



COAL ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: *Coal Assessment Report Trend Mine Peace River District*

TOTAL COST: \$2,429,435

AUTHOR(S): *David Lortie*

SIGNATURE(S): *David Lortie*

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): *Trend Roman Mine Permit C-224*

YEAR OF WORK: **2020**

PROPERTY NAME: *Trend Mine*

COAL LICENSE(S) AND/OR LEASES ON WHICH PHYSICAL WORK WAS DONE: **417059.**

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: *Liard*

NTS / BCGS: **093I 15**

LATITUDE:

LONGITUDE:

UTM Zone: **10** EASTING: **630,000** NORTHING: **6,083,000**

OWNER(S): *Peace River Coal Inc.*

MAILING ADDRESS: *Suite 620 – 650 West Georgia Street, Vancouver, BC V6B 4N8*

OPERATOR(S) [who paid for the work]: *Peace River Coal Inc.*

MAILING ADDRESS: *Suite 620 – 650 West Georgia Street, Vancouver, BC V6B 4N8*

REPORT KEYWORDS (lithology, age, stratigraphy, structure, alteration, mineralization, size and attitude. **Do not use abbreviations or codes**)

Coal, sandstone, siltstone, mudstone, shale, Gates Formation, folding, faulting

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

1. ***Denison Mines Limited. 1976. Quintette Coal: Limited 1975 Exploration and Development Report, January 1976. Report 607***

2. **Denison Mines Limited. 1976. Quintette Coal Limited: Information Summary, August 1976. Report 608**
3. **Denison Mines Limited. 1976. Quintette Coal Limited: 1976 Geological Assessment Report, December 1976. Report 609**

SUMMARY OF TYPES OF WORK IN THIS REPORT		EXTENT OF WORK (in metric units)	ON WHICH TENURES
GEOLOGICAL (scale, area)			
	Ground, mapping		
	Photo interpretation		
GEOPHYSICAL (line-kilometres)			
	Ground (Specify types)		
	Airborne (Specify types)		
	Borehole		
	Gamma, Resistivity,	2454	
	Resistivity		
	Caliper	2454	
	Deviation		
	Dip	2454	
	Density	3130	
	Core	3130	
	Non-core		
SAMPLING AND ANALYSES			
Total # of Samples			
	Proximate	31	
	Ultimate	31	
	Petrographic	31	
	Vitrinite reflectance	31	
	Coking		
	Wash tests	31	
PROSPECTING (scale/area)			

Section 6, Attachment 1, and Appendix 3 all remain confidential under the terms of the Coal Act Regulation and have been removed from the public version.

http://www.bclaws.ca/civix/document/id/complete/statreg/251_2004

COAL ASSESSMENT REPORT TREND PROPERTY

PEACE RIVER DISTRICT

LOCATED AT UTM: 6,083,500 N, 630,000 E

COAL LEASES: 417059, 417609,

Peace River Coal Inc. - Anglo American Metallurgical Coal

620 – 650 West Georgia Street

Vancouver, British Columbia

V6B 4N8

Author: David Lortie P.Geo.

December 29, 2020

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COAL ASSESSMENT REPORT

TREND UNDERGROUND PROJECT

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1 SUMMARY

The Trend Property consists of a coal lease and associated coal licenses on the flank of Roman Mountain in an area that Peace River Coal Inc. acquired in 2006 as part of the formation of the company. Until December 2006, the Trend Mine was owned and operated by NEMI Northern Energy and Mining Inc. (NEMI). In November 2, 2006 NEMI's assets were consolidated with Hillsborough Resources Ltd. and Anglo Canadian Coal Inc. assets to form a new coal mining company, Peace River Coal Limited Partnership (PRCLP). NEMI and Hillsborough Resources Ltd. remained as minority shareholders in PRCLP, and PRC managed the PRCLP assets as general partner.

In October 2011, the NEMI and Hillsborough Resources Ltd. minority interests were sold to PRC. PRC now manages the assets and is a wholly owned subsidiary of Anglo American plc. PRC operates as part of Anglo American's Met Coal business unit based in Brisbane Australia.

The property is located in the Peace River Regional District of Northeast British Columbia, Canada. The property is in the Inner Foothills of the Canadian Rocky Mountains near the town of Tumbler Ridge, British Columbia and about 725 km northeast of Vancouver, British Columbia. The property is readily accessible by provincial highway and an all-weather forestry service road. See Figures 2.1 and 2.2.

The coal resources in the Trend Mine area are part of the Peace River Coalfield. The coal seams are contained in the Lower Cretaceous Gates Formation and were deposited in an alluvial-deltaic environment 145 million years ago. Gates Formation coals have been mined extensively in the region, and the seams at the Trend Mine area may be correlated with the seams mined previously in the region.

Regional tectonism from post-depositional mountain building has folded the geological structures regionally and locally. In this area, significant reverse and thrust faulting are interpreted in parts of the resource area. The local structures are of moderate geology, as defined by GSC paper 88-21,

In the Trend Underground area, the B, E1, F and J Seams of the Gates Formation are considered to have economic potential for development.

Denison carried out drilling exploration in area of the Trend Mine between 1971 and 1974. The work consisted of drilling a one core borehole in 1971, 3 core boreholes in 1972 and 2 diamond core holes in 1974.

In 1985 Quintette Coal Limited drilled two core boreholes, ten rotary boreholes and dug five trenches in what is now Trend South.

NEMI completed exploration programs in Trend South and Trend Extension from 2002 - 2004. The programs consisted of ninety-two rotary boreholes, twenty-one HQ core boreholes, thirty-two LD core boreholes and the digging of fourteen trenches. In 2005, twelve LD core boreholes were completed by NEMI in Trend South.

Drilling activities carried out on Trend Mine by PRC from 2007 to 2012 included eighty eight rotary percussion boreholes, twenty seven HQ core boreholes, eleven HQ core boreholes and thirty seven large diameter boreholes. In addition, twenty two trenches were excavated during the 2007 to 2012 drilling programs.

In 2020 a small exploration program was undertaken to investigate the underground potential on the Trend Roman mine property. This report will deal with the results of the trend Underground exploration program only. For more information on the exploration of the Trend Roman Mine open pit operations refer to previous coal assessment reports filed by Peace River Coal Inc.

2 GENERAL

2.1 Purpose of Report

This report has been prepared to report on the exploration activities undertaken in 2020 on the Trend Mine property as part of the requirements for holding coal tenure under the British Columbia Coal Act. The exploration program was undertaken under the Trend Roman Mine Permit C-224.

2.2 Project Description

Peace River Coal Inc. (PRC) is a producer of high-quality metallurgical coal in Canada. In addition to holding significant coal resources in western Canada, PRC conducts mining operations at the Trend Mine in the Tumbler Ridge area of northeast British Columbia

Until December 2006, the Trend Mine was owned and operated by NEMI Northern Energy and Mining Inc. (NEMI). In November 2006 NEMI's assets were consolidated with Hillsborough Resources Ltd. and Anglo Canadian Coal Inc. assets to form a new coal mining company, Peace River Coal Limited Partnership (PRCLP). NEMI and Hillsborough Resources Ltd. remained as minority shareholders in PRCLP, and PRC managed the PRCLP assets as general partner.

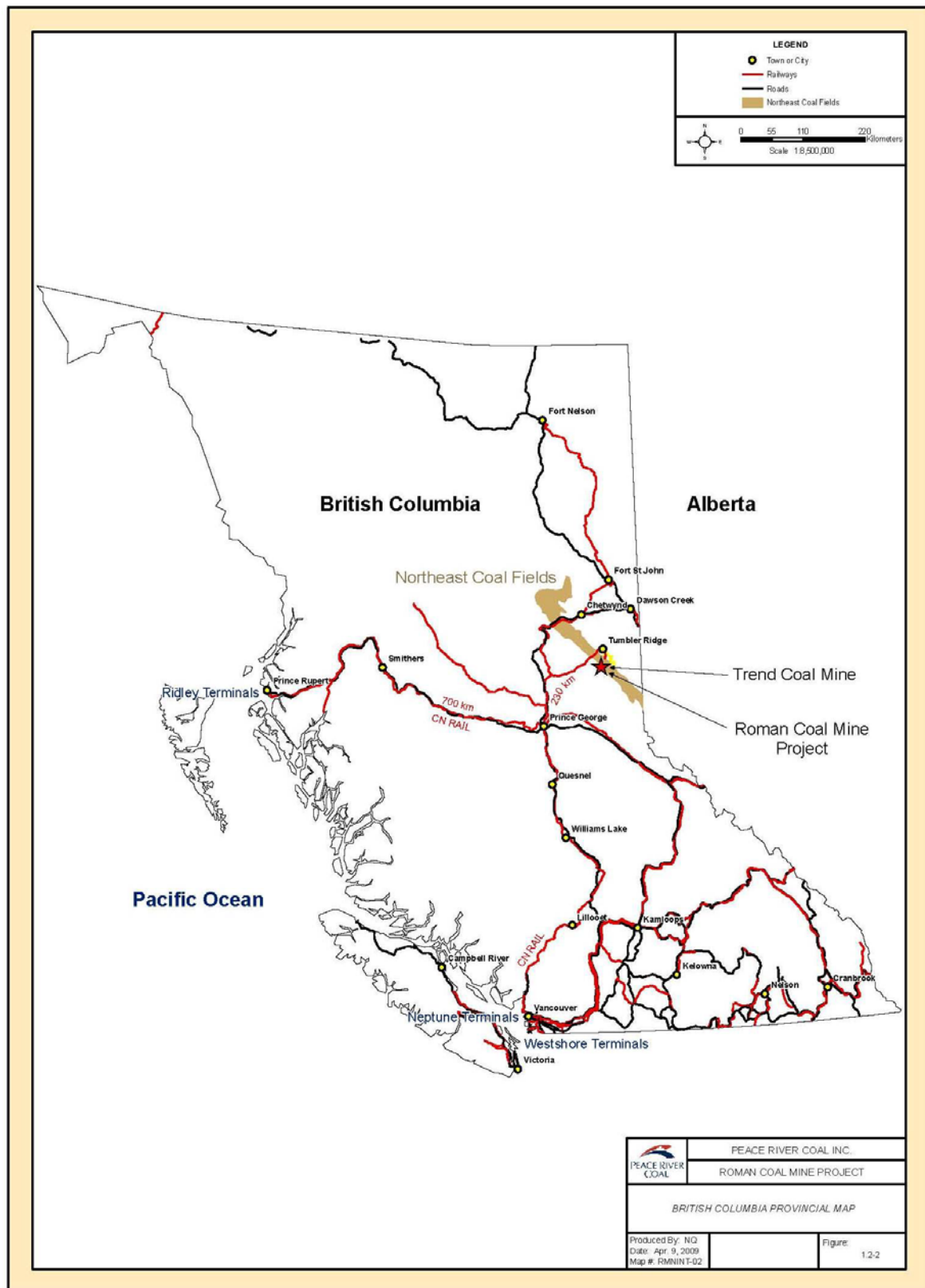
In October 2011, the NEMI and Hillsborough Resources Ltd. minority interests were sold to PRC. PRC now manages the assets and is a wholly owned subsidiary of Anglo American plc. PRC operates as part of Anglo American's Metallurgical Coal business unit based in Brisbane Australia.

In January 2015 the Trend Roman open pit operations were put into care and maintenance as a result of the declining price of coal on the world metallurgical coal market.

2.3 Property Description & Location

The Trend Mine is located in the Rocky Mountain Foothills of north-eastern British Columbia. (Figure 2.1). Access to the project is gained by paved and gravel roads from Tumbler Ridge, located 20 km to the north. It is centered in UTM Zone 10 (NAD 83) at coordinates 6,083,500 N, 630,000 E and is located on NTS Map Sheet 93-I/15 (Figure 2.2)

Figure 2.1 General Location Map British Columbia



2.4 Mineral Rights & Surface Title

The Trend Mine and associated infrastructure occur on two Coal Leases (see Figure 2.3). Table 2.4.1 shows summary information for the coal leases. The Trend Mine is located within Coal Lease 417059 which expires on September 14, 2030 and Coal Lease 417609 which expires on August 7, 2037 both Coal Leases are owned by PRC. The coal lease 417059 covers a total area of 3,201 ha of which approximately 500 ha make up the Trend Mine area and coal lease 417609 covers a total of 1788 ha of which approximately 400 ha make up the Trend Mine area. The Trend Underground exploration program was carried out on Coal Lease 417059. The company advises that the property has not been legally surveyed.

Table 2.4.1: Summary of Mineral Rights

Attribute		
Tenure Type	Coal Lease	Coal Lease
Tenure Number	417059	417609
Site	Trend	Trend
Name	Trend Roman	Trend
Holder 1	PRC	PRC
Holder 1%	100	100
Area	3201	1788
Units	Ha	Ha
Expiry Date	2030-09-14	2037-08-07

2.5 Accessibility, Climate, Infrastructure & Physiography

The Trend Mine is accessed from Tumbler Ridge via the paved Heritage Highway and an all-weather gravel road named Petroleum Development Road 46 (PDR 46), or the Core Lodge Road. PDR 46 is owned and maintained by Canadian Natural Resources Limited (CNRL) and PRC has entered into a Road Use Agreement for mine access and coal haul. The Heritage Highway and PDR 46 road are maintained year-round in good, drivable condition in support of all resource development in the area. (Figure 2.2 Regional Location Map)

All weather data was obtained from the Trend Mine weather station between 2006 and 2009. The station is located in UTM Zone 10, NAD 83 at coordinates 6085666 Northing, 630950 Easting and 1,434 m above mean sea level.

The climate within the project area is characterized by long, cold winters, from November through March, and short, cool summers, from June through August. Summer temperatures generally range between 5°C and 15°C but maximum values of up to 30°C have been recorded. Average winter temperatures range between -10°C and -5°C with minimum temperatures as low as -30°C. Rainfall occurs during the summer months with an annual average of 306 mm. Snowpack at the Trend Mine normally averages 200 cm per annum but may exceed 275 cm. Wind speeds vary throughout the year averaging approximately 16 km per hour. Maximum wind speeds of up to 111 km per hour have

been recorded.

The centre of the Trend Mine area is located about 100 km south of Dawson Creek, British Columbia and 175 km south of Fort St. John, British Columbia. Dawson Creek and Fort St. John have populations of approximately 11,000 and 17,400 respectively. In addition, the Trend Mine is located approximately 175 km northeast of Prince George, British Columbia and 120 km southwest of Grande Prairie, Alberta both of which have populations greater than 40,000. Each of these cities has regularly scheduled flights to and from major western Canadian cities such as Vancouver, Edmonton and Calgary. Tumbler Ridge is a small town with a population of approximately 2,500 located 20 km to the north of the Trend Mine.

The nearest railhead is the CN Rail Tumbler Subdivision, which terminates 12 km south of Tumbler Ridge at the Quintette rail load-out. PRC constructed a rail load-out facility in 2005 located approximately 4 km north of the Quintette rail load-out which also connects with the CN Rail Tumbler Subdivision railhead. Distance from this load-out to the Ridley Terminal Inc., in Prince Rupert, British Columbia is approximately 1,000 km. An airstrip is situated 11 km south of Tumbler Ridge along the Heritage Highway. The unmanned airstrip is primarily used for chartered flights. Primary industrial development activities in the region include oil and natural gas exploration and production, coal exploration and mining, forestry and wind energy generation.

The Trend Mine is located in the Rocky Mountain Foothills of British Columbia. The Foothills consist of a series of ridges and valleys that parallel the Rocky Mountains to the west. The topography of the Trend Mine area varies from gentle slopes to rugged cliffs and steep valleys. The total elevation change across the project area is approximately 500 m, from 1,330 m above mean sea level at Babcock Creek, to 1,850 m above mean sea level at the highest point in Trend Extension.

Figure 2.2 Regional Location Map

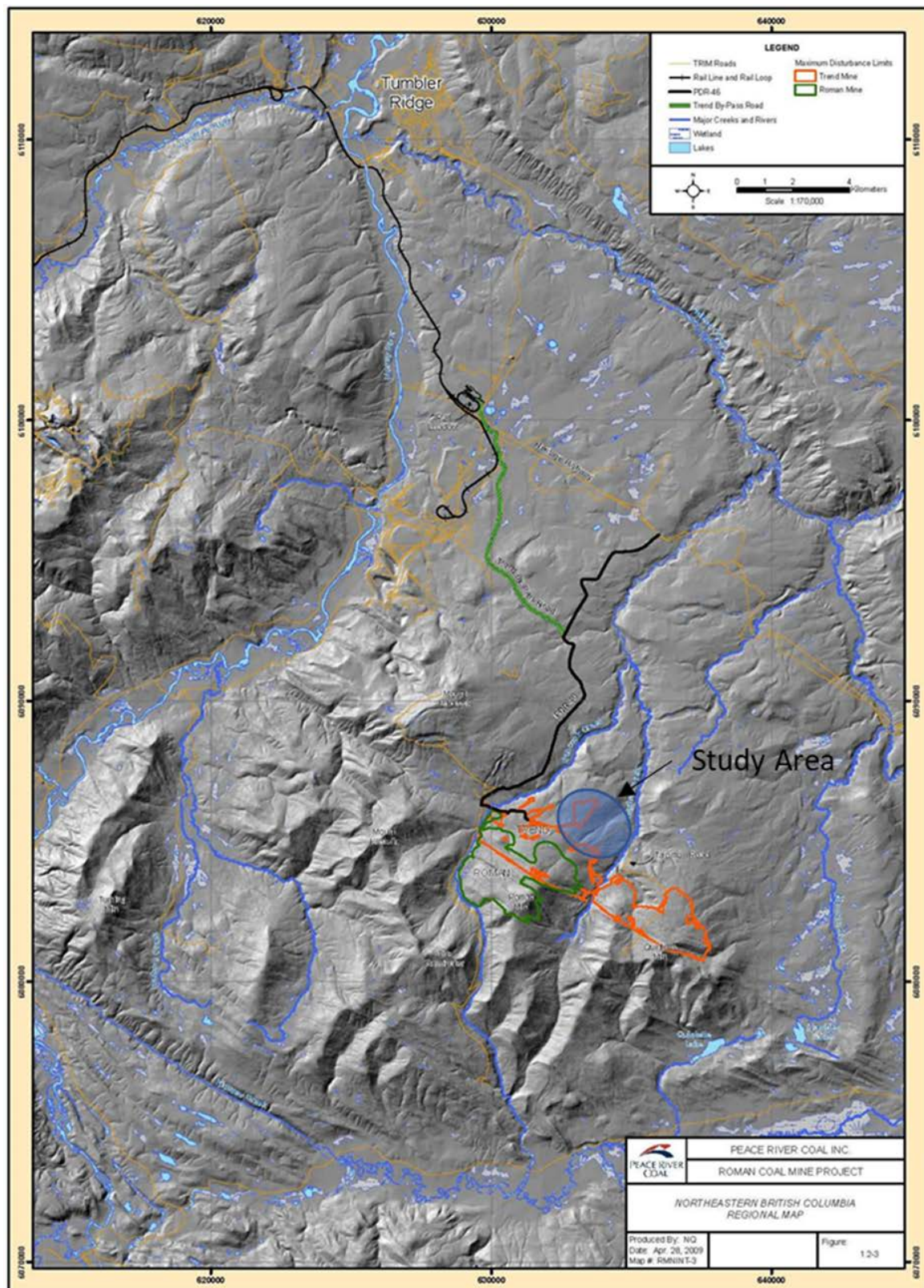
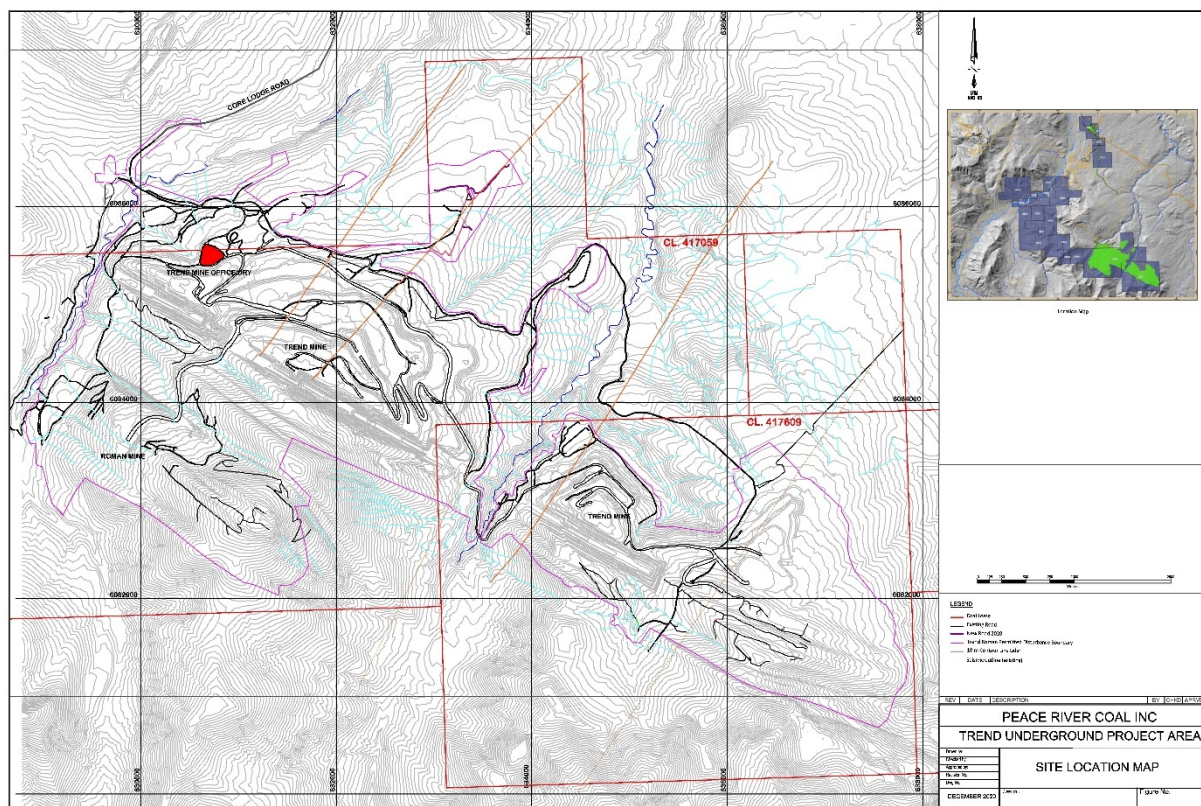


Figure 2.3 Site Location Map

2.6 Adjacent Properties

The Trend Mine is located within an area that contains a number of both closed and currently producing metallurgical coal properties including Perry Creek, Bullmoose, Wolverine and Quintette.

2.7 Historical Information

Commercial coal deposits were first discovered north of the Trend Mine area beside the Sukunka River in 1965, and this discovery triggered a coal “staking rush” by various companies led mainly by Brameda Resources and Denison Mines Limited.

This activity occurred in response to global expansion of steel production which stimulated worldwide exploration for coking coal. Intensive exploration from the late 1960’s to the 1980’s followed that culminated in the development of the Quintette and Bullmoose Coal Mines.

Infrastructure development included the construction of the town of Tumbler Ridge, 129 km of rail line, 95 km of highway, 127 km of high voltage transmission line, a new port at Ridley Island and the upgrading the 752 km of existing rail line from Prince George to the port at Prince Rupert.

The Quintette Mine made its first coal shipment in December 1983 and operated until August 2000. The mine had a raw coal production capacity in excess of 6 million tonnes per annum, making it one of Canada’s largest mines. Production came from four open pits named Mesa, Wolverine, Shikano and Babcock. Clean coal production capacity was 2.3 million tonnes per annum, although shipments

toward the end of the mine's life in 2000 ranged from 1.4 to 1.9 million tonnes per annum.

The Bullmoose Mine produced 34 million tonnes of high quality metallurgical coal from 1983 until its closure in April 2003. Teck, which acquired the property through the purchase of Brameda Resources, operated the mine and owns the majority of the remaining mine assets along with minority partners.

Since 2004 four new open pit coal mines have opened in the region. Two of these which are the Wolverine and Trend Mines, are located in the Tumbler Ridge area and produce metallurgical coal. The others, the Pine Valley Coal Mine and the Brule Mine, are located in the Chetwynd area. The Brule Mine produces Pulverized Coal Injection (PCI) coal while Pine Valley has produced both PCI and metallurgical coal.

In 1970 and subsequent years Denison Mines Limited (Denison) acquired a large number of crown coal licences in the Wolverine Valley, Quintette Mountain and Trend Mine areas. In April 1971 Denison entered into an agreement with Mitsui Mining Co. Ltd., Alco Standard Corporation and Tokyo Boeki Ltd. to form Quintette Coal Ltd. Several changes in the partnership took place in the 1970's and 1980's leaving Denison as the major shareholder and managing partner. By 1983 Denison had accumulated a 50% stake in the partnership with Mitsui Mining Co. Ltd. holding 12.5%. The remainder of the partnership comprised twelve other companies, mainly representing interests in the Japanese steel industry.

In response to decreasing economic certainty and rulings by federal authorities to reduce coal prices, Teck Corporation took control of Quintette Coal Limited from Denison in 1991 and the Quintette Operating Corporation was created. As a result of diminishing coal prices, the Roman licenses reverted to the crown in 1999 to 2000.

Ownership of the Trend Mine coal license was obtained by NEMI in early 2000. When NEMI joined the PRC partnership in 2006 control of the Trend Mine coal licenses and coal leases were transferred to PRC.

2.8 Exploration by Other Parties

Denison Mines Limited carried out extensive exploration work in the area of the Trend Underground project area between 1971 and 1974. The work included detailed surface geological and topographical mapping, structural interpretation and mechanical exploration including drilling.

3 DRILL HOLE DATA

3.1 Historical Drilling

Denison carried out drilling exploration in area of the Trend Underground project area between 1971 and 1974. The work consisted of drilling a one core borehole in 1971, 3 core boreholes in 1972.

3.2 2020 Drilling

In 2020 exploration work was carried out on the Trend property to investigate if there was a potential economic underground coal resource to the northeast of the existing Trend South open pit. The work consisted of the drilling of six core boreholes. Table 3.1.1 list the number of boreholes drilled in the study area, Table 3.2.1 list the 2020 borehole coordinates and Table 3.2.2 list the drilling activities for the 2020 exploration program.

The 2020 exploration took place over two time periods. The program started in mid January 2020 and went to mid March 2020 when the program was paused due to travel restrictions caused by the COVID-19 pandemic. The program was restarted at the beginning of July 2020 and field activities were completed by the end of August 2020.

The drill setup for each borehole included, the setting of casing to bedrock, the cementing of the casing before the restarting of drilling, the installation of BOP device to prevent blowout of gas if gas was detected during drilling and once the borehole was completed all the boreholes were plugged below the casing and then cemented to ground height. During the program no gas was detected while drilling.

During the winter program three boreholes were completed, TUC2020-001 was drilled to 125 metres but had to be abandoned in the Shaftesbury Formation due to poor ground conditions. The core from this borehole is stored on the Trend Mine site but was never logged. TUC2020-002 was drilled close to the collar of TUC2020-001 and was successfully completed to the target depth of 682 metres using PQ core. The borehole was completed to below K3 seam and was successfully geophysically logged by DGI Geoscience. TUC2020-003 was started using PQ size rods but then the hole was reduced to HQ rods due to more ground conditions at 300 metres. The borehole was completed above J seam when poor hole conditions forced the drilling to stop before drilling to the projected depth. The borehole was successfully geophysically logged to the bottom. The winter program provided various problems including the drilling of deep core boreholes, collaring the boreholes in the soft sediments of the Shaftesbury Formation and winter weather. During the winter program 12 drill shifts were lost to weather, a combination of snowstorms and high winds up to 100 km/hour causing snow drifting that led to the blocking of the access roads to the Trend Mine site and to the drill sites.

During the summer program three more boreholes were completed to target depth, the decision was made to use HQ rods for the three remaining boreholes after a comparison of the core recovery between the PQ core and the HQ core drilled in the winter program. All the boreholes drilled in the summer program were completed to target depth. During the summer program only 2 hours was lost to weather when the drill rig had to shut down due to a thunderstorm. Core logs from the 5 boreholes that were geologically logged are in Appendix 4 and the geophysical logs are in Appendix 1.

Table 3.1.1: Trend Underground Boreholes Identified by Year and Type

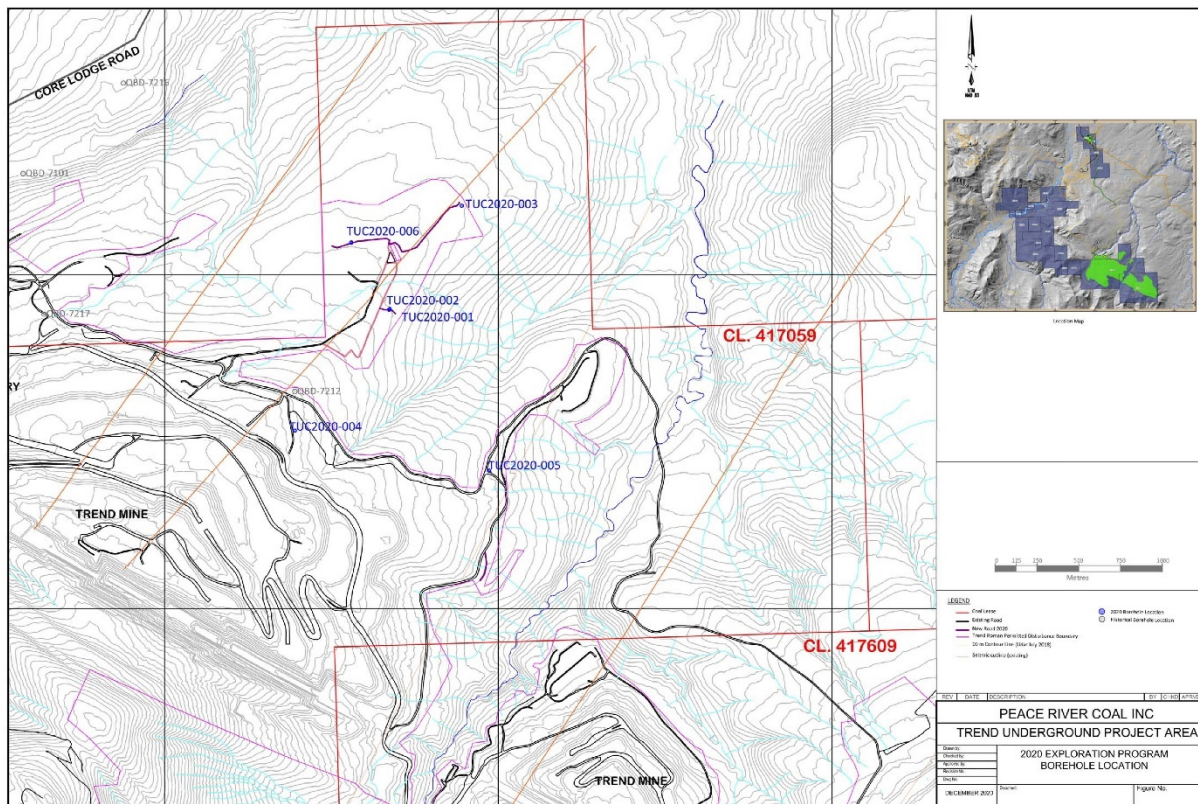
Year	Total	Rotary	Cored
1971	1	0	1
1972	3	0	3
2020	6	0	6
Total	10	0	10

Table 3.2.1: Trend Underground 2020 Boreholes Locations

Borehole	UTM NAD83 Zone 10		ELEVATION
	EASTING	NORTHING	
TUC2020-001	633328.19	6085780.35	1412.37
TUC2020-002	633332.69	6085785.26	1412.59
TUC2020-003	633782.69	6086413.62	1392.86
TUC2020-004	632783.20	6085067.36	1495.31
TUC2020-005	633949.17	6084819.02	1381.17
TUC2020-006	633120.46	6086191.88	1409.42

Table 3.2.2: Trend Underground 2020 Drilling Summary

Borehole	Core Size	Metres Drilled	Comments
TUC2020-001	PQ	125.00	Abandon due to ground conditions
TUC2020-002	PQ	682.50	
TUC2020-003	PQ/HQ	615.00	Changed to HQ at 300 metres
TUC2020-004	HQ	550.00	
TUC2020-005	HQ	606.50	
TUC2020-006	HQ	675.40	Blocked at 300 m Logged through rods

Figure 3.1 Borehole Location Map

3.3 Drill Sample Recovery

Sample analyses were undertaken according to prescribed standard analytical flow sheets. A pre-requisite for analyses to be undertaken on any individual sample was that for raw analyses the coal core recovery had to exceed 60% and for wash ability analyses the coal core recovery had to exceed 65%.

3.4 Geological & Geophysical Logging

All the PRC core boreholes were logged by borehole geophysical techniques employing the following DGI Geoscience Inc. tools:

- gamma / neutron / deviation;
- gamma / density / resistivity / calliper;
- dipmeter / deviation;
- through-rod logs used a gamma-gamma.
- Gamma / caliper / ATV / density
- sonic

DGI Geoscience Inc. carried out the geophysical logging. Deliverables included compiled raw geophysical data based on industry standards; digital and paper logs, based on PRC Standard Operating Procedures. In addition to lithological measurements, strata dip and borehole deviation was also measured.

All coal seams were picked according to the company's Standard Operating Practice (SOP). The geophysical logs were used as the basis for measuring coal sample recoveries and detecting and recording coal seam lithology variations.

3.5 Data Density

The borehole data density for Trend Underground program was not enough to support a declaration of resource statement under either of the Canadian 43-101 requirements or the JORC standard.

3.6 Data Location / Topographical Data

The Trend Mine area was flown for an aerial survey in July 2018 using LIDAR technology with the generation of detail contours and DTM data. This data was used as the basis for the topographic surface used in the geological evaluation model.

3.7 Data Orientation Relative to Geological Structure

Wherever possible, boreholes have been logged with a verticality tool to survey tilt and azimuth down the hole. The data was loaded into Gemcom which displays the seam locations based on the downhole survey. Boreholes without downhole surveys were considered as vertical for the purpose of geological modelling.

3.8 Reporting Archives / Database

The geological data for Trend Underground project is in electronic format except for early historic borehole data from the 1970's and 1980's.

For this project PRC uses the Geovia Gemcom software package for all geological modelling purposes.

4 COAL ANALYSIS

4.1 Sampling

Coal seams were sampled from HQ and PQ size diamond core. With respect to coal handling, description, and sampling the following industry standards and procedures applied:

- At the drill, HQ or PQ core was placed in wooden core boxes with HQ or PQ diameter sized partitions that were covered prior to being transported to the logging area for description and sampling. As per industry standards, a plastic sleeve or plastic sheets were used to wrap the coal core sections. Coal seam cores were geologically logged in detail, and core recoveries obtained by comparing the lithology logs to the detailed density / gamma geophysical logs.
- Photos of core were taken ensuring box number and / or borehole number was visible.
- Sample increments were selected on a geological basis, modified, as necessary, for core recovery. Geologists conducted all sampling. For each sample interval the entire core was submitted for analysis. A suite of selected immediate roof and floor lithologies were also sampled. Only samples with a core recovery greater than 65% were submitted for analysis and the analytical results later included in the quality database.
- Typically, samples were placed in thick plastic bags with each bag containing two sample tags that recorded borehole number, seam, and bag number. Samples were double-bagged and placed in plastic buckets for shipping. Duplicate tags were retained by the company.
- All samples were stored in a cool, dry environment prior to dispatch to the laboratory. Current practice is to ship samples in a timely manner.

4.2 Sub-Sampling and Sample Preparation

At Trend sample preparation was handled differently depending on when the samples were taken.

4.3 Assay, Analysis and Laboratory

Sample preparation and analyses were undertaken according to the standard analytical flow sheets included in flow sheets at the end of this section.

- Raw coal analyses were limited to samples where core recovery was >60%.
- Washability analyses were limited to samples where core recovery was >65%.
- Only samples with >65% recovery were included in the quality model.

Depending on the weight of the sample different flow sheets were utilized at the lab to analyze the samples. The flow sheets can be found in Attachment 1

- For samples less than 5 kg a simple flow sheet was used. The samples were crushed to 12.7mm then screen to 2 size fractions 12.7mm x 0.15mm and 0.15mm x 0 (Crush flow sheet)
- For samples between 5 kg - 15 kg a more detailed flow sheet was used. The samples were sized by drop shatter drops then subjected to both dry and wet attrition test. The screened size fractions were recombined into 3 fractions, -31.5mm x 1.0mmww, 1.0mmww x 0.15mm and 0.15mm x 0 (Pretreat LM flow sheet)

- For samples over 15 kg a more detailed flow sheet was used. The samples were sized by drop shatter drops then subjected to both dry and wet attrition test. The screened size fractions were recombined into 4 fractions, -31.5mm x 12.7mm, 12.7mm x 1.0mmww, 1.0mmww x 0.15mm and 0.15mm x 0 (Pretreat flow sheet)

4.4 Size Analysis

After a review of the size fractions currently used by the Trend Mine CHHP the size fractions listed above were used for screening starting in 2013.

4.5 Raw Coal & Non-Coal Analysis

Refer to attached flow sheets for a detail explanation of the pre-treatment and size analysis carried out on PRC samples (Attachment 1). For the Trend Underground project borehole core is sampled by components, which are analysed for ARD, then the components are combined to form seam composites.

The Raw coal composites are analysed for Proximate Analysis, Sulphur, FSI and Relative Density.

4.6 Washability Analysis

A full suites of analyses were carried out on both the PQ and HQ wash fractions.

The procedure used for the SSP determinations was that a cumulative product cut point closest to a selected ash content was selected:

- 8.5% ash for Gates Formation coal seams.

The 60 second float component from froth flotation cells for ultrafine coal was selected.

Refer to the flow sheets for a detail explanation of the washability analysis carried out on PRC samples in Attachment 1.

4.7 Clean Coal (Float) Product Analysis

The product sample masses were proportionately combined based on seam thickness, seam density and cumulative yield.

Next, washability size fractions were mathematically composited, including the flotation component, to create the Simulated Seam Product. The SSPs were tested for proximate analysis, sulphur, FSI, rheology, petrography, ash mineral matter and carbonization properties.

Refer to the flow sheets for a detail explanation of the washability analysis carried out on PRC samples in Attachment 1.

The Clean Coal composites are analysed for Proximate Analysis, Sulphur, FSI and Relative Density,

4.8 Verification

All boreholes drilled are geophysically logged. Seam depths are adjusted to the geophysics routinely with only these adjusted depths entered into the modelling database. Coal quality sampling occurs after the hole has been geophysically logged thus enabling an assessment of core loss to be made. This has also ensured a consistency of sampling of plies.

All results that were received from the lab were checked for accuracy and the results were compared to samples from similar coal seams in the area. Any results that were questionable were queried and

returned to the lab for retesting.

The GWIL Birtley laboratory used for coal testing by PRC in 2020, adheres to ASTM analytical standards for coal.

5 GEOLOGICAL SETTING AND MINERALIZATION

5.1 Geology General

The Trend Roman property is located in the south-central region of the Peace River Coalfield. It is underlain by Mesozoic strata that form part of the Rocky Mountain Foothills of northeastern British Columbia. Coal seams with resource potential are found with the Lower Cretaceous strata of the Gething and Gates Formations. These units were formed within a deltaic depositional environment. Thin, uneconomic seams may also be encountered within the Boulder Creek Formation above the Gates Formation and in the Minnes Group, below the Cadomin Formation.

The Trend Underground study area is characterized by a stratigraphic sequence including strata from the Minnes Group to the Shaftesbury Formation. Refer to figure 5.1 for an overview of the regional geology and figure 5.2 for general stratigraphic columns and Appendix 2 for additional maps representative cross sections.

Structural geology within the region is characterized by thrust faults and associated folding within alternating layers of competent sandstone units and incompetent mudstone and coal strata. On a regional scale the large thrust faults display a staircase geometry, exhibited by wide flats sub-parallel to bedding joined by narrow ramps oblique to bedding. The faults are generally developed in more incompetent strata whereas ramps are generally contained within competent lithologies. In the major thrust sheets, faulting preceded folding and major faults tend to maintain a constant angle of about 30° to bedding. This is not always the case, however, particularly where smaller structures are involved and where thrusts are dying out.

The structural geology of the Trend Roman Property and that of the surrounding area is dominated by a regional-scale northwesterly trending anticline – syncline pair, the Murray Syncline and the Waterfall Creek Anticline.

The Murray Syncline and Waterfall Creek Anticline are tight, relatively symmetrical folds that are typical of the fold style in this area. Fold axial surfaces are near vertical and axes plunge between 5° and 10° to the northwest. Strata on the east limb of the Waterfall Creek Anticline, where the Trend Mine is located, have fairly uniform dips that range between 60° and 75° to the northeast.

