

MAR 20130011: PEACE RIVER

Peace River- A LiDAR survey near Peace River, northwest Alberta.

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**Metallic and Industrial Mineral Permit
Number 9308050787**

Peace River Project

**Part B
Technical Report**

Submitted By:
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Manager of Geology
Preferred Sands of Canada, ULC

March 10, 2013





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Expenditure Statement by Activity

Required Expenditure	Hectares	Rate	Cost
Permit No. 9308050787	1,489	\$10	\$14,892
Total			\$14,892
Actual Expenditure	Units	Rate	Cost
Prospecting (Geologist Hours)	4	\$150.00	\$600.00
Geological Mapping (LiDAR)	1	\$7,700.00	\$7,700.00
Administration (up to 10%)			\$830.00
Total			\$9,130.00



1.0 Introduction

In 2012, LiDAR information was acquired to gain a better understanding of the property subject to the terms and conditions of the Metallic and Industrial Mineral Permit, No. 9308050787 (Permit) which was issued on May 9th, 2008. Preferred Sands of Canada, ULC (Preferred) acquired the lease in the acquisition of assets from Winn Bay Sands at the end of 2011.

Work completed in the previous work period was conducted to gain a better understanding of the Geology and physical properties of the materials available on the Permit site. It was decided that Preferred required more detailed mapping for the Permit area to better understand topography and other physical characteristics of the site (Appendix C).



2.0 Summary

LiDAR imaging was gained from Clean Harbors Exploration Services, located in Calgary, Alberta. This imaging was used to make a detailed map of the Permit. This information will be used in creating digital terrain models and site maps.

The current assessment period (period2) requires expenses totaling \$10 per hectare for 1489.24 hectares; a total cost of \$14,892.40 on exploration to keep the Permit in good standing. Preferred spent a total of \$9,130.00; therefore \$4,529.40 will be added to the expenditure requirements for the next assessment period.



3.0 Work Performed

The Preferred Geology department has processed the LiDAR data and imagery in AutoCAD Civil 3D to create the current site map. LiDAR data provided by Clean Harbors Exploration Services provided detailed mapping information so that a more accurate topography and site features could be created.

Existing borehole data cited in the report from the previous work period can now be added to the LiDAR information to more accurately qualify and quantify potential reserves. Site analysis, using the updated imaging, will help Preferred gain an understanding of how the Permit may be developed.



4.0 Results

After acquiring the data from Clean Harbors Exploration Services, it was used to create detailed topography of the site. The data represents 16.2 km² of topography and orthorectified photography that covers the Permit area. The LiDAR data provides a cost effective solution for topography (i.e. aerial flyover or GPS surveying) while providing more accuracy than less expensive sources (i.e. Google Earth). The LiDAR data covered portions of the NTS sections noted in Table 4.1. More information can be found in Appendix B.

SECTIONS	SUBSECTIONS
o84Co6B	12, 13, 14
o84Co6C	9, 16, 15
o84Co6F	1, 2
o84Co6G	3, 4

Table 4.1 – Portions of the NTS Sections Covered by LiDAR Data



5.0 Conclusions and Future Work

The current work period can only conclude that Preferred would like to work on processing the current data available on the Permit prior to planning more future work. As a company we will better understand the available data and work that has been done prior to the acquisition of the Permit. We will then assess the work still needed to understand the mineral deposit.

Authors Qualifications

March 10, 2013

I, Matthew Bendernagel, reside in Paoli, Pennsylvania, United States of America and hereby certify that:

1. I am the Manager of Geology for Preferred Sands of Canada, ULC (Preferred), One Radnor Corporate Center, 100 Matsonford Road, Suite 101, Radnor, PA 19087. Preferred has been supplying sand proppant to the oil and gas industry since 2008.
2. I am a graduate of Purdue University, West Lafayette, IN with a B.S. in Earth Science.
3. I have been a geologist in the mining industry since 1999.
4. I have my Masters in Business Administration for the University of Detroit Mercy.
5. I am responsible for the exploration of minerals due diligence for all prospective sites that Preferred explores.
6. I am responsible for all mining planning activities for existing Preferred operations.
7. I have been studying and investigating sandstones suitable for hydraulic fracturing of oil and gas wells since 2010.
8. I co-authored this report with Amanda Lierman, Geologist, Preferred.
9. I am not aware of any material fact or material change with respect to the subject matter of this report that is not reflected in this report, or the omission to disclose which makes this report misleading.



