

- Drillhole Locations**
 - Altitude Resources (2013)
 - Dension Mines (1982)
 - Rio Tinto (1969)
- Trench Locations**
 - Altitude Resources (2013)
 - Altitude Resources (2012)
 - Rio Tinto (1969)
- Well Locations**
 - PNG Wells
- Palisades Field Access**
 - Lease Road
 - Trail
 - - - - Cut-Line
- Geological Structures**
- Local Structure**
 - ▲▲▲▲ Anticline_A
 - Overturned Syncline_A
 - ▲▲▲▲ Syncline; Syncline_A
 - ▲ Thrust Fault_A
 - ▲ Thrust Fault_D; Trust Fault_D
- Stratigraphy**
- Member, Formation**
 - Shaftsbury
 - Mountain Park, Gates
 - Grande Cache, Gates
 - Torrens-Moosebar, Gates
 - Gladstone
 - Cadomin
 - Nikanassin
- Topography**
 - Contours (5m)
 - River/Stream
 - Lake
- Coal Agreements**
 - Altitude Resources Inc.

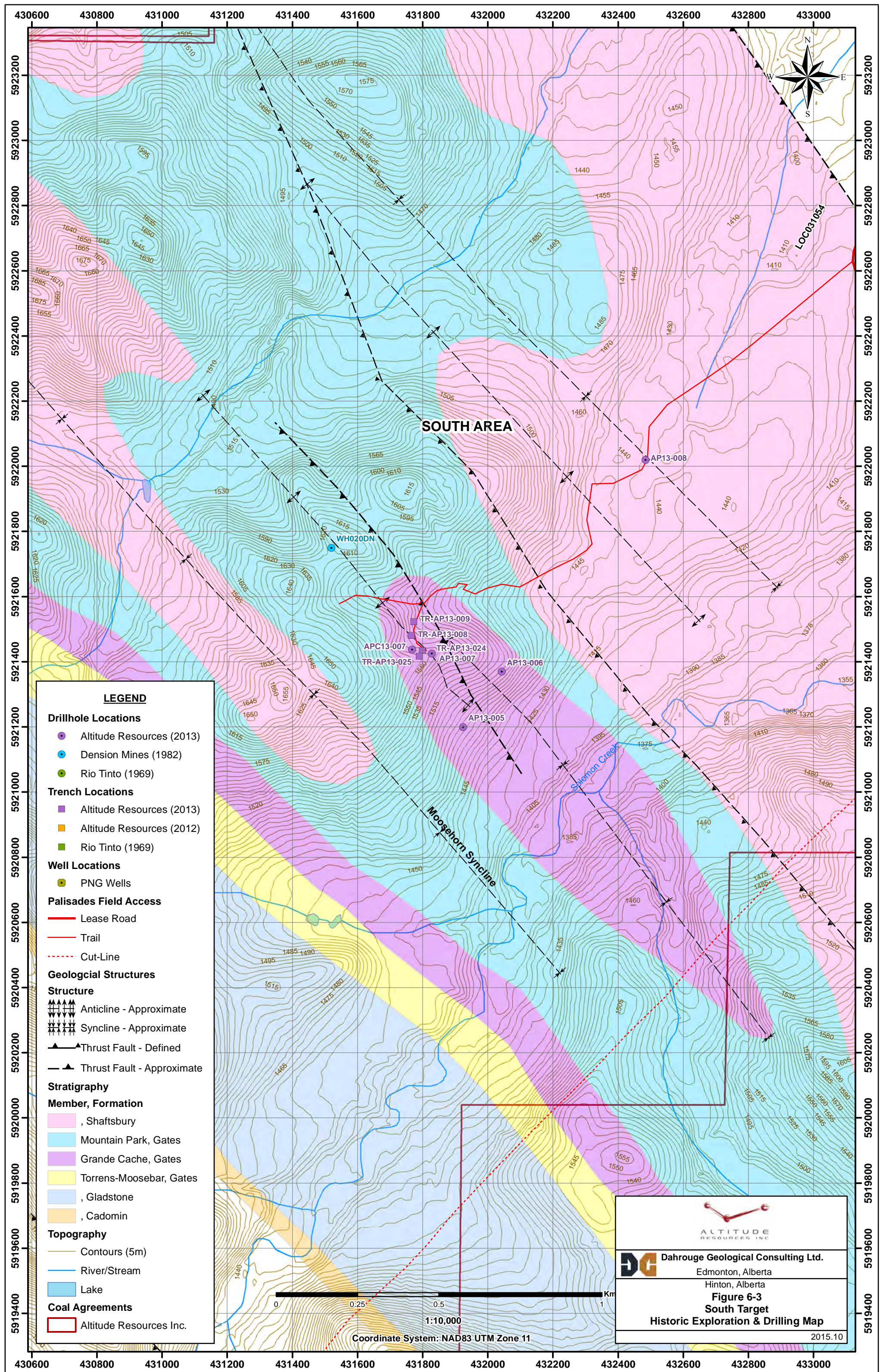

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 Hinton, Alberta

Figure 6-2