5.2 Regional Geology

5.2.1 Cadomin Formation

The Cadomin Formation is the basal unit of the Lower Cretaceous Bullhead Group and lies unconformably on Minnes Group. This formation is predominantly composed of massive to poorly bedded conglomerate; a layer of coarse-grained sandstone, located immediately below the conglomerate, is included within this formation. Typically, the conglomerate is poorly sorted. It consists of well-rounded cobbles, boulders and pebbles of black, white, green and a most distinctive and unique pink coloured chert. Other lithologies present include white and grey quartzite and quartz and, in places, minor limestone. Clasts are hosted in a fine- to coarse-grained sandstone matrix, although some beds may also be clast supported. Due to its resistant nature, the Cadomin Formation is usually well exposed and forms a prominent marker horizon that is traceable throughout much of the property.

5.2.2 Gething Formation

The Gething Formation conformably overlies the Cadomin Formation and forms the upper unit of the Bullhead Group. It is primarily a non-marine sequence composed of fine- to coarse-grained sandstone, conglomerate, siltstone, carbonaceous mudstone, and thin coal seams. The Bluesky unit, which is readily identifiable, marks the top of the Gething Formation and is composed of fine- to medium-grained glauconitic sandstone and is less than 1.0 m thick in the Trend Project area. Further east the Bluesky sequence has formation status and may be up to 40 m thick. Regionally, the Gething formation varies in thickness due to a number of depositional factors including facies changes. It attains a thickness of 385 m at Bullmoose Mountain but the thickness range is only 120 m to 200 m at Trend Mountain. Four significant coal seams that occur towards the top of the Gething Formation have been correlated over a wide area. In descending stratigraphic order, they are named the Bird, GT1, GT2 and GT3 Seams in the Trend Project area.

5.2.3 Moosebar Formation

The Moosebar Formation rests disconformably on the Gething Formation. The contact is taken at the top of the thin glauconitic-bearing conglomerate of the Bluesky unit; the latter represents the onset of the Moosebar marine transgression and is interpreted to be a minor disconformity.

The Moosebar Formation is divided into two sequences; a lower claystone-and-shale sequence and an upper sequence composed of alternating claystone, siltstone, and sandstone beds. From the base, the sequence consists of dark grey-to-black shale grading upward to laminated siltstone and claystone. These lithologies grade upward into a sequence of alternating claystone, siltstone, and very fine-grained sandstone. The sandstone beds thicken and become more numerous upwards, together with an overall coarsening of grain size, with an attendant decrease and gradual disappearance of siltstone and claystone. This inter-layered sequence of sandstone, siltstone, and claystone forms the upper part of the formation and represents the prodeltaic transition from marine sediments to massive continental sands at the base of the overlying Gates Formation.

The Moosebar units form recessive topographic features and commonly occur in subcrop as linear gullies and stream channels; exposures are generally restricted to areas of high relief. The thickness range for this formation is from 120 m to 215 m on the Trend Underground project area.

5.2.4 Gates Formation

The Gates Formation varies in thickness from 270 m to 300 m and conformably overlies the Moosebar Formation. It contains the most significant regional coal resources within the southern part of the Northeast Coal Block. In the Trend Underground Project area, the Gates Formation is informally divided into four units: the Quintette Member, 80 m to 90 m thick, consisting primarily of massive, fine-grained siltstone and sandstone, the Middle Gates Member, 90 m to 100 m thick, consisting of a series of fining-upward sequences each of which culminates in a coal seam, the Babcock Member, 20 m to 30 m thick, which is a fluvial channel deposit comprising massive sandstone, conglomeratic sandstone and chert pebble-to-granule conglomerate, and the Upper Gates Member, 30 m to 40 m, that includes shale and sandy shale with several thin, discontinuous coal seams. A thin bed of ferruginous chert pebbles marks the top of the Gates Formation.

The coal seams contained in the Gates Formation of the Trend Underground Project area are named A through L in descending stratigraphic order. Figure 5.2 is a typical stratigraphic section of the Gates Formation.

5.2.5 Hulcross Formation

The Hulcross Formation is a marine sequence composed predominantly of medium to dark grey, sandy shale with thin interbeds of siltstone and very fine-grained, often laminated or cross-laminated, sandstone. Its thickness varies from 75 m to 105 m.

5.2.6 Boulder Creek Formation

The Boulder Creek Formation is composed of alternating shale and medium-to-fine-grained sandstone, overlain by fine-grained conglomerate and conglomeratic sandstone. Some thin, discontinuous coal seams occur in this formation but are not considered to have economic potential. The thickness of the formation averages approximately 130 m.

5.2.7 Shaftesbury Formation

The Shaftesbury Formation is the uppermost unit found in the Trend Underground Project area and consists of dark grey-to-black, laminated-to-thin interbeds of silty claystone, siltstone and fine-grained sandstone. This unit is generally reported as +450 m in thickness.

Figure 5.1 Regional Geology Map

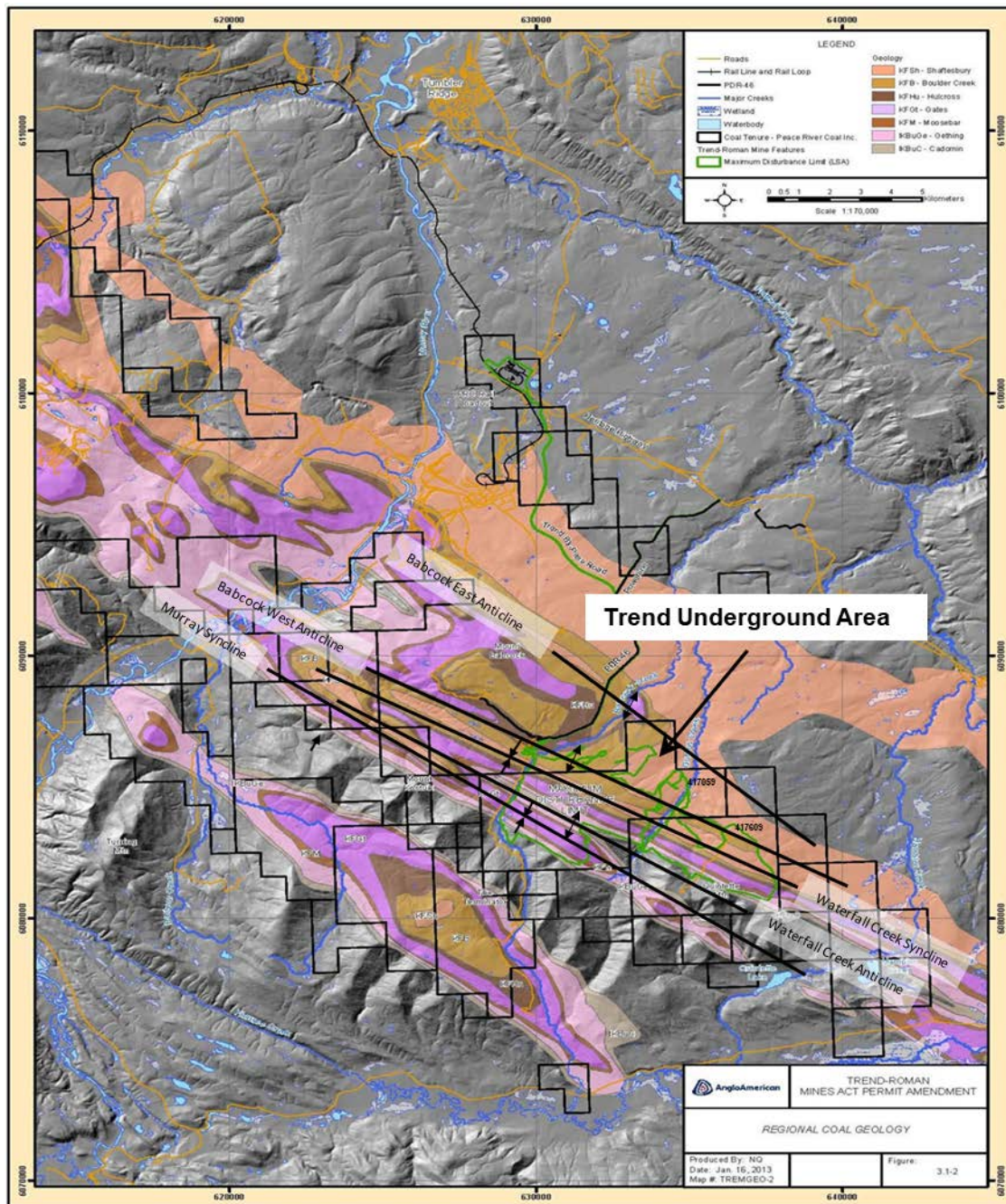
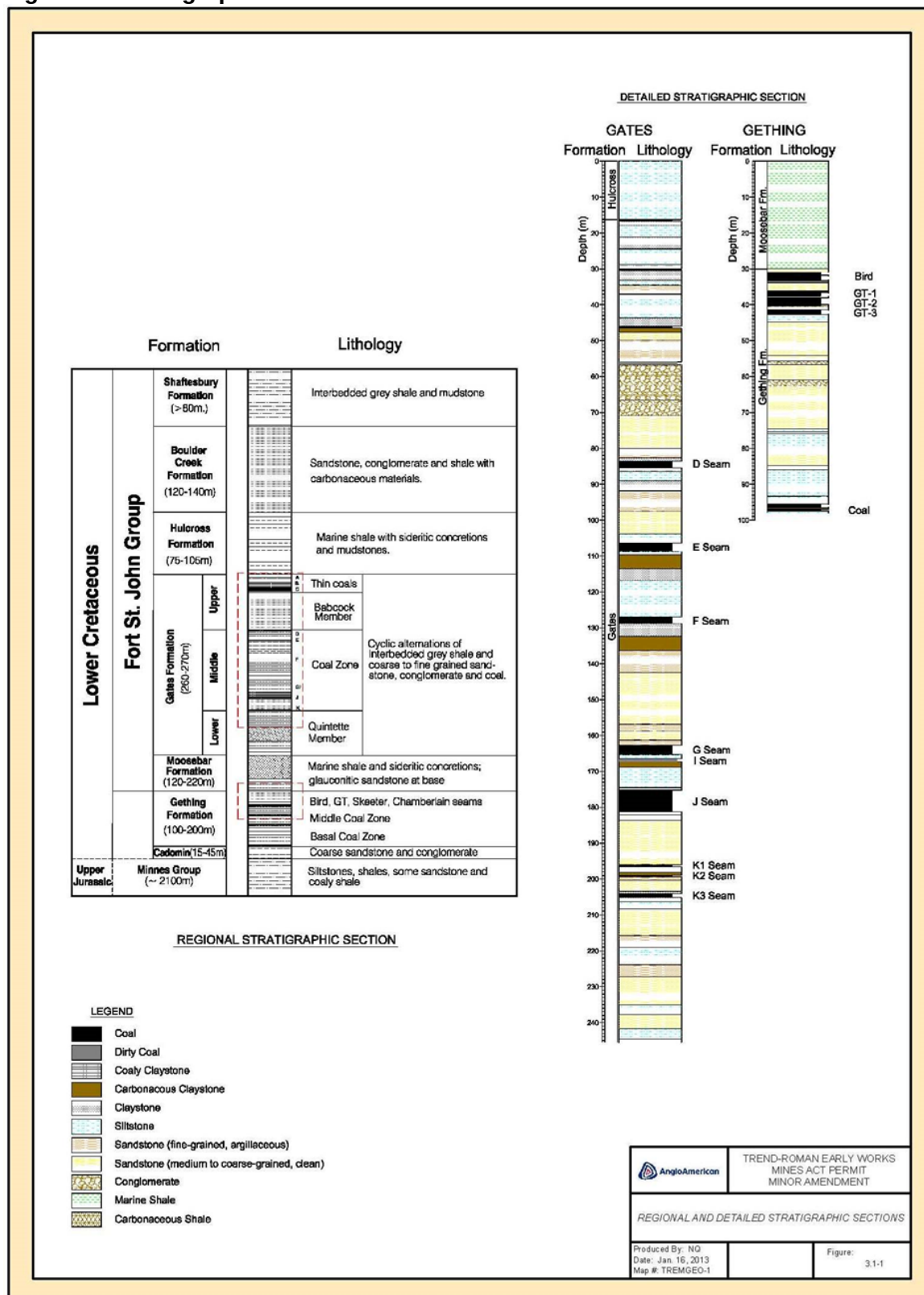


Figure 5.2 Stratigraphic Column



5.3 Coal Seam Geology

5.3.1 Gates Formation

The Gates Formation is the most significant hard coking coal coal-bearing sequence for surface mining in northeast British Columbia. Coal seams of economic thickness are continuous from the Bullmoose Mountain area to the Alberta provincial border, a distance of almost 140 km.

Coal seams and major lithological units correspond closely to those found at the nearby Trend Mine. Eight coal seams have been identified in the Trend Underground Project area. These are named A, at the top of the sequence then B, C, D, E, F, J and K Seams. Within these coal seams, individual coal splits are distinguished by a number (e.g., Seams E1, E2 and E3). Of the eight seams, only the B, E1, F and J Seams are considered to have economic potential for underground development.

5.4 Regional Structural Setting

The Murray Syncline and Waterfall Creek Anticline are tight, relatively symmetrical folds that are typical of the fold style in this area. Fold axial surfaces are near vertical and axes plunge between 5° and 10° to the northwest.

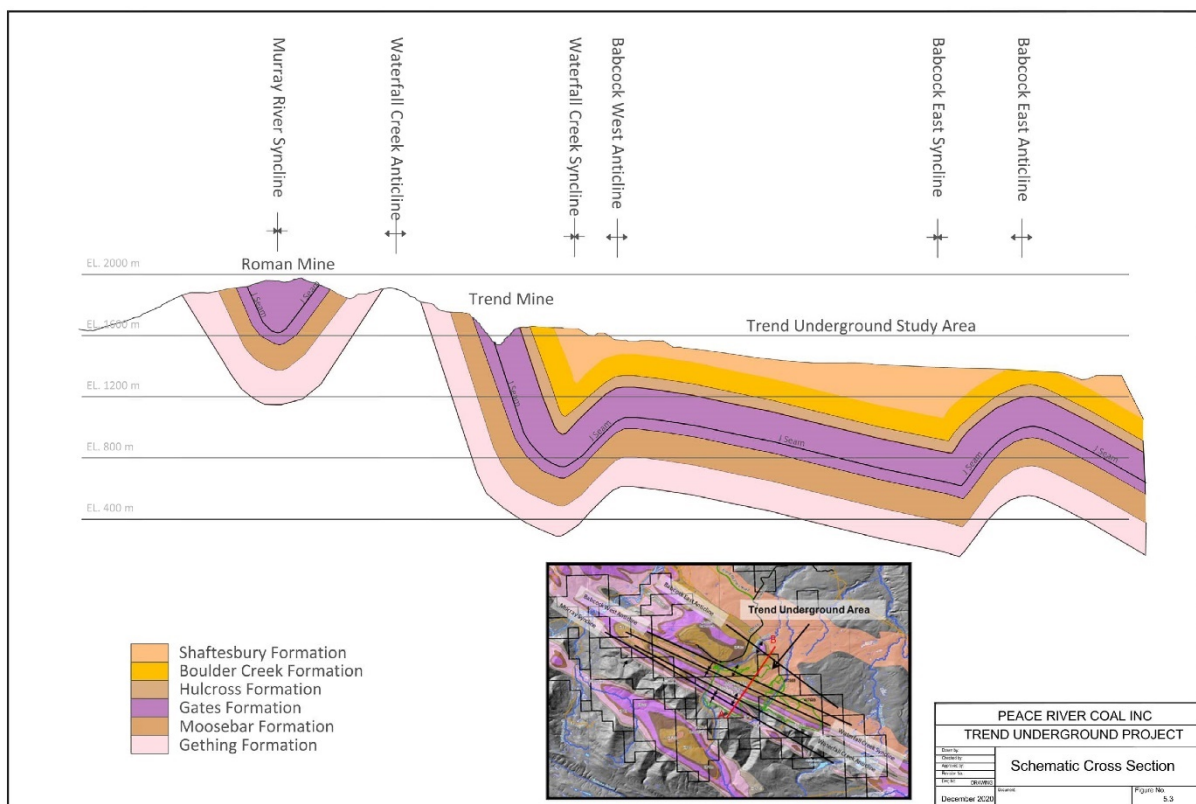
The Murray Syncline is a tight synclinal fold which is roughly symmetrical with the northeast limb dipping uniformly at 50-60° to the southwest. The southwest limb dips generally steeper, up to 80°. The fold axial trend is 130°, with the hinge plunging at an average of 7.5° to the northwest.

The Waterfall Creek Anticline has similar orientation with the strata on the southwest limb dipping at 60° to south west and the strata on the northeast limb, have uniform dips that range between 60° and 75° to the northeast. The Trend open pit operation is situated on the northeast limb of the anticline

The Waterfall Syncline runs southwest in parallel to the Waterfall Anticline with the northeast limb dipping at 45° to the northeast.

The Babcock West Anticline is on the boundary between the complex Trend Roman fold zone and the flat structure exposed on Babcock Mountain. In the study area the fold is an asymmetrical anticline with dips between 8 to 15° then steeping up to 65° south of Gordon Creek. Further to the northeast Babcock East Syncline - Anticline structure appears with dips of 55° on the northeast limb of the syncline dipping to the northwest and dips of 65° on the Northeast limb of the anticline dipping to the northeast.

Figure 5.3 is a stylized cross section showing the regional geology of the Trend Roman area.

Figure 5.3 Cross Section (looking northeast)

5.5 Property Geology

5.5.1 Gates Formation

Eight coal seams have been identified in the Trend Underground project area. These are named A, at the top of the sequence then B, C, D, E, F, J, and K seams. Within these coal seams, individual coal splits are distinguished by a number (e.g., Seams E1, E2 and E3). Of the eight seams, only the B, E1, F and J Seams are considered to have economic potential for underground development.

B Seam occurs at the top of the Gates Formation coal sequence and it is persistent throughout the project area. In the Trend and Roman Mine areas B seam has not developed as an economic seam but in the study area it has an average thickness of 1.76m. Ash content (adb), FSI and sulphur content values for the seam are 28.9%, 4.5 and 0.91% respectively.

The D Seam Zone includes the D1 and the D2 plys. Neither of the D Seam plys are considered of economic importance.

The E Seam Zone occurs approximately 20 m to 24m below the D Seam zone. It is composed of as many as three plys but only the E1 ply is of economic importance. The E1 ply is persistent throughout the Trend Underground project area with the main variations occurring in the number and thickness of partings. The average thickness of the ply in the study area is 2.76m. Typically, E1 ply ash content (adb), FSI and sulphur values are 17.3 %, 5.5 and 0.76% respectively.

F Seam occurs 7 m to 6 m below the E Seam zone and is persistent throughout the project area. It has an average thickness of 3.3m in the study area. Ash content (adb), FSI and sulphur content values for the seam are 13.5%, 7 and 0.40% respectively.

J Seam occurs 55 to 65m below F Seam. J Seam has an average thickness of 5.9m in the Trend Underground area. The J Seam normally forms the base of the Gates Formation economic coal zone and has an ash content (adb), FSI and sulphur content of 18%, 4 and 0.28% respectively.

The K Seam Zone comprises up to three plys named K1, K2 and K3, in descending stratigraphic order. Each ply is separated by 1.0 m to 7.0 m of siltstone. The none of the K seam plys are economically significant in the study area.

The sequence below the K Seam Zone is a 20 m thick siltstone unit overlying a persistent, approximately 1.0 m thick, clay unit. This clay bed is composed of unconsolidated ash fall tuff and has significant implications with respect to geotechnical design due to its mineralogical properties.

Table 5.5.1: Trend Underground Area Coal Seam Thickness Ranges

SEAM_ID	True Thickness			Data points
	Min	Max	Average	
SB	1.16	2.45	1.76	5
SD1	0.42	2.34	1.03	5
SD2	0.66	0.83	0.73	3
SE1	1.45	3.19	2.76	5
SE2			1.59	1
SF	2.57	4.03	3.28	5
SJ	5.40	7.19	5.91	4
SK1	0.54	0.87	0.77	4
SK2	0.32	0.70	0.53	4
SK3	1.11	1.35	1.23	4

5.6 Trend Underground Structure

The decision to explore the Trend Underground Project area was based on the geological work completed by Quintette Coal Ltd and reported in Coal Assessment Report 605. The geological interpretation of the area continues the projection of the Babcock Mountain box anticline down dip to the southwest. The box fold is bounded on each side by the Babcock West Anticline on the west and the Babcock East Syncline Anticline pair on the east. In the 1974 the dips of the coal seams were interpreted as averaging 10° to the southeast. Borehole QBD7212 intersected a west dipping reverse fault.

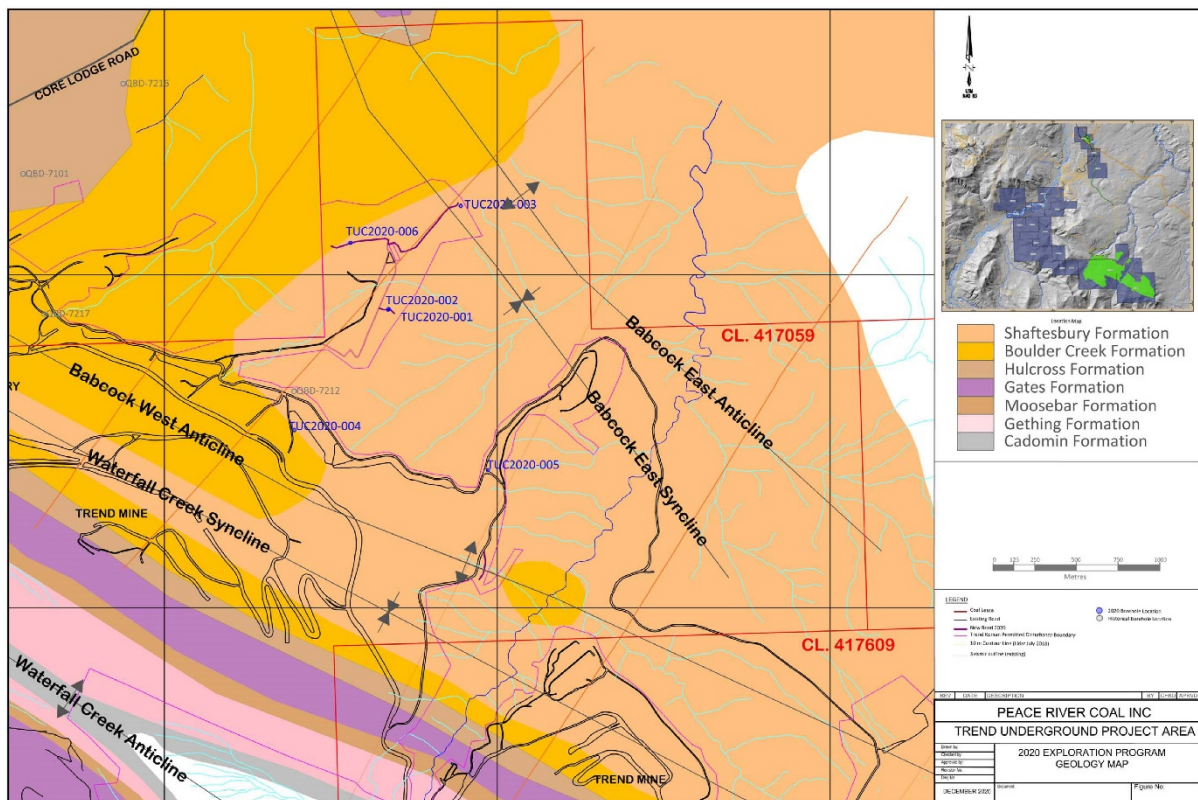
The 2020 exploration program in the project area designed plan was to confirm the coal seam dip and determine if there were any additional faults in the project area.

In the five 2020 boreholes completed to depth, two boreholes TUC2020-003 and TUC2020-004 intersected additional faulting and TUC2020-003 had seam dips in the Gates formation coal sequence between 35° to 45°. The seam dips in the other four boreholes ranged between 10° to 15°. TUC2020-003 is interpreted to have intersect the common limb of the Babcock East Syncline/Anticline pair. This

intersect was not interpreted in the 1974 work done, as the Babcock East Syncline axis was thought to be much flatter and located 1 km to the east. TUC2020-004 was drilled on the east limb of the Babcock West Anticline close to the axis and this may explain the additional faulting intersected in the borehole. The combination of the steeper dips and the movement of the Babcock East Syncline axis reduces the potential of the area for longwall underground mining.

The Babcock West Anticline is on the boundary between the complex Trend Roman fold zone and the flat structure exposed on Babcock Mountain. In the study area the fold is an asymmetrical anticline with dips between 8 to 15° then steeping up to 65° south of Gordon Creek, the axis trends Northeast-Southwest with a strike of 135°. Further to the northeast Babcock East Syncline - Anticline structure appears with dips of 55° on the northeast limb of the syncline dipping to the northwest and dips of 65° on the Northeast limb of the anticline dipping to the northeast. This structure strikes 160°. The structure of the Project area is shown on the Project Geology map Figure 5.6. Geological cross sections of the Project area can be found in Appendix 2.

Figure 5.6 Project Geology Map



5.7 Data Aggregation Methods

Component samples were composited into seam composites for each of the major seams that were identified as minable sections for resource modelling. The seams selected were B, E1 F and J respectively for the Gates coal seams.

5.8 Balanced Reporting

Individual seams were selected for inclusion in the resource evaluation on the basis of its correlation using geophysical logs. In general, all boreholes with geophysical logs have been modelled. Coal seams which had been thickened or thinned due to faulting were used as structural locations and the faulted thickness were not included in creation of hanging wall surfaces.

5.9 Other Substantive Exploration

Other than exploration drilling, downhole geophysical logging and the use of historical geological mapping from the 1970's no other substantial exploration techniques have been used on the property.

5.10 Further Work

Additional drilling will continue need to be carried out on the study area to better define the extend of the flatter dipping geology identified in the 2020 drill program. The drilling will include PQ coring to obtain additional samples to better define the quality of the Trend Underground area.

The structural interpretation has identified several faults in some of the 2020 boreholes, the direction and displacement of these faults will need to be clarified by additional drilling. To help identify the structure geology a 3D seismic undertaken over the study area will help locate the faulting.

A timeline for the additional work has not been determined at this time.

7 RESOURCES AND RESERVES

7.1 Resources and Reserves

7.1.1 General

There has yet to be a determination of the potential resource or reserve of the study area. Additional exploration work will be required before there is enough information to classify this area.

8 OTHERS

8.1 Other Relevant Information

No other relevant information.

8.2 Interpretation & Conclusions

The Peace River Coal Trend Underground study area has identified several coal seams that demonstrate lateral stratigraphic continuity with thickness variations that potentially can lead to future development as an underground project. The structural interpretation has identified several faults in some of the 2020 boreholes, the direction and displacement of these faults will need to be clarified by additional drilling.

The verification of the local geology was accomplished through review of current practices and procedures, inspection of a sampling of raw geological and coal analytical data. The density of drilling on this project is not currently adequate for the delineation of resources amenable to underground mining.

All the coal quality information has now been validated and unified so that just one concise set of data exists.

8.3 Recommendations

It is recommended that PRC continue to review coal seam data and update the geological database as required.

- Additional drilling in the study is required to better define the structural nature of the area, the extent of the size of the underground deposit with coal seam dips less than 15 degrees.
- Additional sampling of the main minable coal seam will help in a better understanding of the overall coal quality.
- Determine if a 3D seismic program will help in the definition of the area extent of the underground deposit and undertake the program if the information derived from a 3D seismic program will justify the cost of the program.

8.4 References

1. Hannah, T, and Ennis S. May 19th, 2010. Technical Report: Trend Mine Tumbler Ridge, British Columbia. Norwest Corporation, Calgary, Alberta.
2. Canadian Institute of Mining, Metallurgy, and Petroleum (CIM). 2005. CIM Definition of Standards - For Mineral Resources and Mineral Reserves, 10 p.
3. Canadian Securities Administrators. 2005. National Instrument 43-101 - Standards of Disclosure for Mineral Projects, Form 43-101 and Companion Policy 43-101CP. Ontario Securities Commission Bulletin, Volume 28, Issue 51, p 10355-10367 (Rules and Policies) p 10368-10374 (Form 43-101F1 Technical Report, Table of Contents) and p 10375-10383 (Companion Policy 43-101CP to National Instrument 43-101 Standards of Disclosure for Mineral Projects).

4. Hughes, J.D., Klatzel-Maudry, L. and Nikols, D.J. 1989. A Standardized Coal Resource/Reserve Reporting System for Canada. Geological Survey of Canada Paper 88-21, 17 p.
5. Norwest Corporation. 2005. Trend Full Mine Feasibility Study for Northern Energy and Mining Inc.; October 2005.
6. Mitsui Mining Co. Ltd. Kakizaki, I. 1974. Report on the Geological Exploration of the Babcock Property, for Denison Mines Ltd. B.C. Min. of Mines Geol. Branch Assessment Report No. 605
7. Denison Mines Limited. 1976. Quintette Coal: Limited 1975 Exploration and Development Report, January 1976.
8. Denison Mines Limited. 1976. Quintette Coal Limited: Information Summary, August 1976.
9. Denison Mines Limited. 1976. Quintette Coal Limited: 1976 Geological Assessment Report, December 1976.
10. McIntyre, R.F. 2005. 2005 Assessment Report – Trend Mine Drilling Program, June 2006.
11. Lortie, D.P. Peace River Coal Inc. 2014. Coal Assessment Report Trend Mine September_12_2014, September 2014.

8.5 Competent Person, Date & Signature Page

Details of the Competent Person, together with signatory pages, are found in Attachment 2.

8.6 Illustrations & Diagrams

See Attachments below and text for references.

Attachment 2

Signature Page

I, David Phillippe Lortie, P. Geo., do hereby certify that:

- a) I am currently employed as Coal Resource Manager by Peace River Coal Inc., Suite 620 - 650 West Georgia Street, Vancouver, British Columbia, Canada V6B 4N8. Peace River Coal Inc. is a subsidiary of Anglo American Plc.
- b) This certificate applies to the Coal Assessment Report entitled "Coal Assessment Report Trend Property Peace River Coal District", dated December 20, 2020.
- c) I graduated with a Bachelor of Science in Geology degree from Acadia University in 1976. I have worked as a Geologist for more than 26 years since my graduation from university. I am a member of the Association of Professional Engineers and Geoscientists of British Columbia (License #31067) I am a "qualified person" for purposes of National Instrument 43-101 ("NI 43-101").
- d) I am responsible for the preparation of this Coal Assessment Report.
- e) I have previously been involved with the Northeast British Columbia coal fields since 2004 as the Chief Geologist with Western Coal Corp. (previously Western Canadian Coal Corp.) and now with Peace River Coal Inc. planning and supervising the exploration work.

Dated this 20 day of December 2020



D.P. Lortie P. Geo.

Attachment 3

Exploration Cost 2020

Exploration Cost	
Type of Work	2020
Total for Geophysics	\$ 130,641
Total for Sample Analysis	\$ 232,657
Total for Fuel	\$ 76,174
Total for Fire, Safety and First Aid	\$ 197,589
Total for Geological Supervision	\$ 174,498
Total for Drilling (including room & board)	\$ 1,515,867
Total for Project Trend Exploration	\$ 2,327,425
Coal Lease	\$ 32,010
Staffing	\$ 70,000
Total Trend Exploration cost	\$ 2,429,435

Appendix 1

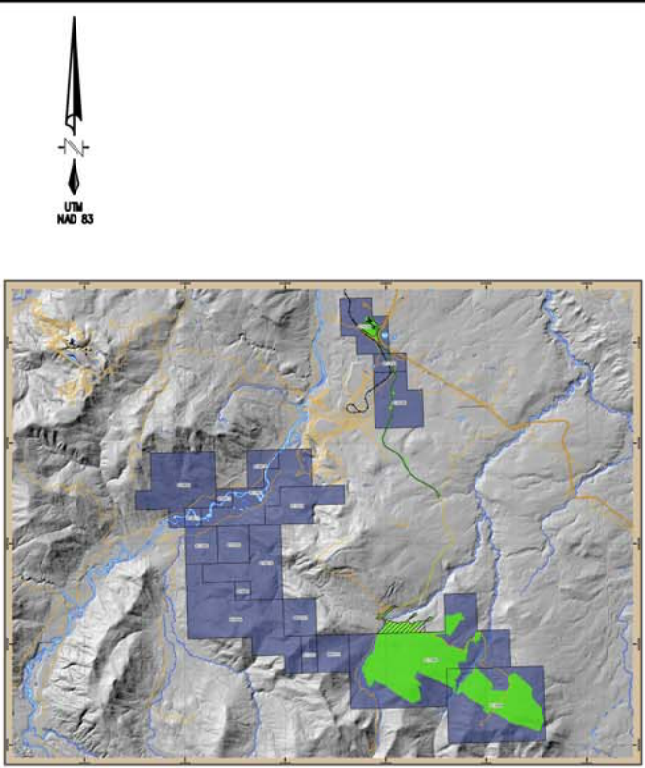
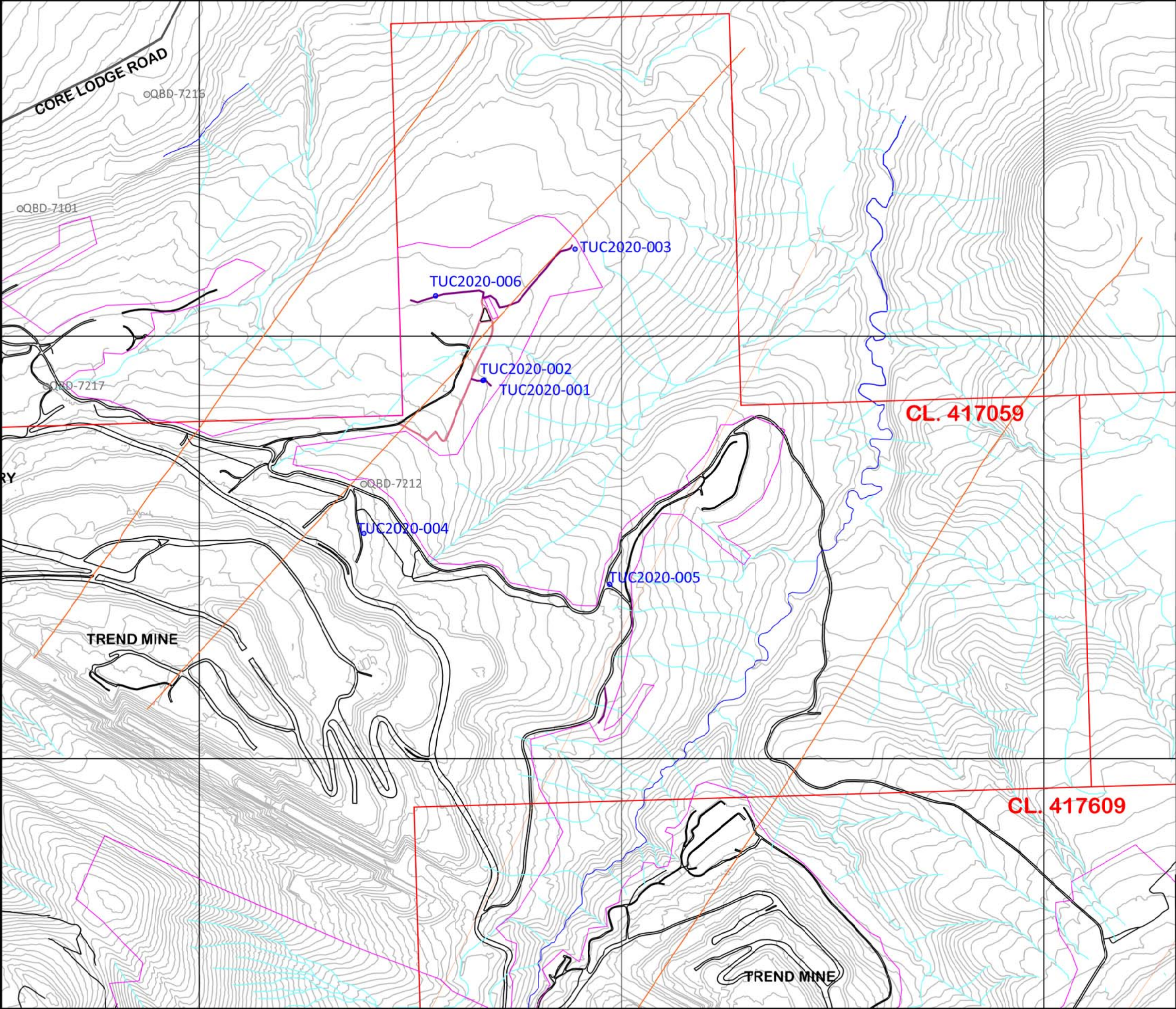
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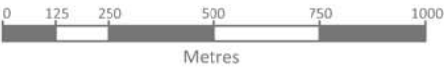
Appendix 2

Maps and Sections

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 Figure 5.6 Project Area Geology Map.pdf	2020-12-18 11:42 ...	Adobe Acrobat D...	509 KB
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 Sec 14900 Report.pdf	2020-12-29 2:26 PM	Adobe Acrobat D...	97 KB
 Trend Underground 2020 Section Lines Location Map .pdf	2020-12-29 2:38 PM	Adobe Acrobat D...	736 KB



Location Map

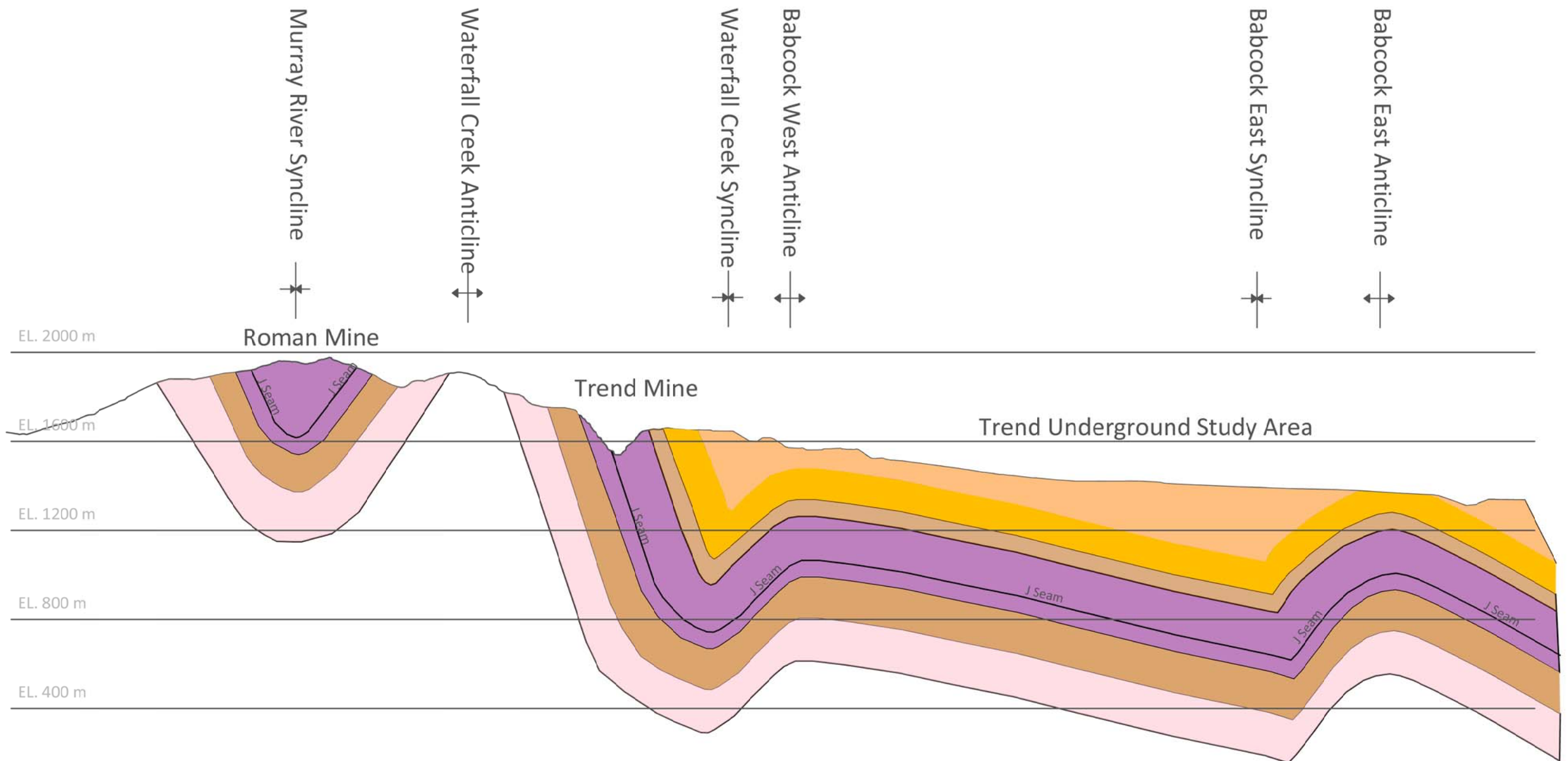


- LEGEND**
- Coal Lease
 - Existing Road
 - New Road 2020
 - Trend Roman Permitted Disturbance Boundary
 - 10 m Contour Line (Lidar July 2018)
 - Seismic cutline (existing)
 - 2020 Borehole Location
 - Historical Borehole Location

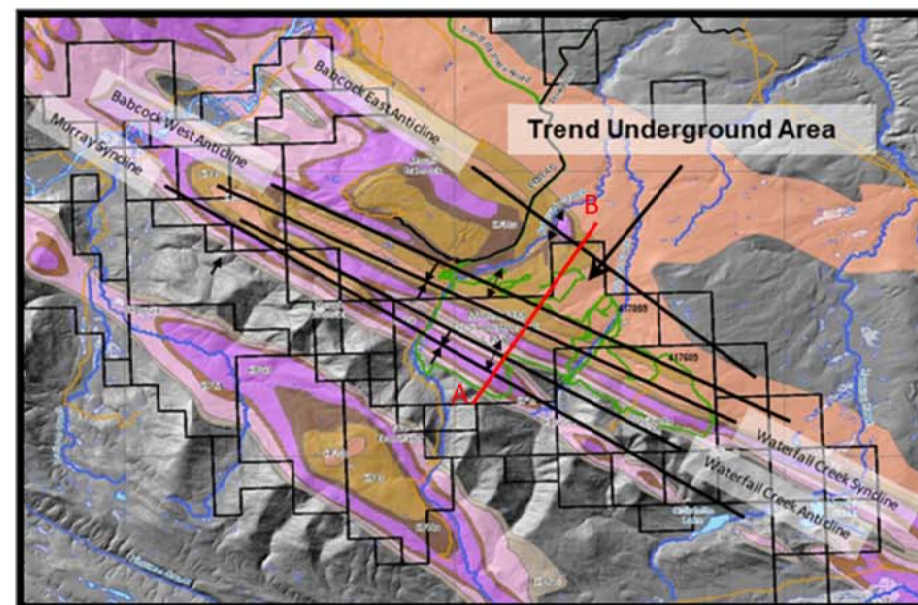
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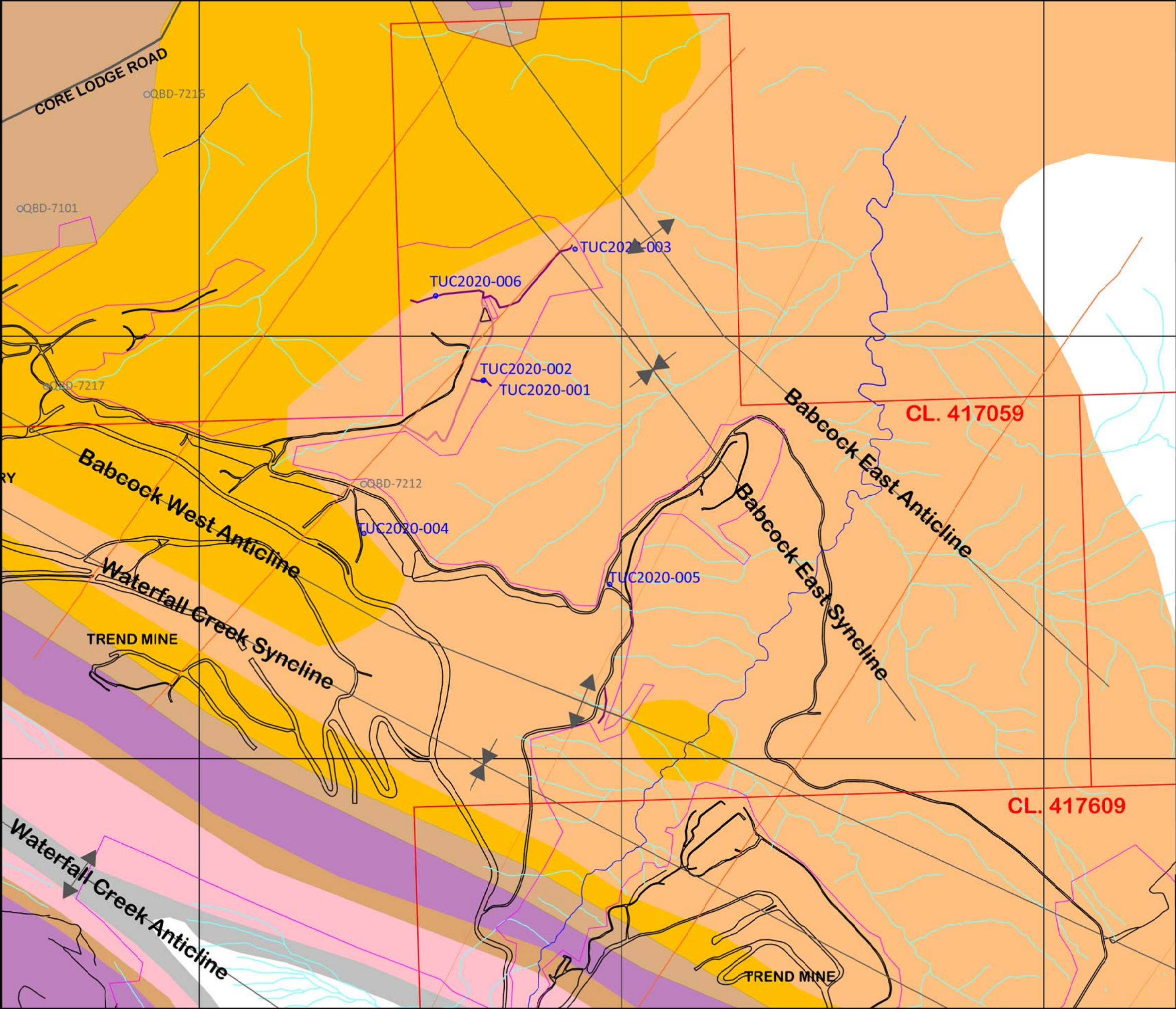
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Revision No.					
Dwg No.					
DECEMBER 2020	Document:				Figure No.