MATTHEW B. BENDERNAGEL

Manager of Geology
Preferred Sands of Canada, ULC

March 10, 2013

I, Amanda Lierman, reside in Bloomer, Wisconsin, United States of America and hereby certify that:

1. I am a Geologist for Preferred Sands of Canada, ULC (Preferred), One Radnor Corporate Center, 100 Matsonford Road, Suite 101, Radnor, PA 19087. Preferred has been supplying sand proppant to the oil and gas industry since 2008.
2. I am a graduate of University Wisconsin Eau Claire, Eau Claire, WI with a B.S. in Geology.
3. I have been working in the mining industry since 2009.
4. I am responsible for field work in association with the exploration of minerals and due diligence necessary for all prospective sites that Preferred explores.
5. I have been studying and investigating sandstones suitable for hydraulic fracturing of oil and gas wells since 2007.
6. I co-authored this report with Matthew Bendernagel, Manager of Geology, Preferred.
7. I am not aware of any material fact or material change with respect to the subject matter of this report that is not reflected in this report, or the omission to disclose which makes this report misleading.



AMANDA LIERMAN

Geologist

Preferred Sands of Canada, ULC



References

LiDAR Project Summary. (2007). Calgary, AB: Clean Harbors Exploration Services

LiDAR Project Summary



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Calgary, Alberta, Canada
T2H 1K8

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Fax: (403) 243 8681
www.airborneimaginginc.com

Project Information

Project Name:	Peace River
Project Number:	11230
Client:	Preferred Sands
Project Type:	Wide Area
Project Location:	Peace River, Alberta, Canada
Project Size:	16.4 sq kms

Acquisition Projects

Project Name	Project Number	Vintage
Peace River	1077	May 2007

Acquisition Parameters

Date (MM/DD/YY)	Mission	Flying Height (m)	Flying Speed (knots)	Pulse Rate Rep (kHz)	Scan Freq (Hz)	Scan Angle (degree)	Side Lap %	Point Density (pts/m ²)	LiDAR System
05/24/07	4307144a	1400	160	70	33	50	50	1.3	Optech 3100
Multiple Return Capabilities:		YES		Number of returns recorded:				Maximum 4	

Geodetic Control

Horizontal Datum:	Nad83 CSRS	Vertical Datum:	CGVD28
Geoid Model:	HT2.0	UTM Zone:	11
Note: We established a local geodetic network fixed to the following control:			
Station ID	Lat	Long	Ellp Height
156224	N56d 16' 36.28940"	W117d 22' 12.10370"	543.996
241455	N56d 25' 14.65842"	W116d 51' 15.09626"	586.760

Calibration Methodology

Airborne Imaging performs a complete calibration on every LiDAR acquisition flight, data is acquired over a calibration site flown with at least two passes in opposite directions before and after the flight. Any error in the attitude of the aircraft (roll, pitch and heading) can be observed and corrected for within system specifications. To statistically quantify the accuracy, we compare the LiDAR elevations with independently surveyed ground points. A GPS mounted truck collects data while driving on an open road. The kinematic positions on the road are post-processed from a nearby base station (common to the aerial survey)