Central Target
Historic Exploration & Drilling Map

2015.10

Coordinate System: NAD83 UTM Zone 11



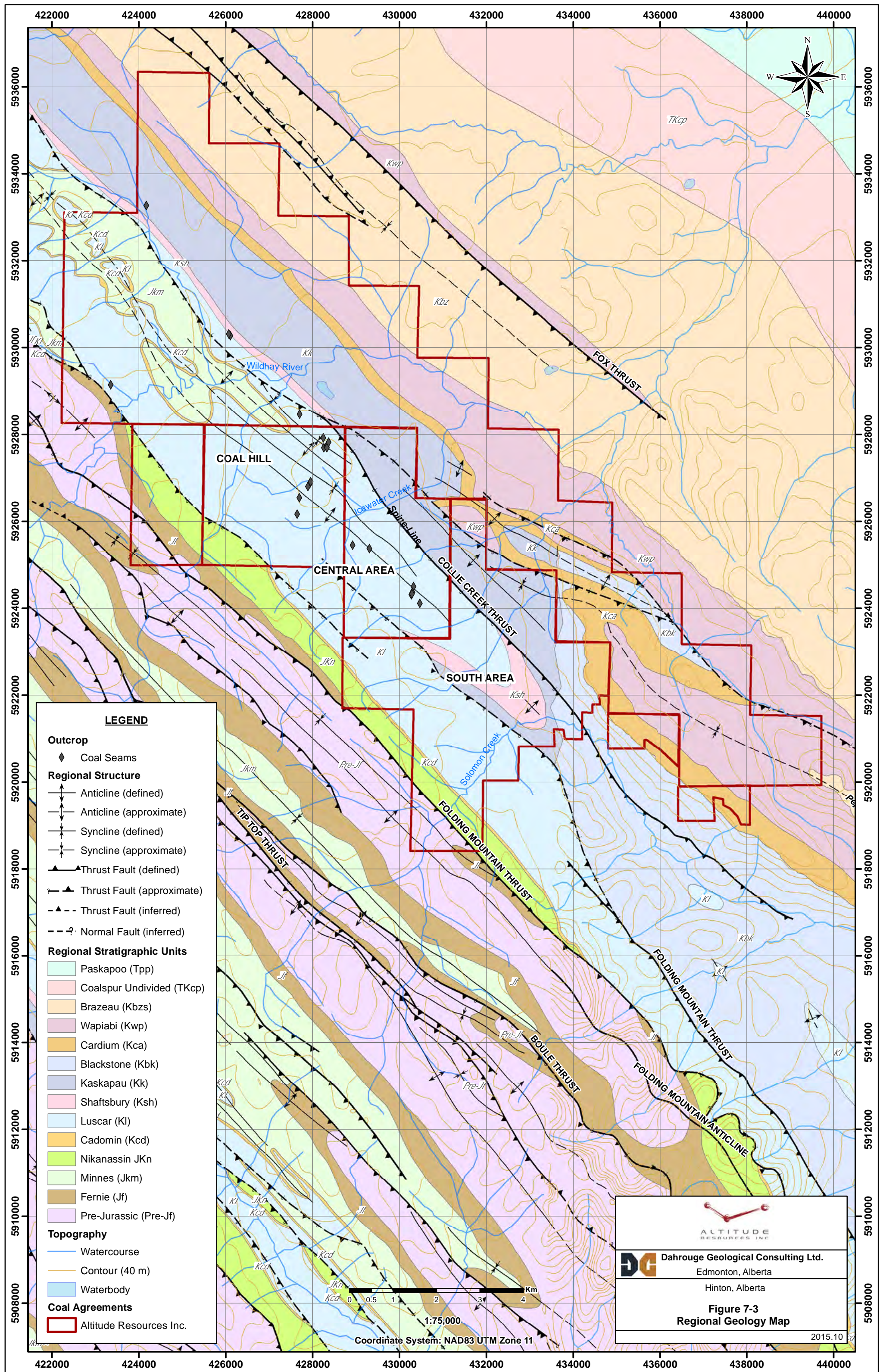
LEGEND



- Drillhole Locations**
 - Altitude Resources (2013)
 - Dension Mines (1982)
 - Rio Tinto (1969)
- Trench Locations**
 - Altitude Resources (2013)
 - Altitude Resources (2012)
 - Rio Tinto (1969)
- Well Locations**
 - PNG Wells
- Palisades Field Access**
 - Lease Road
 - Trail
 - - - Cut-Line
- Geological Structures**
 - Structure**
 - ↑↑↑↑ Anticline - Approximate
 - ↓↓↓↓ Syncline - Approximate
 - ▲ Thrust Fault - Defined
 - ▲ Thrust Fault - Approximate
- Stratigraphy**
- Member, Formation**
 - Shaftsbury
 - Mountain Park, Gates
 - Grande Cache, Gates
 - Torrens-Moosebar, Gates
 - Gladstone
 - Cadomin
- Topography**
 - Contours (5m)
 - River/Stream
 - Lake
- Coal Agreements**
 - Altitude Resources Inc.