- Shaftesbury Formation
- Boulder Creek Formation
- Hulcross Formation
- Gates Formation
- Moosebar Formation
- Gething Formation



PEACE RIVER COAL INC		
TREND UNDERGROUND PROJECT		
Schematic Cross Section		
Drawn by:		
Checked by:		
Approved by:		
Revision No.		
Dwg No.	DRAWING	
December 2020	Document:	Figure No. 5.3



Location Map

- Shaftebury Formation
- Boulder Creek Formation
- Hulcross Formation
- Gates Formation
- Moosebar Formation
- Gething Formation
- Cadomin Formation

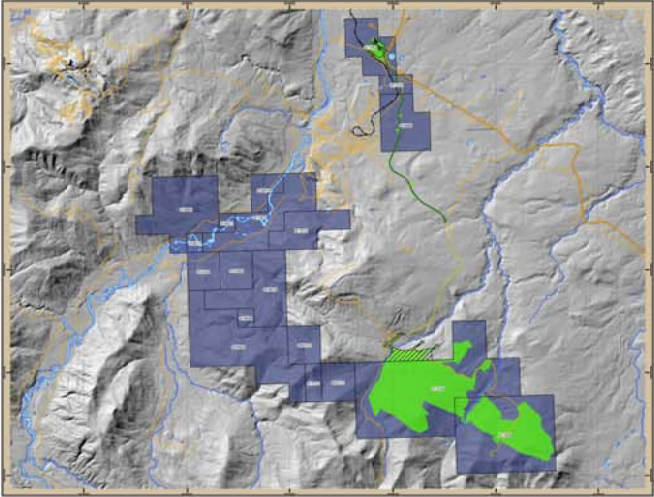
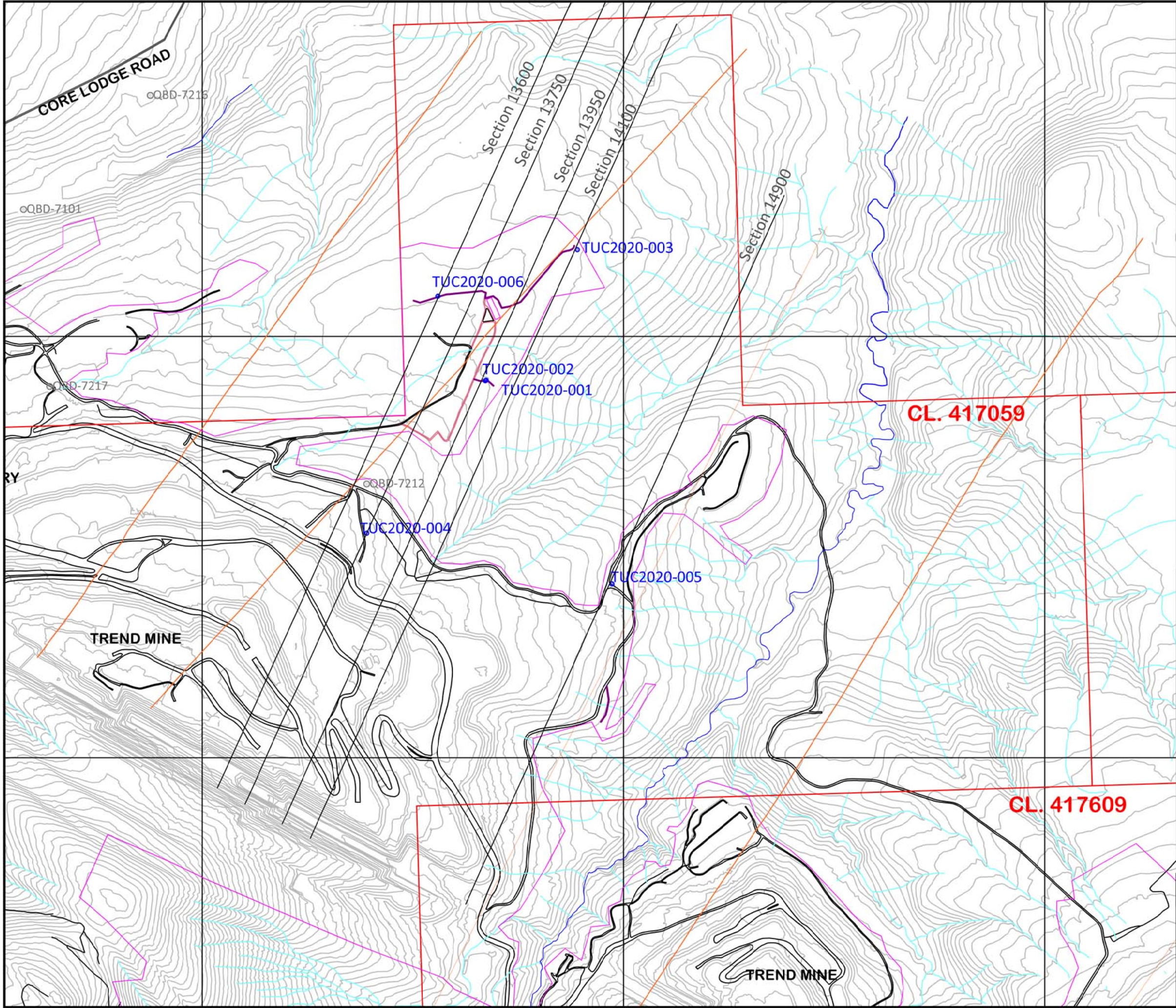
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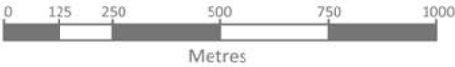
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- 2020 Borehole Location
- Historical Borehole Location

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Approved by:					
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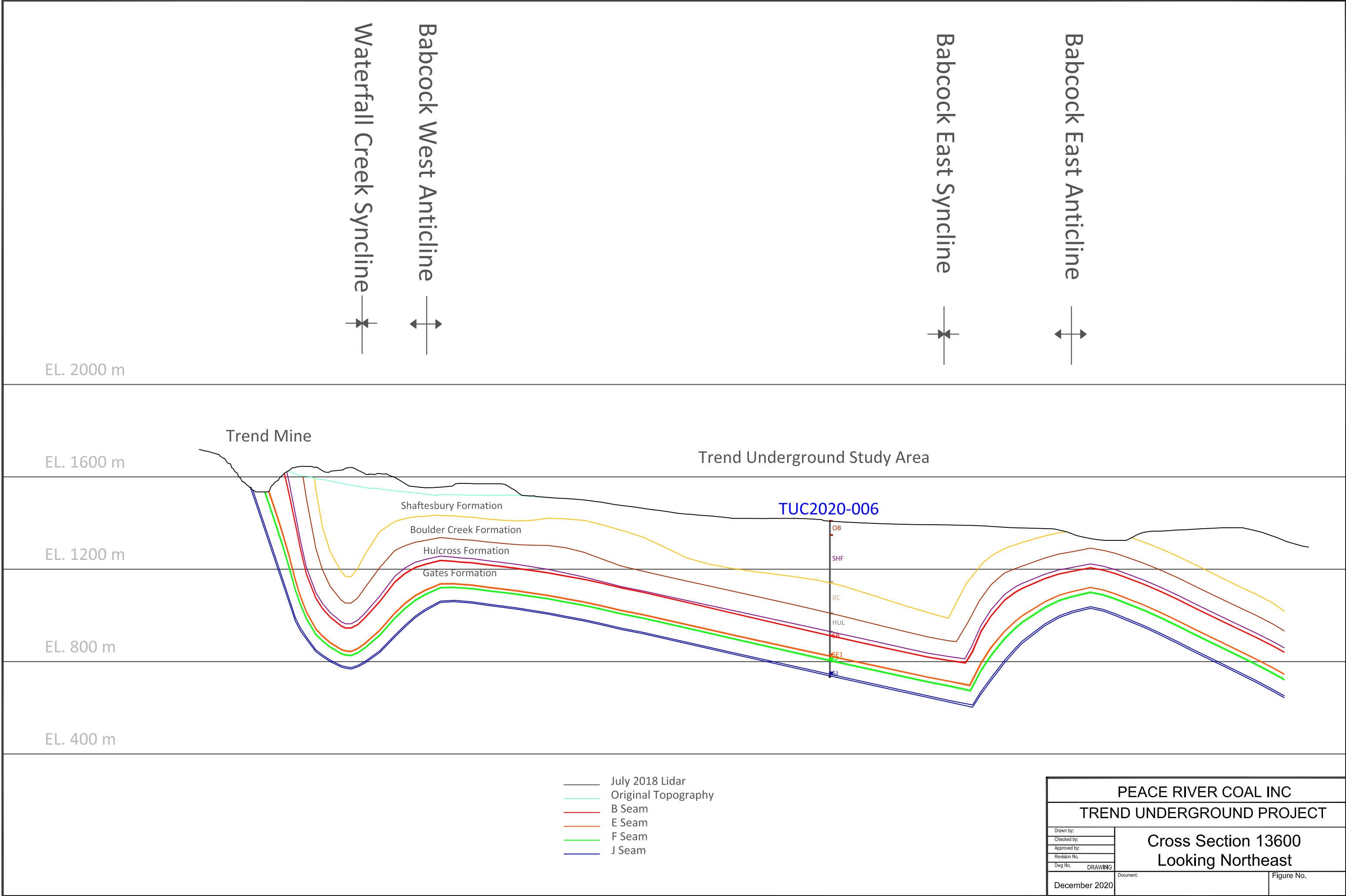


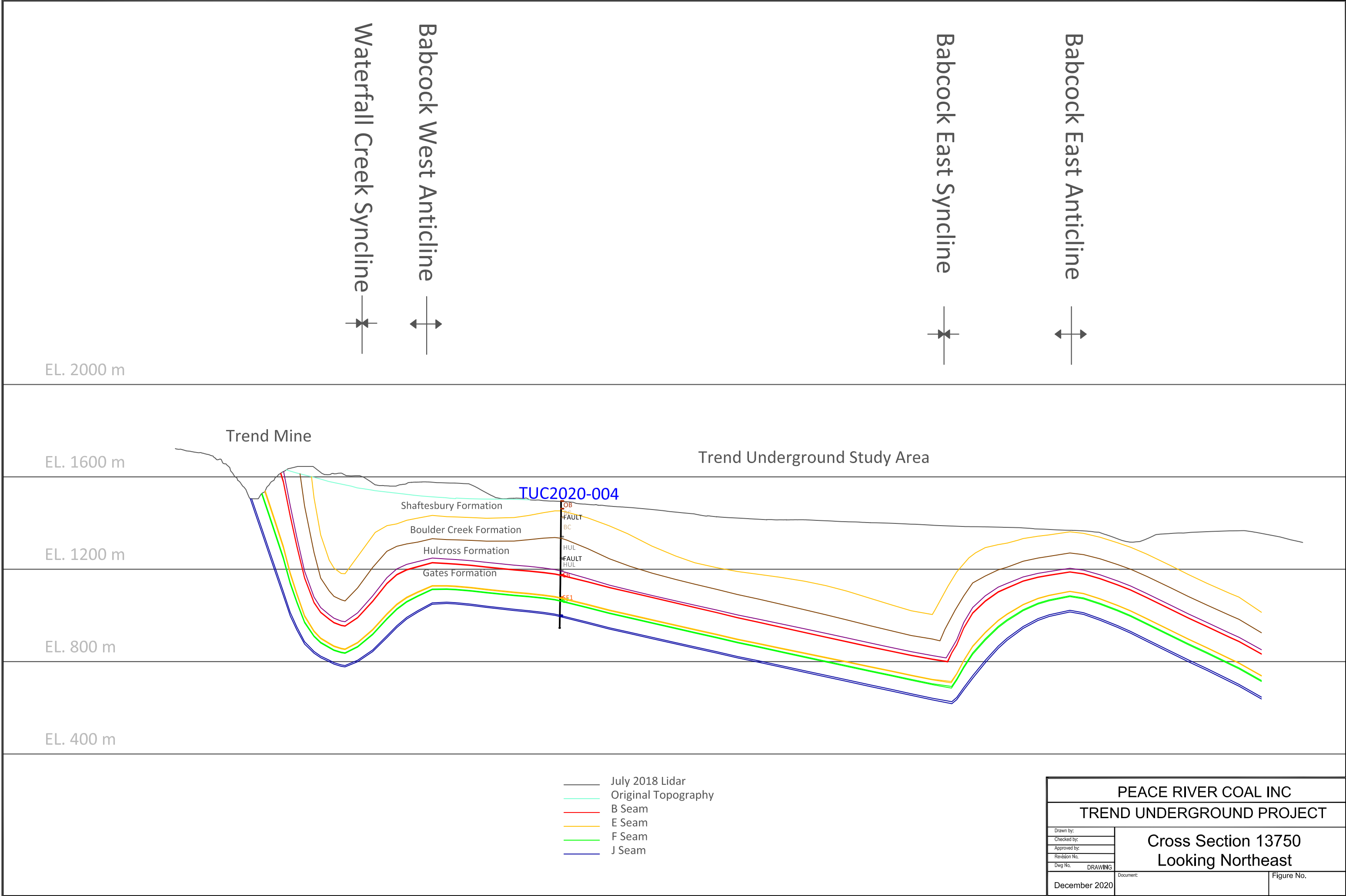
Location Map

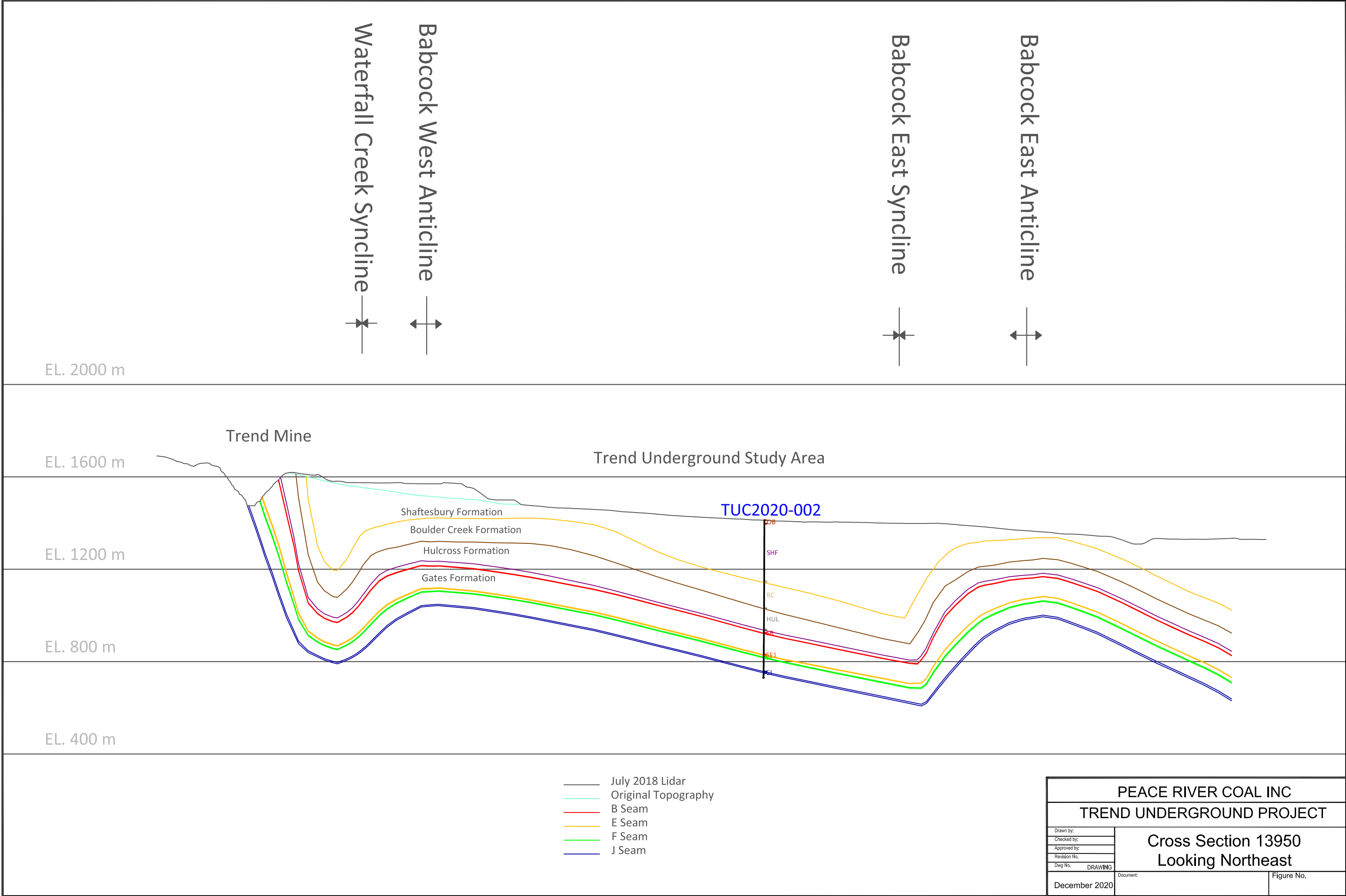


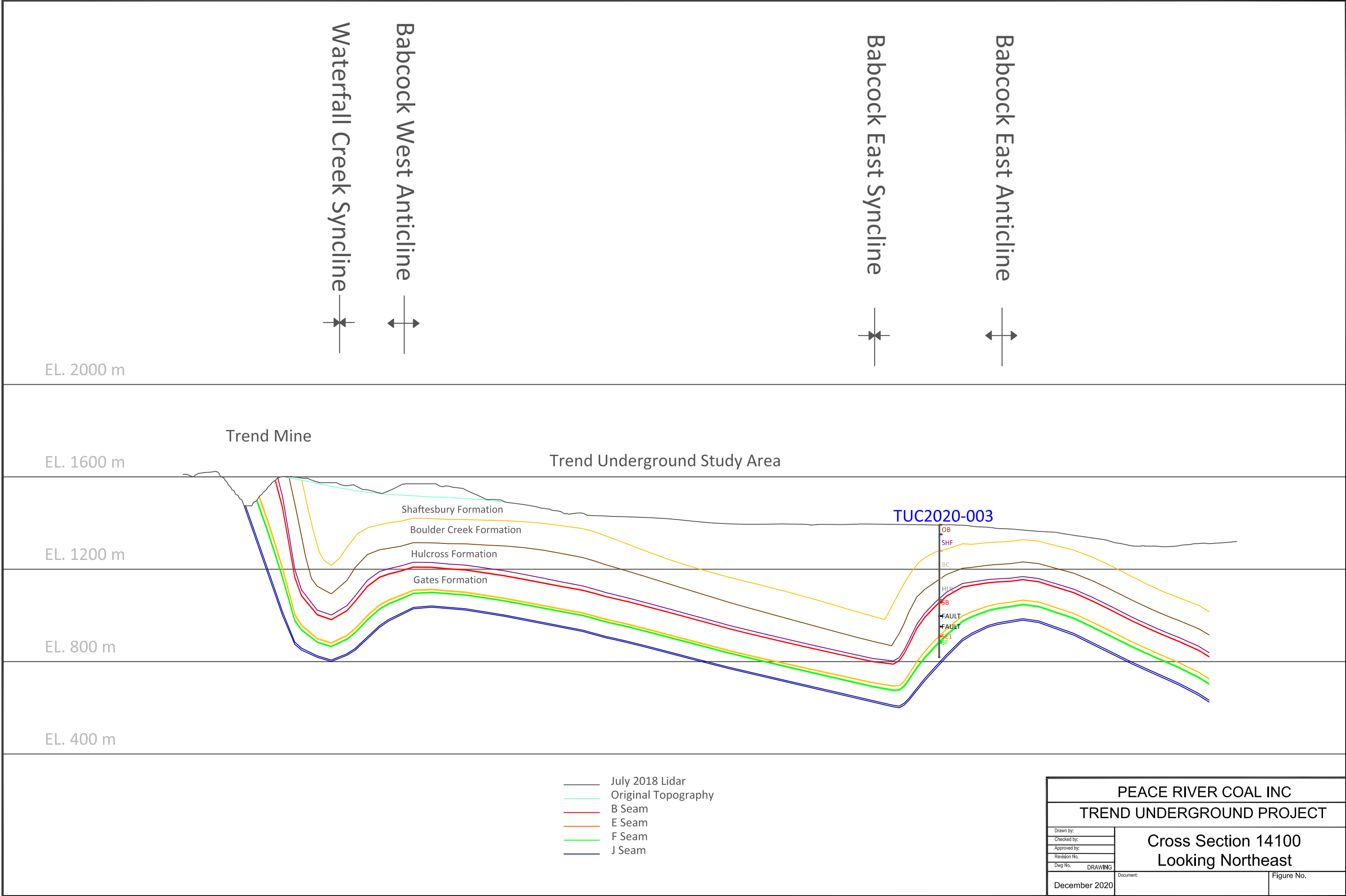
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- Coal Lease
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 - 10 m Contour Line (Lidar July 2018)
 - Seismic outline (existing)
 - 2020 Borehole Location
 - Historical Borehole Location

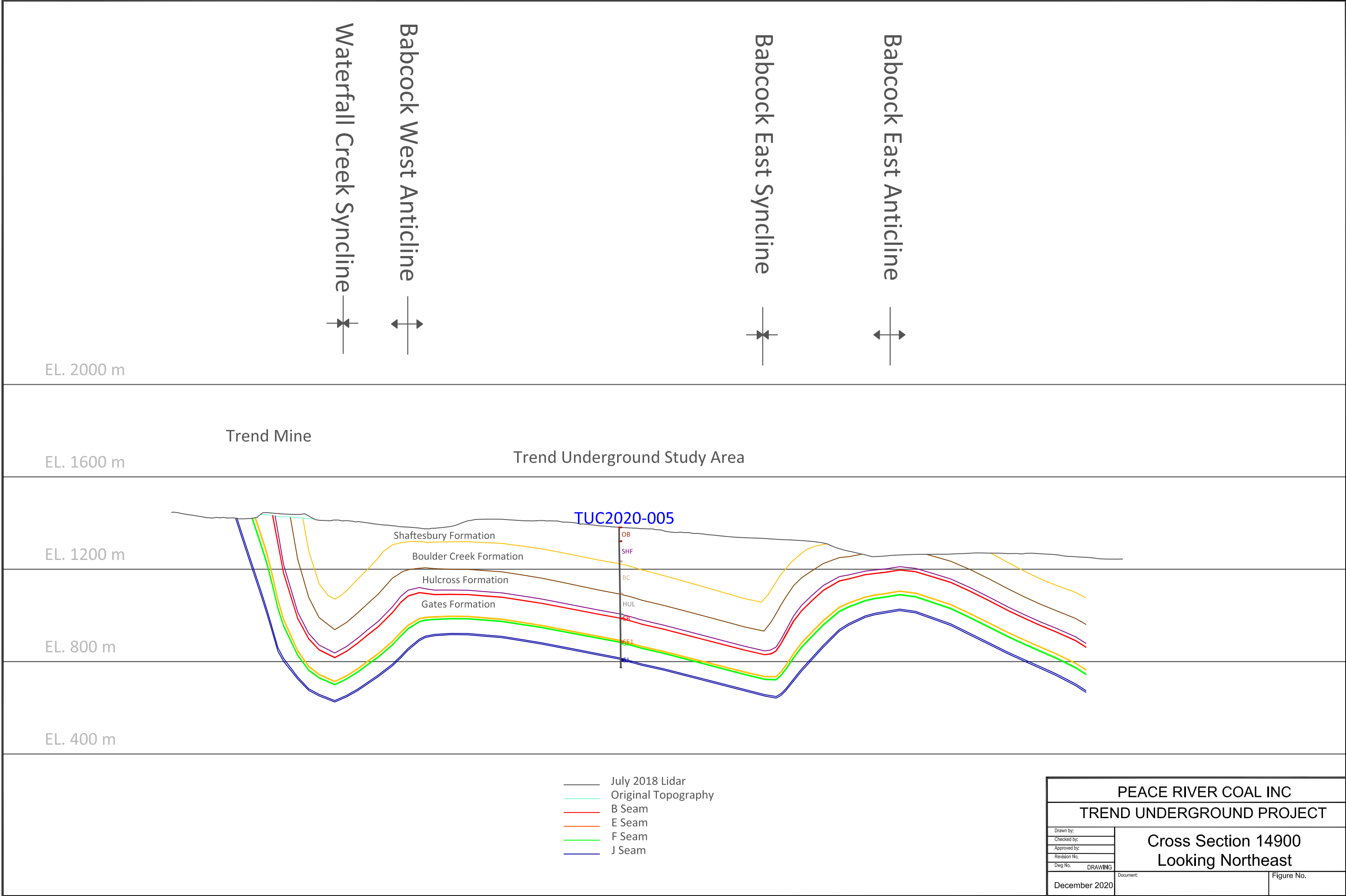
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Revision No.					
Dwg No.					
DECEMBER 2020		Document		Figure No.	











Appendix 4

Borehole Data

 2020 Summary lithology table.pdf	2020-12-19 11:12 ...	Adobe Acrobat D...	38 KB
 CoalLog Lithology Dictionary v12.pdf	2015-02-11 12:01 ...	Adobe Acrobat D...	331 KB
 Core Log_TUC2020-002_21_April_2020 Final.pdf	2020-12-19 11:30 ...	Adobe Acrobat D...	146 KB
 Core Log_TUC2020-003_April_22_2020 Final.pdf	2020-12-19 11:29 ...	Adobe Acrobat D...	143 KB
 Core Log_TUC2020-004_13_July_2020 Final.pdf	2020-12-19 11:38 ...	Adobe Acrobat D...	141 KB
 Core Log_TUC2020-005_20_July_2020 Final.pdf	2020-12-19 11:45 ...	Adobe Acrobat D...	139 KB
 Core Log_TUC2020-006_17_August_2020 Final.pdf	2020-12-19 11:55 ...	Adobe Acrobat D...	140 KB

HOLE-ID	SEAM_ID	FROM	TO	Drilled Thickness
TUC2020-002	OVERBURDEN	0.0	15.2	15.2
TUC2020-002	SHAFTESBURY	15.2	266.0	250.7
TUC2020-002	BOULDER CREEK	266.0	382.1	116.1
TUC2020-002	HULCROSS	382.1	474.3	92.2
TUC2020-002	SB	488.0	489.7	1.6
TUC2020-002	SD1	549.5	549.9	0.4
TUC2020-002	SD2	560.5	561.2	0.7
TUC2020-002	SE1	581.9	584.8	2.9
TUC2020-002	SF	592.5	595.9	3.4
TUC2020-002	SJ	655.4	661.0	5.6
TUC2020-002	SK1	665.2	666.1	0.9
TUC2020-002	SK2	668.4	669.1	0.6
TUC2020-002	SK3	669.7	671.0	1.3
TUC2020-003	OVERBURDEN	0.0	42.0	42.0
TUC2020-003	SHAFTESBURY	42.0	113.2	71.2
TUC2020-003	BOULDER CREEK	113.2	231.7	118.5
TUC2020-003	HULCROSS	231.7	324.4	92.7
TUC2020-003	SB	335.5	337.3	1.8
TUC2020-003	SC	354.1	354.3	0.3
TUC2020-003	FAULT	395.6	395.6	0.0
TUC2020-003	SD1	397.6	398.1	0.5
TUC2020-003	FAULT	441.0	441.1	0.1
TUC2020-003	SE1	482.4	484.4	2.0
TUC2020-003	SE2	488.8	491.1	2.3
TUC2020-003	SF	506.2	511.9	5.7
TUC2020-004	OVERBURDEN	0.0	33.1	33.1
TUC2020-004	BOULDER CREEK	33.1	69.7	36.6
TUC2020-004	FAULT	69.7	70.3	0.6
TUC2020-004	BOULDER CREEK	70.3	154.5	84.2
TUC2020-004	HULCROSS	154.4	247.7	93.2
TUC2020-004	FAULT	247.9	250.7	2.8
TUC2020-004	HULCROSS	250.7	299.5	48.8
TUC2020-004	SB	319.3	322.0	2.7
TUC2020-004	SD1	396.8	399.2	2.4
TUC2020-004	SE1	416.2	419.6	3.5
TUC2020-004	SF	429.4	432.5	3.1
TUC2020-004	SJ	494.8	500.4	5.6
TUC2020-004	SK1	505.5	506.4	0.9
TUC2020-004	SK2	509.6	510.1	0.5
TUC2020-004	SK3	517.1	518.3	1.1
TUC2020-005	OVERBURDEN	0.0	59.9	59.9
TUC2020-005	SHAFTESBURY	59.9	147.5	87.6
TUC2020-005	BOULDER CREEK	147.5	287.3	139.8
TUC2020-005	HULCROSS	287.3	376.4	89.1
TUC2020-005	SB	393.8	395.0	1.2

TUC2020-005	SD1	462.4	463.4	1.1
TUC2020-005	SD2	468.1	469.0	0.9
TUC2020-005	SE1	493.7	496.8	3.1
TUC2020-005	SF	501.3	504.0	2.6
TUC2020-005	SJ	571.1	576.9	5.8
TUC2020-005	SK1	583.0	583.6	0.6
TUC2020-005	SK2	588.5	589.2	0.7
TUC2020-005	SK3	589.5	590.9	1.4
TUC2020-006	OVERBURDEN	0.0	61.2	61.2
TUC2020-006	SHAFTESBURY	61.2	263.1	201.9
TUC2020-006	BOULDER CREEK	263.1	400.2	137.2
TUC2020-006	HULCROSS	400.2	480.1	79.9
TUC2020-006	SB	496.3	498.4	2.0
TUC2020-006	SD1	562.6	563.6	0.9
TUC2020-006	SD2	564.4	565.1	0.7
TUC2020-006	SE1	576.4	579.6	3.2
TUC2020-006	SF	595.7	599.3	3.6
TUC2020-006	SF2	606.6	607.6	1.0
TUC2020-006	SJ	656.2	663.5	7.3
TUC2020-006	SK1	667.5	668.3	0.8
TUC2020-006	SK2	670.5	670.9	0.3
TUC2020-006	SK3	671.7	672.9	1.3

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SAMPLE TYPE		Lignite	LG	Acid Volcanic	AV	Interbanded dull and bright		very fine to fine grained	VF
Coal Quality		Brown Coal	BC	Intermediate Volcanic	IV	(40-60% bright coal)	BD	very fine to medium grained	VM
raw ply (coal, roof, floor or parting)	QP	Peat	PE	Basic Volcanic	BV	mainly dull with frequent bright		very fine to coarse grained	VC
bulk sample	QB	Oil Shale	OS	Acid Intrusive	AI	bands (10-40% bright coal)	DB	very fine to very coarse grained	VX
channel sample (underground)	QU	Tar Sand	TS	Intermediate Intrusive	II	dull with minor bright bands		fine grained	FF
				Basic Intrusive	BI	(1-10% bright coal)	DM	fine to medium grained	FM
						dull (<1% bright coal)	DD	fine to coarse grained	FC
Loxline		Coaly Claystone	ZC	Andesite	AN			fine to very coarse grained	FX
raw ply (coal, roof, floor or parting)	LP	Coaly Mudstone	ZM	Basalt	BS	bright (>90% bright coal)	C1	medium grained	MM
		Coaly Sandstone	ZS	Dolerite	DO	bright with dull bands		medium to coarse grained	MC
Spontaneous Combustion		Coaly Shale	ZH	Granite	GR	(60-90% bright coal)	C2	medium to very coarse grained	MX
raw ply (coal, roof, floor or parting)	SP	Coaly Siltstone	ZT	Granodiorite	GD	Interbanded dull and bright		coarse grained	CC
bulk sample	SB			Gabbro	GB	(40-60% bright coal)	C3	coarse to very coarse grained	CX
channel sample	SU	Carbonaceous Claystone	XC	Rhyolite	RH	mainly dull with frequent bright		very coarse grained	XX
		Carbonaceous Mudstone	XM	Tuff	TF	bands (10-40% bright coal)	C4		
Geotechnical Sample		Carbonaceous Sandstone	XS			dull with minor bright bands		very fine grained (VV)	S1
laboratory tested	GT	Carbonaceous Shale	XH	Metamorphic		(1-10% bright coal)	C5	fine grained (FF)	S2
field tested	GF	Carbonaceous Siltstone	XT	Basement Undifferentiated	BU	dull (<1% bright coal)	C6	fine to medium grained (FM)	S3
				Gneiss	GN			medium grained (MM)	S4
Water Quality Sample		Clastic Sedimentary Rocks		Metamorphic Rock, undifferentiated	MM	mid-lustrous to bright	M1	coarse to very coarse grained (CX)	S5
laboratory tested	WT	Conglomerate	CG	Phyllite	PH	mid-lustrous	M2	Interbedded, fine and coarse	S6
field tested	WF	Sandstone	SS	Quartzite	QT	mid-lustrous to dull	M3	medium to coarse grained (MC)	S7
		Siltstone	ST	Schist	SZ			coarse grained (CC)	S8
Gas Sample		Claystone	CS	Slate	SL	anthracite	AN	very coarse grained (XX)	S9
exploration (virgin)	ME	Breccia	BR			cindered	CI		
compliance (drained)	MD	Fault Breccia	FB	Minerals		coked	KC	SHADES	
		Mudstone	MS	Calcite	CA	cannel (torbanite, bog)	CT	light	L
Environmental Sample		Sedimentary Rock, undifferentiated	SU	Pyrite	PY	dull conchoidal (cannel)	DC	light to medium	A
soil	ES	Shale	SH	Quartz	QZ	extremely weathered	EW	light to dark	C
overburden characterisation	EO	Tillite	TI	Siderite	SD	fusainous	FU	medium	E
(compliance)				Talc	TA	heat affected	HA	medium to dark	B
reactive ground	ER	Chemical Sedimentary Rocks				inferior	IF	dark	D
		Calcrete	CC	Other		sapropelic	SP	banded	N
LITHOLOGIES		Carbonate	CB	Core Loss	KL	stony	SY	mottled	M
Unconsolidated Sediments		Chalk	CK	Old Workings	OW	undifferentiated	CU	speckled	S
Clay	CL	Chert	CH	Non Coal	NC	weathered	WE	variegated	V
Silt	SI	Cone in Cone Carbonate	KK	No Recovery	NR				
Sand	SA	Dolomite	DM	Not Logged	NL	Conglomerates		HUES / COLOURS	
Gravel	GV	Ferricrete	FK	Void	VD	granular	GG	blackish / black	K
Boulders	BO	Fossil Wood	FW			granular to pebbly	GP	bluish / blue	L
		Ironstone	IS			granular to cobbly	GO	brownish / brown	B
Alluvium	AL	Kaolinite	KA	LITHOLOGY QUALIFIERS		granular to bouldery	GU	buff	F
Colluvium	CV	Laterite	LA	Unconsolidated Sediments		pebbly	PP	creamy / cream	C
Diatomaceous Earth	DE	Limestone	LS	clayey	CL	pebbly to cobbly	PO	greenish / green	E
Fill	FI	Limonite	LI	silty	SI	pebbly to bouldery	PU	greyish / grey	G
Fireclay	FC	Silcrete	SC	sandy	SA	cobbly	OO	orangey / orange	O
Loam	LO	Tonstein	TN	gravelly	GV	cobbly to bouldery	OU	pinkish / pink	P
Mud	MD					bouldery	UU	purplish / purple	U
Soil	SO	Igneous		Coals				reddish / red	R
		Igneous Rock, undifferentiated	IG	bright (>90% bright coal)	BR			whitish / white	W
Carbonaceous Sediments		Volcanic Rock, undifferentiated	VR	bright with dull bands		Sandstones		yellowish / yellow	Y
Coal	CO	Intrusive Rock, undifferentiated	IN	(60-90% bright coal)	BB				