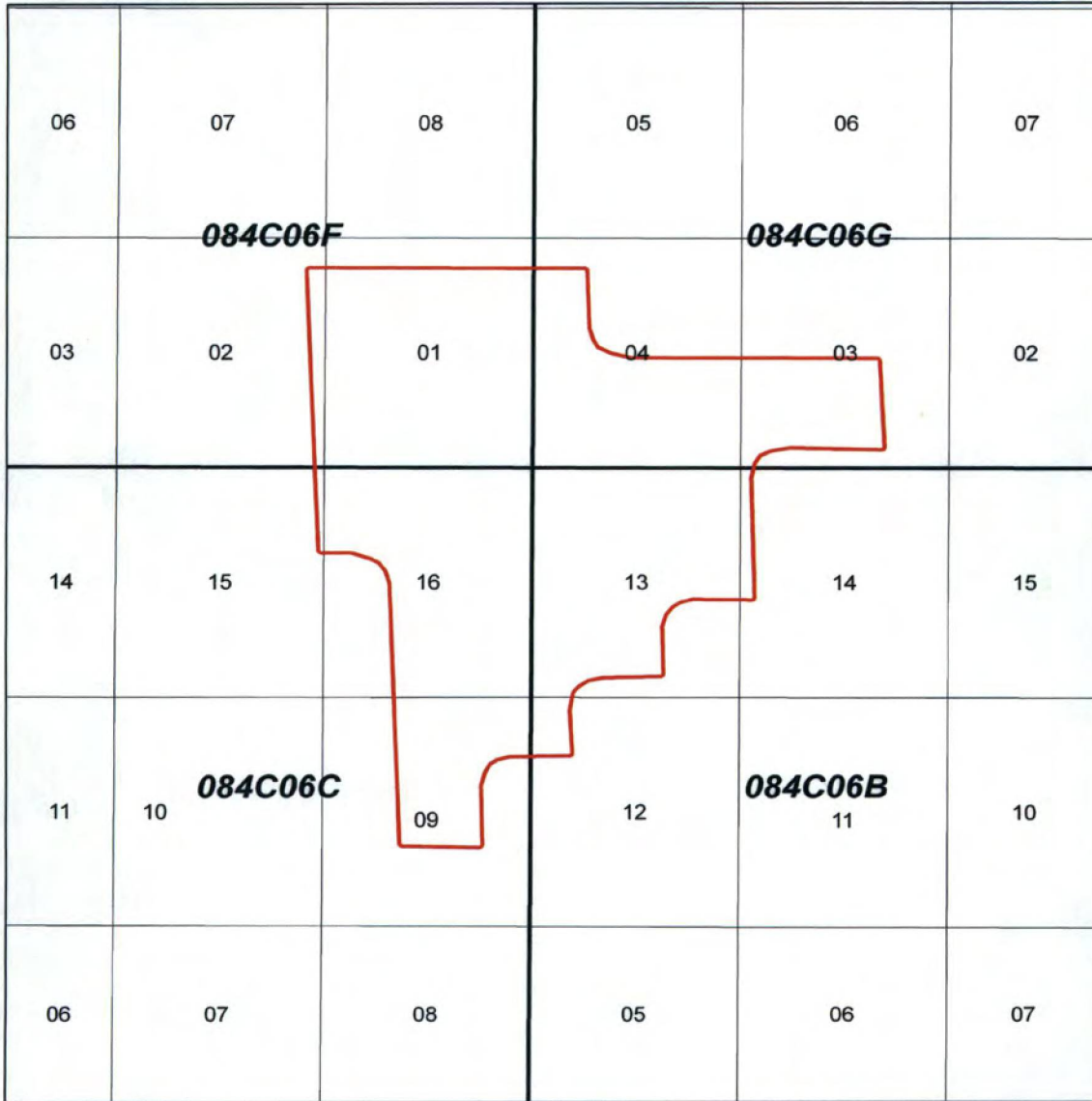
Accuracy

Horizontal Accuracy, 95% or 2σ:	45 cm
Fundamental Vertical Accuracy (on flat hard surfaces), 95% or 2σ:	30 cm

Deliverables

- 1m Grids (XYZ ASCII), Bare Earth and Full Feature
- Hillshade Images (Geotiffs), Bare Earth and Full Feature
- Point Cloud (LAS v1.2, ASPRS Classes)
- .5m Contours (dxf)