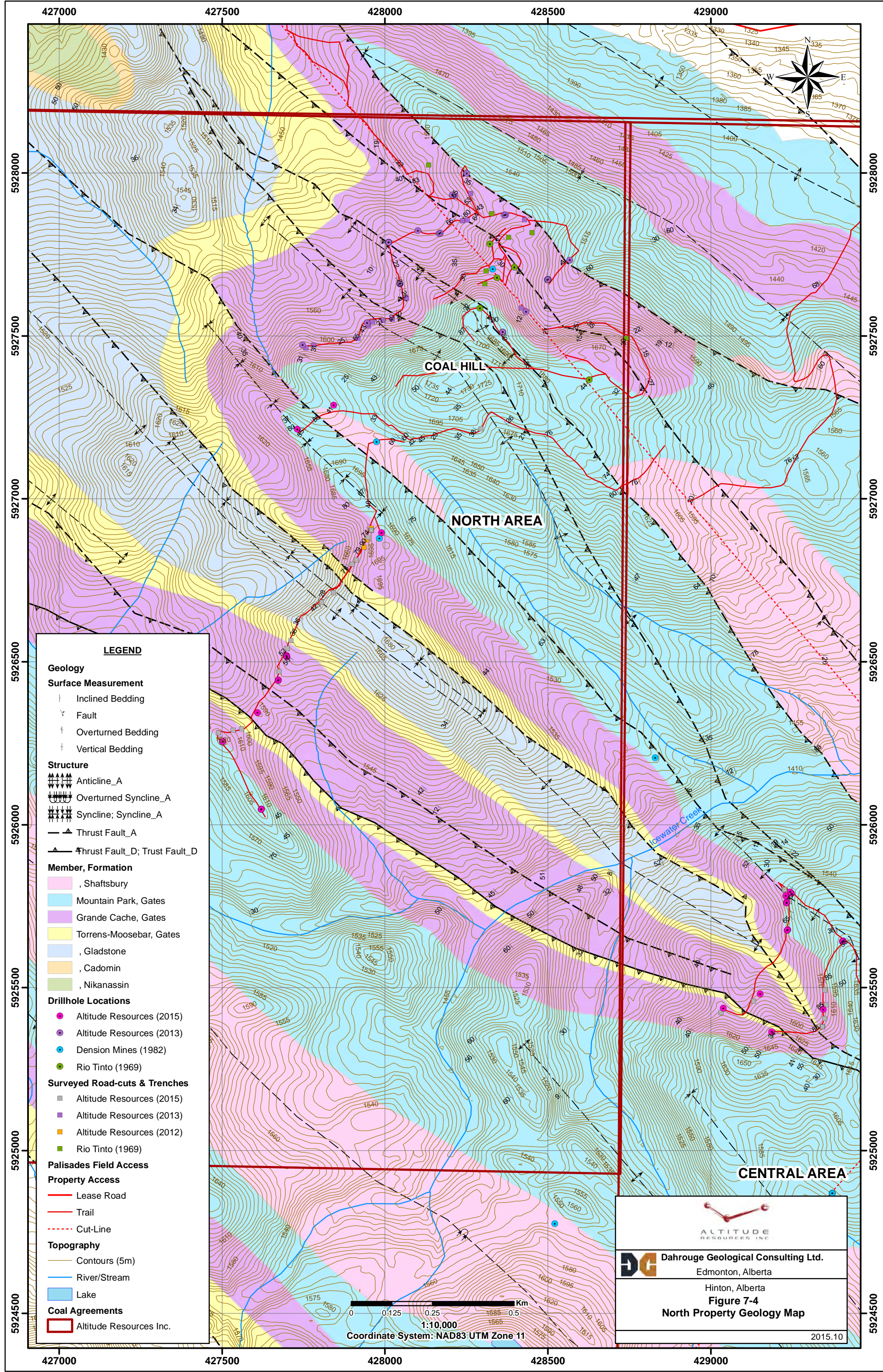


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Figure 6-3
South Target
Historic Exploration & Drilling Map
 2015.10

Coordinate System: NAD83 UTM Zone 11




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Figure 7-3
Regional Geology Map
 2015.10



LEGEND

Geology

Surface Measurement

- Inclined Bedding
- Fault
- Overtured Bedding
- Vertical Bedding

Structure

- Anticline_A
- Overtured Syncline_A
- Syncline; Syncline_A
- Thrust Fault_A
- Thrust Fault_D; Trust Fault_D

Member, Formation

- Shaftsbury
- Mountain Park, Gates
- Grande Cache, Gates
- Torrens-Moosebar, Gates
- Gladstone
- Cadomin
- Nikanassin

Drillhole Locations

- Altitude Resources (2015)
- Altitude Resources (2013)
- Dension Mines (1982)
- Rio Tinto (1969)

Surveyed Road-cuts & Trenches

- Altitude Resources (2015)
- Altitude Resources (2013)
- Altitude Resources (2012)
- Rio Tinto (1969)

Palisades Field Access

Property Access

- Lease Road
- Trail
- Cut-Line

Topography

- Contours (5m)
- River/Stream
- Lake

Coal Agreements

- Altitude Resources Inc.

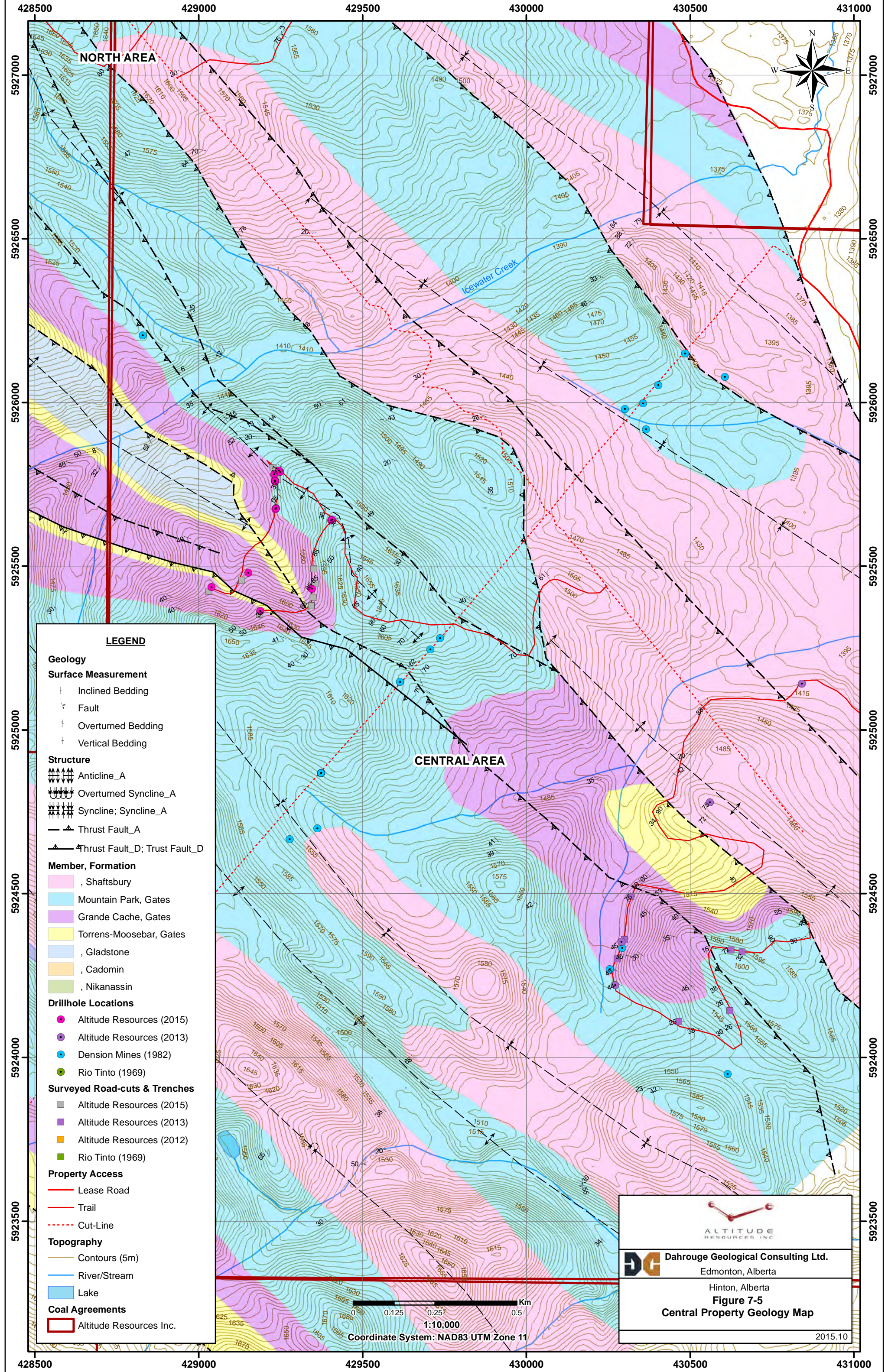
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Hinton, Alberta
Figure 7-4
North Property Geology Map