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<u>ADJECTIVES</u>								<u>DEFECT TYPES</u>	
<u>Quantity</u>									
abundant	AB	conglomeritic	CG	fragments	FR	with nodules of	ND	clay band	CL
decreasing in abundance	DA	detrital	DE	grains	GN	with pebbles of	PB	coal cleat	CE
highly	HI	dolomitic	DM	granules	GR	with pods of	PO	discing	DS
in part	IP	feldspathic	FS	laminae	LM	with wisps of	WP	drilling induced break	DB
increasing in abundance	IA	ferruginous	FE	layers	LY			dyke	DY
irregular	IR	fossiliferous	FO	lenses	LN	<u>WEATHERING</u>		fault/faulted	FA
large	LR	glaucconitic	GC	matrix	MX	residual soil	R	fracture (undifferentiated)	FR
minor	MN	graphitic	GP	nodules	ND	extremely weathered	E	healed joint	HJ
moderately	MO	illitic	IL	partings	PA	highly weathered	H	intact bedding plane	BI
occasional	OC	intermediate	IM	pebbles	PB	distinctly weathered	D	joint/jointed	JN
rare	RA	intrusive	IN	pellets	PT	moderately weathered	M	parted bedding plane	BP
slightly	TY	iron stained	ID	phases	PH	slightly weathered	S	parting along cross bedding	XB
sparse	SE	kaolinitic	KA	pods	PO	weathered	W	shear zone	SZ
sporadic	SP	lateritic	LA	stringers	SG	fresh	F	sill	SL
strongly	TG	limonitic	LI	traces	TR			softened zone (non-tectonic)	SO
thick	TK	lithic	LT	wisps	WP	<u>ESTIMATED STRENGTHS</u>		thermal contraction fracture	TC
thin	TH	loamy	LO			<u>Unconsolidated Cohesive</u>		vein	VN
very	VE	manganiferous	MG	<u>Preposition</u>		very soft	C1		
		marly	MR	and	ET	soft	C2		
		metamorphosed	MM	as	AS	firm	C3	<u>CORE STATES</u>	
		micaceous	MI	of	OF	stiff	C4	overdrilled core	O
<u>Appearance</u>		muddy	MD	on	ON	very stiff	C5	solid core	S
altered	AL	oxidised	OX	with	WI	hard	C6	broken core	B
bright	BR	peaty	PE					very broken core	V
clear	LC	phosphatic	PP	<u>Position</u>		<u>Unconsolidated Cohesionless</u>		fragmented core	F
coarser	XC	pyritic	PY	alternating	AT	very loose	S1	crushed core	C
conchoidal	CC	quartzose	QZ	near base of unit	BU	loose	S2		
dull	DD	sandy	SA	near middle of unit	MU	medium dense	S3	<u>MECHANICAL STATES</u>	
fault gauge	FT	shaly	SH	near top and base of unit	XU	dense	S4	<u>Slaking</u>	
hard	HR	shelly	HY	near top of unit	TU	very dense	S5	non slaking	NS
heat affected	HA	sideritic	SD	tends to	TT			low slaking	LS
interbanded	IB	siliceous	SC	throughout	TO	<u>Rock</u>		medium slaking	MS
lustrous	LU	silicified	SF			extremely low strength rock	R1	high slaking	HS
opaque	OP	silty	SI	<u>LITHOLOGY INTERRELATIONSHIPS</u>		very low strength rock	R2		
resinous	RS	smectitic	SM	coarsening up to	CU	low strength rock	R3	<u>Plasticity</u>	
soft	SO	sooty	SX	disseminated with	DS	medium strength rock	R4	non plastic	NP
translucent	TL	stony	SY	fining up to	FU	high strength rock	R5	low plasticity	LP
		sub arenitic	AM	interbedded with	IB	very high strength rock	R6	intermediate plasticity	IP
<u>Lithological</u>		tillitic	TI	intercalated with	IC	extremely high strength rock	R7	high plasticity	HP
acidic	AC	tonsteinous	TN	interlaminated with	IL				
arenitic	AR	tuffaceous	TF	intermixed with	IM	<u>BED SPACINGS</u>		<u>Other</u>	
arkosic	AK	vitrainous	VI	irregularly interbedded with	IR	massive/absent bedding	MA	brecciated	BR
basaltic	BS	volcanic	VO	with bands of	BN	very thickly bedded (> 2 m)	VB	brittle	BL
basic	BC			with boulders of	BO	thickly bedded (600-2000 mm)	CB	cleated	CE
bentonitic	BE	<u>Inclusions</u>		with cement of	CM	medium bedded (200-600 mm)	MB	disintegrates on wetting	DW
calcareous	CA	bands	BN	with clasts of	CT	thinly bedded (60-200 mm)	TB	expanding clay	EX
carbonaceous	XX	blebs	BL	with cobbles of	OO	very thinly bedded (20-60 mm)	UB	fissile	FS
carbonate	CB	clasts	CT	with fragments of	FR	thickly laminated (6-20 mm)	LM	fissured	FI
chloritic	CR	cobbles	OO	with granules of	GR	thinly laminated (< 6 mm)	LL	flaky	FL
clayey	CL	concretions	CI	with lenses of	LN	irregular spaced bedding	IR	fractured	FR
coaly	CO	disseminated	DS	with matrix of	MX			friable	FB

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indurated	IN	sharp and undulose basal contact	U	rounded fragments	RF	slumping	SP	ironstone	IS
micro faulted	MF			well rounded fragments	WF	soft sediment deformation	DE	kaolinite	KA
non-cleated	NC	<u>SEDIMENTARY FEATURES</u>		very angular pebbles	VP	stylolites	ST	limonite	LI
powdery	PO	<u>Bedding</u>		angular pebbles	AP	varving	VV	magnetite	MT
puggy	PU	contorted bedding	CT	subangular pebbles	GP	water escape structures	WE	manganese	MG
sheared	SH	convoluted bedding	CV	subrounded pebbles	BP			marcasite	MC
slickensided	SK	current bedding	CB	rounded pebbles	RP	<u>Position</u>		mica	MI
sticky	ST	diffuse bedding	DF	well rounded pebbles	WP	in part	IP	montmorillinite	ML
subfissile	SF	disturbed bedding	DB			near base of unit	BU	muscovite	MV
		flasar bedding	FL	<u>Sorting</u>		near middle of unit	MU	olivine	OL
<u>TEXTURES</u>		graded bedding	GB	well sorted	WS	near top and base of unit	XU	opaque minerals	OM
amorphous	AM	lenticular bedding	LB	moderately sorted	MS	near top of unit	TU	orthoclase	OR
amygdaloidal	AG	penny bands	BP	poorly sorted	PS	throughout	TO	phosphates	PP
aphanitic	AP	planar bedding	PL	bimodal sorting	BS			plagioclase	PG
chalky	CK	poorly developed bedding	PD	polymodal sorting	YS	<u>ABUNDANCES</u>		pyrite	PY
cherty	CH	ripple bedding	RI	coarsening upwards	CU	abundant	A	quartz	QZ
concretionary	CI	wavy bedding	WB	fining upwards	FU	secondary	D	siderite	SD
crystalline	XL	well developed bedding	WD			accessory	E	silica	SC
earthy	EA			<u>Permeability/Porosity</u>		minor	M	sulphides	SU
equigranular	EQ	<u>Cross Bedding</u>		impermeable	IR	sporadic	P	talc	TA
fibrous	FB	high angle cross bedding (>30)	HX	low permeability	LP	rare	R	vivianite	VV
flaggy	FG	medium angle cross bedding (10-30)	MX	medium permeability	MP			zeolite	ZE
flow banded	FL	low angle cross bedding (0-10)	LX	high permeability	HP	<u>MINERALS / FOSSILS</u>			
glassy	GS	cross bedding	XX	permeable	PE	<u>Minerals</u>		<u>Fossils</u>	
granular	GG	fine cross bedding	FX	porous	PO	ankerite	AN	bivalves	BI
gritty	GT	tabular cross bedding	TX			apatite	AP	brachiopods	BR
nodular	ND	trough cross bedding	RX	<u>Cracks</u>		bauxite	BA	bryozoans	BZ
oolitic	OO			dessication cracks	DC	biotite	BT	carbonaceous remains	XR
pelletal	PT	<u>Laminations</u>		intraformational cracks	IC	calcite	CA	carbonaceous root traces	RC
pisolitic	PS	large scale cross laminations		mud casts/cracks	MC	carbonate	CB	charcoal	FB
platey	PL	(>1m)	LL	shrinkage cracks	SC	chalcedony	CD	coprolites	CP
porphyritic	PR	medium scale cross laminations		syneresis cracks	YC	chalcOPYrite	CC	faecal remains	FR
schistose	SZ	(10cm – 1m)	ML			chert	CH	foraminifera	FM
soapy	SO	small scale cross laminations		<u>Structures</u>		chlorite	CR	fossil wood	FW
vesicular	VS	(< 10cm)	SL	bioturbated	BT	clay	CL	fossils	FO
vitreous	VT	wavy laminations	WL	boudinage	BD	common opal	OP	gastropods	GT
vughy	VU			bounce marks/prod casts	PC	dickite	DI	marine fossils	MF
waxy	WX	<u>Shape</u>		burrowing	BW	dolomite	DM	pelecypods	PE
		very angular grains	VG	climbing ripples	CR	epidote	EP	plant fragments	PF
<u>BASAL CONTACTS</u>		angular grains	AG	colloidal iron deposit	CI	feldspar	FS	plant impressions	PI
basal contact open or readily parts	B	subangular grains	GG	compaction feature	CF	galena	GA	resin	RS
basal contact deformed	D	subrounded grains	BG	flame structures	FS	garnet	GR	resin aggregates	RA
erosional basal contact	E	rounded grains	RG	imbricate clasts	IM	glauconite	GC	root traces	RT
faulted at basal contact	F	well rounded grains	WG	load cast	LC	goethite	GO	rootlets	RO
gradational basal contact	G	bladed grains	DG	pebble lag	PG	graphite	GP	sediment filled root traces	SR
sharp and irregular basal contact	I	prolate grains	LG	reworked	RW	gypsum	GY	shells	HY
jointed at basal contact	J	tabular grains	TG	ripple marks	RM	haematite	HE	woody fragments	WF
sharp and oblique basal contact	O	very angular fragments	VF	rip-up clasts	RU	heavy minerals	HM		
sharp and planar basal contact	P	angular fragments	AF	rootlet beds	RB	illite	IL	<u>MINERAL ASSOCIATION</u>	
fractured at basal contact	R	subangular fragments	GF	scour and fill	SF	ilmenite	IM	amorphous	AM
sheared at basal contact	S	subrounded fragments	BF	sedimentary dyke	DY	iron oxide	IO	bands	BN

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cement	CM	H2S not detected	N
clasts	CT	H2S present	P
coarse grains	CC		
coating	OU		
concentrated at base	CB		
concentrated at top	CN		
concretions	CI		
cone in cone structure	KK		
crystals	XL		
detrital	DE		
disseminated	DS		
fibrous	FB		
fine grains	FF		
fragments	FR		
grains	GN		
in blebs	BL		
in cavities	CV		
in cleat	CE		
in pods	PO		
in veins	VN		
in vesicles	VS		
in vughs	VU		
infilling fault discontinuities	FD		
infilling of burrows	IB		
infilling vesicles	IV		
intercalations	IC		
laminae	LM		
lenses	LN		
matrix	MX		
nodules	ND		
on bedding planes	BP		
on fracture planes	FP		
on joints	JN		
oolites	OO		
pebbles	PB		
pellets	PT		
phenocrysts	PH		
radial filaments	FL		
replacement	RE		
replacing fossils	RF		
resinous	RS		
rhombs	RH		
staining	SN		
traces	TR		
wisps	WP		
GAS			
trace	T		
low gas present	L		
moderate gas present	M		
abundant gas present	A		

Peace River Coal Inc																																					
DRILL CORE LOG																																					
Hole No: TUC2020-002										Area: Trend UG										Logged By: I. Fraser/J. Galbraith																	
te Begun: 04-Feb-20										Collar Bearing: 0										Date Logged: 13 Feb 2020 - 14 Mar 2020																	
Finished: 12-Mar-20										Collar Elev. (m): 1412.59										Northing: 6085785.3																	
ole Size: PQ										Hole Angle: -90 (veritcal)										Easting: 633332.69																	
epth (m): 685m										Overall Recovery 99% -6.90 m cumulative loss/gain										Projection: NAD 83 Zone 10																	
Box No.	Driller's Marker (m)			Recovered Length (m)	Recovery (%)	Loss (m)	Total Length of pieces >0.1m	RQD (%)	Lithological Unit					Lithological Unit					Coal Type	Color	Shade	Weathering	Grain Size	Core State	Bedding Sedimentary Structure	Structure	BCN (°)		HCI (Acid test)	Additional Descriptions	Logged By (Initials)	Seam	Recovered Length (m)	Actual Length-Geophys (m)	Coal Recovery (%)	Sample Number	
	From (m)	To (m)	Drilled Length (m)						From (m)	To (m)	Length (m)	Actual Length (m)	Lost (m)	From (m)	To (m)	Length (m)	Adjusted Length (m)	Lost (m)									Rock Type	Roof									Floor
	0	8	8	0.00	0%	-8.00	0.00	0%																					Start of hole, core recovery started in box 1 at 8 m. Drilers and Geophysical log out by 3 metres	IF							
1	8	11	3	2.68	89%	-0.32	2.56	85%																													
									8.00	11.00	3.00																			Muddy till, rounded fragments	IF						
2	11	14	3	2.33	78%	-0.67	1.85	62%																													
									11.00	12.00	1.00																				As above, 0.45cm very coarse sandstone	IF					
									12.00	14.00	2.00																				Minor oxidation on fracture surfaces,Shaftesbury Formation	IF					
2-3	14	17	3	3.05	102%	0.05	2.74	91%																													
									14.00	17.00	3.00																10			Same as above, 14.3-14.63m soft, muddy band, 5mm calcareous fossils (shells), minor bedding parallel fractures	IF						
4-5	17	20	3	3.00	100%	0.00	2.80	93%																													
									17.00	20.00	3.00																10				Same as above	IF					
5-6	20	23	3	3.03	101%	0.03	2.60	87%																													
									20.00	23.00	3.00																				Same as above, 30cm fracture zone at 20.15m with soft gouge infill.	IF					
6-7	23	26	3	3.68	123%	0.68	2.60	87%																													
									23.00	26.00	3.00																										
7-8	26	29	3	2.10	70%	-0.9	1.20	40%																													
									26.00	29.00	3.00																				Same as above, gradtional transition to finer grained, increasing presence of dessication cracks with depth. Increased degree of oxidation on fracture surfaces.	IF					
8-9	29	32	3	2.95	98%	-0.05	1.40	47%																													
									29.00	32.00	3.00																				Same as above, top half of interval is fragmented and lower half broken core.	IF					
9-10	32	35	3	2.90	97%	-0.1	1.67	56%																													
									32.00	32.92	0.92																				Same as above	IF					
									32.92	35.00	2.08																				Same as above; however, transitioning to interbedded shale and mudstone, dessication cracks	IF					
10-11	35	38	3	2.23	74%	-0.77	0.24	8%																													
									35.00	38.00	3.00																				Same as above	IF					
11-12	38	41	3	2.97	99%	-0.03	0.41	14%																													
									38.00	39.60	1.60																				Same as above	IF					
									39.60	41.00	1.40																				Same as above	IF					
13-14	41	44	3	2.85	95%	-0.15	1.11	37%																													
									41.00	44.00	3.00																				Same as above	IF					
14-15	44	47	3	2.92	97%	-0.08	0.80	27%																													
									44.00	47.00	3.00																				Darker in colour, more massive shale, weathering not as apparent - minor	IF					
15-16	47	50	3	3.00	100%	0	1.41	47%																													
									47.00	50.00	3.00																				Same as above; however fresh, not as broken	IF					
16-17	50	53	3	2.95	98%	-0.05	0.89	30%																													
									50.00	53.00	3.00																				Same as above	IF					
17-18	53	56	3	2.86	95%	-0.14	0.78	26%																													
									53.00	55.10	2.10																				Same as above	IF					
									55.10	56.00	0.90																				Same as above	IF					
19-19	56	59	3	2.81	94%	-0.19	0.95	32%																													
									56.00	58.10	2.10																				Same as above	IF					
									58.10	59.00	0.90																				Same as above	IF					
19-20	59	62	3	2.84	95%	-0.16	1.00	33%																													

									59.00	62.00	3.00				62.23	65.23		3.00			SH	G	E	F	FF	B	PD					Same as above	IF					
20-22	62	65	3	2.97	99%	-0.03	0.93	31%													SH	G	E	F	FF	B	PD											
									62.00	64.30	2.30				65.23	67.53		2.30			SH	G	E	F	FF	B	PD					Same as above	IF					
									64.30	65.00	0.70				67.53	68.23		0.70			SH	G	E	F	FF	B	PD					Same as above	IF					
22-23	65	68	3	2.60	87%	-0.4	1.15	38%																														
									65.00	68.00	3.00				68.23	71.23		3.00			SH	G	E	F	FF	B	PD					Same as above	IF					
23-24	68	71	3	3.00	100%	0	2.16	72%																														
									68.00	69.60	1.60				71.23	72.83		1.60			SH	G	E	F	FF	F	PD					Same as above	IF					
									69.60	71.00	1.40				72.83	74.23		1.40			SH	G	E	F	FF	F	PD					Same as above	IF					
24-25	71	74	3	3.00	100%	0.00	2.17	72%																														
									71.00	74.00	3.00				74.23	77.23		3.00			SH	G	E	F	FF	F	PD		10			Same as above, light grey siltier interbeds-bands @10dg TCA occur increasing downhole	IF					
25-26	74	77	3	3.00	100%	0.00	2.44	81%																														
									74.00	77.00	3.00				77.23	80.23		3.00			SH	G	E	F	FF	S	PD					Same as above	IF					
26-27	77	80	3	2.90	97%	-0.10	2.47	82%																														
									77.00	80.00	3.00				80.23	83.23		3.00			SH	G	E	F	FF	F	PD					Same as above	IF					
27-28	80	83	3	3.13	104%	0.13	2.50	83%																														
									80.00	83.00	3.00				83.23	86.23		3.00			SH	G	E	F	FF	F	PD					Same as above	IF					
28-29	83	86	3	2.88	96%	-0.12	1.72	57%																														
									83.00	86.00	3.00				86.23	89.23		3.00			SH	G	E	F	FF	F	PD					Same as above	IF					
29-30	86	89	3	2.90	97%	-0.10	2.56	85%																														
									86.00	89.00	3.00				89.23	92.23		3.00			SH	G	E	F	FF	F	PD					Same as above	IF					
30-31	89	92	3	3.00	100%	0.00	2.53	84%																														
									89.00	92.00	3.00				92.23	95.23		3.00			SH	G	E	F	FF	S	PL					Same as above; however, the silt interbeds are more prominent, bedding better developed	IF					
31-32	92	95	3	3.08	103%	0.08	2.11	70%																														
									92.00	95.00	3.00				95.23	98.23		3.00			SH	G	E	F	FF	F	PL					Same as above	IF					
33-34	95	98	3	2.95	98%	-0.05	1.15	38%																														
									95.00	98.00	3.00				98.23	101.23		3.00			SH	G	E	F	FF	B	PL		15			Same as above	IF					
34-35	98	101	3	2.85	95%	-0.15	1.81	60%																														
									98.00	101.00	3.00				101.23	104.23		3.00			SH	G	E	F	FF	F	PL					Same as above	IF					
35-36	101	104	3	3.05	102%	0.05	2.50	83%																														
									101.00	104.00	3.00				104.23	107.23		3.00			SH	G	E	F	FF	S	PL					Same as above	IF					
36-37	104	107	3	2.96	99%	-0.04	2.90	97%																														
									104.00	107.00	3.00				107.23	110.23		3.00			SH	G	E	F	FF	S	PL					Same as above	IF					
37-38	107	110	3	3.06	102%	0.06	1.88	63%																														
									107.00	110.00	3.00				110.23	113.23		3.00			SH	G	E	F	FF	S	PL		15			Same as above	IF					
38-39	110	113	3	3.05	102%	0.05	2.45	82%																														
									110.00	113.00	3.00				113.23	116.23		3.00			SH	G	E	F	FF	F	PL					Same as above	IF					
39-40	113	116	3	3.00	100%	0.00	2.77	92%																														
									113.00	116.00	3.00				116.23	119.23		3.00			SH	G	E	F	FF	S	PL					Same as above	IF					
40-41	116	119	3	2.92	97%	-0.08	2.76	92%																														
									116.00	119.00	3.00				119.23	122.23		3.00			SH	G	E	F	FF	S	PL					Same as above	IF					
41-42	119	122	3	3.06	102%	0.06	2.95	98%																														
									119.00	122.00	3.00				122.23	125.23		3.00			SH	G	E	F	FF	S	PL		15			Same as above	IF					
42-43	122	125	3	2.98	99%	-0.02	2.77	92%																														
									122.00	125.00	3.00				125.23	128.23		3.00			SH	G	E	F	FF	S						Same as above	IF					
43-44	125	128	3	3.03	101%	0.03	2.76	92%																														
									125.00	128.00	3.00				128.23	131.23		3.00			SH	G	E	F	FF	S						Same as above	IF					
44-45	128	131	3	3.05	102%	0.05	2.81	94%																														
									128.00	131.00	3.00				131.23	134.23		3.00			SH	G	E	F	FF	S	FL		15			Same as above; however, shale unit more interlaminated with fine grain, light grey silt-sandstone beds	IF					

[illegible]

[illegible]

									266.00	267.83	1.83			268.90	270.73		1.83		SS	G	L	F	FC	S	PL		25					IF						
									267.83	268.00	0.17			270.73	270.90		0.17		SH	G	E	F	FF	S							Shale very fine laminated interbed	IF						
									268.00	269.00	1.00			270.90	271.90		1.00		SS	G	L	F	FC	S							As to 263.00m	IF						
94-95	269	272	3	2.95	98%	-0.05	2.70	90%																								IF						
									269.00	272.00	3.00	2.95		271.90	274.85		2.95		SS	G	L	F	FC	S							As to 263.00m	IF						
95-96	272	275	3	2.82	94%	-0.18	2.52	84%																								IF						
									272.00	273.20	1.20	1.02		274.85	275.87		1.02		SS	G	L	F	FC	S							As to 263.00m	IF						
									273.00	275.00	2.00			275.87	277.87		2.00		CG	G	E	F	MC	S							Conglomerate - with fine grain sandstone interbeds	IF						
96-97	275	278	3	3.08	103%	0.08	2.60	87%																								IF						
									275.00	276.56	1.56			277.87	279.43		1.56		CG	G	E	F	MC	S							Same as above	IF						
									276.56	277.66	1.10			279.43	280.53		1.10		SS	G	L	F	FC	S							Sandstone interbedded with carbonaceous shale and coarser conglomerates, coal fragments within	IF						
									277.66	278.00	0.34			280.53	280.87		0.34		SS	G	L	F	FF	S							Very fine grain sandstone interbedded with massive, light grey-pale brown to darker grey shale units, coal fragments disseminated throughout	IF						
97-98	278	281	3	3.03	101%	0.03	2.91	97%																								IF						
									278.00	281.00	3.00			280.87	283.87		3.00		SS	G	L	F	FF	S							Same as above	IF						
98-99	281	284	3	3.16	105%	0.16	2.75	92%																								IF						
									281.00	284.00	3.00			283.87	286.87		3.00		SS	G	L	F	FF	S							Same as above	IF						
99-100	284	287	3	3.10	103%	0.10	2.90	97%																								IF						
									284.00	287.00	3.00			286.87	289.87		3.00		SS	G	L	F	FF	S							Same as above	IF						
100-101	287	290	3	2.93	98%	-0.07	2.86	95%																								IF						
									287.00	290.00	3.00			289.87	292.87		3.00		SS	G	L	F	FF	S							Same as above	IF						
101-102	290	293	3	2.98	99%	-0.02	2.80	93%																								IF						
									290.00	293.00	3.00			292.87	295.87		3.00		SS	G	L	F	FF	S							Same as above	IF						
102-103	293	296	3	3.10	103%	0.10	3.00	100%																								IF						
									293.00	296.00	3.00			295.87	298.87		3.00		SS	G	L	F	FF	S							Same as above	IF						
104	296	299	3	2.77	92%	-0.23	2.61	87%																								IF						
									296.00	297.93	1.93			298.87	300.80		1.93		SS	G	L	F	FF	S	PL		10					Same as above, bed of conglomerate 11cm thick	IF					
									297.93	299.00	1.07	0.84		300.80	301.64		0.84		SH	G	L	F	FF	S							Shale - very fine, light grey to darker grey, locally sandy, with interbedded siltstone - fg sandstone, local coal fragments, locally pale brown nodular fragments	IF						
105-106	299	302	3	3.16	105%	0.16	2.50	83%																								IF						
									299.00	302.00	3.00			301.64	304.64		3.00		SH	G	L	F	FF	S							Same as above	IF						
106-107	302	305	3	2.97	99%	-0.03	2.91	97%																								IF						
									302.00	305.00	3.00			304.64	307.64		3.00		SH	G	L	F	FF	S							Same as above	IF						
107-108	305	308	3	3.00	100%	0.00	2.95	98%																								IF						
									305.00	308.00	3.00			307.64	310.64		3.00		SH	G	L	F	FF	S							Same as above	IF						
108-109	308	311	3	3.00	100%	0.00	2.60	87%																								IF						
									308.00	311.00	3.00			310.64	313.64		3.00		SH	G	L	F	FF	S							Same as above	IF						
109-110	311	314	3	2.95	98%	-0.05	2.85	95%																								IF						
									311.00	313.32	2.32			313.64	315.96		2.32		SH	G	L	F	FF	S							Same as above	IF						
									313.32	313.45	0.13			315.96	316.09		0.13		XM	B	E	F	FF	S			7	10			Carbonaceous Mudstone - fine grain brown with shiny, thin up to 5mm black coal seams, parallel to and discordant to bedding	IF						
									313.45	314.00	0.55			316.09	316.64		0.55		SH	G	L	F	FF	S							Same as above - Shale	IF						
110-111	314	317	3	3.05	102%	0.05	2.95	98%																								IF						
									314.00	317.00	3.00			316.64	319.64		3.00		SH	G	L	F	FF	S							Same as above	IF						
111-112	317	320	3	2.86	95%	-0.14	2.62	87%																								IF						
									317.00	318.28	1.28			319.64	320.92		1.28		SH	G	L	F	FF	S							Same as above	IF						
									318.28	319.00	0.72	0.58		320.92	321.50		0.58		XM	B	E	F	FF	S			15	15			Carbonaceous Mudstone, same as above at 313.32m, well defined conformable contacts, coal fragments very thin seams within	IF						
									319.00	320.00	1.00			321.50	322.50		1.00		SH	G	E	F	FF	S							Same as above - Shale	IF						
112-113	320	323	3	2.93	98%	-0.07	2.76	92%																								IF						
									320.00	321.16	1.16			322.50	323.66		1.16		SS	G	L	F	FF	S							Interbedded Sandstone, fine grain, gradual upper contact, sharp lower contact / bed with Shale unit	IF						

									321.16	323.00	1.84			323.66	325.50		1.84		SH	G	E	F	FF	S						Same as above - Shale with interbedded siltstone - fg sandstone	IF						
113-114	323	326	3	3.04	101%	0.04	2.90	97%																							IF						
									323.00	326.00	3.00			325.50	328.50		3.00		SH	G	E	F	FF	S						Same as above	IF						
114-115	326	329	3	3.06	102%	0.06	2.90	97%																							IF						
									326.00	327.70	1.70			328.50	330.20		1.70		SH	G	E	F	FF	S						Same as above	IF						
									327.70	329.00	1.30			330.20	331.50		1.30		SS	G	L	F	FF	S						Fine grain Sandstone interbedded with light grey siltstone and darker grey shale, local coal fragments	IF						
115-116	329	332	3	3.10	103%	0.10	3.10	103%																							IF						
									329.00	332.00	3.00			331.50	334.50		3.00		SS	G	L	F	FF	S						Same as above	IF						
116-117	332	335	3	3.00	100%	0.00	2.40	80%																							IF						
									332.00	333.35	1.35			334.50	335.85		1.35		SS	G	L	F	FF	S	PL		23			Same as above	IF						
									333.35	335.00	1.65			335.85	337.50		1.65		SH	G	E	F	FF	S						Shale - medium to darker grey, with light grey siltstone - fg sandstone interbeds, local coal fragments	IF						
117-118	335	338	3	3.00	100%	0.00	2.77	92%																							IF						
									335.00	337.24	2.24			337.50	339.74		2.24		SH	G	E	F	FF	S						Same as above	IF						
									337.24	338.00	0.76			339.74	340.50		0.76		SS	G	L	F	FF	S						Fine grain Sandstone interbedded with light grey siltstone and darker grey shale, local coal fragments	IF						
118-119	338	341	3	2.93	98%	-0.07	2.62	87%																							IF						
									338.00	340.28	2.28			340.50	342.78		2.28		SS	G	L	F	FF	S						Same as above	IF						
									340.28	340.90	0.62			342.78	343.40		0.62		XH	G	D	F	FF	S						Shale - Carbonaceous Shale	IF						
									340.90	341.00	0.10			343.40	343.50		0.10		XM	K	B	F	FF	F						Carbonaceous Mudstone - Coal (approx 30%)	IF						
119-120	341	344	3	2.90	97%	-0.10	1.95	65%																							IF						
									341.00	341.32	0.32			343.50	343.82		0.32		XM	K	B	F	FF	F						Same as above	IF						
									341.32	342.45	1.13			343.82	344.95		1.13		XH	G	B	F	FF	S						Shale - Carbonaceous Shale	IF						
									342.45	344.00	1.55			344.95	346.50		1.55		SS	G	L	F	FF	S	PL		15			Very fine to fine grain Sandstone, massive, bedding better developed	IF						
121	344	347	3	3.00	100%	0.00	3.00	100%																							IF						
									344.00	346.25	2.25			346.50	348.75		2.25		SS	G	L	F	FF	S						Same as above	IF						
									346.25	347.00	0.75			348.75	349.50		0.75		SS	G	L	F	MC	S	GB		25			Medium - coarse grain Sandstone, minor rip-up clasts of shale, minor coal as fragments and as very thin (1mm) beds conformable to bedding	IF						
122-123	347	350	3	2.98	99%	-0.02	2.91	97%																							IF						
									347.00	350.00	3.00			349.50	352.50		3.00		SS	G	L	F	MC	S						Same as above	IF						
123-124	350	353	3	3.07	102%	0.07	2.97	99%																							IF						
									350.00	353.00	3.00			352.50	355.50		3.00		SS	G	L	F	MC	S						Same as above	IF						
124-125	353	356	3	2.98	99%	-0.02	2.89	96%																							IF						
									353.00	356.00	3.00			355.50	358.50		3.00		SS	G	L	F	MC	S						Same as above	IF						
125-126	356	359	3	2.90	97%	-0.10	2.90	97%																							IF						
									356.00	359.00	3.00			358.50	361.50		3.00		SS	G	L	F	MC	S						Same as above	IF						
126-127	359	362	3	3.01	100%	0.01	2.66	89%																							IF						
									359.00	360.57	1.57			361.50	363.07		1.57		SS	G	L	F	MC	S						Same as above	IF						
									360.57	362.00	1.43			363.07	364.50		1.43		SH	G	B	F	FF	S						Shale - massive, medium-dark grey	IF						
127-128	362	365	3	3.03	101%	0.03	2.74	91%																							IF						
									362.00	365.00	3.00			364.50	367.50		3.00		SH	G	B	F	FF	S						Same as above	IF						
128-129	365	368	3	2.98	99%	-0.02	2.72	91%																							IF						
									365.00	365.73	0.73			367.50	368.23		0.73		SH	G	B	F	FF	S						Same as above	IF						
									365.73	366.90	1.17			368.23	369.40		1.17		SS	G	A	F	FM	S						Sandstone conformable with upper shale, gradational contact, unit contains rip up frags of shale	IF						
									366.90	368.00	1.10			369.40	370.50		1.10		CG	G	E	F	CC	S						Conglomerate - massive unit, cobbles up to 20x10mm, sub rounded - rounded, fragments very thin interbeds of coal locally	IF						
129-130	368	371	3	2.99	100%	-0.01	2.99	100%																							IF						
									368.00	371.00	3.00			370.50	373.50		3.00		CG	G	E	F	CC	S						Same as above	IF						
130-131	371	374	3	3.07	102%	0.07	2.69	90%																							IF						
									371.00	373.47	2.47			373.50	375.97		2.47		CG	G	E	F	CC	S				20		Same as above, bottom contact last of conglomerate, sharp at 20dg	IF						
									373.47	374.00	0.53			375.97	376.50		0.53		SS	G	A	F	FF	S						Sandstone - massive, bedded	IF						
131-132	374	377	3	2.90	97%	-0.10	2.90	97%																							IF						

									374.00	377.00	3.00				376.50	379.50		3.00			SS	G	A	F	FF	S						Same as above	IF					
132-133	377	380	3	3.10	103%	0.10	3.05	102%																								IF						
									377.00	379.56	2.56				379.50	382.06		2.56			SS	G	A	F	FF	S						Same as above, Bottom of Boulder Creek	IF					
									379.56	380.00	0.44				382.06	382.50		0.44			SH	G	E	F	FF	S	PL		18			Shale with interbedded siltstone -sandstone, Top of Huicross Formation, distinct from above by interbedding, and increasing shale component downhole - siderite concretions / beds apparent, minor local coal frags	IF					
133-134	380	383	3	2.88	96%	-0.12	2.64	88%																								IF						
									380.00	383.00	3.00				382.50	385.50		3.00			SH	G	E	F	FF	S						Same as above	IF					
134-135	383	386	3	3.05	102%	0.05	2.50	83%																								IF						
									383.00	386.00	3.00				385.50	388.50		3.00			SH	G	E	F	FF	S						Same as above	IF					
135-136	386	389	3	2.94	98%	-0.06	2.53	84%																								IF						
									386.00	389.00	3.00				388.50	391.50		3.00			SH	G	E	F	FF	S						Same as above	IF					
136-137	389	392	3	3.08	103%	0.08	3.08	103%																								IF						
									389.00	390.00	1.00				391.50	392.50		1.00			SH	G	E	F	FF	S						Same as above	IF					
									390.00	392.00	2.00				392.50	394.50		2.00			SH	G	B	F	FF	S						Shale as above, siltstone-sandstone interbeds are thinner, unit more shale-siltstone less sandstone interbeds	IF					
137-138	392	395	3	2.93	98%	-0.07	2.93	98%																								IF						
									392.00	395.00	3.00				394.50	397.50		3.00			SH	G	B	F	FF	S	PL	10				Same as above	IF					
138-139	395	398	3	2.97	99%	-0.03	2.88	96%																								IF						
									395.00	398.00	3.00				397.50	400.50		3.00			SH	G	B	F	FF	S						Same as above	IF					
139-140	398	401	3	3.05	102%	0.05	2.60	87%																								IF						
									398.00	401.00	3.00				400.50	403.50		3.00			SH	G	B	F	FF	S						Same as above	IF					
141-142	401	404	3	3.00	100%	0.00	2.91	97%																								IF						
									401.00	404.00	3.00				403.50	406.50		3.00			SH	G	B	F	FF	S						Same as above	IF					
142-143	404	407	3	2.93	98%	-0.07	2.84	95%																								IF						
									404.00	407.00	3.00				406.50	409.50		3.00			SH	G	B	F	FF	S						Same as above	IF					
143-144	407	410	3	3.04	101%	0.04	2.94	98%																								IF						
									407.00	410.00	3.00				409.50	412.50		3.00			SH	G	B	F	FF	S	PL	10				Same as above	IF					
144-145	410	413	3	3.02	101%	0.02	2.95	98%																								IF						
									410.00	413.00	3.00				412.50	415.50		3.00			SH	G	B	F	FF	S						Same as above	IF					
145-146	413	416	3	3.07	102%	0.07	2.58	86%																								IF						
									413.00	416.00	3.00				415.50	418.50		3.00			SH	G	B	F	FF	S						Same as above	IF					
146-147	416	419	3	2.90	97%	-0.10	0.98	33%																								IF						
									416.00	416.40	0.40				418.50	418.90		0.40			SH	G	B	F	FF	S						Same as above	IF					
									416.40	419.00	2.60				418.90	421.50		2.60			MS	G	D	F	FF	F						Mudstone - Shale - unit becomes darker colour, more fissile and fragmented core - broken core	IF					
147-148	419	422	3	3.22	107%	0.22	1.65	55%																								JLG						
									419.00	422.00	3.00				421.50	424.50		3.00			MS	G	D	F	FF	F	PL		7			Same as above	JLG					
148-149	422	425	3	2.88	96%	-0.12	1.40	47%																								JLG						
									422.00	425.00	3.00				424.50	427.50		3.00			MS	G	D	F	FF	F	PL	joints	10			Same as above, prominent joint/fracture throughout parallel to core axis.	JLG					
149-150	425	428	3	3.04	101%	0.04	2.42	81%																								JLG						
									425.00	425.16	0.16				427.50	427.66		0.16			CS	G	L	F	FF	S						clayey band, soft, few mm scale mudstone laminations	JLG					
									425.16	428.00	2.84				427.66	430.50		2.84			MS	G	D	F	FF	S	PL		10			same as mudstone above, Bedding parallel fractures with smooth carbonaceous surface.	JLG					
150-151	428	431	3	3.11	104%	0.11	2.54	85%																								JLG						
									428.00	431.00	3.00				430.50	433.50		3.00			MS	G	D	F	FF	S	PL		10			same as above. Mudstone with silty laminations 1mm up to 1cm scale. Bedding parallel fractures with smooth carbonaceous surface.	JLG					
151-152	431	434	3	2.99	100%	-0.01	2.57	86%																								JLG						
									431.00	434.00	3.00				433.50	436.50		3.00			MS	G	D	F	FF	S	PL		10			same as above	JLG					
152-153	434	437	3	2.91	97%	-0.09	2.51	84%																								JLG						
									434.00	437.00	3.00				436.50	439.50		3.00			MS	G	D	F	FF	S	PL		15			same as above	JLG					
153-154	437	440	3	2.99	100%	-0.01	2.85	95%																								JLG						
									437.00	440.00	3.00				439.50	442.50		3.00			MS	G	E	F	FM	S	PL		15			same as above, increasing silt content.	JLG					
155-156	440	443	3	3.07	102%	0.07	3.01	100%																								JLG						