Summary Produced: March 1, 2013

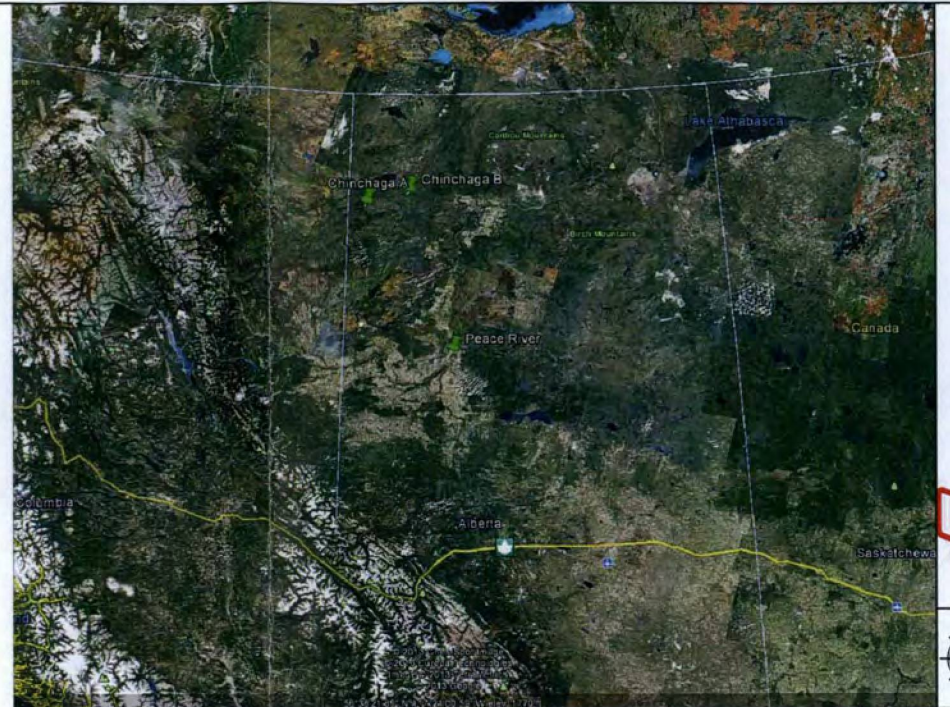
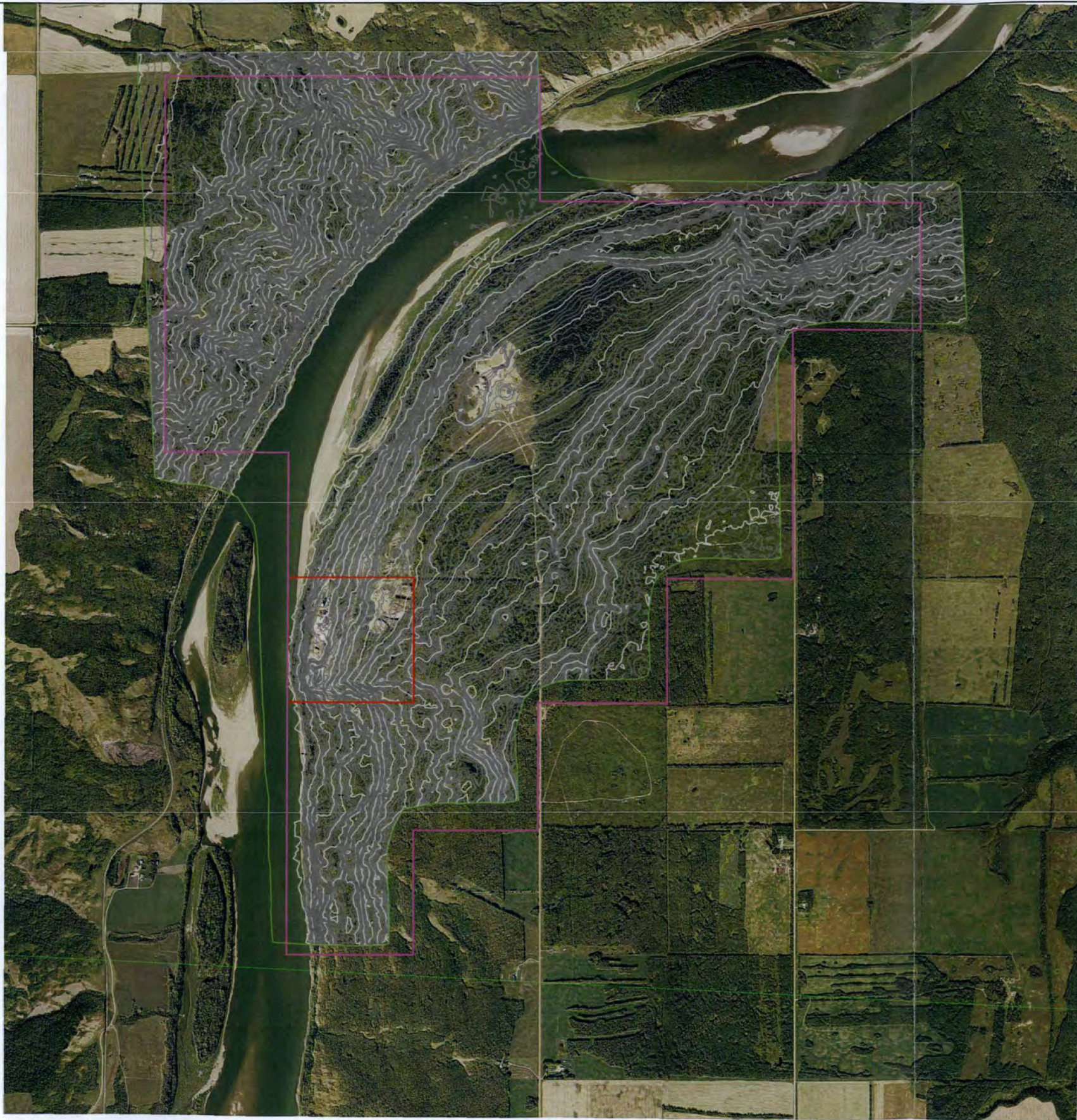


11230 - Peace River - Preferred Sands

1:50,000

The Red outline represents the extent of the data delivered.
Our data is tiled following the National Topographic System (NTS).

The NTS system is separated into four tiling levels for example: 93 L 10 D.
We have divided these blocks further into 16ths to make them into a manageable tile size of about 2km X 2km.
Our final tile names appear as follows: 093L10D15



Site Map - Not to Scale

- Lease Boundary
- Surface Boundary
- Major Contour (10m)
- Minor Contour (2m)
- Out Parcel

preferred sands

APPENDIX B

PEACE RIVER PROPERTY - 9308050787
ALBERTA, CA

MDD	DATE
MDD	SCALE
MDD	DRAWN BY
MDD	PROJECT NUMBER
MDD	SHEET NO.

1 of 1