2015.10

0 0.125 0.25 0.5 Km
1:10,000
Coordinate System: NAD83 UTM Zone 11





NORTH AREA

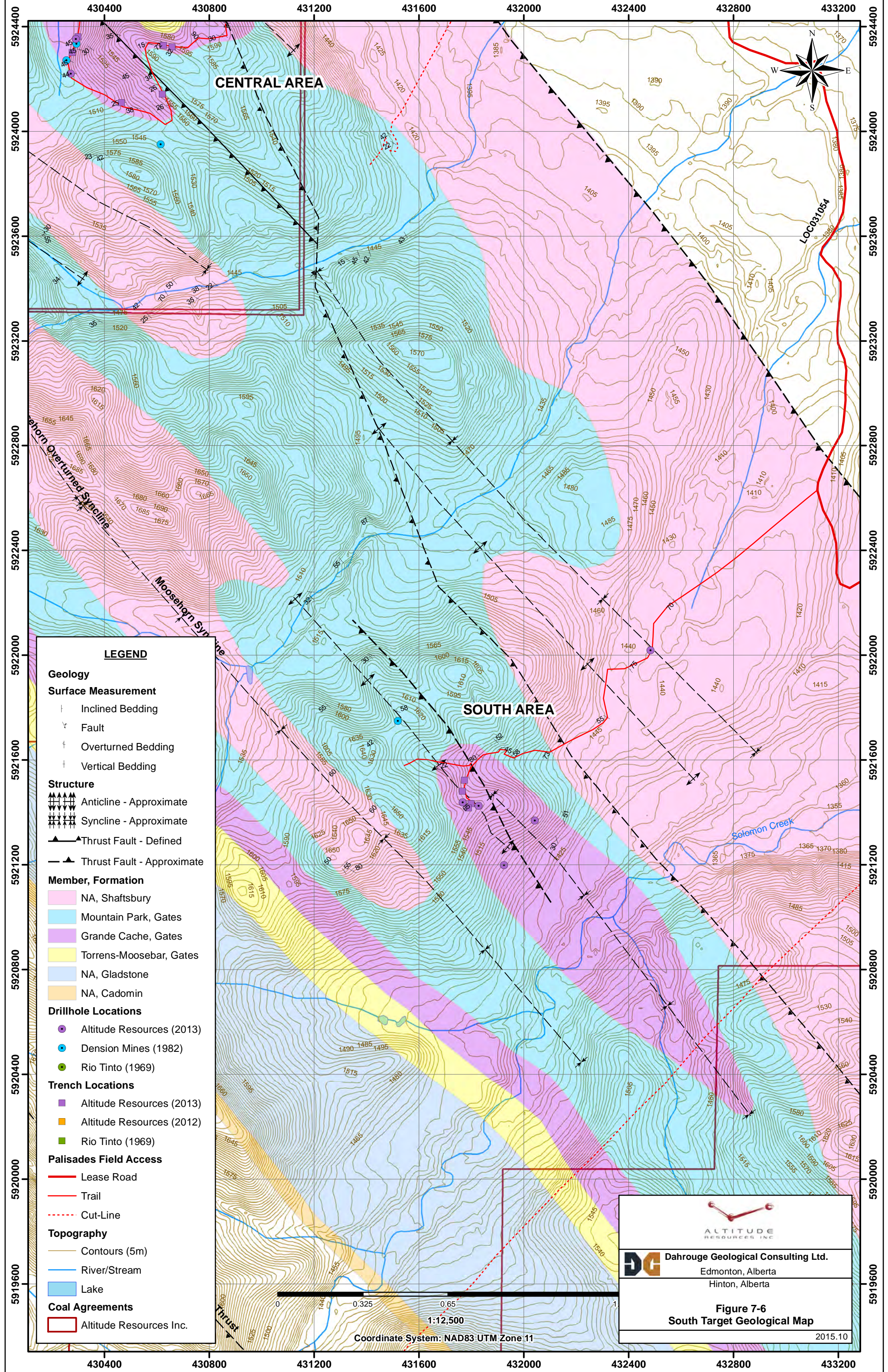
CENTRAL AREA

LEGEND

- Geology**
- Surface Measurement**
 - † Inclined Bedding
 - ↖ Fault
 - † Overturned Bedding
 - † Vertical Bedding
- Structure**
 - ▲▲▲▲ Anticline_A
 - Overturned Syncline_A
 - ▲▲▲▲ Syncline; Syncline_A
 - ▲ Thrust Fault_A
 - ▲ Thrust Fault_D; Trust Fault_D
- Member, Formation**
 - Shaftsbury
 - Mountain Park, Gates
 - Grande Cache, Gates
 - Torrens-Moosebar, Gates
 - Gladstone
 - Cadomin
 - Nikanassin
- Drillhole Locations**
 - Altitude Resources (2015)
 - Altitude Resources (2013)
 - Dension Mines (1982)
 - Rio Tinto (1969)
- Surveyed Road-cuts & Trenches**
 - Altitude Resources (2015)
 - Altitude Resources (2013)
 - Altitude Resources (2012)
 - Rio Tinto (1969)
- Property Access**
 - Lease Road
 - Trail
 - - - Cut-Line
- Topography**
 - Contours (5m)
 - River/Stream
 - Lake
- Coal Agreements**
 - Altitude Resources Inc.

0 0.125 0.25 0.5 Km
 1:10,000
 Coordinate System: NAD83 UTM Zone 11


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 Hinton, Alberta
Figure 7-5
Central Property Geology Map
 2015.10



430400 430800 431200 431600 432000 432400 432800 433200

5924400
5924000
5923600
5923200
5922800
5922400
5922000
5921600
5921200
5920800
5920400
5920000
5919600



CENTRAL AREA

SOUTH AREA


LOC031054

LEGEND


- Geology**
- Surface Measurement**
 - Inclined Bedding
 - Fault
 - Overturned Bedding
 - Vertical Bedding
- Structure**
 - Anticline - Approximate
 - Syncline - Approximate
 - Thrust Fault - Defined
 - Thrust Fault - Approximate
- Member, Formation**
 - NA, Shaftsbury
 - Mountain Park, Gates
 - Grande Cache, Gates
 - Torrens-Moosebar, Gates
 - NA, Gladstone
 - NA, Cadomin
- Drillhole Locations**
 - Altitude Resources (2013)
 - Dension Mines (1982)
 - Rio Tinto (1969)
- Trench Locations**
 - Altitude Resources (2013)
 - Altitude Resources (2012)
 - Rio Tinto (1969)
- Palisades Field Access**
 - Lease Road
 - Trail
 - Cut-Line
- Topography**
 - Contours (5m)
 - River/Stream
 - Lake
- Coal Agreements**
 - Altitude Resources Inc.