									522.96	524.00	1.04			525.48	526.52		1.04		CG-SS	G	A	F	GP-MM	S	PL	10				interbedded conglomerate and sandstone, 15-20cm-scale beds, poorly sorted conglomerate, same as above, sporadic pebbles	JLG						
184-185	524	527	3	2.97	99%	-0.03	2.97	99%																						JLG							
									524.00	525.02	1.02			526.52	527.54		1.02		CG-SS	G	A	F	GP-FM	S	PL	10				same as above	JLG						
									525.02	526.47	1.45			527.54	528.99		1.45		SS	G	E	F	CC	S	XB	15				cross-bedding throughout, rare pebble	JLG						
									526.47	527.00	0.53			528.99	529.52		0.53		SS	G	L	F	FM	S	PL, SP	15				some evidence of slumping	JLG						
185-186	527	530	3	2.98	99%	-0.02	2.97	99%																						JLG							
									527.00	529.32	2.32			529.52	531.84		2.32		SS	G	E	F	FM	S	PL, XB	20				sporadic granule conglomerate layers (cm-scale), few mudstone bands 1-5cm thick	JLG						
									529.32	529.35	0.03			531.84	531.87		0.03		CG	G	E	F	GG	S						rounded to sub-rounded clasts, sand and mud matrix	JLG						
									529.35	530.00	0.65			531.87	532.52		0.65		SS	G	L	F	FM	S						massive	JLG						
186-187	530	533	3	3.00	100%	0.00	3.00	100%																						JLG							
									530.00	533.00	3.00			532.52	535.52		3.00		SS	G	L	F	FM	S	PL	15				same as above, faint bedding, rare pebbles	JLG						
187-188	533	536	3	3.05	102%	0.05	3.05	102%																						JLG							
									533.00	536.00	3.00			535.52	538.52		3.00		SS	G	L	F	FC	S	PL	10				same as above	JLG						
188-189	536	539	3	2.95	98%	-0.05	2.95	98%																						JLG							
									536.00	539.00	3.00			538.52	541.52		3.00		SS	G	L	F	FM	S	PL	10				same as above	JLG						
189-190	539	542	3	3.07	102%	0.07	3.07	102%																						JLG							
									539.00	542.00	3.00			541.52	544.52		3.00		SS	G	L	F	FM	S	PL	10				same as above	JLG						
190-191	542	545	3	3.01	100%	0.01	2.83	94%																						JLG							
									542.00	543.43	1.43			544.52	545.95		1.43		SS	G	L	F	FM	S	PL	10		10		same as above, one 1cm mudstone layer.	JLG						
									543.43	544.79	1.36			545.95	547.31		1.36		SS-MS	G	B	F	FM	S	PL+WL	7				interbedded sandstone and mudstone, 10cm thick beds, up to 1cm pyrite blebs in mudstone	JLG						
									544.79	545.00	0.21			547.31	547.52		0.21		CG	G	E	F	PP	S	PS					Poorly sorted pebble to granule conglomerate, rounded clasts with sandstone matrix, mixed sedimentary clasts.	JLG						
191-192	545	548	3	2.91	97%	-0.09	2.86	95%																						JLG							
									545.00	545.61	0.61			547.52	548.13		0.61		CG	G	E	F	GP	S	PS					same as above, lower pebble content.	JLG						
									545.61	545.68	0.07			548.13	548.20		0.07		MS	G	D	F	FF	S	PL					minor pyrite grains and blebs in layers throughout	JLG						
									545.68	545.96	0.28			548.20	548.48		0.28		SS	G	E	F	FM	S	WL	10				Minor mudstone laminations, increasing towards base	JLG						
									545.96	546.95	0.99			548.48	549.47		0.99		MS	G	D	F	S	S		5				rare sandy lense n(mm-scale)	JLG						
									546.95	547.37	0.42			549.50	549.92		0.42		CO	K	DM	F		S						hard coal, minor cleating, rare 5mm mudstone layer	JLG		D1				
									547.37	548.00	0.63			549.92	550.55		0.63		ST	G	E	F	FF	S						massive	JLG						
193-194	548	551	3	3.05	102%	0.05	2.79	93%																						JLG							
									548.00	548.33	0.33			550.55	550.88		0.33		ST	G	E	F	FF	S						same as above	JLG						
									548.33	551.00	2.67			550.88	553.57		2.69		SS-MS	G	B	F	FC	S	WL	5				interlaminated sandstone and mudstone, few silty layers, increasing mudstone content towards base of interval,	JLG						
194	551	551.5	0.5	0.52	104%	0.02	0.47	94%																						JLG							
									551.00	551.50	0.50			553.57	554.07		0.50		SS-MS	G	B	F	FC	S	WL	5				same as above	JLG						
194-195	551.5	554	2.5	2.34	94%	-0.16	2.10	84%																						JLG							
									551.50	554.00	2.50			554.07	556.57		2.50		ST	G	E	F	FF	S						Minor sandy and muddy laminations	JLG						
195-196	554	557	3	2.91	97%	-0.09	2.70	90%																						JLG							
									554.00	557.00	3.00			556.57	559.57		3.00		MS-ST	G	D	F	FF	S						interlaminated mudstone and siltstone, rare mm-scale coaly lense	JLG						
196	557	559.2	2.2	2.13	97%	-0.07	1.36	62%																						JLG							
									557.00	557.88	0.88			559.57	560.45		0.88		MS-ST	G	D	F	FF	S						same as above	JLG						044079
									557.88	558.49	0.61	0.61	0.00	560.45	561.06		0.61		CO	K	DM	F		F						hard coal, fractured, rare 5mm mudstone layer	JLG		D2				044080
														561.06	561.15		0.09		CL																		
									558.49	559.20	0.71			561.15	561.86		0.71		XM-ST	G	D	F	S	S						same as MS-ST above, more carbonaceous	JLG						044081
197	559.2	559.7	0.5	0.52	104%	0.02	0.00	0%																						JLG							
									559.20	559.31	0.11			561.86	561.97		0.11		XM	G	D	F	FF	S						sporadic mm-scale coaly lenses.	JLG						
									559.31	559.50	0.19	0.19	0.00	561.97	562.16		0.19		CO	K	DD	F								carbonaceous mudstone bands, come cleating, friable.	JLG						
									559.50	559.70	0.20			562.16	562.36		0.20		MS	G	D	F	FF	F						minor 1mm coaly lenses	JLG						
197	559.7	560	0.3	0.29	97%	-0.01	0.29	97%																						JLG							
									559.70	559.84	0.14			562.36	562.52		0.16		MS	G	D	F	FF	S						same as above	JLG						

									674.00	676.11	2.11			676.92	679.03		2.11		SS	G	E	F	FM	S	PL, WL	10					same as above	JLG						
									676.11	677.00	0.89			679.03	679.89		0.86		SS	G	A	F	MM	S	PL	10					massive, rare mudstone lamination	JLG						
238-239	677	680	3	2.91	97%	-0.09	2.91	97%																							JLG							
									677.00	680.00	3.00			679.89	682.80		2.91		SS	G	A	F	FC	S	PL	15					same as above, some interbedding between coarse and fine sandstone bands in lower 1m of interval, and fining toward base (Coarsening upward)	JLG						
239-240	680	683	3	2.99	100%	-0.01	2.98	99%																							JLG							
									680.00	680.10	0.10			682.80	682.90		0.10		SS	G	A	F	FC	S	PL			10			same as above, abrupt contact, 10 degrees TCN	JLG						
									680.10	681.65	1.55			682.90	684.45		1.55		SS-MS	G	B	F	FM	S	PL	10					sandstone interbedded with mudstone, and minor siltstone, minor sections with wavy laminations	JLG						
									681.65	683.00	1.35			684.45	685.80		1.35		SS	G	E	F	FM	S	PL, WL	10					rare mudstone laminations and interbed, rare evidence of worm burrows and large-scale possible x-bedding in middle of interval	JLG						
		EOH																													JLG							

[illegible]

[illegible]

									324.66	324.92	0.26	0.18			325.70	325.95		0.25	CO	K	DM	F		F				5	5		Coal - dull, hard, fractured parallel to bedding roof, floor well defined	IF					
									324.84	325.10	0.26				325.95	326.21		0.26	SH	G	B	F	FF	S	PL			5			Shale as above, some coal rip ups, gradational into Siltstone	IF					
									325.10	325.63	0.53				326.21	326.74		0.53	ST-SS	G	B	F	FF	S	PL	15				Siltstone - fg Sandstone - intercalating, minor shale component, minor coal rip ups very thin bands	IF						
									325.63	325.67	0.04				326.74	326.80		0.06	CO	K	DD	F		S				15	5		Coal - thin dull coal seam, or possible rip up	IF					
									325.67	326.00	0.33				326.80	327.13		0.33	SS	G	E	F	FF	S	PL	15				Sandstone - interbedded with darker sandy shales and siltstones, local wavy laminations	IF						
100-101	326	329	3	3.15	105%	0.15	3.00	100%																							IF						
									326.00	329.00	3.00				327.13	330.28		3.15	SS	G	E	F	FF	S	PL	10				Same as above	IF						
101-102	329	332	3	2.96	99%	-0.04	2.77	92%																							IF						
									329.00	332.00	3.00				330.28	333.32		3.04	SS	G	E	F	FF	S	PL	5				Same as above, flatter bedding	IF						
102	332	335	3	2.77	92%	-0.23	2.39	80%																							IF						
									332.00	333.00	1.00				333.32	334.35		1.03	SS	G	E	F	FF	S	PL			5		Same as above, very thin coaly bands at base	IF						
									333.00	333.65	0.65				334.35	335.00		0.65	SH	G	B	F	FF	S	PL			5		Shale - massive, gradational with SS below, @ 33.40-333.54m dense section pyrite rich, pitted the result of weathered out pyrite nodules?	IF						
									333.65	334.04	0.39				335.00	335.39		0.39	SS	G	E	F	FF	S	PL			15		Same as above, interbedded with minor shale	IF					044051	
									334.04	334.15	0.11				335.39	335.50		0.11	XH	G	B	F	FF	S	PL			15	5	Shale - softer, carbonaceous	IF					044051	
									334.15	335.00	0.85	0.57			335.50	336.07		0.57	CO	K	DM			F				5		Coal - mostly dull, minor bright sections, pyrite nodules/ bands, fractures parallel to core axis	IF	SB				044052	
															336.07	336.32		0.25	CL																		
102-103	335	338	3	2.74	91%	-0.26	2.01	67%																							IF						
									335.00	336.23	1.23	0.98			336.32	337.30		0.98	CO	K	DM			F					5		Coal as above, thin carb shale parting at 335.45-335.50m, hard, some cleating apparent	IF	SB				044052
									336.23	336.40	0.17				337.30	337.47		0.17	XH	G	D	F	FF	S				5		Carb Shale - massive, minor coaly bands at top, gradational with fg SS below	IF					044053	
									336.40	338.00	1.60				337.47	339.07		1.60	SS	G	B	F	FF	S	PL	15				Sandstone - silty Shale, well bedded, local x-beds, interlaminated with darker thin beds shale	IF					044053	
103-104	338	341	3	3.00	100%	0.00	2.81	94%																							IF						
									338.00	341.00	3.00				339.07	342.07		3.00	SH	G	B	F	FF	S	PL	5				Shale as above - shale dominant interbedded with fg SS	IF						
104	341	344	3	3.00	100%	0.00	2.93	98%																							IF						
									341.00	342.82	1.82				342.07	343.89		1.82	SS	G	E	F	FF	S	PL			5		Sandstone - silty Shale, well bedded, local x-beds, interlaminated with darker thin beds shale	IF						
									342.82	344.00	1.18				343.89	345.07		1.18	SH	G	B	F	FF	S				5		Shale - darker colour, minor calcite veinlets, pale brown nodules localized - cherty - massive texture minor laminations of fg SS	IF						
104-105	344	347	3	2.84	95%	-0.16	2.40	80%																							IF						
									344.00	345.10	1.10				345.07	346.33		1.26	SH	G	B	F	FF	S							Same as above - gradational with SS below	IF					
									345.10	347.00	1.90				346.33	348.23		1.90	SS	G	E	F	FF	S	PL	10				Sandstone - as above, minor shale laminations, calcite veining, local x-beds	IF						
105-106	347	350	3	3.00	100%	0.00	2.42	81%																							IF						
									347.00	347.39	0.39				348.23	348.62		0.39	SS	G	E	F	FF	S	PL						Same as above	IF					
									347.39	349.12	1.73				348.62	350.35		1.73	SH	G	B	F	FF	S							Same as above - sharp irregular upper contact, gradational with SS below	IF					
									349.12	350.00	0.88				350.35	351.23		0.88	SS	G	E	F	FF	S	fracture	75				Same as above, joint semi parallel to core axis	IF						
106	350	353	3	2.90	97%	-0.10	2.73	91%																							IF						
									350.00	352.70	2.70				351.23	353.93		2.70	SS	G	E	F	FF	S	PL	10				Same as above	IF						
									352.70	352.78	0.08				353.93	354.05		0.12	XH	G	D	F	FF	S							Carbonaceous shale - dark brown grey colour, massive	IF					
									352.78	353.00	0.22	0.11			354.05	354.16		0.11	CO	K	DD	F		F				10		Coal - dull, hard, minor cleating, carb shale partings?	IF						
									354.16	354.22	0.06				354.16	354.22		0.06	CL																		
106-107	353	356	3	2.98	99%	-0.02	2.13	71%																							IF						
									353.00	353.08	0.08	0.08			354.22	354.30		0.08	CO	K	DD	F		F					10		Same as above	IF					
									353.08	354.00	0.92				35																						

									365.00	367.60	2.60			366.22	368.82		2.60		SS	G	E	F	FM	S						Same as above	IF					
									367.60	368.00	0.40			368.82	369.22		0.40		SS	G	E	F	FM	S	PL	7				Same as above; however local beds of pebble conglomerate	IF					
110-111	368	371	3	2.60	87%	-0.40	1.84	61%																						IF						
									368.00	368.18	0.18			369.22	369.40		0.18		SS	G	E	F	FM	S	PL	7				Same as above; however local beds of pebble conglomerate	IF					
									368.18	371.00	2.82			369.40	372.22		2.82		SS	G	E	F	FM	B						SS same as above, section broken core ~370-371m - mechanical	IF					
111-112	371	374	3	3.00	100%	0.00	2.82	94%																						IF						
									371.00	372.50	1.50			372.22	373.72		1.50		SS	G	E	F	FM	S	FU					Same as above - local pebble beds	IF					
									372.50	372.75	0.25			373.72	373.97		0.25		CG	G	E	F	CC	S	PS					Conglomerate - pebble CG bed within massive SS	IF					
									372.75	374.00	1.25			373.97	375.22		1.25		SS	G	E	F	FM	S	FU	10				Same as above - local pebble beds	IF					
112	374	377	3	2.87	96%	-0.13	2.80	93%																						IF						
									374.00	374.45	0.45			375.22	375.67		0.45		SS	G	E	F	FM	S	FU					Same as above - local pebble beds	IF					
									374.45	374.67	0.22			375.67	375.89		0.22		CG	G	E	F	CC	S	PS			20		Conglomerate - pebble CG bed within massive SS	IF					
									374.67	377.00	2.33			375.89	378.22		2.33		SS	G	E	F	FM	S	FU	15				Same as above - local pebble beds	IF					
112-113	377	380	3	3.00	100%	0.00	2.80	93%																						IF						
									377.00	380.00	3.00			378.22	381.22		3.00		SS	G	E	F	FM	S						Sandstone - massive	IF					
113-114	380	383	3	2.90	97%	-0.10	2.00	67%																						IF						
									380.00	383.00	3.00			381.22	384.22		3.00		SS	G	E	F	FM	S	PL	20				Sandstone - massive, local bedding, fractured / jointing oblique to bedding @ 55dg to core axis	IF					
114	383	386	3	2.96	99%	-0.04	2.45	82%																						IF						
									383.00	386.00	3.00			384.22	387.22		3.00		SS	G	E	F	FM	F	PL					Same as above, blocky / fractured, calcite veins infill fractures / joint planes oblique to core axis / bedding	IF					
114-115	386	389	3	3.00	100%	0.00	2.70	90%																						IF						
									386.00	389.00	3.00			387.22	390.22		3.00		SS	G	E	F	FM	F	PL	25				Same as above, abundant calcite fractures / jointing	IF					
115-116	389	392	3	3.00	100%	0.00	2.98	99%																						IF						
									389.00	392.00	3.00			390.22	393.22		3.00		SS	G	E	F	FM	F	PL	25				Same as above, abundant calcite fractures / jointing	IF					
116	392	395	3	2.88	96%	-0.12	2.52	84%																						IF						
									392.00	392.34	0.34			393.22	393.66		0.44		ST	G	D	F	FF	F	PL	33				Siltstone / Shale - interbedded / lamination of fine grain siltstones and mudstone/ shales. MS darker in colour, unit tends to be more fissile	IF					
									392.34	393.07	0.73			393.66	394.39		0.73		SS	G	E	F	FM	F	PL			27		Same as above more massive SS	IF					
									393.07	395.00	1.93			394.39	396.32		1.93		ST	G	D	F	FF	S	PL					Siltstone / Shale - interbedded / lamination of fine grain siltstones and mudstone/ shales. Fold with axis at approx 394.35m very apparent; synclinal fold? Darker mudstone unit has pyrite nodules. Abundant fracturing and calcite veining thru interval	IF					
116-117	395	398	3	2.86	95%	-0.14	1.35	45%																						IF						
									395.00	396.13	1.13			396.32	397.55		1.23		ST	G	D	F	FF	F	PL	27				Same as above, well laminated, calcite veining parallel to bedding. Thin CG bed @ 396-396.05m	IF					
									396.00	396.50	0.50	0.35		397.55	397.90		0.35		CO	K	DM	F		F			35	45		Coal - hard, fractured dull	IF		SD1			
														397.90	398.05		0.15		CL																	
									396.50	396.60	0.10			398.05	398.15		0.10		CG	G	B	F	CC	S	PS					Conglomerate bed,	IF					
									396.60	398.00	1.40			398.15	399.55		1.40		SH	G	D	F	FF	S	RU					Shale - Carb shale, dark grey brown colour massive, minor coaly fragments and bands	IF					
117-118	398	401	3	2.77	92%	-0.23	2.23	74%																						IF						
									398.00	401.00	3.00			399.55	402.55		3.00		SH	G	D	F	FF	S	RU					Same as above	IF					
118	401	404	3	2.85	95%	-0.15	1.74	58%																						IF						
									401.00	404.00	3.00			402.55	405.55		3.00		SH	G	D	F	FF	S	RU					Same as above	IF					
119	404	407	3	3.06	102%	0.06	2.73	91%																						IF						
									404.00	407.00	3.00			405.55	408.55		3.00		ST	G	E	F	FF	S						Siltstone - gradational from above SH, massive unit, lighter colour	IF					
119-120	407	410	3	3.00	100%	0.00	2.93	98%																						IF						
									407.00	409.00	2.00			408.55	410.55		2.00		ST	G	E	F	FF	S						Same as above	IF					
									409.00	410.00	1.00			410.55	411.55		1.00		SS	G	E	F	FF	S	PL	50				Sandstone fine grain bedded	IF					
120-121	410	413	3	3.08	103%	0.08	3.03	101%																						IF						

									419.00	421.46	2.46			420.55	423.01		2.46		SS	G	B	F	FF	S	PL			45		Same as above	IF					
									421.46	422.00	0.54			423.01	423.55		0.54		SH	G	D	F	FF	S	PD					Shale - Carb Shale, shiny smooth fractured surfaces	IF					
123	422	425	3	2.94	98%	-0.06	2.47	82%																							IF					
									422.00	422.37	0.37			423.55	423.92		0.37		SH	G	D	F	FF	S	PD			45		Same as above	IF					
									422.37	425.00	2.63			423.92	426.55		2.63		SS	G	B	F	FF	S	PL	50				Sandstone - well bedded, minor mudstone-shale laminations and minor coaly rip ups / bands	IF					
123-124	425	428	3	2.94	98%	-0.06	2.80	93%																							IF					
									425.00	428.00	3.00			426.55	429.55		3.00		SS	G	B	F	FF	S	PL	50				Same as above	IF					
124-125	428	431	3	2.94	98%	-0.06	2.85	95%																							IF					
									428.00	431.00	3.00			429.55	432.55		3.00		SS	G	B	F	FF	S	PL	55				Same as above	IF					
125-126	431	434	3	2.82	94%	-0.18	2.61	87%																							IF					
									431.00	434.00	3.00			432.55	435.55		3.00		SS	G	E	F	FF	S	PL	55				Same as above, calcite veining along bedding planes and fractures/joints ppd to bedding	IF					
126	434	437	3	2.90	97%	-0.10	2.30	77%																							IF					
									434.00	437.00	3.00			435.55	438.55		3.00		SS	G	E	F	FF	S	PL	75				Same as above	IF					
126-127	437	440	3	2.95	98%	-0.05	2.95	98%																							IF					
									437.00	440.00	3.00			438.55	441.55		3.00		SS	G	E	F	FF	S	PL	60				Same as above	IF					
127-128	440	443	3	3.06	102%	0.06	2.68	89%																							IF					
									440.00	443.00	3.00			441.55	444.55		3.00		SS	G	E	F	FF	F	PL	70				Same as above, increased calcite filled fractures / stockwork, evidence of movement along bedding planes / faulting	IF					
128	443	446	3	2.90	97%	-0.10	2.55	85%																							IF					
									443.00	446.00	3.00			444.55	447.55		3.00		SS	G	E	F	FF	F	PL	75				Same as above, increased calcite filled fractures / stockwork, evidence of movement along bedding planes / faulting	IF					
128-129	446	449	3	2.90	97%	-0.10	2.50	83%																							IF					
									446.00	449.00	3.00			447.55	450.55		3.00		SS	G	E	F	FF	F	PL	73				Same as above, increased calcite filled fractures / stockwork, evidence of movement along bedding planes / faulting	IF					
129-130	449	452	3	3.00	100%	0.00	2.18	73%																							IF					
									449.00	452.00	3.00			450.55	453.55		3.00		SS	G	E	F	FF	F	PL	65				Same as above, strong evidence of faulting - calcite stockwork	IF					
130-131	452	455	3	2.95	98%	-0.05	2.34	78%																							IF					
									452.00	453.75	1.75			453.55	455.30		1.75		SS	G	E	F	FF	F	PL	70				Same as above, strong evidence of faulting - calcite stockwork, movement along bedding planes. Section of faulting calcite stockwork 440-453.75m	IF					
									453.75	455.00	1.25			455.30	456.55		1.25		ST	G	B	F	FF	S	WB					Siltstone - finer grain unit locally pale in colour, wavy bedding more indicative of a mudstone composition. Calcite stockwork / fracturing still present not as prevalent	IF					
131	455	458	3	2.95	98%	-0.05	2.68	89%																							IF					
									455.00	456.05	1.05			456.55	457.60		1.05		ST	G	B	F	FF	S	WB					Same as above - core angles very steep to core axis / parallel / sub parallel, evidence of folding	IF					
									456.05	458.00	1.95			457.60	459.55		1.95		SS	G	E	F	FF	S	PL	75				Sandstone - well bedded, steep to core axis, coal rip up fragments / bands present	IF					
131-132	458	461	3	2.90	97%	-0.10	2.48	83%																							IF					
									458.00	461.00	3.00			459.55	462.55		3.00		SS	G	E	F	FF	S	PL	65				Same as above	IF					
132-133	461	464	3	2.90	97%	-0.10	2.66	89%																							IF					
									461.00	464.00	3.00			462.55	465.55		3.00		SS	G	E	F	FF	S	PL	73				Same as above	IF					
133	464	467	3	2.92	97%	-0.08	2.17	72%																							IF					
									464.00	464.75	0.75			465.55	466.30		0.75		SS	G	E	F	FF	S	PL	45				Same as above - core angles flatten	IF					
									464.75	467.00	2.25			466.30	468.65		2.35		SS	G	E	F	FF	F	PL	60				Same unit as above - made interval to highlight increased calcite veining / stockwork, entry more strongly fractured - begin of another zone of faulting - minor fault breccia at 220-225m. Calcite veining / fracture filling ppd to bedding	IF					
133-134	467	470	3	2.90	97%	-0.10	2.48	83%																							IF					
									467.00	470.00	3.00			468.65	471.65		3.00		SS	G	E	F	FF	F	PL					Same as above - within zone of faulting / fracturing, core angles very variable to steep - 45dg to core axis	IF					
134-135	470	473	3	3.14	105%	0.14	2.32	77%																							IF					
									470.00	472.70	2.70			471.65	474.45		2.80		SS	G	E	F	FF	F	PL					Same aqs above - abundant structure fold hinge at 470.90m, fracture / fault plane steep to core axis with evidence of movement uphole? 471.5-472.5m	IF					
									472.70	473.00	0.30			474.45	474.75		0.30		SS	G	E	F	FF	S	PL	65				Sandstone - well bedded, fracturing less prevalent	IF					
135-136	473	476	3	2.97	99%	-0.03	2.60	87%																							IF					
									473.00	476.00	3.00			474.75	477.75		3.00		SS	G	E	F	FF	S	PL	30				Same as above - core angles flatten down hole	IF					
136	476	479	3	3.00	100%	0.00	2.84	95%																							IF					
									476.00	478.40	2.40			477.75	480.15		2.40		SS	G	E	F	FF	S	PL	20				Same as above, coaly fragments, calcite veining fracturing @ start to 476.70m	IF					
									478.40	479.00	0.60			480.15	480.75		0.60		ST	G	D	F	FF	S	PL	20				Siltstone - bedding still evident, well rounded clasts of ff SS within, gradational with Shale - Carb shale below	IF					
136-137	479	482	3	2.84	95%	-0.16	1.58	53%																							IF					
									479.00	479.15	0.15			480.75	480.90		0.15		ST	G	D	F	FF	S	PL					Same as above	IF					
									479.15	480.60	1.45			480.90	482.35		1.45		ZH	G	D	F	FF	S	RU	37				Coaly Shale - abundant coal rip ups, bands, bands aligned parallel to bedding	IF					044054
									480.60	482.00	1.40	1.33		482.35	483.68		1.33		CO	K	DM	F		F						Coal - hard minor bright cleated bands,	IF					044055, 044056, 044057

[illegible]

Peace River Coal Inc

DRILL CORE LOG

Hole No:	TUC2020-004	Area:	Trend UG	Logged By:	J. Galbraith
Date Begun:	01-Jul-20	Collar Bearing:	0	Date Logged:	04-Jul-20 13-Jul-20
Date Finished:	11-Jul-20	Collar Elev. (m):	1495.31	Northing:	6085067.4
Hole Size:	HQ	Hole Angle:	-90 (veritcal)	Eastng:	632783.2
Total Depth (m):	545	overall recovery	m cummulative loss/gain	Projection:	NAD 83 Zone 10

Box No.	Driller's Marker (m)			Recovered Length (m)	Recovery (%)	Loss (m)	Total Length of pieces >0.1m	RQD (%)	Lithological Unit					Coal Type Rock Type	Color	Shade	Weathering	Grain Size	Core State	Bedding Sedimentary Structure	Structure	BCN (°)		HCl (Acid test)	Additional Descriptions	Logged By (Initials)	Seam	Recovered Length (m)	Actual Length-Geophys (m)	Coal Recovery (%)	Sample Number
	From (m)	To (m)	Drilled Length (m)						From (m)	To (m)	Length (m)	Actual (measured) Length (m)	Lost (m)									Roof	Floor								
N/A	0	30	30	0.00	0%	-30.00	0.00	0%						OV										6" casing to 30m set by Fraste drill before moving diamond drill onto site.							
1	32.5	35	2.5	2.50	100%	0.00	0.78	31%																							
									32.89	33.14		0.25		OV	B	E	W	CL-GP	F						Till overburden, clayey with pebbles						
									33.14	33.30		0.16		CG	G	A	S	GP	S	MS					Sub-rounded clastsof mudstone and siltstone in sandstone matrix						
									33.30	34.40		1.10		SS	G	A	W	CC	F	PL		20			oxidized bands and fracture surfaces. 6cm conglomerate band at base of interval, one 5mm coaly lense above CG band						
									34.40	35.43		1.03		SS	G	L	S	FM	S	PL		20			oxidized on fracture surfaces, few muddy laminations						
1-3	35	38	3	3.05	102%	0.05	2.16	72%																							
									35.43	37.13		1.70		SS	G	L	S	FM	S	PL		10			same as above						
									37.13	38.48		1.35		SS	G	A	S	FF	S	PL		20			laminations throughout, scarce muddy band						
3-4	38	41	3	2.99	100%	-0.01	2.73	91%																							
									38.48	39.57		1.09		SS	G	A	S	FF	S	PL		15			same as above						
									39.57	40.94		1.37		SS	G	L	S	MM	S			20			massive, 1 cm band of mud rip up clasts near base						
									40.94	41.47		0.53		SS	G	A	S	MC	S	PL		20			coarsening downwards	JLG					
4-5	41	44	3	2.92	97%	-0.08	2.64	88%																			JLG				
									41.47	42.53		1.06		SS	G	A	S	MC	S	PL		15			same as above	JLG					
									42.53	44.39		1.86		SS	G	L	S	FM	S						massive, slight oxidation on fracture surfaces	JLG					
5-6	44	47	3	3.02	101%	0.02	2.89	96%																			JLG				
									44.39	45.77	</																				

									67.98	69.20		1.22		ST	G	A	F	FF	S							same as above	JLG					
									69.20	69.72	0.52			RL																		
									69.72	70.30		0.58		MS	G	B	F	FF	F		Fault Gouge					soft, clayey gouge bands up to 6cm thick within mudstone	JLG					
									70.30	70.96		0.66		ST	G	E	F	FF	B		Fracture	40				interbedded with MS	JLG					
11	71	74	3	3.02	101%	0.02	2.76	92%																			JLG					
									70.96	73.98		3.02		ST	G	E	F	FF	B		fracture	35, 60				same as above, grading into fine sandstone toward base	JLG					
11-12	74	77	3	3.09	103%	0.09	2.82	94%																			JLG					
									73.98	77.07		3.09		SS	G	E	F	FM	S	PL		30	10			few carbonaceous laminations, few mud rip up clasts, bedding changes from steeper in top half to shallower in lower half	JLG					
12-13	77	80	3	2.95	98%	-0.05	2.95	98%																			JLG					
									77.07	80.02		2.95		SS	G	A	F	FC	S	PL		15				same as above, grading into coarse at base	JLG					
13	80	83	3	2.96	99%	-0.04	2.92	97%																			JLG					
									80.02	81.59		1.57		SS	G	A	F	FC	S	PL						same as above, few granular conglomerate bands up to 10cm	JLG					
									81.59	82.98		1.39		MS	G	D	F	FF	S							hard, almost carbonaceous, some siltstone and sandstone	JLG					
14	83	86	3	3.02	101%	0.02	2.80	93%																			JLG					
									82.98	83.09		0.11		MS	G	D	F	FF	S							same as above	JLG					
									83.09	84.36		1.27		ST	G	B	F	FF	S							grading into siltstone from MS above, and into SS below	JLG					
									84.36	86.00		1.64		SS	G	E	F	FF	S	PL		25				few muddy and silty bands, rare mm-scale coaly lense	JLG					
14-15	86	89	3	3.03	101%	0.03	2.45	82%																			JLG					
									86.00	86.88		0.88		SS	G	E	F	FF	S	PL		26				same as above	JLG					
									86.88	88.26		1.38		ST	G	E	F	FF	S	PL	fracture	20				gradational/interbedded with SS, fracture parallel to core axis, 40m length, few muddy laminations	JLG					
									88.26	88.42		0.16		XM	G	D	F	FF	B							coaly lenses, polished on fracture surface	JLG					
									88.42	89.03		0.61		ST	G	E	F	FF	S	BT?						coalified plant fragments throughout, and sandy lenses	JLG					
15-16	89	92	3	3.04	101%	0.04	2.83	94%																			JLG					

									89.03	89.70		0.67		ST	G	E	F	FF	S	BT?					same as above	JLG					
									89.70	91.51		1.81		ST	G	E	F	FF	S				30		massive, scarce faint laminations, wavy lower contact with SS	JLG					
									91.51	92.03		0.52		SS	G	A	F	FF	S	PD			30		fractured on coaly lenses	JLG					
16	92	95	3	3.00	100%	0.00	2.83	94%																		JLG					
									92.03	94.21		2.18		SS	G	A	F	FF	S	PD			30		same as above, coal bands up to 1cm thick	JLG					
									94.21	95.03		0.82		MS/SS	G	B	F	FF	S	PD			20		interbedded contact zone between SS and MS units	JLG					
16-17	95	98	3	3.05	102%	0.05	3.02	101%																		JLG					
									95.03	98.08		3.05		MS/SS	G	B	F	FF	S	PD					same as above, fewer SS beds, some ST zones	JLG					
17-18	98	101	3	2.98	99%	-0.02	2.68	89%																		JLG					
									98.08	101.06		2.98		ST	G	B	F	FF	S	PD					gradatuonaly interbedded with SS ans MS	JLG					
18	101	104	3	2.98	99%	-0.02	2.90	97%																		JLG					
									101.06	102.28		1.22		ST	G	B	F	FF	S	PD					same as above	JLG					
									102.28	104.04		1.76		SS	G	E	F	FF	S	PD			30		interbedded with ST	JLG					
18-19	104	107	3	2.93	98%	-0.07	2.83	94%																		JLG					
									104.04	104.69		0.65		SS	G	E	F	FF	S	PD			20		same as above	JLG					
									104.69	106.97		2.28		ST-MS	G	B	F	FF	S	PD					interbedded. Mm-scale calcite veinlets, possible burrows.	JLG					
19-20	107	110	3	3.12	104%	0.12	2.88	96%																		JLG					
									106.97	110.09		3.12		ST-MS	G	B	F	FF	S	PD					same as above, 30cm sandy zone with coalified fragments	JLG					
20	110	113	3	3.05	102%	0.05	2.61	87%																		JLG					
									110.09	110.58		0.49		ST-MS	G	B	F	FF	S	PD					same as above	JLG					
									110.58	112.65		2.07		SS	G	E	F	FF	S	WL			25		MS and ST laminations thoroughout	JLG					
									112.65	113.14		0.49		MS	G	D	F	FF	S						somewhat silty (transitional)	JLG					
21	113	116	3	2.67	89%	-0.33	2.09	70%																		JLG					
									113.14	113.39		0.25		MS	G	D	F	FF	S						same as above	JLG					
									113.39	113.44		0.05		MS	G	D	F	FF	V						soft, clayey gouge zone	JLG					
									113.44	113.66		0.22		MS	G	D	F	FF	S						same as MS above	JLG					
									113.66	114.70		1.04		XM	G	D	F	FF	F						mm-scale coaly lenses, dessication cracks visible when wet	JLG					
									114.70	115.20		0.50		MS	G	D	F	FF	S						polished to slickensided on fracture surfaces	JLG					
									115.20	115.81		0.61		ST	G	E	F	FF	S						gradational with some MS	JLG					
21-22	116	119	3	2.97	99%	-0.03	1.94	65%																		JLG					
									115.81	118.78		2.97		ST	G	A	F	FF	S	PL			20		interbedded with fine SS and rare MS, wavy bedding more developed in SS bed	JLG					
22	119	122	3	2.98	99%	-0.02	2.83	94%																		JLG					
									118.78	121.76		2.98		ST	G	A	F	FF	S	PL			20		same as above, p to medium grained SS, 1 cm quartz band mid-interval. Poorly developed XB, few MS rip-up clasts	JLG					
23	122	125	3	2.92	97%	-0.08	2.02	67%																		JLG					
									121.76	122.34		0.58		ST	G	A	F	FF	S	WL			20		same as above	JLG					
									122.34	123.32		0.98		XM	G	D	F	FF	F						mm-scale coaly lenses, dessication cracks visible when wet	JLG					
									123.32	124.68		1.36		ST	G	E	F	FF	S				Fracture-40		dessication cracks, polished fracture mid-interval	JLG					
23-24	125	128	3	3.11	104%	0.11	2.78	93%																		JLG					
									124.68	127.79		3.11		ST-MS	G	B	F	FF	S	PD					same as above, laminated	JLG					
24-25	128	131	3	3.00	100%	0.00	2.78	93%																		JLG					
									127.79	129.14		1.35		MS-ST	G	B	F	FF	S	PD					same as above, higher MS content	JLG					
									129.14	130.44		1.30		SS	G	L	F	CC	S	XB					some granule CG layers, rare mm-scale coaly lense	JLG					
									130.44	130.79		0.35		CG	G	A	F	GG	S						sub-rounded, moderately sorted, rare mm-scale coaly lense	JLG					
25	131	134	3	2.88	96%	-0.12	2.68	89%																		JLG					
									130.79	131.05		0.26		CG	G	A	F	GG	S						same as above	JLG					
									131.05	132.13		1.08		CG-SS	G	A	F	GP-MM	S	WL					interbedded CG ans SS, 1-5mm scale coaly lenses, poorly sorted CG,	JLG					
									132.13	132.40		0.27		CG	G	A	F	GP	S	FU					moderately sorted, possible XB	JLG					
									132.40	133.67		1.27		MS	G	D	F	FF	F						some carbonaceous bands, rare mm-scale coaly lenses, highly polished fracture surfaces	JLG					

25-26	134	137	3	2.99	100%	-0.01	2.62	87%																	JLG						
									133.67	136.66		2.99		MS	G	D	F	FF	F	PL			20		same as above, decreasing carbonaceous content with depth, increasing ST content	JLG					
26-27	137	140	3	3.05	102%	0.05	2.81	94%																	JLG						
									136.66	137.54		0.88		ST	G	E	F	FF	S	PL		22			gradational zone between units above and below. Interlaminated with SS, highly polished bedding parallel fractures	JLG					
									137.54	139.13		1.59		SS	G	L	F	MC	S	XB		30	20		rare mm-scale coaly lense, lower 20 cm of interval, grading into pebble CG	JLG					
									139.13	139.71		0.58		CG	G	A	F	PP	S	MS					sub-rounded, with granule and fine sand matrix	JLG					
27	140	143	3	2.92	97%	-0.08	2.66	89%																	JLG						
									139.71	142.63		2.92		CG-SS	G	A	F	PP-FF	S	WL		30			interbeddd CG ans SS, with rare MS band, rare mm-sclae coaly lense, 15-30cm interbeds	JLG					
27-28	143	146	3	2.97	99%	-0.03	2.74	91%																	JLG						
									142.63	144.25		1.62		SS	G	L	F	FM	S	PL-WL		25			few CG bands up to 5cm thick, pebble size, rare mm-cm scale carbonaceous band	JLG					
									144.25	144.49		0.24		MS	G	E	F	FF	S		fracture-85	20	10		rip-up at upper contact, CG band at lower contact	JLG					
									144.49	144.92		0.43		SS	G	A	F	FM	S	PL		15			same as SS above, grain size decreasing, 15cm CG band at base	JLG					
									144.92	145.12		0.20		MS	G	E	F	FF	S						same as MS band above	JLG					
									145.12	145.60		0.48		SS	G	L	F	FF	S						clean SS, rare MS rip-up clast	JLG					
28-29	146	149	3	3.04	101%	0.04	2.67	89%																	JLG						
									145.60	148.64		3.04		SS	G	L	F	FF	S						same as above, rare 10cm MS band, and 2cm CG band	JLG					
29	149	152	3	3.08	103%	0.08	3.08	103%																	JLG						
									148.64	151.72		3.08		SS	G	L	F	FF	S						same as above, massive, clean	JLG					
29-30	152	155	3	2.81	94%	-0.19	2.51	84%																	JLG						
									151.72	154.08		2.36		SS	G	L	F	FF	S						same as above, massive, clean	JLG					
									154.08	154.53		0.45		MS-SS	G	C	F	FF	F	PL	15	15			interbedded transitional contact zone - Boulder creek to Hulcross contact. 1cm-15 cm interbeds. 0.5cm soft muddy band w/in MS. Polished, slickensided fracture surfaces, beddign parallel fractures	JLG					
30-31	155	158	3	3.04	101%	0.04	2.74	91%																	JLG						
									154.53	155.82		1.29		MS-SS	G	C	F	FF	F	PL		15			same as above	JLG					

38-39	191	194	3	3.02	101%	0.02	2.82	94%																JLG						
									190.58	193.60		3.02		MS	G	B	F	FF	S	PL		16			same as above. 15 cm broekn-fractured zone mid-interval	JLG				
39-40	194	197	3	3.08	103%	0.08	3.00	100%																JLG						
									193.60	196.68		3.08		MS	G	B	F	FF	S	PL		10			same as above	JLG				
40	197	200	3	2.99	100%	-0.01	2.80	93%																JLG						
									196.68	199.67		2.99		MS	G	B	F	FF	S	PL		15			same as above. 10 cm calcified band in lower 1m of interval	JLG				
40-41	200	203	3	2.97	99%	-0.03	2.67	89%																JLG						
									199.67	202.64		2.97		MS	G	B	F	FF	S	PL		12			same as above, minor calcified band <5cm, mid-interval	JLG				
41-42	203	206	3	2.99	100%	-0.01	2.67	89%																JLG						
									202.64	205.63		2.99		MS	G	B	F	FF	S	PL		12			same as above, minor calcified band <5cm, mid-interval	JLG				
42-43	206	209	3	3.04	101%	0.04	2.73	91%																JLG						
									205.63	208.67		3.04		MS	G	B	F	FF	S	PL		15			same as above	JLG				
43	209	212	3	3.05	102%	0.05	2.80	93%																JLG						
									208.67	211.72		3.05		MS	G	B	F	FF	S	PL		10			same as above	JLG				
43-44	212	215	3	2.99	100%	-0.01	2.49	83%																JLG						
									211.72	214.71		2.99		MS	G	B	F	FF	S	PL		12			same as above	JLG				
44-45	215	218	3	2.94	98%	-0.06	2.88	96%																JLG						
									214.71	217.65		2.94		MS	G	B	F	FF	S	PL		15			same as above	JLG				
45	218	221	3	3.05	102%	0.05	2.97	99%																JLG						
									217.65	220.70		3.05		MS	G	B	F	FF	S	PL		16			same as above	JLG				
45-46	221	224	3	3.03	101%	0.03	2.93	98%																JLG						
									220.70	223.73		3.03		MS	G	B	F	FF	S	PL		15			same as above, 4cm calcified band mid-interval	JLG				
46-47	224	227	3	3.09	103%	0.09	2.74	91%																JLG						
									223.73	226.82		3.09		MS	G	B	F	FF	S	PL	Fracture-75	12			same as above, one steep fracture- clean surface	JLG				
47	227	230	3	2.90	97%	-0.10	1.34																							