Coordinate System: NAD83 UTM Zone 11



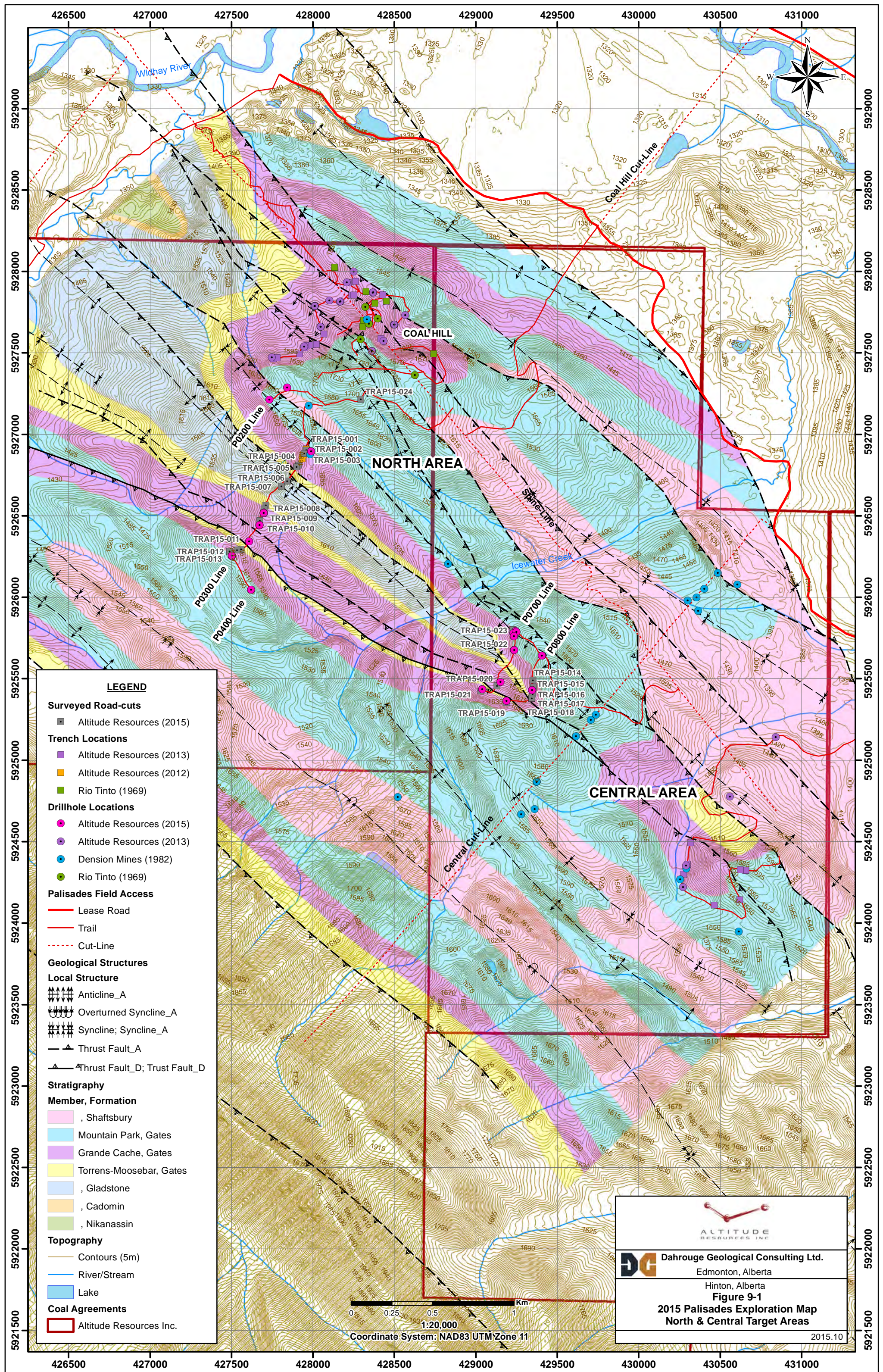
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Figure 7-6
South Target Geological Map

2015.10



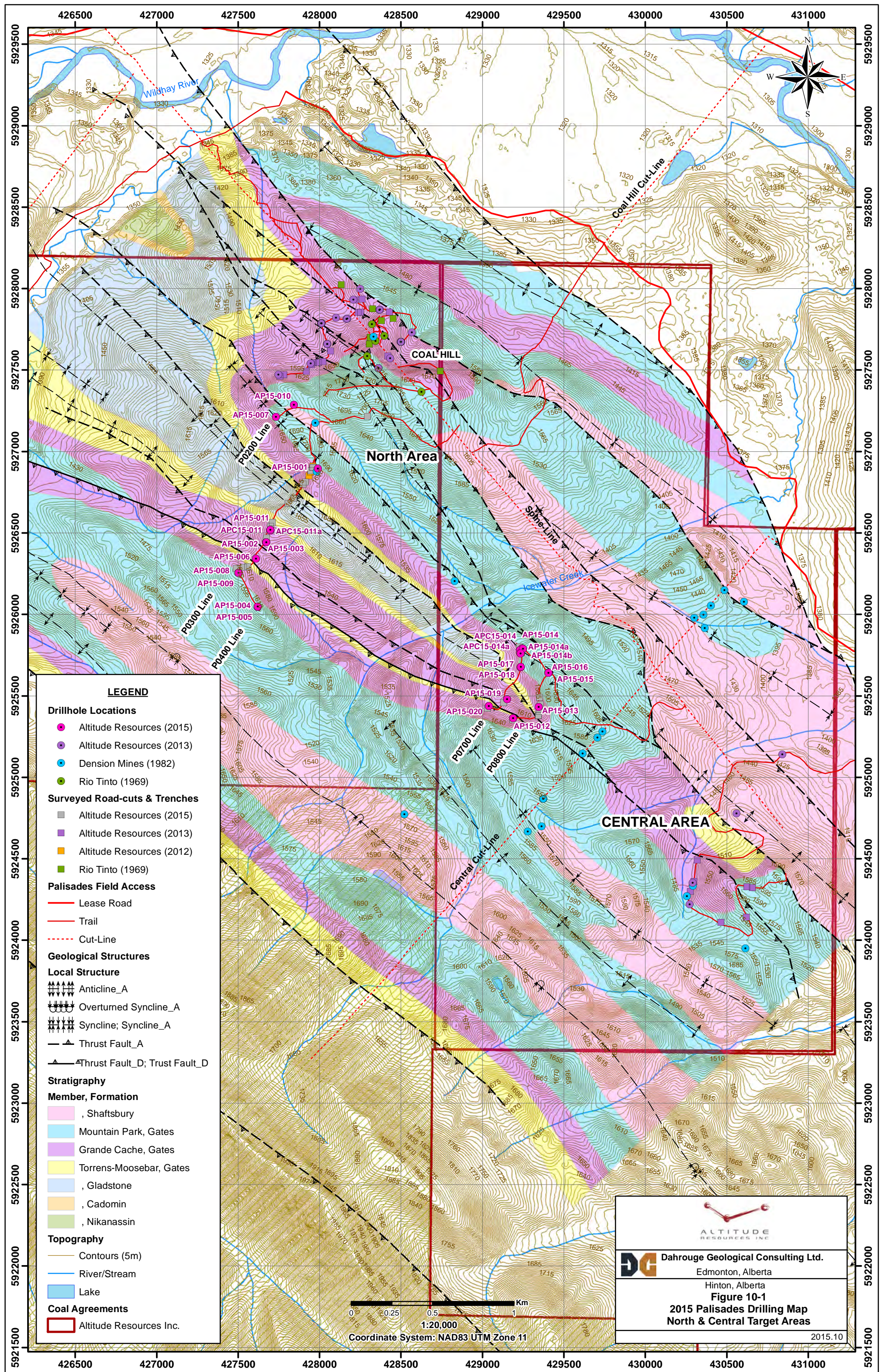
LEGEND

- Surveyed Road-cuts**
 - Altitude Resources (2015)
- Trench Locations**
 - Altitude Resources (2013)
 - Altitude Resources (2012)
 - Rio Tinto (1969)
- Drillhole Locations**
 - Altitude Resources (2015)
 - Altitude Resources (2013)
 - Dension Mines (1982)
 - Rio Tinto (1969)
- Palisades Field Access**
 - Lease Road
 - Trail
 - - - Cut-Line
- Geological Structures**
- Local Structure**
 - ▲▲▲▲ Anticline_A
 - ▼▼▼▼ Overturned Syncline_A
 - ▲▲▲▲ Syncline; Syncline_A
 - ▲ Thrust Fault_A
 - ▲ Thrust Fault_D; Trust Fault_D
- Stratigraphy**
- Member, Formation**
 - Shaftsbury
 - Mountain Park, Gates
 - Grande Cache, Gates
 - Torrens-Moosebar, Gates
 - Gladstone
 - Cadomin
 - Nikanassin
- Topography**
 - Contours (5m)
 - River/Stream
 - Lake
- Coal Agreements**
 - Altitude Resources Inc.



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Figure 9-1
2015 Palisades Exploration Map
North & Central Target Areas
 2015.10