53	254	255.33	1.33	1.28	96%	-0.05	0.00	0%																JLG						
									253.70	253.86		0.16		MS	G	D	F	FF	F	CT	Fractures-70				same as above - FAULT ZONE	JLG				
									253.86	255.03		1.17		MS	G	D	F	FF	V	WL	Fractures-70	60-70			same unit as above, Highly fractured, with shearing, slickensides and clacite veinlets throughout. (less sheared than interval above) - FAULT ZONE	JLG				
53	255.33	257	1.67	1.18	71%	-0.49	0.00	0%																JLG						
									255.03	255.52	0.49			RL																
									255.52	256.94		1.42		MS	G	D	F	FF	V	PL	Fractures-70	70			same unit as above, polished fracture surfaces with slickensides-FAULT ZONE	JLG				
									256.94	257.19		0.25		MS	G	D	F	FF	C	CT					same unit as above, completely sheared, all rubble- FAULT ZONE	JLG				
54	257	260	3	2.90	97%	-0.10	1.90	63%																JLG						
									257.19	258.21		1.02		MS	G	D	F	FF	V	CT	Fractures-30				same unit as above (Hulcross Fm), highly sheared, calcite veinlets thoroughout- FAULT ZONE	JLG				
									258.21	260.09		1.88		MS	G	D	F	FF	F	WL-PL	Fractures-30	30			same unit as above (laminated MS with minor ST and SS), minor calcite veinlets, polished fracture surfaces- periphery of fault zone, minor burrows and soft sediment deformation	JLG				
54-55	260	263	3	2.91	97%	-0.09	2.50	83%																JLG						
									260.09	263.00		2.91		MS	G	D	F	FF	F	PL	Fractures-20	25			Hulcross- same as above	JLG				
55	263	266	3	2.92	97%	-0.08	1.20	40%																JLG						
									263.00	264.40	1.40														Adjusted rock loss in fault zone					
									264.40	264.90		0.50		MS	G	D	F	FF	F	WL		10			same as above	JLG				
									264.90	265.42		0.52		MS	G	D	F	FF	B	CT					same as above, highly fractured, sheared, calcite veinlets throughout	JLG				
									265.42	267.32		1.90		MS	G	D	F	FF	F	WL	Fracture-90	85			same as above, bedding parallel to core axis, 1.2m long fracture along calcite veinlet, parallel to core axis, polished surface with calcite	JLG				
56	266	269	3	2.90	97%	-0.10	2.17	72%																JLG						
									267.32	270.22		2.90		MS	G	D	F	FF	F	WL	Fractures-45	85	45		top 0.75m of interval- bedding parallel to axis, minor calcite veinlets, lower segment 45 degree bedding, fracture surfaces slickensided	JLG				
56-57	269	272	3	3.00	100%	0.00	2.68	89%																JLG						
									270.22	273.22		3.00		MS	G	D	F	FF	S	PL		30			same as above, 3cm brecciated calcite bands in top 10cm of interval.	JLG				
57-58	272	275	3	2.90	97%	-0.10	2.14	71%																JLG						
									273.22	276.12		2.90		MS	G	D	F	FF	F	PL		15			same as above	JLG				
58	275	278	3	3.03	101%	0.03	2.38	7																						

									300.48	300.59		0.11		CO	K	DD	F		F							hard, Sheared on fracture surface, some coaly rubble	JLG					
									300.59	300.66		0.07		XM	G	D	F	FF	S							minor mm-scale coaly lense	JLG					
									300.66	301.54		0.88		ST	G	E	F	FF	S	WL		30				rare mm-scale coaly lense, minor MS rip-up clasts at base	JLG					
64	302	305	3	2.96	99%	-0.04	2.87	96%																			JLG					
									301.54	304.50		2.96		SS	G	A	F	FF	S	PL		10				interbedded with minor MS bands 5-10cm thick, sporadic MS rip up clasts and rare calcite veinlet 1-mm scale	JLG					
64-65	305	308	3	3.14	105%	0.14	3.08	103%																			JLG					
									304.50	307.64		3.14		SS	G	A	F	FM	S	PL		15				same as above	JLG					
65-66	308	311	3	2.85	95%	-0.15	2.85	95%																			JLG					
									307.64	310.49		2.85		SS	G	A	F	FM	S	PL		20				same as above	JLG					
66-67	311	314	3	3.09	103%	0.09	3.06	102%																			JLG					
									310.49	312.70		2.21		SS	G	A	F	FM	S	PL		8				same as above, rare cm-scale coal lense	JLG					
									312.70	313.13		0.43		MS	G	D	F	FF	S							with SS rip-up clast (10cm)	JLG					
									313.13	313.16		0.03		CO	K	DB	F		F							hard, cleated	JLG					
									313.16	313.58		0.42		ST	G	B	F	FF	S	PL		30					JLG					
67	314	317	3	3.02	101%	0.02	2.39	80%																			JLG					
									313.58	316.07		2.49		SS	G	A	F	FM	S	PL						interbedded with MS, minor mm-scale coaly lenses throughout	JLG					
									316.07	316.60		0.53		MS-XM	G	D	F	FF	F							carboaceous bands, sheared on fractuer surfaces with slickensides, rare mm-sclae calcite veinlet	JLG					
67-68	317	320	3	2.92	97%	-0.08	2.41	80%																			JLG					
									316.60	317.11		0.51		MS	G	D	F	FF	F							same as above	JLG					
									317.11	317.92		0.81		SS	G	E	A	MC	S							coaly lenses throughout, up to 5mm, rare calcite veinlet, middle 20cm of interval is very coarse grained	JLG					
									317.92	319.30		1.38		ST	G	B	F	FF	S	WL		30				laminated with MS	JLG					044156
									319.30	319.52	0.22	0.22		CO	K	DD	F		V							Hard, friable, sheared, soft crushed material at base of interval	JLG			0.22		
68-69	320	323	3	2.70	90%	-0.30	0.85	28%																			JLG					
									319.52	319.64	0.12		0.12	CL												coal lost						
									319.64	319.72	0.08	0.08		CO	K	DD	F		V							same as above	JLG			0.08		
									319.72	320.16	0.44	0.44		XM	G	D	F	FF	F							Sheared on fracture surfaces	JLG			0.44		044158
									320.16	320.82	0.66	0.66		CO	K	DM	F		B							Hard, banded, fractured, sheared on fracture surfaces	JLG			0.66		
									320.82	320.92	0.10		0.10	CL												coal lost						
									320.92	321.10	0.18	0.15		XM	G	D	F	FF	S								JLG			0.18		
									321.10	321.25	0.15	0.15		CO-XM	K	D	F	FF	V							Sheared and friable, soft, dull, with carb mud bands	JLG			0.15		
									321.25	321.75	0.50		0.50	CL												coal lost						
									321.75	322.00	0.25	0.40		CO	K	DM	F									Hard, banded, sheared on fracture surfaces, 3cm sheared/crushed zone mid-interval	JLG			0.25		
									322.00	322.09		0.09		XM	G	D	F	FF	S							parting	JLG					044161
									322.09	322.26		0.17		CO-ZH	K	DD	F		F			20				hard, shaly,	JLG					
									322.26	322.39		0.13		ZH	K	DD	F		F							hard, looks rocky, but low density	JLG					
									322.39	322.82		0.43		MS	G	D	F	FF	S							bottom 4cm is completely crushed and sheareed	JLG					
69	323	326	3	2.84	95%	-0.16	2.76	92%																			JLG					
									322.82	324.07		1.25		MS	G	D	F	FF	S							same as above, fractured with some shearing in lower 50cm of interval	JLG					
									324.07	324.23	0.16		0.16	RL																		
									324.23	325.82		1.59		SS	G	A	F	FF	S	PL		20				laminated with MS and ST	JLG					
69-70	326	329	3	2.94	98%	-0.06	2.56	85%																			JLG					
									325.82	327.26		1.44		SS	G	A	F	FF	S	PL		20				same as above	JLG					
									327.26	327.90		0.64		ST	G	D	F	FF	S	PD						grading into MS	JLG					
									327.90	328.00		0.10		XM	G	D	F	FF	F							with coaly bands	JLG					
									328.00	328.28		0.28		ST-MS	G	D	F	FF	S	PL		20					JLG					
									328.28	328.43		0.15		XM	G	D	F	FF	F							with coaly bands (cm-scale)	JLG					
									328.43	328.63		0.20		ST	G	D	F	FF	S	PD							JLG					
70-71	329	332	3	3.09	103%	0.09	3.09	103%																			JLG					

									328.63	328.92		0.29		ST	G	D	F	FF	S	PD						same as above	JLG					
									328.92	330.27		1.35		SS	G	A	F	FM	S	WL		20				with MS interbeds and rip-up clasts, rare mm-scale calcite veinlet	JLG					
									330.27	331.72		1.45		MS	G	D	F	FF	S							5 cm SS band 0.5m from base of interval	JLG					
71	332	335	3	2.60	87%	-0.40	2.46	82%																			JLG					
									331.72	334.02		2.30		MS	G	D	F	FF	S							same as above, massive	JLG					
									334.02	334.08		0.06		CO	K	DD	F		C							3cm hard, 3cm crushed, soft, sheared	JLG					
									334.08	334.48	0.40		0.40	CL																		
									334.48	334.62		0.14		MS	G	D	F	FF	S							5mm coal band in middle of interval	JLG					
									334.62	334.72		0.10		XM/ZH	G	D	F	FF	B							with dull coal bands	JLG					
71-72	335	338	3	2.86	95%	-0.14	2.63	88%																			JLG					
									334.72	334.91		0.19		XM/ZH	G	D	F	FF	B							same as above	JLG					
									334.91	335.39		0.48		MS	G	D	F	FF	S	WL						rare SS lamination	JLG					
									335.39	335.43		0.04		CO	K	DM	F		F			10				hard	JLG					
									335.43	335.57	0.14		0.14	CL																		
									335.57	337.72		2.15		SS	G	A	F	FM	S	PD		15				slightly laminated in upper 1m, grading to massive	JLG					
72-73	338	341	3	2.90	97%	-0.10	2.75	92%																			JLG					
									337.72	340.62		2.90		SS	G	A	F	FM	S	PD		10				same as above, rare MS band, rare calcite veinlet (1mm)	JLG					
73	341	344	3	3.00	100%	0.00	2.68	89%																			JLG					
									340.62	343.62		3.00		SS	G	A	F	FF	S	PD	Fracture-35					same as above, 10 cm laminated MS band, polished fracture surfaces (20cm fractured zone mid-interval	JLG					
73-74	344	347	3	2.87	96%	-0.13	2.72	91%																			JLG					
									343.62	346.49		2.87		SS	G	A	F	FF	S	PD						same as above, massive SS	JLG					
74-75	347	350	3	3.03	101%	0.03	3.00	100%																			JLG					
									346.49	349.52		3.03		SS	G	L	F	FF	S	PD		18				massive SS, sporadic 1cm CG bands throughout	JLG					
75	350	353	3	3.02	101%	0.02	3.02	101%																			JLG					
									349.52	352.54		3.02		SS	G	L	F	FF	S	PD						same as above	JLG					
76	353	356	3	2.98	99%	-0.02	2.98	99%																			JLG					
									352.54	352.99		0.45		SS	G	L	F	FF	S	PD						same as above	JLG					
									352.99	355.52		2.53		CG	G	A	F	GG	S	MS						massive, SS matrix	JLG					
76-77	356	359	3	2.98	99%	-0.02	2.70	90%																			JLG					
									355.52	358.50		2.98		CG	G	A	F	GP	S	MS	fracture - 50					same as above, 20 cm minor fracture zone	JLG					
77-78	359	362	3	3.01	100%	0.01	2.43	81%																			JLG					
									358.50	361.51		3.01		CG	G	A	F	GP	S	MS						same as above, increasing pebble size with depth	JLG					
78	362	365	3	2.95	98%	-0.05	2.93	98%																			JLG					
									361.51	364.46		2.95		CG	G	A	F	GP	S	PS						same as above, few bands of very coarse pebbles, 5 cm SS interbedd near base	JLG					
78-79	365	368	3	3.00	100%	0.00	2.90	97%																			JLG					
									364.46	366.82		2.36		CG	G	A	F	GP	S	CU						same as above	JLG					
									366.82	367.46		0.64		SS	G	A	F	FC	S							few GG CG interbeds	JLG					
79-80	368	371	3	2.82	94%	-0.18	2.37	79%																			JLG					
									367.46	370.28		2.82		SS	G	A	F	FC	S	CU, PD		28				same as above, 10 c fractured/rubble zone mid-interval	JLG					
80	371	374	3	3.04	101%	0.04	3.04	101%																			JLG					
									370.28	373.32		3.04		SS	G	L	F	FM	S	PD						top 50cm is med-coarse, rest of interval is massive fine grained	JLG					
80-81	374	377	3	2.98	99%	-0.02	2.98	99%																			JLG					
									373.32	376.30		2.98		SS	G	L	F	FM	S	PD						same as above, massive	JLG					
81-82	377	380	3	3.06	102%	0.06	3.06	102%																			JLG					
									376.30	379.36		3.06		SS	G	L	F	FM	S	PD						same as above, massive	JLG					
82	380	383	3	2.96	99%	-0.04	2.81	94%																			JLG					
									379.36	381.96		2.60		SS	G	L	F	FM	S	PD						same as above	JLG					
									381.96	382.02		0.06		MD	G	D	F	FF	F							soft muddy gouge	JLG					

									382.02	382.32		0.30		MS	G	B	F	FF	F	PL		10			laminated MS with SS	JLG						
83	383	386	3	2.85	95%	-0.15	2.43	81%																		JLG						
									382.32	382.42		0.10		MS	G	B	F	FF	F	PL						same as above	JLG					
									382.42	382.56		0.14		CG	G	E	F	PP	F	MS						rounded to sub-rounded clasts	JLG					
									382.56	382.66	0.10		0.10	RL																		
									382.66	382.73		0.07		MS	G	D	F	FF	C							fractured and broken with 2cm soft muddy gouge band at base	JLG					
									382.73	382.95		0.22		SS	G	L	F	FF	S	PD		20					JLG					
									382.95	383.14		0.19		MS	G	D	F	FF	F	PL						laminated with minor SS	JLG					
									383.14	383.49		0.35		CG	G	A	F	PP	S	PS						rounded clasts	JLG					
									383.49	385.27		1.78		SS	G	L	F	FM	S	PL		15				interbedded with sporadic 5-10cm GG CG bands	JLG					
83-84	386	389	3	3.05	102%	0.05	3.03	101%																		JLG						
									385.27	388.32		3.05		SS	G	L	F	FM	S	PL		15				same as above, CG bands up to 30cm thick	JLG					
84-85	389	392	3	3.06	102%	0.06	3.06	102%																		JLG						
									388.32	388.55		0.23		SS	G	L	F	FM	S	PL						same as above	JLG					
									388.55	391.11		2.56		CG	G	A	F	GP	S	BS		20				few SS interbeds, massive	JLG					
									391.11	391.38		0.27		SS-CG	G	L	F	FF-GP	S	BS						interbedded SS and CG, bed thickness 0.2-0.5m	JLG					
85	392	395	3	2.93	98%	-0.07	2.93	98%																		JLG						
									391.38	394.31		2.93		SS-CG	G	L	F	FF-GP	S	BS		20				same as above	JLG					
85-86	395	398	3	2.88	96%	-0.12	2.20	73%																		JLG						
									394.31	395.39		1.08		SS-CG	G	L	F	FF-GP	S	BS		15				same as above	JLG					
									395.39	395.51	0.12		0.12	RL																		
									395.51	396.29		0.78		SS	G	A	F	FM	S	WL		15				rare conglomerate granule, minor mm-scale coaly lenses throughout,	JLG					
									396.29	396.80		0.51		MS	G	D	F	FF	S	WL		15				few 0.5cm SS laminations,decreasing with depth	JLG					044162
									396.80	397.31	0.51	0.51		CO	K	DM	F		F			15				hard, sporadic bright bands 0.5cm thick,3 x 2cm XM bands mid-interval, minor calcite on sheared fracture surfaces, lower 10cm of interval more broken.	JLG					044163
86-87	398	401	3	2.75	92%	-0.25	1.37	46%																		JLG						
									397.31	398.82	1.51	1.51		CO	K	DM	F		B							hard coal, mostly fragmented core with minor broken zones, minor shearing	JLG					044164, 044165, 044166
									398.82	399.22	0.40		0.40	CL												Coal Loss						
									399.22	399.73		0.51		MS-XM	G	D	F	FF	F							carbonaceous zones, 3cm coal band in top 10 cm, rare mm-scale coal laminations, 1cm soft muddy zone in lower 5cm	JLG					044167
									399.73	399.94		0.21		CO	K	DM	F		F				10			hard, banded, minor shearing	JLG					
									399.94	400.03		0.09		XM	G	D	F	FF	S								JLG					
									400.03	400.46		0.43		MS	G	D	F	FF	S							minor carbonaceous zones	JLG					
87	401	404	3	2.78	93%	-0.22	2.46	82%																		JLG						
									400.46	400.65		0.19		CO	K	DD	F		S							very hard, sheared on upper contact/fracture surface	JLG					
									400.65	400.76		0.11		XM	G	D	F	FF	S			5	5			minor laminations	JLG					
									400.76	401.21		0.45		XM-CO	G-K	D-DD	F	FF	F							carbonaceous mudstone with coal bands up to 3cm thick. Hard, blocky coal, sheared on fracture surfaces	JLG					
									401.21	401.36		0.15		MS	G	D	F	FF	S							sheared on fracture surfaces	JLG					
									401.36	403.24		1.88		ST	G	B	F	FF	S	WL		25				minor SS interbeds, and MS laminations	JLG					
87-88	404	407	3	3.07	102%	0.07	3.07	102%																		JLG						
									403.24	404.95		1.71		ST	G	B	F	FF	S	WL		20				same as above	JLG					
									404.95	406.31		1.36		SS	G	A	F	FM	S	PL	Fractures-35, 25	25				laminated with minor MS, rare mm-scale coaly lense, slickensides on fractures surfaces, rare calcite veinlet	JLG					
88-89	407	410	3	2.99	100%	-0.01	2.99	100%																		JLG						
									406.31	409.30		2.99		SS	G	A	F	FM	S	PL						same as above, grading into ST below	JLG					
89	410	413	3	2.96	99%	-0.04	2.96	99%																		JLG						
									409.30	411.21		1.91		ST	G	E	F	FF	S			20				minor SS laminations, sporadic mm-scale calcite veinlets, rare mm-scale coaly lense	JLG					
									411.21	412.26		1.05		MS	G	D	F	FF	S	PD		15				minor ST lamination	JLG					
89-90	413	416	3	3.05	102%	0.05	3.05	102%																		JLG						
									412.26	412.46		0.20		MS	G	D	F	FF	S	PD						same as above	JLG					

									412.46	415.31		2.85		ST	G	E	F	FF	S	PL		15			minor MS lamination, sporadic burrows, rare coaly lense	JLG						
90-91	416	419	3	2.83	94%	-0.17	1.12	37%																		JLG						
									415.31	415.57		0.26		ST	G	E	F	FF	S	PL						JLG						
									415.57	416.11		0.54		MS	G	D	F	FF	F							JLG						
									416.11	416.16		0.05		XM	G	D	F	FF	F							JLG					044168	
									416.16	416.38	0.22		0.22	CL													E Seam					044169, 044170, 044171
									416.38	417.59	1.21	1.21		CO	K	DM	F		B		fractures-50					JLG						
									417.59	417.79	0.20	0.20		CO	K	DD	F		S							JLG						
									417.79	418.36	0.57	0.57		CO	K	DM	F		S							JLG						044172
91-92	419	422	3	2.94	98%	-0.06	2.44	81%																		JLG						044172
									418.36	419.43	1.07	1.07		CO	K	DB	F		F		fractures 25					JLG					044173, 044174	
									419.43	419.62	0.19		0.19	CL																		
									419.62	419.69		0.07		MS	G	D	F	FF	S							JLG					044175	
									419.69	421.49		1.80		SS	G	E	F	FF	S	PL-WL		15-20				JLG						
92	422	425	3	2.80	93%	-0.20	1.85	62%																		JLG						
									421.49	421.98		0.49		SS	G	E	F	FF	S	PL-WL		25				JLG						
									421.98	422.31		0.33		MS	G	D	F	FF	S							JLG						
									422.31	422.95		0.64		XM	G	D	F	FF	F							JLG						
									422.95	423.27		0.32		ZH	G	D	F	FF	S	PL		15				JLG						
									423.27	423.49		0.22		MS	G	D	F	FF	S	PL		15				JLG						
									423.49	423.67		0.18		CO	K	DM	F		B							JLG						
									423.67	423.87	0.20		0.20	CL																		
									423.87	424.02		0.15		ZH	G	D	F	FF	F							JLG						
									424.02	424.17		0.15		XM	G	D	F	FF	F							JLG						
									424.17	424.30		0.13		MS	G	D	F	FF	S							JLG						
									424.30	424.49		0.19		ST	G	E	F	FF	S	WL		15				JLG						
92-93	425	428	3	2.94	98%	-0.06	2.65	88%																		JLG						
									424.49	426.05		1.56		ST	G	E	F	FF	S	WL	fracture-30	20				JLG						
									426.05	427.43		1.38		MS	G	D	F	FF	F	PL		15				JLG						
93-94	428	431	3	3.02	101%	0.02	2.14	71%																		JLG						
									427.43	429.21		1.78		MS	G	D	F	FF	F							JLG						
									429.21	429.40		0.19		ZH	G	D	F	FF	S							JLG					044176	
									429.40	430.49	1.09	1.09		CO	K	DB	F		F							JLG	F Seam					044177
94	431	434	3	2.75	92%	-0.25	1.40	47%													fractures - 30					JLG						044178, 044179
									430.49	432.39	1.90	1.90		CO	K	DB	F		F							JLG						
									432.39	432.50	0.11		0.11	CL																		
									432.50	433.35		0.85		MS	G	DB	F	FF	F	PD		15				JLG					044180	
94-95	434	437	3	2.99	100%	-0.01	2.65	88%																		JLG						
									433.35	433.56		0.21		MS	G	DB	F	FF	F	PD						JLG						
									433.56	434.41		0.85		ST	G	E	F	FF	S	WL		15				JLG						
									434.41	435.38		0.97		MS	G	D	F	FF	S							JLG						
									435.38	435.90		0.52		ZH	G	D	F	FF	B							JLG						
									435.90	436.34		0.44		MS	G	D	F	FF	S							JLG						
95-96	437	440	3	3.00	100%	0.00	2.88	96%																		JLG						
									436.34	436.59		0.25		MS	G	D	F	FF	S							JLG						
									436.59	437.82		1.23		ST	G	A	F	FF	S	PD						JLG						
									437.82	439.34		1.52		SS	G	A	F	FF	S	PD		10				JLG						
96-97	440	443	3	2.97	99%	-0.03	2.97	99%																		JLG						

									439.34	440.99		1.65		SS	G	A	F	FF	S	PD	Fracture-40	20				same as above, fracture with slickensides and calcite	JLG					
									440.99	442.31		1.32		ST	G	E	F	FF	S	PD		25				rare MS os SS laminae	JLG					
97	443	446	3	3.08	103%	0.08	3.08	103%																			JLG					
									442.31	445.39		3.08		SS	G	A	F	FF	S	PL		20				minor ST interbedds, rare mm-scale calcite vein and MS rip-up clasts	JLG					
97-98	446	449	3	2.95	98%	-0.05	2.95	98%																			JLG					
									445.39	446.95		1.56		SS	G	A	F	FF	S	PL, XB		20				same as above	JLG					
									446.95	448.34		1.39		SS	G	A	F	MC	S	PL, XB		40				sporadic coaly lenses	JLG					
98-99	449	452	3	2.92	97%	-0.08	2.72	91%																			JLG					
									448.34	451.26		2.92		SS	G	A	F	MC	S	PL, XB		30				same as above	JLG					
99	452	455	3	3.00	100%	0.00	2.90	97%																			JLG					
									451.26	454.26		3.00		SS	G	A	F	MC	S	PL, XB		30				same as above	JLG					
99-100	455	458	3	2.95	98%	-0.05	2.72	91%																			JLG					
									454.26	455.24		0.98		MS	G	D	F	FF	F	WL		30				minor ST band and rare SS band near lower contact, rare carbaceous band, rare coaly lenses, shearing on fracture surfacces, rare mm-scale calcite veinlet	JLG					
									455.24	456.71		1.47		SS	G	A	F	FF	S	WL		20				rare coarse SS band, MS lamination and coaly lense	JLG					
									456.71	457.14		0.43		MS	G	D	F	FF	F							rare ooaly lense	JLG					
									457.14	457.19		0.05		XM	G	D	F	FF	F							coaly, calcite veining throughout	JLG					
									457.19	457.21		0.02		CO	K	DD	F		F							fissile, sheared, moderately hard	JLG					
100-101	458	461	3	2.99	100%	-0.01	2.99	100%																			JLG					
									457.21	457.30		0.09		CO	K	DD	F		F							same as above	JLG					
									457.30	460.20		2.90		ST	G	E	F	FF	S	WL		20				carbonaceour at contact, rare MS lamination and calcite veinlet	JLG					
101-102	461	464	3	2.90	97%	-0.10	2.34	78%																			JLG					
									460.20	461.37		1.17		SS	G	A	F	FF	S	PL		5				rare MS band, gradational lower contact- grades into ST at base	JLG					
									461.37	463.10		1.73		MS	G	D	F	FF	F							XM zone (~20cm) mid-interval, 2 x 5cm broken core zone with SS fragments	JLG					
102	464	467	3	2.72	91%	-0.28	1.81	60%																			JLG					
									463.10	464.26		1.16		MS	G	D	F	FF	F							same as above	JLG					
									464.26	464.96		0.70		XM	G	D	F	FF	F	Fracture-30							JLG					
									464.96	464.98		0.02		Gouge	G	B	F	FF	F	25						soft muddy gouge band	JLG					
									464.98	465.26	0.28		0.28	RL																		
									465.26	465.36		0.10		XM	G	D	F	FF	F							same as XM above	JLG					
									465.36	465.43		0.07		Gouge	G	B	F	FF	F							soft muddy gouge band	JLG					
									465.43	466.10		0.67		XM	G	D	F	FF	F							same as Xm above, lower 30cm has coaly bands,and broken coaly fragements at base of interval	JLG					
102-103	467	470	3	2.82	94%	-0.18	1.17	39%																			JLG					
									466.10	467.22		1.12		XM	G	D	F	FF	B							same as above, coaly laminations throughout, sheared	JLG					
									467.22	467.54		0.32		CO	K	DM	F		V							hard, blocky, broken, some crushed core, sheared, 3cm MST band ~mid-interval	JLG					
									467.54	467.72	0.18		0.18	CL																		
									467.72	468.23		0.51		CO	K	DM	F		F							hard, minor shearing, minor fracturing	JLG					
									468.23	469.10		0.87		XM	G	D	F	FF	F							coaly lenses thoroughout, MS band in top half of interval	JLG					
103-104	470	473	3	2.63	88%	-0.37	1.50	50%																			JLG					
									469.10	470.15		1.05		XM	G	D	F	FF	F							same as above	JLG					
									470.15	470.52	0.37		0.37	RL																		
									470.52	471.09		0.57		ZH-CO	K	DM	F		F							rocky, banded, rare calcite lense	JLG					
									471.09	472.10		1.01		XM	G	D	F	FF	F	PD		15				coaly bands and lenses throughout, rare calcite veinlet, minor shearing on fractuer surfaces	JLG					
104	473	476	3	3.07	102%	0.07	2.68	89%																			JLG					
									472.10	475.17		3.07		MS	G	D	F	FF	S	PD						rare coaly lense and calcite veinlets, minor shearing/slickenside on fracture surface	JLG					
104-105	476	479	3	3.06	102%	0.06	2.89	96%																			JLG					
									475.17	478.23		3.06		MS	G	D	F	FF	S	PD						same as above	JLG					
105-106	479	482	3	2.87	96%	-0.13	2.15	72%																			JLG					

									478.23	478.72		0.49		SS	G	E	F	FF	S	XB		10				rare MS lamination	JLG							
									478.72	479.38		0.66		MS	G	D	F	FF	S	PD		10						JLG						
									479.38	480.31		0.93		XM	G	D	F	FF	F							minor coaly lenses, up to 5mm thick, throughout	JLG							
									480.31	480.55		0.24		ZH	G	DD	F	FF	F							coaly laminations throughout, rocky, banded	JLG							
									480.55	480.75		0.20		CO	K	DM	F		V-C							sheared, fissile, rare rocky MS band	JLG							
									480.75	480.88	0.13		0.13	RL																				
									480.88	481.00		0.12		ZH	G	DD	F	FF	F							fissile, rocky, hard, coal lenses 5mm	JLG							
									481.00	481.19		0.19		XM	G	D	F	FF	S									JLG						
									481.19	481.23		0.04		CO	K	DM	F		B							fissile, hard, blocky	JLG							
106	482	485	3	2.87	96%	-0.13	1.82	61%																				JLG						
									481.23	481.29		0.06		CO	K	DD	F		B							same as above, shaly and calcite veinlets at base of interval	JLG							
									481.29	481.42	0.13		0.13	RL																				
									481.42	484.23		2.81		MS	G	D	F	FF	F							Carbonaceous at upper contact. Minor shearing on fracture surfaces, in lower 0.5m 45cm long coaly lense parallel to core axis broken core- fractured along coal lense	JLG							
106-17	485	488	3	2.94	98%	-0.06	2.94	98%																				JLG						
									484.23	484.60		0.37		MS	G	D	F	FF	S	PD		20				same as above	JLG							
									484.60	487.17		2.57		SS	G	E	F	FM	S	WL-PL		25	10			MS and ST laminations throughout	JLG							
107-108	488	491	3	2.99	100%	-0.01	2.98	99%																				JLG						
									487.17	490.16		2.99		SS	G	E	F	FM	S	WL-PL		15				same as above, minor soft sediment deformation, rare XB	JLG							
108	491	494	3	3.04	101%	0.04	2.99	100%																				JLG						
									490.16	492.36		2.20		ST	G	E	F	FF	S	PD						MS and SS laminations	JLG							
									492.36	493.20		0.84		MS	G	B	F	FF	S	PD						sporadic coaly lense- up to 1cm	JLG							
109	494	497	3	2.67	89%	-0.33	1.50	50%																				JLG						
									493.20	493.60		0.40		XM	G	D	F	FF	F	PD						mm-scale coaly lenses throughout	JLG							
									493.60	493.86	0.26		0.13	RL																				
									493.86	494.80		0.94		MS	G	D	F	FF	O							silty. Bottom 1cm is carbonaceous	JLG	J Seam					044181	
									494.80	495.30	0.50	0.50		CO	K	DM	F		B						hard, brittle, minor shearing, rare cleated band	JLG							044182	
									495.30	495.31	0.01	0.01		MS	G	D	F	FF	S						rock band	JLG								
									495.31	496.00	0.69			CL																				
									496.00	496.82	0.82	0.82		CO	K	DM	F		F							same as coal above	JLG							044183
109-110	497	500	3	2.82	94%	-0.18	2.02	67%																					JLG					
									496.82	499.64	2.82	2.82		CO	K	DB	F		S							same as above, more bright bands, mostly solid, competent core.	JLG						044184, 044185, 044186, 044187, 044188, 044189, 044190	
110	500	503	3	2.58	86%	-0.42	1.75	58%																				JLG						
									499.64	500.33	0.69	0.69		CO	K	DB	F		F							same as above, more blocky and fragmented	JLG							
									500.33	500.42	0.09		0.09	CL																				
									500.42	500.61		0.19		XM	G	DD	F	FF	C-F							top 5cm is completely crushed, coaly lenses throughout, rare calcite veinlet	JLG						044191	
									500.61	501.11		0.50		SS	G	E	F	FM	S							rare MS lamination	JLG							
									501.11	502.31		1.20		MS	G	D	F	FF	F	PD		15				sporadic SS interbed (5cm scale)	JLG							
110-111	503	506	3	2.85	95%	-0.15	2.05	68%																				JLG						
									502.31	502.60		0.29		MS	G	D	F	FF	F	PD						same as above	JLG							
									502.60	505.16		2.56		XM	G	D	F	FF	F	PD		25				coaly lenses/bands throughout, mm-scale up to 5cm thick, sporadic clacite veinlet bands	JLG							
111-112	506	509	3	2.92	97%	-0.08	1.70	57%																				JLG						
									505.16	505.25		0.09		XM	G	D	F	FF	F	PD						same as above	JLG	K1 Seam					044192	
									505.50	506.37	0.87	0.87		CO	K																			

Peace River Coal Inc																																	
DRILL CORE LOG																																	
Hole No:		TUC2020-005							Area:		Trend UG							Logged By:		J. Galbraith/M.Dorsey													
Date Begun:		12-Jul-20							Collar Bearing:		0							Date Logged:		18-Jul-20 28-Jul-20													
Date Finished:		26-Jul-20							Collar Elev. (m):		1381.17							Northing:		6084819													
Hole Size:		HQ							Hole Angle:		-90 (veritcal)							Easting:		633949.17													
Total Depth (m):		612							overall recovery		98%							-10.94 m cummulative loss/gain		Projection:		NAD 83 Zone 10											
Box No.	Driller's Marker (m)			Recovered Length (m)	Recovery (%)	Loss (m)	Total Length of pieces >0.1m	RQD (%)	Lithological Unit					Coal Type Rock Type	Color	Shade	Weathering	Grain Size	Core State	Bedding Sedimentary Structure	Structure	BCN (°)		HCl (Acid test)	Additional Descriptions	Logged By (Initials)	Seam	Recovered Length (m)	Actual Length-Geophys (m)	Coal Recovery (%)	Sample Number		
	From (m)	To (m)	Drilled Length (m)						From (m)	To (m)	Length (m)	Actual (measured) Length (m)	Lost (m)									Roof	Floor										
0	0	56	56	0.00	0%	-56.00		0%																	OVB material not saved	JLG							
									2.28	58.28		56.00		OVB												Till with clay and boulders	JLG						
1	56	59	3	1.50	50%	-1.50	0.00	0%																									
									58.28	59.90		1.62		OVB	G	D	W	FF	C								clay till	JLG					
									59.90	61.28		1.38		MS	G-O	B	E	FF	V	WL							top of bedrock zone, rusty weathering throughout, 15 cnm clay band toward base of interval, mostly rubble	JLG					
1-2	59	62	3	2.15	72%	-0.85	0.45	15%																									
									61.28	62.96		1.68		MS	G-O	B	D	FF	V								same as above	JLG					
									62.96	63.43		0.47		MS	G	B	S	FF	F	WL		19					laminated MS with ST and SS laminations throughout, sporadic XB	JLG					
2-3	62	65	3	2.90	97%	-0.10	1.86	62%																									
									63.43	66.43		3.00		MS	G	B	S	FF	F	WL		19					same as above	JLG					
3	65	68	3	2.92	97%	-0.08	2.43	81%																									
									66.43	69.43		3.00		MS	G	B	F	FF	F	WL		20					same as above	JLG					
3-4	68	71	3	2.96	99%	-0.04	2.80	93%																									
									69.43	72.43		3.00		MS	G	B	F	FF	S	WL		23					same as above	JLG					
4-5	71	74	3	2.98	99%	-0.02	2.69	90%																									
									72.43	75.41		2.98		MS	G	B	F	FF	S	WL		19					same as above	JLG					
5	74	77	3	2.96	99%	-0.04	2.79	93%																									
									75.41	78.37		2.96		MS	G	B	F	FF	S	WL		23					same as above, minor fissile bands	JLG					
5-6	77	80	3	2.89	96%	-0.11	2.26	75%																									
									78.37	81.37		3.00		MS	G	B	F	FF	S	WL		23					same as above	JLG					
6-7	80	83	3	2.97	99%	-0.03	2.85	95%																									
									81.37	84.34		2.97		MS	G	B	F	FF	S	WL		19					same as above	JLG					
7	83	86	3	3.10	103%	0.10	2.88	96%																									
									84.34	87.44		3.10		MS	G	B	F	FF	S	WL		19					same as above, laminations less prominent	JLG					
7-8	86	89	3	2.97	99%	-0.03	2.53	84%																									
									87.44	90.41		2.97		MS	G	B	F	FF	S	WL		20					same as above	JLG					
8-9	89	92	3	2.87	96%	-0.13	2.60	87%																									
									90.41	93.28		2.87		MS	G	B	F	FF	S	WL		20					same as above	JLG					
9	92	95	3	3.13	104%	0.13	2.83	94%											</														

									108.49	111.41		2.92		MS	G	B	F	FF	S	WL		16			same as above	JLG					
13-14	110	113	3	3.09	103%	0.09	3.09	103%																		JLG					
									111.41	114.50		3.09		MS	G	B	F	FF	S	WL		20			same as above	JLG					
14	113	116	3	3.00	100%	0.00	2.79	93%																		JLG					
									114.50	117.50		3.00		MS	G	B	F	FF	S	WL		15			same as above, 7cm soft silty/clayey band at top of interval	JLG					
14-15	116	119	3	3.05	102%	0.05	2.73	91%																		JLG					
									117.50	120.55		3.05		MS	G	B	F	FF	S	WL		21			same as above	JLG					
15-16	119	122	3	2.92	97%	-0.08	2.87	96%																		JLG					
									120.55	123.47		2.92		MS	G	B	F	FF	S	WL		17			same as above	JLG					

16	122	125	3	3.02	101%	0.02	2.67	89%							MS	G	B	F	FF	S	WL		15				same as above	JLG					
									123.47	126.49			3.02															JLG					
16-17	125	128	3	3.02	101%	0.02	2.62	87%																				JLG					
									126.49	129.51			3.02		MS	G	B	F	FF	S	WL		20				same as above	JLG					
17-18	128	131	3	2.96	99%	-0.04	2.84	95%																				JLG					
									129.51	132.47			2.96		MS	G	B	F	FF	S	WL		20				same as above	JLG					
18	131	134	3	3.08	103%	0.08	2.93	98%																				JLG					
									132.47	135.55			3.08		MS	G	B	F	FF	S	WL		23				same as above	JLG					
19	134	137	3	2.97	99%	-0.03	2.97	99%																				JLG					
									135.55	138.52			2.97		MS	G	B	F	FF	S	WL		30				same as above	JLG					
19-20	137	140	3	3.00	100%	0.00	2.97	99%																				JLG					
									138.52	141.52			3.00		MS	G	B	F	FF	S	WL		30				same as above	JLG					
20-21	140	143	3	3.00	100%	0.00	3.00	100%																				JLG					
									141.52	144.52			3.00		MS	G	B	F	FF	S	WL		25				same as above	JLG					
21	143	146	3	2.95	98%	-0.05	2.95	98%																				JLG					
									144.52	147.47			2.95		MS	G	B	F	FF	S	WL		25				same as above	JLG					
21-22	146	149	3	3.06	102%	0.06	2.98	99%																				JLG					
									147.47	148.70			1.23		MS	G	B	F	FF	S	WL		25				same as above, abrupt lower contact w/ Boulder Ck Fm	JLG					
									148.70	148.89			0.19		CG	G	A	F	GP	S	FU						moderately sorted	JLG					
									148.89	150.53			1.64		ST	G	E	F	FF	S							rare SS or MS lense	JLG					
22-23	149	152	3	2.96	99%	-0.04	2.82	94%																				JLG					
									150.53	151.17			0.64		ST	G	E	F	FF	S							same as above	JLG					
									151.17	151.98			0.81		SS	G	A	F	FF	S	PL	Fracture 30	20				rare MS lense or band, polished/slickensided on fracture surfaces	JLG					
									151.98	153.51			1.53		SS	G	L	F	MC	S	PL	Fracture 40, 20	25				rare coaly lense, polished/slickensided on fracutre surfaces	JLG					
23	152	155	3	2.93	98%	-0.07	2.93	98%																				JLG					
									153.51	154.48			0.97		SS	G	L	F	MC	S	PL						same as above	JLG					
									154.48	156.49			2.01		MS	G	D	F	FF	S	FU						grading to silty towards base of interval	JLG					
23-24	155	158	3	3.05	102%	0.05	3.05	102%																				JLG					
									156.49	159.54			3.05		ST	G	B	F	FF	S	PD						gradational contact from MS above, sporadic SS lense	JLG					
24-25	158	161	3	3.00	100%	0.00	3.00	100%																				JLG					
									159.54	160.14			0.60		ST	G	B	F	FF	S	PD						same as above, rare coaly lense	JLG					
									160.14	160.84			0.70		SS	G	A	F	FF	S	PD						gradational zone between ST and MM SS	JLG					
									160.84	161.72			0.88		SS	G	A	F	MM	S	WL		30				sporadic ST laminations and mm-scale coaly fragments	JLG					
									161.72	162.54			0.82		ST	G	E	F	FF	S						sporadic coaly lenses and MS band	JLG						
25	161	164	3	3.01	100%	0.01	2.76	92%																				JLG					
									162.54	162.79			0.25		ST	G	E	F	FF	S							same as above	JLG					
									162.79	163.93			1.14		SS	G	L	F	FF	S	PD		25				silty SS, rare mm-scale coaly lense in top 20cm of interval	JLG					
									163.93	165.55			1.62		ST	G	B	F	FF	S	PD-WL		25				rare MS band, rare coaly lenses	JLG					
25-26	164	167	3	2.91	97%	-0.09	2.35	78%																				JLG					
									165.55	166.23			0.68		ST	G	B	F	FF	S							same as above	JLG					
									166.23	167.43			1.20		SS	G	A	F	FF	S	PD			18			top half of interval is silty, possible burrows, rare mm-scale calcite veinlet	JLG					
									167.43	168.54			1.11		ST	G	D	F	FF	S	PD			30			interbedded with muddy bands	JLG					
26-27	167	170	3	3.00	100%	0.00	3.00	100%																				JLG					
									168.54	171.54			3.00		ST	G	B	F	FF	S							same as above, interbedded with fine sandy bands	JLG					
27	170	173	3	2.93	98%	-0.07	2.69	90%																				JLG					
									171.54	174.16			2.62		ST	G	B	F	FF	S		Fracture 70					same as above	JLG					