0 0.25 0.5 1 Km
 1:20,000
 Coordinate System: NAD83 UTM Zone 11

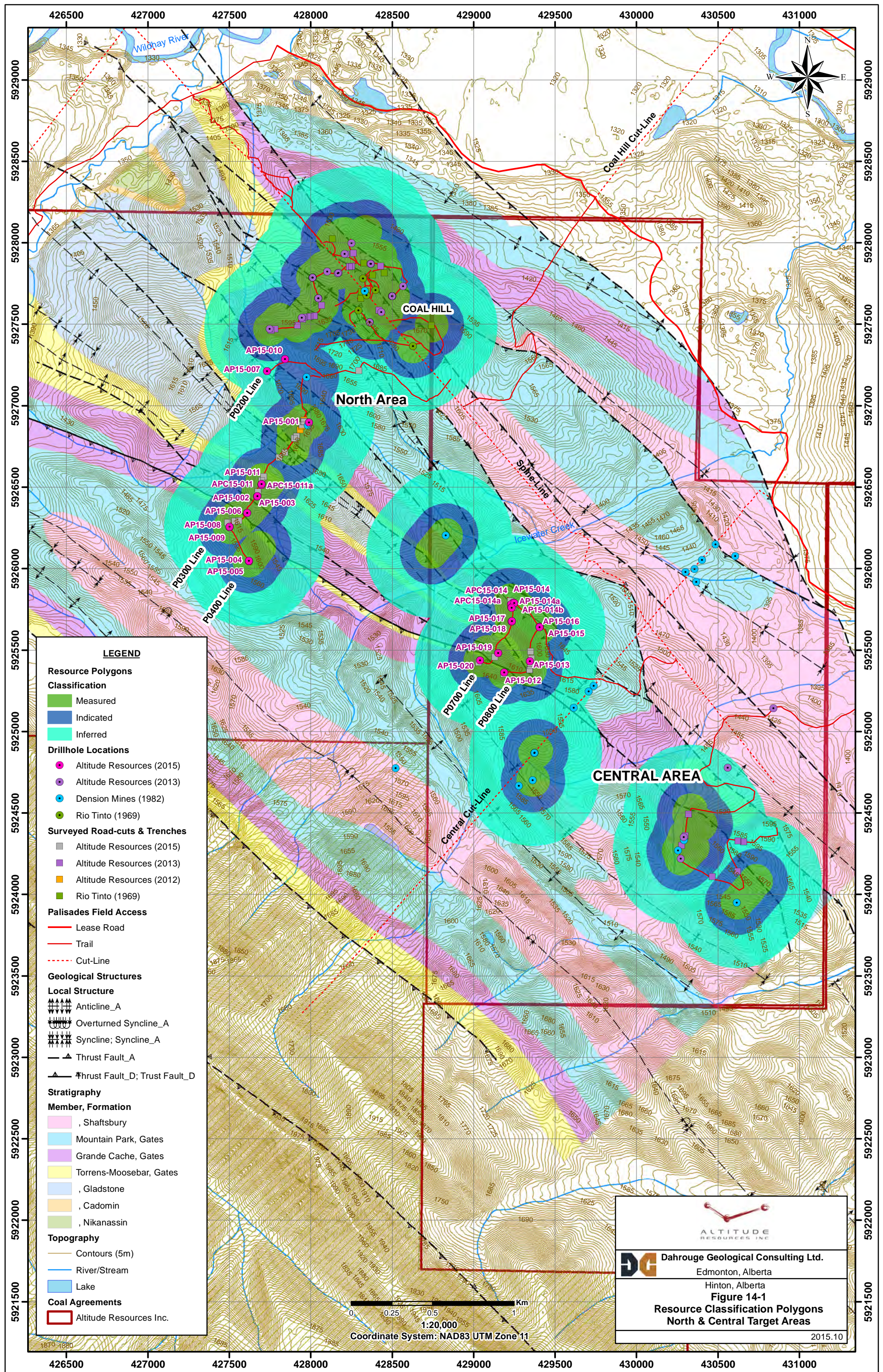


LEGEND

- Drillhole Locations**
 - Altitude Resources (2015)
 - Altitude Resources (2013)
 - Dension Mines (1982)
 - Rio Tinto (1969)
- Surveyed Road-cuts & Trenches**
 - Altitude Resources (2015)
 - Altitude Resources (2013)
 - Altitude Resources (2012)
 - Rio Tinto (1969)
- Palisades Field Access**
 - Lease Road
 - Trail
 - - - - - Cut-Line
- Geological Structures**
 - Local Structure**
 - ▲▲▲▲ Anticline_A
 - Overturned Syncline_A
 - ▲▲▲▲ Syncline; Syncline_A
 - ▲ Thrust Fault_A
 - ▲ Thrust Fault_D; Trust Fault_D
- Stratigraphy**
 - Member, Formation**
 - Shaftsbury
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 - Gladstone
 - Cadomin
 - Nikanassin
- Topography**
 - Contours (5m)
 - River/Stream
 - Lake
- Coal Agreements**
 - Altitude Resources Inc.

0 0.25 0.5 1 Km
 1:20,000
 Coordinate System: NAD83 UTM Zone 11


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Figure 10-1
2015 Palisades Drilling Map
North & Central Target Areas
 2015.10



LEGEND

Resource Polygons

Classification

- Measured
- Indicated
- Inferred

Drillhole Locations

- Altitude Resources (2015)
- Altitude Resources (2013)
- Dension Mines (1982)
- Rio Tinto (1969)

Surveyed Road-cuts & Trenches

- Altitude Resources (2015)
- Altitude Resources (2013)
- Altitude Resources (2012)
- Rio Tinto (1969)

Palisades Field Access

- Lease Road
- Trail
- Cut-Line

Geological Structures

Local Structure

- Anticline_A
- Overtuned Syncline_A
- Syncline; Syncline_A
- Thrust Fault_A
- Thrust Fault_D; Trust Fault_D

Stratigraphy

Member, Formation


- , Shaftsbury
- Mountain Park, Gates
- Grande Cache, Gates
- Torrens-Moosebar, Gates
- , Gladstone
- , Cadomin
- , Nikanassin

Topography

- Contours (5m)
- River/Stream
- Lake

Coal Agreements

- Altitude Resources Inc.


ALTITUDE RESOURCES INC.