									174.16	174.53		0.37		SS	G	E	F	FF	S								sporadic carbonaceous fragments	JLG					
27-28	173	176	3	2.99	100%	-0.01	2.83	94%																				JLG					
									174.53	176.65		2.12		ST	G	B	F	FF	S		Fracture 65						same as ST above, interbedded with SS and MS beds, rae MM SS bed	JLG					
									176.65	177.05		0.40		SS	G	L	F	FF	S								very fine, sporadic <mm-scale carbonaceous fragments	JLG					
									177.05	177.52		0.47		ST	G	E	F	FF	S								same as ST above	JLG					
28-29	176	179	3	2.99	100%	-0.01	2.89	96%																				JLG					
									177.52	180.51		2.99		ST	G	E	F	FF	S								same as above	JLG					
29-30	179	182	3	2.98	99%	-0.02	2.90	97%																				JLG					
									180.51	182.61		2.10		ST	G	E	F	FF	S				20				same as above, mm-scale coaly lenses	JLG, MD					
									182.61	183.49		0.88		SS	G	E	F	FM	S	WL		20				sporadic MS and ST mm-cm scale laminations, coarsening downhole with wispy laminations uphole, mm-scale coaly lenses within MM sandstone	JLG, MD						
30	182	185	3	3.04	101%	0.04	2.99	100%																				JLG, MD					
									183.49	186.53		3.04		SS	G	A	F	FM	S	WL		20				30cm interbed of MS and ST with mm-scale coaly fragments, lower 30cm is coarsd grained SS	JLG, MD						

41	230	233	3	2.96	99%	-0.04	2.78	93%						ST-MS	G	C	F	FF	S	PL		30			Same as above, rare convoluted bedding/flame structures, sporadic sub-planar laminations	JLG, MD						
									231.40	234.40		3.00														JLG, MD						
41-42	233	236	3	2.42	81%	-0.58	1.98	66%																		JLG, MD						
									234.40	234.89		0.49		ST-MS	G	C	F	FF	S	WL		25			Interbedded, minor fine-medium grained SS interbeds	JLG, MD						
									234.89	235.27		0.38		MS	G	D	F	FF	O							JLG, MD						
									235.27	235.83		0.56		XM	G	D	F	FF	F						10 cm coal band in top section with minor mm-scale coaly lenses dispersed downhole	JLG, MD						
									235.83	236.41	0.58		0.58	RL																		
									236.41	237.40		0.99		ST-MS	G	C	F	FF	S						Interbedded, minor fine-medium grained SS interbeds	JLG, MD						
42-43	236	239	3	2.98	99%	-0.02	2.98	99%																		JLG, MD						
									237.40	237.72		0.32		ST-MS	G	C	F	FF	S	PD		25			Same as above	JLG, MD						
									237.72	240.38		2.66		SS	G	L	F	FF	S	PL		30			Rare MS mm-scale laminations	JLG, MD						
43	239	242	3	2.94	98%	-0.06	2.86	95%																		MD						
									240.38	242.92		2.54		SS	G	A	F	FF	S	PL-CT	Fold-30	25			Minor MS mm-scale planar laminations with potential cm-scale slump folding	MD						
									242.92	243.37		0.45		SS	G	E	F	MM	S	PL					Minor cm-scale slump folding	MD						
43-44	242	245	3	2.82	94%	-0.18	2.74	91%																		MD						
									243.37	246.37		3.00		SS	G	E	F	MC	S	PL		25			Rare discontinuous mm-scale MS stringers paralleling lamination orientation uphole, laminations consist of medium grained sandstone between minor cm-scale beds of coarse grained	MD						
44-45	245	248	3	3.08	103%	0.08	2.88	96%																		MD						
									246.37	249.45		3.08		SS	G	A	F	MC	S	PL		28			Minor cm-scale interbeds or medium to fine grained SS, sporadic cm-scale upper coarse SS to conglomeratic interbeds, rare dark grey discontinuous sub-planar mm-scale mudstone laminations	MD						
45-46	248	251	3	2.90	97%	-0.10	2.60	87%																		MD						
									249.45	252.45		3.00		SS	G	A	F	MC	F	PL	fracture-30	25			Same as above, 21 cm bed of MS-ST, weakly friable 10cm rubble section with slickensided lower bounding fracture	MD						
46	251	254	3	2.98	99%	-0.02	2.84	95%																		MD						
									252.45	255.43		2.98		SS	G	E	F	FC	S	PD		20			Minor cm-scale interbeds or upper coarse to conglomeratic beds with discontinuous mm-scale coaly fragments and laminations on margin	MD						
46-47	254	257	3	2.95	98%	-0.05	2.81	94%																		MD						
									255.43	256.83		1.40		SS	G	E	F	MC	S	PD		10			30 cm interbed of conglomerate	MD						
									256.83	258.38		1.55		SS	G	B	F	FM	S	PD-PL		15			31 cm interbed of MS-ST at top of section	MD						
47-48	257	260	3	2.98	99%	-0.02	2.80	93%																		MD						
									258.38	261.38		3.00		SS	G	E	F	FM	S	PD					6 cm and 50 cm interbeds or conglomerate containing subrounded to subangular clasts up to 1cm diameter, minor cm-scale coarse grained SS interbeds, rare ST laminations and mm-scale	MD						
48	260	263	3	2.96	99%	-0.04	2.90	97%																		MD						
									261.38	264.38		3.00		SS	G	E	F	MC	S	MX		35,15			Sporadic cm-scale interbeds of upper coarse to conglomeratic SS, rare mm-scale coaly laminations	MD						
48-49	263	266	3	2.95	98%	-0.05	2.87	96%																		MD						
									264.38	264.60		0.22		SS	G	E	F	MC	S	PL		30			Minor mm-scale coaly laminations, sharp boundary with conglomerate downhole	MD						
									264.60	267.33		2.73		CG	G	A	F	GP	S						Subrounded to subangular petromict orthoconglomerate, generally bimodal, very rare mm-scale coaly fragments and discontinuous laminations	MD						
49-50	266	269	3	2.97	99%	-0.03	2.89	96%																		MD						
									267.33	270.11		2.78		CG	G	A	F	GP	S						Same as above, 15 cm interbed of medium grained SS, bottom 41 cm is a gradational contact with underlying fine grained SS, rare 3cm dark grey MS bed	MD						
									270.11	270.30		0.19		SS	G	E	F	FF	S	PL		20					MD					
50-51	269	272	3	2.98	99%	-0.02	2.98	99%																		MD						
									270.30	273.30		3.00		SS	G	E	F	FF	S	PL-MX		20			Minor crossbedding below 5cm petromict orthoconglomerate bed, 18cm ST interbed, rare mm-scale dark grey MS bed and discontinuous stringer laminations	MD						
51	272	275	3	2.96	99%	-0.04	2.83	94%																		MD						
									273.30	276.30		3.00		SS	G	E	F	FF	S	PL		20			Minor ST laminations	MD						
51-52	275	278	3	2.91	97%	-0.09	2.57	86%																		MD						
									276.30	279.30		3.00		SS	G	E	F	FF	S	PD					Same as above, 36 cm bed of MS with rare mm-scale MS stringers downhole containing polished fracture surfaces	MD						
52-53	278	281	3	2.98	99%	-0.02	2.33	78%																		MD						
									279.30	281.59		2.29		SS	G	E	F	FF	S	PL	Fault-25	20			Minor ST laminations, interbedded dark grey MS-ST, rare wavy and crossbedded structures, small 8cm 278.48-278.56m fractured fault zone with weak-moderately developed 2cm gouge and gouge-filled fractures	MD						
									281.59	282.28		0.69		MS-ST	G	B	F	FF	S	PL-WL		20			Minor mm-cm scale interbeds of fine grained SS, 3cm bed of oligomict paraconglomerate containing sub-rounded and elongated <1cm clasts	MD						

[illegible]

[illegible]

79-80	395	398	3	2.92	97%	-0.08	2.57	86%						ST-SS	G	B	F	FF	S	PL		25						Sporadic mm-scale MS laminations	MD							
									396.38	397.62		1.24																								
									397.62	398.96		1.34			MS-ST	G	D	F	FF	F																
									398.96	399.35		0.39			ST-MS	G	B	F	FF	S																
80-81	398	401	3	2.96	99%	-0.04	2.82	94%																												
									399.35	401.78		2.43			ST-MS	G	B	F	FF	S	PD-WL															
									401.78	402.33		0.55			MS	G	D	F	FF	S																
81	401	404	3	2.95	98%	-0.05	2.65	88%																												
									402.33	402.71		0.38			MS	G	D	F	FF	S																
									402.71	404.29		1.58			MS-ST	G	E	F	FF	S	CV															
									404.29	405.33		1.04			SS	G	A	F	FM	S	PL-WL		35													
81-82	404	407	3	2.92	97%	-0.08	2.83	94%																												
									405.33	407.24		1.91			SS-ST	G	A	F	FM	S	PL-WL															
									407.24	408.32		1.08			MS-ST	G	D	F	FF	S																
82-83	407	410	3	2.91	97%	-0.09	2.10	70%																												
									408.32	408.78		0.46			MS	G	D	F	FF	S																
									408.78	408.94		0.16			CO	K	BD	F		F																
									408.94	409.06		0.12			MS	G	D	F	FF	S																
									409.06	409.24		0.18			CO	K	BB	F		F			Fault													
									409.24	409.34		0.10			MS	G	D	F	FF	S			Fracture-20													
									409.34	409.50		0.16			CO	K	BB	F		F			Fractures-30													
									409.50	410.73		1.23			MS-ST	G	D	F	FF	S																
									410.73	411.31		0.58			SS	G	E	F	FF	S																
83-84	410	413	3	2.94	98%	-0.06	2.73	91%																												
									411.31	414.31		3.00			SS	G	A	F	FF	S			15													
84	413	416	3	2.99	100%	-0.01	2.99	100%																												
									414.31	415.76		1.45			SS	G	A	F	FF	S																
									415.76	416.57		0.81			MS-ST	G	E	F	FF	S	PL															
									416.57	417.30		0.73			SS	G	A	F	FF	S			20													
84-85	416	419	3	2.94	98%	-0.06	2.94	98%																												
									417.30	420.30		3.00			SS	G	A	F	FF	S																
85-86	419	422	3	2.97	99%	-0.03	2.77	92%																												
									420.30	423.30		3.00			SS	G	A	F	FF	S																
86	422	425	3	2.97	99%	-0.03	2.97	99%																												
									423.30	426.05		2.75			SS	G	A	F	FF	S																
									426.05	426.27		0.22			CG	G	E	F	GP	S																
86-87	425	428	3	2.90	97%	-0.10	2.90	97%																												
									426.27	429.27		3.00			CG	G	E	F	GP	S																
87-88	428	431	3	2.95	98%	-0.05	2.66	89%																												
									429.27	432.27		3.00			CG	G	E	F	GP	S																
88	431	434	3	3.00	100%	0.00	2.91	97%																												
									432.27	435.27		3.00			CG	G	E	F	GP	S																
88-89	434	437	3	2.92	97%	-0.08	2.64	88%																												
									435.27	438.27		3.00			CG	G	E	F	GU	F																
89-90	437	440	3	3.01	100%	0.01	3.01	100%																												
									438.27	439.97		1.70			CG	G	E	F	GP-GU	S																

									439.97	441.28		1.31		SS	G	E	F	CC	S					Moderate cm-scale interbeds of pebbly CG, minor cm-scale interbeds of fine grained SS, rare interstitial calcite	MD								
90	440	443	3	2.95	98%	-0.05	2.60	87%																		MD							
									441.28	441.47		0.19		SS	G	E	F	CC	S						Same as above	MD							
									441.47	443.49		2.02		SS	G	E	F	MC	F			20			Rare mm-cm scale fine grained SS interbeds with scour and till undulating upper contacts, 13cm ST bed with coaly mm-scale laminations within and along polished fracture surfaces/contacts	MD							
									443.49	444.28		0.79		SS	G	A	F	FF	S						Moderate <1cm interbeds of medium grained SS and rare stylolitic mm-scale carbonaceous MS lamination	MD							
91	443	446	3	3.01	100%	0.01	3.01	100%																		MD							
									444.28	447.29		3.01		SS	G	A	F	FF	S	PL		15			Same as above, medium to coarse grained SS interbeds are mainly within upper 36cm of sequence	MD							
91-92	446	449	3	2.99	100%	-0.01	2.99	100%																		MD							
									447.29	450.29		3.00		SS	G	A	F	FF	S						Rare mm-scale carbonaceous MS laminations, massive	MD							
92-93	449	452	3	2.97	99%	-0.03	2.88	96%																		MD							
									450.29	453.29		3.00		SS	G	A	F	FF	S						Massive	MD							
93	452	455	3	2.94	98%	-0.06	2.68	89%																		MD							
									453.29	455.83		2.54		SS	G	A	F	FF	S						Same as above	MD							
									455.83	456.29		0.46		MS	G	D	F	FF	F	PL-WL		25			Carbonaceous, minor interbedded SS and ST, minor flame structures in MS	MD							
93-94	455	458	3	2.97	99%	-0.03	2.73	91%																		MD							
									456.29	456.38		0.09		MS	G	D	F	FF	F	PL-WL					Same as above	MD							
									456.38	456.53		0.15		SS	G	E	F	FF	F						Rare mm-scale MS laminations	MD							
									456.53	459.26		2.73		CG-SS	G	E	F	GP-GU	F						Granular to pebbly petromict orthoconglomerate interbedded with cm-dm scale fine grained SS, CG clasts are subangular to subrounded, rare interstitial calcite cement	MD							
94-95	458	461	3	2.98	99%	-0.02	2.56	85%																		MD							
									459.26	461.49		2.23		CG-SS	G	E	F	GP-GU	F	PL		20			Same as above, well bedded	MD							
									461.49	462.22		0.73		SS-ST	G	B	F	SS	S	WL					Interlaminated SS and ST-MS becoming more MS-rich downhole nearing the lower contact with coal, polished surfaces	MD					044120		
									462.22	462.26		0.04		CO	K	BD	F		S						Moderately hard and sheared	MD							
95	461	464	3	2.89	96%	-0.11	1.57	52%																		MD							
									462.26	462.35		0.09		XM	G	D	F	FF	S						Carbonaceous with mm-scale coaly laminations	MD							
									462.35	463.42	1.07	1.07		CO	K	BB	F		F						Moderately hard, 10% <2mm dull bands, locally sheared and rubbly, rare disseminated and massive fine grained pyrite	MD	D1				044121-044122		
									463.42	463.98	0.56	0.56		XM	G	D	F	FF	F						Carbonaceous with mm-scale coal laminations	MD						044123	
									463.98	464.30	0.32	0.32		CO	K	BD	F		F						Moderately hard, 40% <1cm dull bands, locally moderate to strongly sheared along bed contacts	MD							
									464.30	465.16		0.86		MS	G	D	F	FF	F	PL		15			Moderate coal interbeds <2cm and laminations <2mm	MD							
									465.16	465.28	0.12		0.12	RL																			
95-96	464	467	3	2.87	96%	-0.13	2.02	67%																		MD							
									465.28	465.41	0.13		0.13	RL																			
									465.41	465.65		0.24		MS	G	D	F	FF	F						Same as above	MD							
									465.65	468.09		2.44		MS	G	D	F	FF	F						Rare mm-scale coal laminations and calcite veinlet	MD							
									468.09	468.28		0.19		CO	K	BD	F		F						Minor interlaminated MS, moderately hard	MD	D2						
96-97	467	470	3	3.02	101%	0.02	2.46	82%																	MD								
									468.28	468.63		0.35		XM	G	D	F	FF	S							MD							
									468.63	468.81		0.18		CO	K	DD	F		F						Strongly sheared along upper contacts with MS, moderately hard	MD							
									468.81	468.92		0.11		XM	G	D	F	FF	S							MD							
									468.92	468.97		0.05		CO	K	DD	F		F						Moderately hard	MD							
									468.97	469.67		0.70		XM	G	D	F	FF	S						Minor coal laminations <1cm interbedded near upper contact with coal, lower gradational contact into SS	MD							
									469.67	471.30		1.63		SS	G	E	F	FF	S	PL		20			Abundant mm-coal fragment specks throughout upper section of SS, finely laminated within upper section leading into 18cm ST interbed, mm-laminations appear carbonaceous	MD							
97-98	470	473	3	3.09	103%	0.09	2.98	99%																		MD							
									471.30	473.38		2.08		ST-SS	G	E	F	FF	S	CV					Interlaminated and bedded ST with fine grained SS, locally finely laminated otherwise moderate to strong bioturbation and burrows where ST is more abundant in the lower section of	MD							
									473.38	474.39		1.01		SS	G	A	F	FF	S	PL		15			Moderate ST-MS laminations that appear carbonaceous	MD							
98	473	476	3	3.00	100%	0.00	2.71	90%																		MD							
									474.39	477.39		3.00		SS	G	A	F	FF	S	PL-SL					Fine small-scale cross-laminations in lower section, upper section contains 15cm of mm-scale angular non-carbonaceous and carbonaceous MS	MD							

									513.44	515.48		2.04		MS	G	D	F	FF	S		Fracture-90					Poorly developed fracture parallel to core axis	MD					
									515.48	515.78		0.30		CO	K	DM	F		F							Bright bands are typically 0.5mm, moderately hard	MD					
									515.78	515.98		0.20		MS	G	D	F	FF	F								MD					
									515.98	516.30		0.32		ZM	G	D	F	FF	F							Rare mm-scale coal beds within coaly mudstone	MD					
									516.30	516.44		0.14		MS	G	D	F	FF	F								MD					
107-108	515	518	3	3.04	101%	0.04	2.68	89%																			MD					
									516.44	518.60		2.16		MS-ST	G	E	F	FF	S	PD		20					MD					
									518.60	519.48		0.88		SS-ST	G	E	F	FF	S	PD							MD					
108-109	518	521	3	3.03	101%	0.03	2.89	96%																			MD					
									519.48	521.19		1.71		SS-ST	G	E	F	FF	S	PD						Minor 1-3cm breccia zones with calcite fill, rare mm-scale planar calcite veinlets, rare carbonaceous fracture fill	MD					
									521.19	522.51		1.32		SS-ST	G	E	F	FF	S	PL		40				Well laminated with defined dm-scale ST-enriched beds	MD					
109	521	524	3	2.92	97%	-0.08	2.73	91%																			MD					
									522.51	525.49		2.98		SS-ST	G	E	F	FF	S	PL						Same as above, rare mm-scale carbonaceous laminations and angular to subrounded MS rip-up clasts, minor calcite veining sub-parallel to laminations.	MD					
110	524	527	3	2.93	98%	-0.07	2.50	83%																			MD					
									525.49	527.25		1.76		SS-ST	G	E	F	FF	S	PL-ST	Stylolite-20					Same as above, rare 0.5cm void in calcite veinlet, stylolitic boundary cross-cuts laminations and calcite veinlets, polished surfaces.	MD					
									527.25	527.49		0.24		SS	G	E	F	FF	F		BR Fault-15					Moderately to strongly brecciated and fractured, abundant calcite fracture fill, lower contact has mm-fault gouge	MD					
									527.49	528.49		1.00		SS	G	E	F	FM	S	PL-XB		35				Grain size coarsens downhole, low angle crossbedding	MD					
110-111	527	530	3	2.96	99%	-0.04	2.70	90%																			MD					
									528.49	530.88		2.39		SS	G	E	F	FM	S	PL-XB						Coarsening to medium grained towards lower section, minor irregular 0.5cm coal bed with mm-cm scale angular and subangular coal rip up clasts.	MD					
									530.88	531.45		0.57		SS	G	E	F	FF	S	PL		20				Moderate mm-scale coal laminations and angular rip up clasts	MD					
111-112	530	533	3	2.98	99%	-0.02	2.85	95%																			MD					
									531.45	534.43		2.98		SS	G	E	F	FM	S	PL						Interbedded fine and medium-grained SS, mm-scale elongated and angular coal rip-up clasts are concentrated within medium grained SS, minor crossbedding, rare angular to subangular mm.	MD					
112	533	536	3	2.90	97%	-0.10	2.90	97%																			MD					
									534.43	537.38		2.95		SS	G	E	F	MM	S	PL		25				Rare coaly laminations with polished fracture surfaces	MD					
112-113	536	539	3	2.99	100%	-0.01	2.81	94%																			MD					
									537.38	540.27		2.89		SS	G	E	F	MM	S	PL						Same as above, minor interbedded fine grained SS	MD					
									540.27	540.37		0.10		ST-MS	G	E	F	FF	S	WL						Interlaminated MS-ST	MD					
113-114	539	542	3	2.90	97%	-0.10	2.79	93%																			MD					
									540.37	542.15		1.78		ST-MS	G	E	F	FF	S	WL						Same as above	MD					
									542.15	543.35		1.20		SS	G	E	F	FF	S							Massive	MD					
114	542	545	3	3.00	100%	0.00	2.83	94%																			MD					
									543.35	546.35		3.00		SS-ST	G	E	F	FF	S	PL-WL		30				Interbedded and laminated SS and ST, minor cm-scale MS beds	MD					
114-115	545	548	3	2.99	100%	-0.01	2.75	92%																			MD					
									546.35	549.34		2.99		SS-ST	G	E	F	FF	S	PL-WL						Same as above, weak to moderate bioturbation in MS, two polished fractures contain mm-scale euhedral calcite crystals	MD					
115-116	548	551	3	2.89	96%	-0.11	2.82	94%																			MD					
									549.34	550.52		1.18		SS-ST	G	E	F	FF	S	PL-WL						Interbedded and laminated SS and ST, minor cm-scale MS beds, abundant mm-cm angular MS rip-up clasts towards bottom of section.	MD					
									550.52	552.30		1.78		SS	G	E	F	FF	S	PL		20				Finely laminated, 3 cm bed of mm-scale angular rip-up clasts	MD					
116-117	551	554	3	2.74	91%	-0.26	2.00	67%																			MD					
									552.30	554.67		2.37		SS-MS	G	E	F	FF	F	PL						Finely laminated with cm-dm scale MS beds with abundant mm-cm scale angular MS rip-up clasts along upper contacts, rare mm-scale discontinuous wavy calcite veinlets cross-cut	MD					
									554.67	555.16		0.49		SS-MS	G	E	F	FF	F		Rubble					Rubble zone with same lithology as above, no fault gouge	MD					
									555.16	555.30		0.14		SS	G	A	F	FF	S							Massive	MD					
117	554	557	3	3.07	102%	0.07	2.83	94%																			MD					
									555.30	558.37		3.07		SS-MS	G	E	F	FF	S							SS mainly massive, interbeds of mm-dm scale angular rip-up clasts composed of laminated MS-ST	MD					
117-118	557	560	3	2.85	95%	-0.15	2.19	73%																			MD					
									558.37	558.75		0.38		SS-MS	G	E	F	FF	S							Same as above	MD					
									558.75	561.37		2.62		MS	G	D	F	FF	F	WL-PL		20				Massive to mm-scale laminations	MD					

[illegible]

									589.17	589.39	0.22	0.22		XM	G	D	F	FF	F							Rare <0.5cm coal beds, lower contact with CO moderate to strongly fractured	MD					
									589.39	589.50	0.11		0.11	RL																		
									589.50	590.10	0.60	0.60		CO	K	BD	F		B							Moderately hard, dull bands <0.2cm	MD/JLG	K3				044153
									590.10	590.72	0.62	0.62		CO	K	BD	F		C			Fault, Fractures-85			Locally strongly fractured and rubby, 5cm and 10cm sections contain well developed fault gouge that appears parallel to bedding on fractured surfaces. competent sections contain dm.	MD/JLG						044154
									590.72	590.90	0.18		0.18	CL																		
									590.90	591.02		0.12		XM	G	D	F	FF	F							Rare mm-scale CO stringers	MD/JLG					044155
									591.02	591.51		0.49		MS-ST	G	E	F	FF	S	PL-WL					Laminated MS-ST, 10cm medium grained SS bed in middle of section, increasing mud content downhole	MD/JLG						
125	590	593	3	2.95	98%	-0.05	2.88	96%																			MD					
									591.51	591.78		0.27		MS-ST	G	E	F	FF	S	PL		15				Same as above	MD					
									591.78	593.48		1.70		MS	G	D	F	FF	S							Massive, gradational lower contact with SS	MD					
									593.48	594.46		0.98		SS-ST	G	B	F	FF	S	WL-PL					Interbedded SS-ST, ST is moderately laminated with MS and SS, rare mm-scale calcite veinlets and carbonaceous stringers in SS	MD						
125-126	593	596	3	2.97	99%	-0.03	2.97	99%																			MD					
									594.46	594.78		0.32		SS-ST	G	B	F	FF	S	CV						Same as above, water escape structures along lower contact with massive SS	MD					
									594.78	597.43		2.65		SS	G	A	F	FF	S							Massive	MD					
126-127	596	599	3	2.84	95%	-0.16	2.71	90%																			MD					
									597.43	600.18		2.75		SS	G	A	F	FF	S							Same as above, rare mm-carbonaceous laminations	MD					
									600.18	600.27		0.09		ST-MS	G	B	F	FF	S	PL						Interbedded and laminated ST-MS with rare mm-scale burrows and cm-scale interbedded fine grained SS	MD					
127-128	599	602	3	3.12	104%	0.12	2.99	100%																			MD					
									600.27	601.66		1.39		ST-MS	G	B	F	FF	S	PL		20				Same as above	MD					
									601.66	603.39		1.73		SS	G	E	F	FF	S							Massive, 20cm interbedded strongly bioturbated MS	MD					
128	602	605	3	2.92	97%	-0.08	2.82	94%																			MD					
									603.39	605.52		2.13		SS	G	A	F	FF	S							Massive	MD					
									605.52	606.38		0.86		MS-ST	G	B	F	FF	S	PL						Interbedded and laminated MS-ST, cm-dm scale fine grained SS interbeds	MD					
128-129	605	608	3	3.03	101%	0.03	2.94	98%																			MD					
									606.38	609.41		3.03		MS-ST	G	B	F	FF	S	PL-CV						Same as above, moderate soft sediment deformation, slump folding, and flame structures	MD					
129-130	608	611	3	2.89	96%	-0.11	2.80	93%																			MD					
		TD							609.41	612.30		2.89		MS-ST	G	B	F	FF	S	PL-CV		20				Same as above, End of Hole	MD					

									96.02	98.63	2.61	2.61		SH-ST	G	B	S	FF	F	WL		15			higher silt content, transitioning into ST unit, 10cm med SS band at top of interval	JLG					
9-10	98	101	3	2.74	91%	-0.26	1.31	44%																		JLG					
									98.63	98.89	0.26		0.26	RL																	
									98.89	101.63	2.74	2.74		ST	G	B	S	FF	F	WL		15			wispy laminations of SS and MS, minor MS interbeds, minor crushed/broken zone mind-interval (10cm)	JLG					
10	101	104	3	2.92	97%	-0.08	2.17	72%																		JLG					
									101.63	104.55	2.92	2.92		ST	G	B	S	FF	F-S	WL		15			same as above	JLG					
10-11	104	107	3	1.69	56%	-1.31	0.40	13%																		JLG					
									104.55	105.86	1.31		1.31	RL																	
									105.86	107.55	1.69	1.69		SH	G	B	S	FF	V	PL		10			laminations of SS and ST, oxidation staining on fracture surfaces, some soft muddy gouge in lower 30cm of interval	JLG					
11-12	107	110	3	2.98	99%	-0.02	2.46	82%																		JLG					
									107.55	110.53	2.98	2.98		ST	G	B	F	FF	F	WL		12			same as ST unit above, wispy laminations, MS interbeds, and minor SS	JLG					
12	110	113	3	3.05	102%	0.05	2.85	95%																		JLG					
									110.53	113.58	3.05	3.05		ST	G	B	F	FF	S	WL		12			same as above, SS bands up to 5cm, rare burrows	JLG					
12-13	113	116	3	2.94	98%	-0.06	2.32	77%																		JLG					
									113.58	116.52	2.94	2.94		ST	G	B	F	FF	F	WL	Fractures - 70	12			same as above, minor MS rip up clasts in SS bands, increasing MS content toward base	JLG					
13-14	116	119	3	2.94	98%	-0.06	1.95	65%																		JLG					
									116.52	119.46	2.94	2.94		MS	G	D	F	FF	F	WL	Fracture- 80	10			interbedded with minor laminated ST and SS bands	JLG					
14	119	122	3	2.43	81%	-0.57	1.17	39%																		JLG					
									119.46	120.03	0.57		0.57	RL																	
									120.03	122.46	2.43	2.43		MS	G	D	F	FF	B	WL	Fracture- 85	12			same as above, 1m broken/fractured zone mid-interval with with minor soft muddy gouge	JLG					
14-15	122	125	3	2.84	95%	-0.16	2.82	94%																		JLG					
									122.46	125.30	2.84	2.84		ST-MS	G	B	F	FF	F	WL	Fracture - 70	12			interbedded, laminations, rare SS band	JLG					

30	188	191	3	2.95	98%	-0.05	2.95	98%							ST	G	B	F	FF	S	WL		8					JLG							
									188.59	191.59	3.00	3.00															same as above	JLG							
30-31	191	194	3	2.97	99%	-0.03	2.97	99%																				JLG							
									191.59	194.59	3.00	3.00			ST	G	B	F	FF	S	WL		8					same as above, rare pyrite lense, minor MS interbeds	JLG						
31-32	194	197	3	3.03	101%	0.03	2.83	94%																				JLG							
									194.59	197.62	3.03	3.03			ST	G	B	F	FF	S	WL		12					same as above, laminated with MS, minor XB in SS interbeds	JLG						
32	197	200	3	3.04	101%	0.04	2.80	93%																				JLG							
									197.62	200.66	3.04	3.04			ST	G	B	F	FF	S	WL		10					same as above	JLG						
32-33	200	203	3	2.99	100%	-0.01	2.85	95%																				JLG							
									200.66	203.65	2.99	2.99			ST	G	B	F	FF	S	WL		10					same as above	JLG						
33-34	203	206	3	2.83	94%	-0.17	2.24	75%																				JLG							
									203.65	206.48	2.83	2.83			ST	G	B	F	FF	F	WL	Fracture 85	8					same as above, rare burrow, 30 cm fractured/broken zone toward base of intervall	JLG						
34-35	206	209	3	3.07	102%	0.07	3.07	102%																				JLG							
									206.48	209.55	3.07	3.07			ST	G	B	F	FF	S	WL		8					same as above	JLG						
35	209	212	3	3.06	102%	0.06	3.06	102%																				JLG							
									209.55	212.61	3.06	3.06			ST	G	B	F	FF	S	WL		8					same as above	JLG						
35-36	212	215	3	3.02	101%	0.02	3.00	100%																				JLG							
									212.61	215.63	3.02	3.02			ST	G	B	F	FF	S	WL		10					same as above	JLG						
36-37	215	218	3	2.92	97%	-0.08	2.83	94%																				JLG							
									215.63	218.55	2.92	2.92			ST-MS	G	C	F	FF	S	WL		13					same as above, increasing MS conent	JLG						
37	218	221	3	3.05	102%	0.05	3.05	102%																				JLG							
									218.55	221.60	3.05	3.05			ST-MS	G	B	F	FF	S	WL		12					same as above, sporadic burrows	JLG						
37-38	221	224	3	3.01	100%	0.01	3.01	100%																				JLG							
									221.60	224.61	3.01	3.01			ST-MS	G	B	F	FF	S	WL		12					same as above, higher SS content in lower half of interval	JLG						
38-39	224	227	3	3.03	101%	0.03	2.90	97%																				JLG							
									224.61	227.64	3.03	3.03			ST-MS	G	B	F	FF	S	WL		15					same as above	JLG						
39	227	230	3	2.96	99%	-0.04	2.96	99%																				JLG							
									227.64	230.60	2.96	2.96			ST-MS	G	B	F	FF	S	WL							same as above, SS laminations throughout	JLG						
39-40	230	233	3	2.94	98%	-0.06	2.79	93%																				JLG							
									230.60	233.54	2.94	2.94			ST-MS	G	B	F	FF	S	WL	Fractures 45-55	15					same as above	JLG						
40-41	233	236	3	2.86	95%	-0.14	1.83	61%																				JLG							
									233.54	235.11	1.57	1.57			ST-MS	G	B	F	FF	S	WL		8					same as above	JLG						
									235.11	236.47	1.36	1.36			ST-MS	G	B	F	FF	B	WL							same as above	JLG						
41-42	236	239	3	3.02	101%	0.02	3.02	101%																				JLG							
									236.47	239.49	3.02	3.0																							

									254.53	257.49	2.96	2.96		ST-MS	G	B	F	FF	S	WL		15			same as above	JLG					
46	257	260	3	3.02	101%	0.02	3.02	101%																		JLG					
									257.49	260.51	3.02	3.02		ST-MS	G	B	F	FF	S	WL		8			same as above, rare bioturbation and pyrite lense	JLG					
46-47	260	263	3	3.01	100%	0.01	3.01	100%																		JLG					
									260.51	263.05	2.54	2.54		ST-MS	G	B	F	FF	S	WL		15			same as above, minor 1 cm CG laminations in lower 20 cm of interval, and 5 cm SS band- transitional contact zone, polished carbonaceous fracture surfaces	JLG					
									263.05	263.31	0.26	0.26		CG	G	A	F	GG	S	MS			20		sub-rounded grains, SS matrix	JLG					
									263.31	263.52	0.21	0.21		SS	G	C	F	FF	S						5 cm MS band at top and botom of interval	JLG					
47-48	263	266	3	3.01	100%	0.01	2.97	99%																		JLG					
									263.52	266.53	3.01	3.01		SS	G	A	F	FF	S	PD, FU					Massive, rare MS laminations, medium grained SS bands in lower 20cm of interval	JLG					
48	266	269	3	2.98	99%	-0.02	2.98	99%																		JLG					
									266.53	269.51	2.98	2.98		SS	G	L	F	MC	S	PL, FU		25			minor pebble CG interbeds	JLG					
48-49	269	272	3	2.99	100%	-0.01	2.99	100%																		JLG					
									269.51	272.50	2.99	2.99		SS	G	L	F	MC	S	PL		28			same as above, sporadic mm-scale carbonaceous/coaly lenses	JLG					
49-50	272	275	3	3.03	101%	0.03	3.03	101%																		JLG					
									272.50	275.53	3.03	3.03		SS	G	L	F	MC	S	PL					same as above, lower 30 cm of interval has minor coaly lenses thoroughout, bands up to 0.5cm and coaly-polished fracture surface	JLG					
50	275	278	3	2.96	99%	-0.04	2.81	94%																		JLG					
									275.53	275.69	0.16	0.16		SS	G	L	F	MC	S	PL					same as above, few fine SS rip-up clasts at base	JLG					
									275.69	277.12	1.43	1.43		SS	G	E	F	FF	S						massive, gradational lower contact	JLG					
									277.12	278.12	1.00	1.00		MS	G	B	F	FF	S, O						gradational lower contact. 20 cm overdrilled section	JLG					
									278.12	278.53	0.41	0.41		SS	G	E	F	FF	S						sporadic carby bioturbation	JLG					
50-51	278	281	3	3.02	101%	0.02	3.02	101%																		JLG					
									278.53	279.61	1.08	1.08		SS	G	E	F	FF	S						same as above	JLG					
									279.61	281.55	1.94	1.94		MS	G	B	F	FF	S			15			silty, minor laminations at upper contact for 30cm	JLG					
51-52	281	284	3	2.96	99%	-0.04	2.85	95%																		JLG					
									281.55	282.10	0.55	0.55		MS	G	B	F	FF	S						same as above	JLG					
									282.10	282.70	0.60	0.60		SS	G	B	F	FF	S						mm-scale carby lenses	JLG					
									282.70	284.51	1.81	1.81		SS	G	A	F	FC	S						rare ST interbeds (15cm-scale), rare CG pebble, coaly lense/fracture surface- coalified plant fragments	JLG					
52	284	287	3	2.99	100%	-0.01	2.83	94%																		JLG					
									284.51	287.29	2.78	2.78		SS	G	A	F	FC	S			28			same as above, rare MS-ST rip-up clasts	JLG					
									287.29	287.50	0.21	0.21		MS	G	D	F	FF	F		Fracture-60				polished fracture surface	JLG					
53	287	290	3	3.00	100%	0.00	2.81	94%																		JLG					
									287.50	287.88	0.38	0.38		MS	G	D	F	FF	S						same as above (MS interbed within main SS unit)	JLG					
									287.88	290.50	2.62	2.62		SS	G	A	F	FM	S	PD					same as SS above, massive	JLG					
53-54	290	293	3	2.97	99%	-0.03	2.88	96%																		JLG					
									290.50	293.47	2.97	2.97		SS	G	A	F	FC	S	PD					minor MS and ST laminations, lower 30cm is coarse SS interbed	JLG					
54-55	293	296	3	2.99	100%	-0.01	2.97	99%																		JLG					
									293.47	295.69	2.22	2.22		SS	G	A	F	FC	S	PD		15			same as above, rare ST rip-up clasts, 2cm quartz veinlet in top 20 cm of interval, carby lenses (mm-scale), interbedded coarse-medium-fine SS	JLG					
									295.69	296.06	0.37	0.37		MS	G	D	F	FF	S						MS interbed	JLG					
									296.06	296.46	0.40	0.40		SS	G	A	F	MC	S			20			carbonaceous polished fracture surface, parallel to laminations	JLG					
55	296	299	3	2.91	97%	-0.09	2.82	94%																		JLG					
									296.46	299.45	2.99	2.99		ST	G	E	F	FF	S		Fractures-55, 30				rare muddy or sandy zone, mostly massive	JLG					
55-56	299	302	3	3.04	101%	0.04	3.04	101%																		JLG					
									299.45	300.25	0.80	0.80		ST	G	E	F	FF	S						same as above	JLG					
									300.25	301.85	1.60	1.60		SS	G	A	F	FF	S						sporadic bioturbation, massive	JLG					
									301.85	302.49	0.64	0.64		ST	G	E	F	FF	S						same as ST above	JLG					

56-57	302	305	3	2.97	99%	-0.03	2.66	89%																JLG						
									302.49	305.46	2.97	2.97		ST	G	E	F	FF	S		Fractures-20				same as above, polished fracture surfaces, 30cm soft, flaky, overdrilled zone mid-interval, minor SS interbeds	JLG				
57	305	308	3	2.89	96%	-0.11	2.30	77%																JLG						
									305.46	308.44	2.98	2.98		ST	G	A	F	FF	F		fractures-15				same as above, lower half of interval is fractured and broken, silicified, and quartz filled fracture surfaces, minor SS interbeds	JLG				
57-58	308	311	3	2.86	95%	-0.14	2.70	90%																JLG						
									308.44	309.36	0.92	0.92		ST	G	E	F	FF	S					same as above	JLG					
									309.36	309.80	0.44	0.44		SS	G	A	F	FF	S	WL			15	minor MS laminations	JLG					
									309.80	310.57	0.77	0.77		MS	G	D	F	FF	S					minor ST content	JLG					
									310.57	311.29	0.72	0.72		ST	G	E	F	FF	S/O					top half is overdrilled,grading to MS toward base	JLG					
58-59	311	314	3	3.05	102%	0.05	3.01	100%																JLG						
									311.29	311.69	0.40	0.40		MS	G	D	F	FF	S	fracture-30					polished fracture surface	JLG				
									311.69	314.06	2.37	2.37		SS	G	L	F	FF	S					massive, rare MS lense	JLG					
									314.06	314.34	0.28	0.28		ST	G	E	F	FF	S					minor MS bands	JLG					
59	314	317	3	3.04	101%	0.04	2.95	98%																JLG						
									314.34	316.31	1.97	1.97		ST	G	E	F	FF	S					same as above, gradational contact	JLG					
									316.31	317.38	1.07	1.07		SS	G	A	F	FF	S					rare MS and ST lamination	JLG					
59=60	317	320	3	3.05	102%	0.05	3.05	102%																JLG						
									317.38	318.08	0.70	0.70		ST	G	E	F	FF	S	PD					laminated with MS and minor SS	JLG				
									318.08	318.99	0.91	0.91		SS	G	A	F	MM	S					minor MS and ST laminations and rip up clasts	JLG					
									318.99	319.97	0.98	0.98		SS	G	A	F	FF	S					massive	JLG					
									319.97	320.43	0.46	0.46		MS	G	D	F	FF	S					minor overdrilled segment,	JLG					
60-61	320	323	3	2.86	95%	-0.14	2.86	95%																JLG						
									320.43	320.48	0.05	0.05		MS	G	D	F	FF	S					same as above	JLG					
									320.48	321.16	0.68	0.68		SS	G	A	F	FF	S					interbedded with ST/MS zone	JLG					
									321.16	322.24	1.08	1.08		MS	G	D	F	FF	S	PD	Fracture - 50	20			same as MS above, polished, carbonaceous fracture surface toward base	JLG				
									322.24	323.43	1.19	1.19		SS	G	E	F	FF	S					minor bioturbation, minor mm-scale quartz veinlets	JLG					
61-62	323	326	3	2.96	99%	-0.04	2.91	97%																JLG						
									323.43	326.39	2.96	2.96		MS-SS	G	C	F	FF	S	WL	Fractire 70	30			same as MS and SS above. 30cm scale interbeds, medium SS layer in lower 1m of interval	JLG				
62	326	329	3	3.02	101%	0.02	2.85	95%																JLG						
									326.39	329.41	3.02	3.02		MS-SS	G	C	F	FF	S	WL			10		same as above, laminations increasing toward base	JLG				
62-63	329	332	3	2.97	99%	-0.03	2.97	99%																JLG						
									329.41	330.43	1.02	1.02		SS	G	L	F	MM	S	WL, FU			30		MS laminations throughout, minor carby lenses	JLG				
									330.43	332.38	1.95	1.95		ST	G	E	F	FF	S		Fracture - 55				minor MS interbed, minor bioturbation	JLG				
63-64	332	335	3	3.01	100%	0.01	2.87	96%																JLG						
									332.38	334.82	2.44	2.44		ST	G	E	F	FF	S					same as above, minor MS and SS interbed	JLG					
									334.82	335.39	0.57	0.57		SS	G	A	F	FM	S	WL			15		minor carbonaceous lenses, rare mm-sclae quartz veinlet, sporadic MS lamination	JLG				
64	335	338	3	3.04	101%	0.04	3.04	101%																JLG						
									335.39	338.43	3.04	3.04		ST-SS	G	C	F	FF	S		fracture - 45				interbedded ST and SS, minor MS laminations, rare medium SS band with carby lenses,	JLG				
64-65	338	341	3	2.97	99%	-0.03	2.88	96%																JLG						
									338.43	341.40	2.97	2.97		MS-ST	G	B	F	FF	S						rare mm-scale carbonaceous/coaly lenses, MS dominant toward base of interval	JLG				
65-66	341	344	3	3.06	102%	0.06	3.06	102%																JLG						
									341.40	344.00	2.60	2.60		ST	G	E	F	FF	S	FU					minor SS and MS, minor bioturbation, rare coaly lenses up to 5mm	JLG				
									344.00	344.46	0.46	0.46		SS	G	A	F	FF	S	PD					silty SS interbed, rare MS lamination	JLG				
66	344	347	3	2.88	96%	-0.12	2.25	75%																JLG						
									344.46	345.58	1.12	1.12		SS	G	A	F	FF	S	PD					same as above	JLG				
									345.58	347.13	1.55	1.55		MS	G	D	F	FF	S						minor carbonaceous lenses, poished fracture surfaces	JLG				