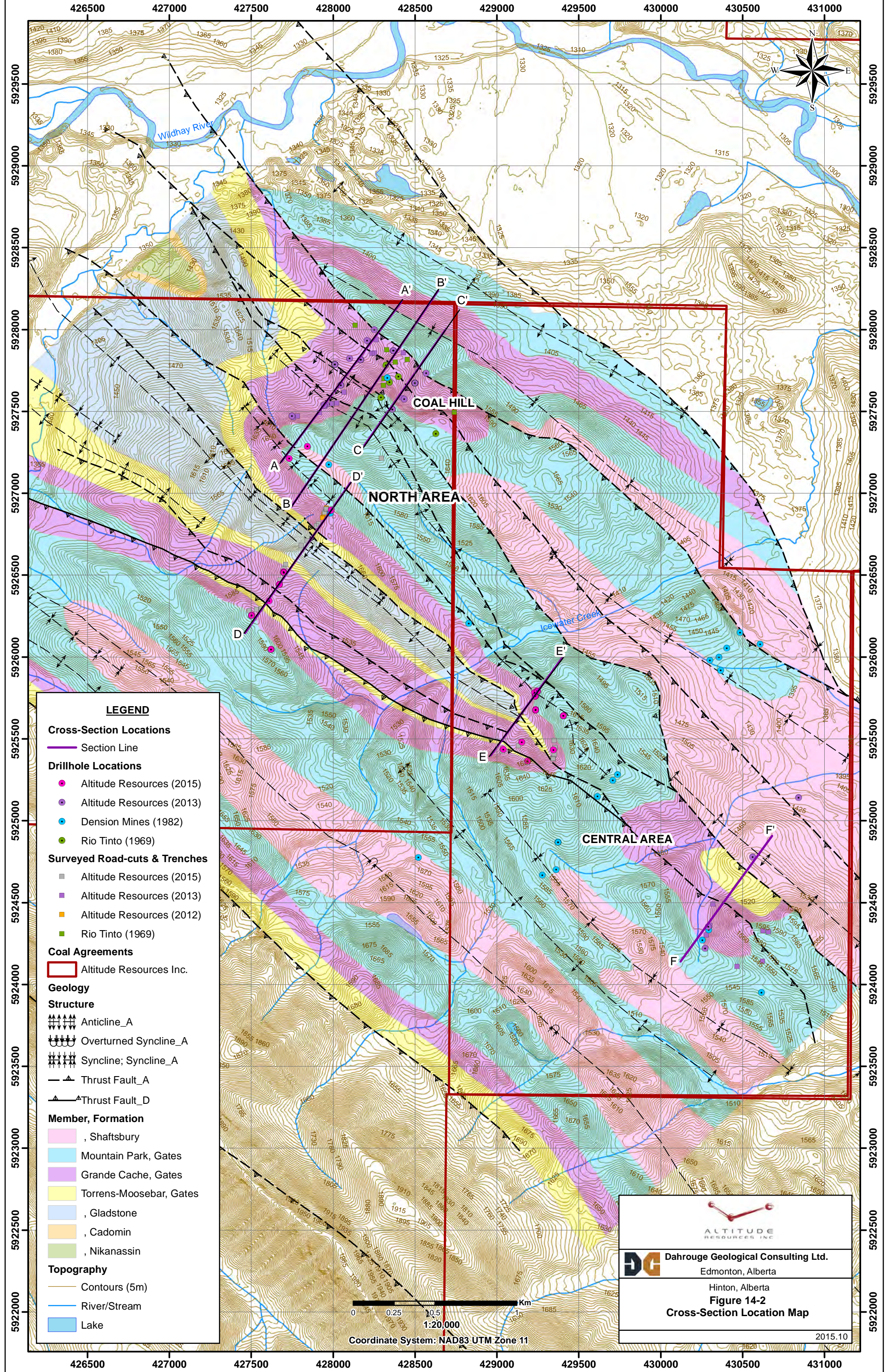
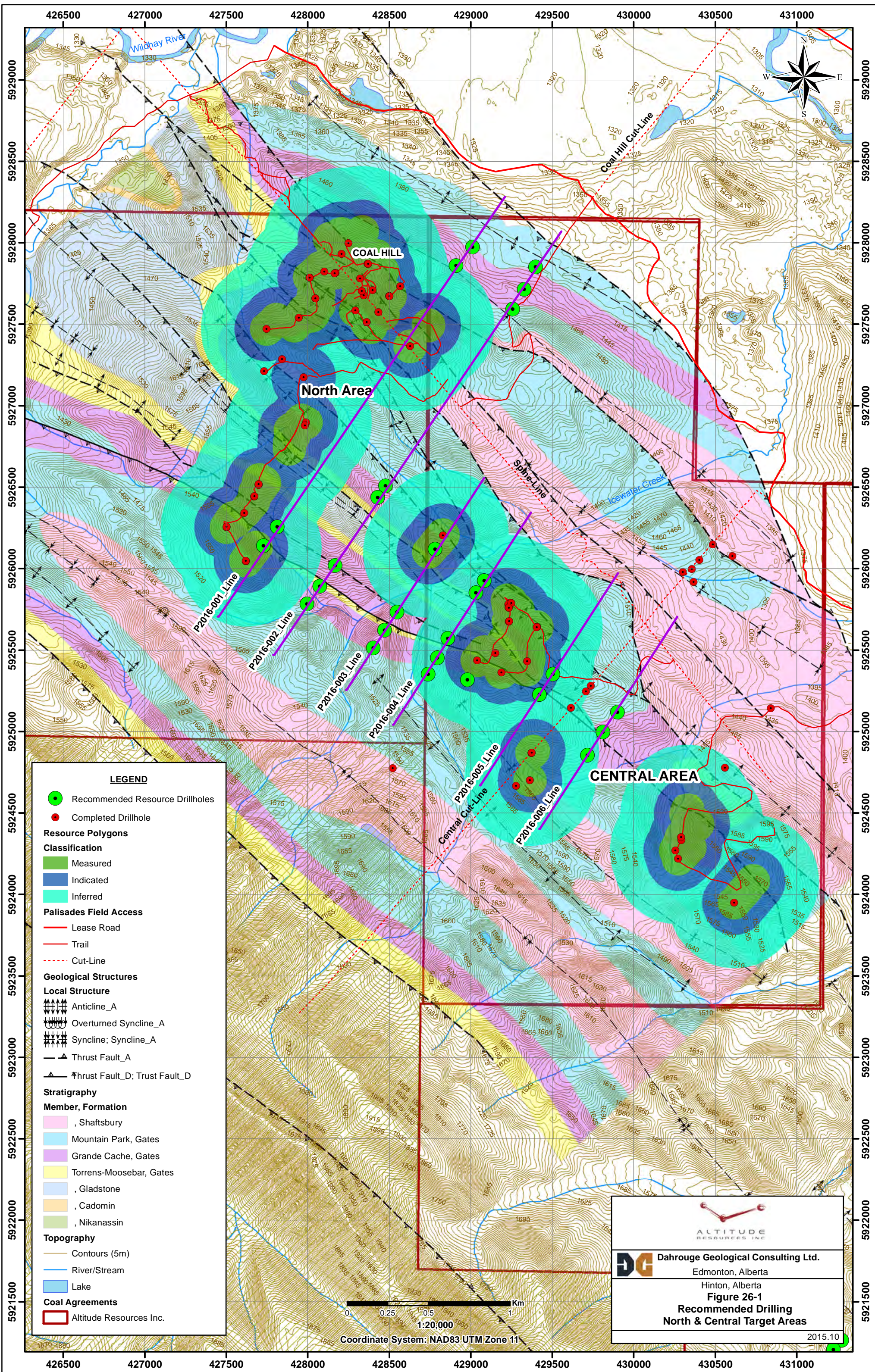

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Figure 14-1
Resource Classification Polygons
North & Central Target Areas

2015.10





LEGEND

- Recommended Resource Drillholes
- Completed Drillhole
- Resource Polygons**
- Classification**
- Measured
- Indicated
- Inferred
- Palisades Field Access**
- Lease Road
- - - Trail
- · - · - Cut-Line
- Geological Structures**
- Local Structure**
- ▲▲▲▲ Anticline_A
- Overturned Syncline_A
- ▲▲▲▲ Syncline; Syncline_A
- ▲ Thrust Fault_A
- ▲ Thrust Fault_D; Trust Fault_D
- Stratigraphy**
- Member, Formation**
- , Shaftsbury
- Mountain Park, Gates
- Grande Cache, Gates
- Torrens-Moosebar, Gates
- , Gladstone
- , Cadomin
- , Nikanassin
- Topography**
- Contours (5m)
- River/Stream
- Lake
- Coal Agreements**
- Altitude Resources Inc.



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Figure 26-1
Recommended Drilling
North & Central Target Areas

0 0.25 0.5 1 Km
 1:20,000
 Coordinate System: NAD83 UTM Zone 11

2015.10