									347.13	347.45	0.32	0.32		ZM	G	D	F	FF	F						coal lenses, polished fracture surfaces	JLG						
66-67	347	350	3	2.83	94%	-0.17	2.41	80%																		JLG						
									347.45	347.60	0.15	0.15		ZM	G	D	F	FF	B							same as above, coal bands up to 3cm	JLG					
									347.60	347.90	0.30	0.30		XM	G	D	F	FF	B							coaly lenses (mm-scale)	JLG					
									347.90	348.42	0.52	0.52		MS	G	D	F	FF	F							rare ST lamination	JLG					
									348.42	350.41	1.99	1.99		ST	G	E	F	FF	S		Fracture 85					minor bioturbation, rare SS-band- 5cm, polished fracture surface	JLG					
67-68	350	353	3	2.94	98%	-0.06	2.94	98%																		JLG						
									350.41	350.87	0.46	0.46		ST	G	E	F	FF	S							same as above, increasing sand content with depth	JLG					
									350.87	351.73	0.86	0.86		SS	G	E	F	FF	S							minor MS and SS	JLG					
									351.73	353.39	1.66	1.66		SS	G	A	F	FM	S	CV, XB		10				minor MS and ST laminations and interbeds, rare rip-up clasts	JLG					
68	353	356	3	3.02	101%	0.02	3.02	101%																		JLG						
									353.39	354.45	1.06	1.06		SS	G	A	F	FM	S							same as above	JLG					
									354.45	356.41	1.96	1.96		SS	G	L	F	MC	S	FU		15				lower 20 cm is very coarse to granular CG, rare mm-scale coaly lense	JLG					
68-69	356	359	3	3.02	101%	0.02	3.02	101%																		JLG						
									356.41	359.43	3.02	3.02		SS	G	A	F	CC	S	BS						same as above, interbedded with variations in grain size and minor granule CG beds up to 15cm.	JLG					
69-70	359	362	3	3.02	101%	0.02	2.76	92%																		JLG						
									359.43	362.45	3.02	3.02		MS	G	D	F	FF	S-F							minor fractured zones with highly polished surfaces, rare silty and carbonaceous interbeds,	JLG					
70-71	362	365	3	3.02	101%	0.02	2.66	89%																		JLG						
									362.45	362.92	0.47	0.47		MS	G	D	F	FF	S							same as above	JLG					
									362.92	365.47	2.55	2.55		SS	G	L	F	MC	S	PD		20				top 0.5m has minor mm-scale coaly lenses, carbonaceous polished fracture surfaces, sporadic granule CG interbed	JLG					
71	365	368	3	2.96	99%	-0.04	2.90	97%																		JLG						
									365.47	366.05	0.58	0.58		SS	G	L	F	MC	S	PD		15				same as above, coaly lenses up to 3cm	JLG					
									366.05	366.36	0.31	0.31		MS	G	C	F	FF	S							rip up clasts in SS matrix in lower 10cm of interval	JLG					
									366.36	368.15	1.79	1.79		SS	G	A	F	FM	S	FU, XB		15				rare band with MS lenses, lower 5cm is very coarse to granule CG, minor XB, top 50cm is fine SS	JLG					
									368.15	368.43	0.28	0.28		SS	G	E	F	FF	S							rare MS lamination	JLG					
71-72	368	371	3	2.82	0.94	-0.18	2.66	0.89																		JLG						
									368.43	370.74	2.31	2.31		SS	G	E	F	FF	S							same as above	JLG					
									370.74	371.42	0.68	0.68		MS	G	B	F	FF	F		Fractures- 50, 30	15				Fissile, fractured, highly polished on fracture surfaces, rare coarse SS band and XM band 5cm each	JLG					
72-73	371	374	3	2.92	97%	-0.08	2.63	88%																		JLG						
									371.42	372.12	0.70	0.70		MS	G	B	F	FF	F, O, B							same as above, broken and overdrilled segments	JLG					
									372.12	374.34	2.22	2.22		CG	G	A	F	GP	S	PS						rare coaly lense, rare interbeds of by grain size, sub rounded grains	JLG					
73	374	377	3	3.03	101%	0.03	3.03	101%																		JLG						
									374.34	374.81	0.47	0.47		SS	G	L	F	FF	S							rare pebble CG band	JLG					
									374.81	377.37	2.56	2.56		CG	G	A	F	GP	S	PS						same as CG above, rare SS band (cm-scale)	JLG					
73-74	377	380	3	2.97	99%	-0.03	2.25	75%																		JLG						
									377.37	377.89	0.52	0.52		CG	G	A	F	GP	S	PS						same as above	JLG					
									377.89	378.73	0.84	0.84		SS	G	A	F	FC	F							minor MS bands, minor granule CG laminations	JLG					
									378.73	380.34	1.61	1.61		SS	G	L	F	MC	S-B		Fracture- bedding parallel	20				massive, clean, lower 50cm is fractured and broken- looks like caused by drilling	JLG					
74-75	380	383	3	2.99	100%	-0.01	2.97	99%																		JLG						
									380.34	380.93	0.59	0.59		SS	G	L	F	MC	S-B							same as above, few granules/pebbles at lower contact	JLG					
									380.93	383.33	2.40	2.40		SS	G	L	F	FF	S							massive, rare MS lense and pebble/granules	JLG					
75	383	386	3	2.94	98%	-0.06	2.94	98%																		JLG						
									383.33	386.31	2.98	2.98		SS	G	L	F	FF	S							same as above	JLG					
75-76	386	389	3	2.93	98%	-0.07	2.71	90%																		JLG						
									386.31	388.19	1.88	1.88		SS	G	L	F	FF	S							same as above	JLG					

									388.19	389.29	1.10	1.10		MS-SS	G	C	F	FF	F	PL		12			interbedded laminated MS (hulcross fm) and SS as above- transitional contact zone. Polished fracture surfaces, rare MS rip up clasts, minor ST content	JLG						
76-77	389	392	3	2.95	98%	-0.05	2.88	96%																		JLG						
									389.29	392.24	2.95	2.95		MS-SS	G	C	F	FF	F	PL, WL		10			same as above	JLG						
77-78	392	395	3	3.04	101%	0.04	2.81	94%																		JLG						
									392.24	395.28	3.04	3.04		MS-SS	G	B	F	FF	F	PL, WL	Fractures- bedding parallel	18			same as above, rare 5mm coaly band	JLG						
78	395	398	3	3.04	101%	0.04	3.04	101%																		JLG						
									395.28	398.32	3.04	3.04		MS-SS	G	B	F	FF	F	WL		18			same as above, SS getting dirtier with depth	JLG						
78-79	398	401	3	3.00	100%	0.00	2.52	84%																		JLG						
									398.32	400.22	1.90	1.90		MS-SS	G	B	F	FF	F	WL	Fracture - 90	10			same as above	JLG						
									400.22	401.32	1.10	1.10		MS	G	D	F	FF	S	WL, PL		13			Hulcross Fm. Lmainated with minor SS and ST, minor bedding parallel fractures	JLG						
79-80	401	404	3	2.98	99%	-0.02	2.14	71%																		JLG						
									401.32	404.30	2.98	2.98		MS	G	D	F	FF	F	WL, PL	Fracture - 90	20			same as above	JLG						
80	404	407	3	3.03	101%	0.03	2.93	98%																		JLG						
									404.30	407.33	3.03	3.03		MS	G	D	F	FF	S	PL		10			same as above, minor polished fracture surfaces	JLG						
80-81	407	410	3	3.08	103%	0.08	3.08	103%																		JLG						
									407.33	410.41	3.08	3.08		MS-SS	G	B	F	FF	S	WL-PL		10			same as above, increased SS content	JLG						
81-82	410	413	3	3.01	100%	0.01	2.63	88%																		JLG						
									410.41	413.42	3.01	3.01		MS-SS	G	B	F	FF	F	WL-PL	Fractures 90	10			same as above (increased SS)	JLG						
82	413	416	3	3.00	100%	0.00	1.42	47%																		JLG						
									413.42	416.42	3.00	3.00		MS-SS	G	B	F	FF	F	WL-PL	Fractures 90	10			same as above, SS decreasing, fracture parallel to core axis runs length of core for lower 0.75m of interval	JLG						
82-83	416	419	3	2.88	96%	-0.12	2.64	88%																		JLG						
									416.42	419.30	2.88	2.88		MS	G	D	F	FF	F	PL		10			same as above, SS reduced to minor.	JLG						
83-84	419	422	3	3.12	104%	0.12	2.66	89%																		JLG						
									419.30	422.42	3.12	3.12		MS	G	D	F	FF	F	PL		10			same as above	JLG						
84-85	422	425	3	2.92	97%	-0.08	2.92	97%																		JLG						
									422.42	425.34	2.92	2.92		MS	G	D	F	FF	F	PL		12			same as above	JLG						
85	425	428	3	2.85	95%	-0.15	2.59	86%																		JLG						
									425.34	428.32	2.98	2.98		MS	G	D	F	FF	F	PL		11			same as above	JLG						
85-86	428	431	3	3.08	103%	0.08	2.40	80%																		JLG						
									428.32	431.38	3.06	3.06		MS	G	D	F	FF	F	PL	Fractures - 90	10			same as above, polished fracture surfaces parallel to bedding, fracture parparallel to coire axis with minor calcite infill	JLG						
86-87	431	434	3	2.97	99%	-0.03	2.57	86%																		JLG						
									431.38	434.35	2.97	2.97		MS	G	D	F	FF	S	PL		10			same as above, 10 cm soft light gray to white band mid-interval- calcified?	JLG						
87	434	437	3	2.93	98%	-0.07	2.24	75%																		JLG						
									434.35	437.28	2.93	2.93		MS	G	D	F	FF	F	PL		12			same as above, minor calcified lenses in lower 3cm of interval	JLG						
87-88	437	440	3	3.06	102%	0.06	2.50	83%																		JLG						
									437.28	440.34	3.06	3.06		MS	G	D	F	FF	F	PL		12			same as above	JLG						
88-89	440	443	3	2.97	99%	-0.03	2.09	70%																		JLG						
									440.34	443.31	2.97	2.97		MS	G	D	F	FF	F	PL		12			same as above	JLG						
89	443	446	3	2.93	98%	-0.07	2.51	84%																		JLG						
									443.31	446.24	2.93	2.93		MS	G	D	F	FF	F	PL		14			same as above, middle 1m of interval- slightly increased SS content	JLG						
89-90	446	449	3	3.00	100%	0.00	2.72	91%																		JLG						
									446.24	449.24	3.00	3.00		MS	G	D	F	FF	F	PL		14			same as above, rare band of calcified lenses, minor WL in sandier laminations	JLG						
90-91	449	452	3	3.08	103%	0.08	2.55	85%																		JLG						
									449.24	452.32	3.08	3.08		MS-SS	G	D	F	FF	F	PL		12			same as above, increased SS content	JLG						
91-92	452	455	3	2.91	97%	-0.09	2.67	89%																		JLG						

									452.32	455.23	2.91	2.91		MS-SS	G	D	F	FF	F	PL		10			same as above, rare calcified lenses	JLG					
92	455	458	3	3.05	102%	0.05	2.95	98%																		JLG					
									455.23	458.28	3.05	3.05		MS-SS	G	D	F	FF	F	PL		10			same as above	JLG					
92-93	458	461	3	2.95	98%	-0.05	2.87	96%																		JLG					
									458.28	461.23	2.95	2.95		MS	G	D	F	FF	F	PL		15			same as above, SS content reduced	JLG					
93-94	461	464	3	3.05	102%	0.05	2.99	100%																		JLG					
									461.23	464.28	3.05	3.05		MS-SS	G	D	F	FF	F	PL		15			same as above, increased SS content/laminations	JLG					
94	464	467	3	2.98	99%	-0.02	2.78	93%																		JLG					
									464.28	467.26	2.98	2.98		MS-SS	G	D	F	FF	F	PL		17			same as above	JLG					
94-95	467	470	3	3.01	100%	0.01	2.49	83%																		JLG					
									467.26	470.27	3.01	3.01		MS	G	D	F	FF	F	PL		8			same as above, SS content reduced, polished crabonacoues fracture surfaces	JLG					
95-96	470	473	3	2.98	99%	-0.02	2.31	77%																		JLG					
									470.27	473.25	2.98	2.98		MS	G	B	F	FF	F	PL, FU		15			same as above, to 15cm is filled with calcite veinlets and lenses, soft, light grey to white. Lower half of interval has higher SS and ST content, and rare calcified band	JLG					
96	473	476	3	3.07	102%	0.07	2.55	85%																		JLG					
									473.25	476.32	3.07	3.07		MS	G	D	F	FF	F	PL		20			same as above, laminated with ST and SS throughout, minor bedding parallel fractures with polished surfaces.	JLG					
96-97	476	479	3	3.02	101%	0.02	3.02	101%																		JLG					
									476.32	479.34	3.02	3.02		MS-ST	G	D	F	FF	F	PL		15			same as above, coarsening with depth, increased ST content.	JLG					
97-98	479	482	3	2.93	98%	-0.07	2.70	90%																		JLG					
									479.34	479.76	0.42	0.42		MS-ST	G	D	F	FF	F	PL		12			same as above	JLG					
									479.76	480.09	0.33	0.33		SS	G	A	F	FF	F	WL		12			minor MS laminations throughout, 0.5cm band of granules at lower contact. Hulcross-Gates contact	JLG					
									480.09	481.00	0.91	0.91		XM	G	D	F	FF	F						minor SS interbeds up to 5cm thick, rare pyrite grain	JLG					
									481.00	481.05	0.05	0.05		ZM	G-K	D	F	FF	B						with coaly bands, highly polished/sheared fracture surfaces	JLG					
									481.05	481.25	0.20	0.20		MS	G	D	F	FF	S						gradational lower contact	JLG					
									481.25	482.27	1.02	1.02		SS	G	E	F	FF	S	PD		15			rare MS + ST laminations	JLG					
98-99	482	485	3	3.03	101%	0.03	3.03	101%																		JLG					
									482.27	482.52	0.25	0.25		SS	G	L	F	FF	S			25				JLG					
									482.52	483.16	0.64	0.64		MS	G	D	F	FF	S			20			2cm coaly band mid-interval with 5mm pyrite blebs along upper and lower contact, sporadic mm-scale pyrite blebs throughout.	JLG					
									483.16	483.74	0.58	0.58		SS	G	L	F	FM	S			20				JLG					
									483.74	483.96	0.22	0.22		MS	G	B	F	FF	S						carbonaceous at lower contact	JLG					
									483.96	485.30	1.34	1.34		SS	G	E	F	FF	S	WL		40			minor MS and ST laminations, fracture at base with calcite and slickensides	JLG					
99	485	488	3	2.96	99%	-0.04	2.96	99%																		JLG					
									485.30	488.26	2.96	2.96		SS	G	A	F	FF	S	PD, PL, WL	Fracture-bedding parallel	20			same as above, polished fracture surfaces	JLG					
99-100	488	491	3	2.95	98%	-0.05	2.85	95%																		JLG					
									488.26	491.21	2.95	2.95		SS	G	A	F	MM	S	FU	Fracture 90	18			coarser than above, minor MS laminations and rare MS band, rare MS rip up clast, polished fracture surfaces	JLG					
100-101	491	494	3	3.01	100%	0.01	2.91	97%																		JLG					
									491.21	494.22	3.01	3.01		SS	G	A	F	MC	S	FU		25			same as above, grain size increasing with depth	JLG					
101	494	497	3	2.80	93%	-0.20	2.48	83%																		JLG					
									494.22	495.74	1.52	1.52		SS	G	A	F	CC	S			20			minor carbonaceous lenses thoroughout	JLG					
									495.74	495.79	0.05	0.05		ZH	B	D	F		F						dull, coaly	JLG					
									495.79	496.34	0.55	0.55		MS	G	D	F	FF	S						massive	JLG					044198
									496.34	497.02	0.68	0.68		CO	K	DM	F		F		Fracture 90				hard, minor polished fracture surfaces (bedding parallel)	JLG					
									497.02	497.24	0.22		0.22	CL																	
101-102	497	500	3	2.49	83%	-0.51	1.82	61%																		JLG					044199
									497.24	497.36	0.12	0.12		ZH	B	D	F	FF	F						dull, coaly bands	JLG					
									497.36	497.54	0.18	0.18		CO	K	DM	F		B						hard, blocky	JLG					

									497.54	498.35	0.81		0.81	CL																				
									498.35	498.43	0.08	0.08		XM	G	D	F	FF	B								coaly lenses (mm-scale), polished fracture surfaces	JLG						044200
									498.43	498.51	0.08	0.08		ZH	B	D	F	FF	F								dull, coaly bands	JLG						
									498.51	498.58	0.07	0.07		XM	G	D	F	FF	B								minor mm-scale coal lenses	JLG						
									498.58	498.63	0.05	0.05		ZH	B	D	F	FF	F								dull, coaly bands	JLG						
									498.63	499.10	0.47	0.47		MS	G	D	F	FF	S								minor ST, gradational contact	JLG						
									499.10	499.98	0.88	0.88		SS	G	E	F	FF	S	PD		12					minor MS laminations/bands	JLG						
									499.98	500.54	0.56	0.56		MS	G	D	F	FF	S								massive	JLG						
102-103	500	503	3	2.97	99%	-0.03	2.45	82%																				JLG						
									500.54	501.16	0.62	0.62		MS	G	D	F	FF	F								minor coal bands up to 1cm, increasingly carbonaceous toward base	JLG						
									501.16	501.22	0.06	0.06		CO	K	DM	F		B								hard	JLG						
									501.22	501.56	0.34	0.34		MS	G	D	F	FF	S								carbonaceous at upper contact, grading into ST below.	JLG						
									501.56	503.51	1.95	1.95		ST	G	B	F	FF	S		Fracture 20	20					minor SS interbeds up to 15cm, fracture surface polished with slickensides	JLG						
103	503	506	3	2.96	99%	-0.04	2.78	93%																				JLG						
									503.51	505.60	2.09	2.09		ST	G	B	F	FF	S								same as above	JLG						
									505.60	506.15	0.55	0.55		MS	G	D	F	FF	S								minor mm-scale carbonaceous lenses	JLG						
									506.15	506.40	0.25	0.25		SS	G	E	F	FF	S			15					minor MS and ST	JLG						
									506.40	506.47	0.07	0.07		SS	G	L	F	MM	S								rare MS rip up clasts	JLG						
103-104	506	509	3	3.00	100%	0.00	3.00	100%																				JLG						
									506.47	508.73	2.26	2.26		SS	G	A	F	FC	S			30					same as above, minor XB, rare mm-scale coaly lenses, rare calcite veinlet, minor MS/dirty sand interbed in lower half of interval	JLG						
									508.73	509.47	0.74	0.74		MS	G	D	F	FF	S								slightly carbonaceous toward base, rare mm-scale coaly lense	JLG						
104-105	509	512	3	2.90	97%	-0.10	2.38	79%																				JLG						
									509.47	509.98	0.51	0.51		MS	G	D	F	FF	S								same as above	JLG						
									509.98	510.20	0.22	0.22		ST	G	E	F	FF	S								minor MS	JLG						
									510.20	510.84	0.64	0.64		SS	G	A	F	FM	S								minor MS laminations	JLG						
									510.84	511.24	0.40	0.40		ST	G	E	F	FF	S								minor MS	JLG						
									511.24	511.79	0.55	0.55		XM	G	D	F	FF	F								minor coal lenses up to 2cm	JLG						
									511.79	512.12	0.33	0.33		CO	K	DD	F		F								hard, blocky, shaly at lower contact	JLG						
									512.12	512.37	0.25	0.25		XM	G	D	F	FF	F-B								coal bands up to 2cm, pyrite on fracture surface in coal band	JLG						
105	512	515	3	2.84	95%	-0.16	2.54	85%																				JLG						
									512.37	512.47	0.10	0.10		XM	G	D	F	FF	F-B								same as above	JLG						
									512.47	512.94	0.47	0.47		ST	G	E	F	FF	S								gradational between MS and SS	JLG						
									512.94	513.91	0.97	0.97		SS	G	A	F	FF	S								minor ST and MS laminations	JLG						
									513.91	514.23	0.32	0.32		ST	G	E	F	FF	S								rare mm-scale calcite veinlet	JLG						
									514.23	514.28	0.05	0.05		CO	K	DD	F		F								hard	JLG						
									514.28	514.38	0.10	0.10		XM	G	D	F	FF	S								minor mm-scale coaly lenses	JLG						
									514.38	515.21	0.83	0.83		SS	G	A	F	FM	S								minor ST interbed at base of interval	JLG						
105-106	515	518	3	3.08	103%	0.08	3.01	100%																				JLG						
									515.21	518.29	3.08	3.08		SS	G	L	F	FF	S			13					minor MS and ST interbeds, 5cm brecciated band at 515.5m with calcite infill, massive SS between interbed zones	JLG						
106-107	518	521	3	2.97	99%	-0.03	2.97	99%																				JLG						
									518.29	521.26	2.97	2.97		SS	G	L	F	FF	S			17					same as above (no breccia), minor bedding parallel fractures	JLG						
107	521	524	3	3.07	102%	0.07	3.05	102%																				JLG						
									521.26	524.33	3.07	3.07		SS	G	L	F	FF	S			9					same as above	JLG						
108	524	527	3	2.96	99%	-0.04	2.96	99%																				JLG						
									524.33	527.29	2.96	2.96		SS	G	L	F	FF	S								massive, sporadic mm-cm scale band of granules	JLG						

108-109	527	530	3	3.02	101%	0.02	3.02	101%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										</
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									565.92	565.96	0.04	0.04		ZM	G	D	F	FF	F							coaly laminations	JLG						
									565.96	566.04	0.08	0.08		CO	K	DM	F		F							hard, minor cleating on bright bands	JLG	D3 Seam					Not Sampled
117-118	566	569	3	2.89	96%	-0.11	2.63	88%																		JLG							
									566.04	566.16	0.12	0.12		CO	K	DM	F		F							same as above	JLG						
									566.16	566.98	0.82	0.82		MS	G	D	F	FF	F							minor carbonaceous bands and sporadic mm-scale coaly lenses	JLG						
									566.98	568.93	1.95	1.95		ST	G	E	F	FF	S	PD		7				minor laminations of MS	JLG						
118	569	572	3	3.07	102%	0.07	2.79	93%																		JLG							
									568.93	569.69	0.76	0.76		ST	G	E	F	FF	S	PD						same as above	JLG						
									569.69	569.94	0.25	0.25		MS	G	D	F	FF	S							minor ST	JLG						
									569.94	572.00	2.06	2.06		SS	G	A	F	FF	S	PD						minor laminations of ST and MS, rare mm-scale coaly lense	JLG						
118-119	572	575	3	2.98	99%	-0.02	2.76	92%																		JLG							
									572.00	574.64	2.64	2.64		ST	G	E	F	FF	S	PD						gradational from interval above, minor MS and SS, rare mm-scale coaly lense	JLG						
									574.64	574.98	0.34	0.34		MS	G	B	F	FF	S							gradational contact, minor ST	JLG						
119-120	575	578	3	2.88	96%	-0.12	2.05	68%																		JLG							
									574.98	576.20	1.22	1.22		ST	G	E	F	FF	S	PD		10				same as ST above, minor MS interbeds	JLG					044204	
									576.20	576.36	0.16	0.16		MS	G	D	F	FF	F							minor carbonaceous content, polished/sheared on fracture surfaces, carbonaceous and sheared at lower contact	JLG	E Seam					
									576.36	576.44	0.08	0.08		CO	K	DD	F		F							hard, polished fracture surfaces	JLG						
									576.44	576.47	0.03	0.03		XM	G	D	F	FF	F							rock band	JLG						
									576.47	577.35	0.88	0.88		CO	K	DM	F		S/B							hard, competent, lower 5cm is broken/crushed	JLG						
									577.35	577.55	0.20	0.20		MS	G	D	F	FF	B			Fractures 90				minor calcite staining on fracture surfaces	JLG						
									577.55	577.61	0.06		0.06	RL																			
									577.61	577.93	0.32	0.32		CO	K	DM	F		B			Fracture 70				hard, blocky, lower half of interval is broken	JLG						
									577.93	577.99	0.06		0.06	CL																			
120-121	578	581	3	2.84	95%	-0.16	1.86	62%																		JLG							
									577.99	579.50	1.51	1.51		CO	K	DM	F		F			Fracture 70				hard, generally competent, minor cleating in bright bands	JLG						
									579.50	579.60	0.10		0.10	CL																			
									579.60	579.83	0.23	0.23		SS	G	E	F	FF	S							silty SS, minor mm-scale coaly lenses	JLG						
									579.83	580.93	1.10	1.10		SS	G	A	F	FM	S	PL						minor MS and coaly laminations, decreasing with depth	JLG						
121	581	584	3	3.08	103%	0.08	2.93	98%																		JLG							
									580.93	584.01	3.08	3.08		SS	G	A	F	FM	S	PD		20				same as above, rare MS band, rare coaly lenses	JLG						
121-122	584	587	3	2.97	99%	-0.03	2.97	99%																		JLG							
									584.01	586.98	2.97	2.97		SS	G	A	F	FM	S	PD						same as above, sporadic band with MS rip-up clasts, rare band with granule CG (1cm), sporadic coaly lenses	JLG						
122-123	587	590	3	2.85	95%	-0.15	2.56	85%																		JLG							
									586.98	588.01	1.03	1.03		SS	G	A	F	FM	S	PD						same as above	JLG						
									588.01	588.17	0.16	0.16		CG	G	A	F	GG	S	MS, FU						sub-rounded clasts, SS matrix, rare mm-scale coaly lense	JLG						
									588.17	588.70	0.53	0.53		SS	G	A	F	FM	S	PD						same as SS above, XM rip up clast up to 10cm, 5cm grnaule CG band in top 20cm, rare calcite veinlet	JLG						
									588.70	589.83	1.13	1.13		XM	G	D	F	FF	F							minor coaly lenses/bands up to 0.5cm thick	JLG						
123	590	593	3	3.08	103%	0.08	3.08	103%																		JLG							
									589.83	589.93	0.10	0.10		MS	G	D	F	FF	S							rare coaly lense, top 2cm broken core	JLG						
									589.93	592.88	2.95	2.95		SS	G	A	F	FM	S			15				minor MS laminations near top and base of interval , rare coaly lense	JLG						
123-124	593	596	3	2.91	97%	-0.09	1.72	57%																		JLG							
									592.88	592.90	0.02	0.02		SS	G	A	F	FM	S							same as above	JLG						
									592.90	593.61	0.71	0.71		MS	G	D	F	FF	F							rare mm-scale coaly lense, coaly and polished on fracture surfaces	JLG						
									593.61	594.79	1.18	1.18		XM	G	D	F	FF	F							minor coaly lenses throughout, up to 0.5cm	JLG						
									594.79	594.83	0.04	0.04		CO	K	DM	F		F							friable, minor cleating, minor shearing	JLG						
									594.83	595.50	0.67	0.67		MS	G	D	F	FF	F							minor ST laminations	JLG						

									595.50	595.65	0.15	0.15		XM	G	D	F	FF	F						coal bands up to 0.5cm	JLG						044210	
									595.65	595.79	0.14	0.14		CO	K	DD	F		B						very hard, blocky, dull	JLG	F Seam					044211	
									595.79	595.93	0.14		0.14	CL																			
124-125	596	599	3	2.23	74%	-0.77	0.00	0%																		JLG							
									595.79	595.80	0.01	0.01		CO	K	DD	F		S						same as above	JLG							
									595.80	595.85	0.05	0.05		ST	G	E	F	FF	S						minor mm-scale coaly lenses	JLG							
									595.85	598.02	2.17	2.17		CO	K	DB	F		B		Fractures - 90				hard with soft, friable bands,and crushed zones, can hear gasses cracking in the coal, highly fractured, fractures parallel to core axis throughout, caused difficulty drilling and tube blocked-likely result fo fracturing. Recovery is estimated because spread out a lot when moved from tube to box. Too friable to put back together.	JLG						044212, 044215	
									598.02	598.79	0.77		0.77	CL																			
125	599	602	3	2.71	90%	-0.29	1.75	58%																		JLG							
									598.79	599.08	0.29		0.29	CL																			
									599.07	599.30	0.23	0.23		CO	K	DM	F		F						hard, blocky, minor shearing on fracture surfaces	JLG							
									599.30	601.78	2.48	2.48		XM	G	D	F	FF	F						minor coaly lenses throughout, sporadic MS interbeds, polisehd fracture surfaces	JLG						044216	
125-126	602	605	3	2.93	98%	-0.07	2.27	76%																		JLG							
									601.78	602.95	1.17	1.17		XM	G	D	F	FF	F						same as above, 3cm soft friable band in up 30cm	JLG							
									602.95	603.29	0.34	0.34		ST	G	B	F	FF	S						minor MS laminations, gradational upper contact	JLG							
									603.29	603.38	0.09	0.09		SS	G	A	F	FF	S	CV					MS laminations	JLG							
									603.38	603.97	0.59	0.59		XM	G	D	F	FF	F						coaly lenses throughout	JLG							
									603.97	604.07	0.10	0.10		ZM	G	DD	F	FF	F						coaly bands	JLG							
									604.07	604.21	0.14	0.14		XM	G	D	F	FF	F						coaly lenses throughout	JLG							
									604.21	604.71	0.50	0.50		ST	G	E	F	FF	S	CV					MS laminations	JLG							
126-127	605	608	3	2.92	97%	-0.08	1.98	66%																		JLG							
									604.71	605.45	0.74	0.74		ST	G	E	F	FF	F			17			same as above, polished coaly fracture surfaces	JLG							
									605.45	606.10	0.65	0.65		MS	G	D	F	FF	F						polished fracture surfaces, rare coaly lense	JLG							
									606.10	606.60	0.50	0.50		XM	G	D	F	FF	F						minor coaly lenses throughout	JLG						044217	
									606.60	606.71	0.11	0.11		CO	K	DD	F		F						hard, competent, minor shearing on fracture surfaces	JLG	F2 Seam					044218	
									606.71	606.76	0.05	0.05		XM	G	D	F	FF	S									JLG					
									606.76	606.88	0.12	0.12		CO	K	DD	F		F						hard, lower 2cm crushed, polished/sheared fracture surface	JLG							
									606.88	606.89	0.01	0.01		XM	G	D	F	FF	S						rock band	JLG							
									606.89	606.95	0.06	0.06		CO	K	DD	F		F						rare bright band, hard, sheared onfracture surface	JLG							
									606.95	607.04	0.09	0.09		XM	G	D	F	FF	F						sheared on fracture surfaces	JLG							
									607.04	607.11	0.07	0.07		CO	K	DD	F		F						friable, sheared, hard bands	JLG							
									607.11	607.14	0.03	0.03		XM	G	D	F	FF	F						rock band	JLG							
									607.14	607.16	0.02	0.02		CO	K	DD	F		F						friable coal band	JLG							
									607.16	607.18	0.02	0.02		XM	G	D	F	FF	F						rock band	JLG							
									607.18	607.60	0.42	0.42		CO	K	DM	F		F-S						hard, comtetent, sheared on fracture surfaces	JLG							
									607.60	607.67	0.07	0.07		ZM	K	D	F	FF	F						rocky, very hard	JLG					044220		
									607.67	607.75	0.08	0.08		XM	G	D	F	FF	F							JLG							
127	608	611	3	3.05	102%	0.05	2.96	99%																		JLG							
									607.75	607.89	0.14	0.14		XM	G	D	F	FF	F						same as above	JLG							
									607.89	608.19	0.30	0.30		MS	G	B	F	FF	S						gradational	JLG							
									608.19	609.71	1.52	1.52		ST	G	E	F	FF	S						gradational, minor MS and SS content	JLG							
									609.71	610.80	1.09	1.09		SS	G	A	F	FF	S	PD					silty	JLG							
127-128	611	614	3	3.02	101%	0.02	2.99	100%																		JLG							
									610.80	613.82	3.02	3.02		SS	G	A	F	FF	S	PL		14			less ST than above, minor MS laminations	JLG							

128-129	614	617	3	2.92	97%	-0.08	2.71	90%																						
									613.82	615.18	1.36	1.36		SS	G	A	F	FF	S	PL		15			same as above, rare XM band, and 5mm coal lense	JLG				
									615.18	615.96	0.78	0.78		SS	G	L	F	MC	S	PL		15			MS rip up clasts throughout lower half of interval, rare coaly lense	JLG				
									615.96	616.38	0.42	0.42		SS	G	E	F	FF	S						masive, MS band and coaly lense in lower 15cm of interval	JLG				
									616.38	616.75	0.37	0.37		SS	G	L	F	MC	S	PL, XB		15			same as MC SS above	JLG				
129	617	620	3	3.01	100%	0.01	2.84	95%																						
									616.75	619.76	3.01	3.01		SS	G	A	F	CC	S	PL, XB		8			rare coaly lenses- coalified plant material?	JLG				
130	620	623	3	3.02	101%	0.02	2.92	97%																						
									619.76	622.78	3.02	3.02		SS	G	A	F	CC	S	PL, XB		20			same as above, minor MM sand interbeds, sporadic coal lenses	JLG				
130-131	623	626	3	2.99	100%	-0.01	2.93	98%																						
									622.78	625.77	2.99	2.99		SS	G	A	F	MC	S	PL, XB		20, 12			same as above, rare MS rip up clast	JLG				
131-132	626	629	3	3.07	102%	0.07	3.07	102%																						
									625.77	628.60	2.83	2.84		SS	G	A	F	MC	S	PL, XB		15			same as above	JLG				
									628.60	628.83	0.23	0.23		SS	G	L	F	FM	S	PD		8			rare coaly lense at upper contact	JLG				
132	629	632	3	3.06	102%	0.06	3.06	102%																						
									628.83	631.83	3.00	3.06		SS	G	L	F	FM	S	PL, XB		10			same as above, minor interbeds with MS laminations, rare MS rip up clasts	JLG				
132-133	632	635	3	2.94	98%	-0.06	2.94	98%																						
									631.83	632.50	0.67	0.67		SS	G	L	F	FM	S	PL, XB		8			same as above	JLG				
									632.50	634.13	1.63	1.63		SS	G	A	F	CC	S	PL, XB		10			sporadic coaly lenses, sporadic granule CG bands	JLG				
									634.13	634.77	0.64	0.64		ST	G	E	F	FF	S						minor MS rip up clasts throughout, rare sandy lenses	JLG				
133-134	635	638	3	3.09	103%	0.09	2.85	95%																						
									634.77	636.22	1.45	1.54		SS	G	L	F	MM	S	PL, XB		12			rare coaly lense, rare MS rup up clasts	JLG				
									636.22	637.02	0.80	0.80		CG	G	A	F	GG	S	BS					interbedded with minor SS bands, sporadic coaly lenses	JLG				
									637.02	637.77	0.75	0.75		MS	G	D	F	FF	S						rare coaly lense, minor carbonaceous content	JLG				
134	638	641	3	2.86	95%	-0.14	1.58	53%																						
									637.77	640.63	2.86	2.86		XM	G	D	F	FF	F						coal bands throughout, up to 1.5cm thick, sheared on fracture surfaces	JLG				
134-135	641	644	3	2.99	100%	-0.01	2.80	93%																						
									640.63	643.30	2.67	2.67		MS	G	B	F	FF	S			15			rare XM bands, up to 10cm, rare coaly lense	JLG				
									643.30	643.62	0.32	0.32		ST	G	E	F	FF	S						minor MS laminations	JLG				
135-136	644	647	3	3.01	100%	0.01	3.01	100%																						
									643.62	645.64	2.02	2.03		ST	G	E	F	FF	S			8			same as above, MS decreasing with depth, rare SS lense	JLG				
									645.64	646.62	0.98	0.98		SS	G	L	F	FF	S			8			minor MS and ST laminations	JLG				
136	647	650	3	2.98	99%	-0.02	2.98	99%																						
									646.62	649.60	2.98	2.98		SS	G	L	F	FF	S	PD, PL		6			same as above	JLG				
136-137	650	653	3	2.89	96%	-0.11	2.89	96%																						
									649.60	652.49	2.89	2.89		SS	G	L	F	FF	S	PD, PL		10			same as above	JLG				
137-138	653	656	3	3.02	101%	0.02	3.02	101%																						
									652.49	653.64	1.15	1.16		SS	G	A	F	FF	S	PD, PL		10			same as above, MS and ST increasing with depth- gradational lower contact	JLG				
									653.64	655.49	1.85	1.86		ST	G	E	F	FF	S	PL		10			minor MS and ST laminations	JLG				
138	656	659	3	2.80	93%	-0.20	1.58	53%																						
									655.49	656.20	0.71	0.71		MS	G	B	F	FF	F						rare silty lamination, rare coaly lense	JLG				
									656.20	656.35	0.15	0.15		CO	K	DD	F		C						sheared and broken, fissile, minor hard bands	JLG				
									656.35	657.33	0.98	0.98		MS	G	D	F	FF	F						minor coaly lenses, up to 1cm	JLG				044221
									657.33	657.63	0.30	0.30		CO	K	DM	F		F						hard, sheared on fracture surfaces, minor hard-rocky band	JLG				
									657.63	657.67	0.04	0.04		XM	G	D	F	FF	F						coaly land polished on fracture surfaces	JLG				
									657.67	657.77	0.10	0.10		CO	K	DM	F		F						hard, fissile, sheared on fracture surfaces	JLG				

									657.77	657.83	0.06	0.06		MS	G	D	F	FF	S							minor coaly lenses	JLG	J					044223	
									657.83	658.01	0.18	0.18		CO	K	DD	F		F							hard, blocky, sheared on fracture surfaces	JLG							
									658.01	658.20	0.19		0.19	CL																				
									658.20	658.30	0.10	0.10		ZM	K	DD	F	FF	S							very hard, rocky, dense	JLG							
									658.30	658.35	0.05	0.05		MS	G	D	F	FF	F							polished and coaly on fracture surfaces	JLG							
									658.35	658.44	0.09	0.09		ZM	K	DD	F	FF	S							very hard, rocky, dense	JLG							
									658.44	658.49	0.05	0.05		ST	G	E	F	FF	B								JLG							
139	659	662	3	2.91	97%	-0.09	1.41	47%																			JLG							
									658.49	658.54	0.05	0.05		ST	G	E	F	FF	B							same as above	JLG							
									658.54	658.71	0.17	0.17		ZM	K	DD	F	FF	F							coal bands up to 2cm, rare sandy lense	JLG							
									658.71	658.85	0.14	0.14		XM	G	D	F	FF	F								JLG							
									658.85	661.42	2.57	2.57		CO	K	DM	F		F						hard, farctured with competent zones, minor fractures parallel to cre axis, rare fracture with rusty calcite slickensides, crackling with gasses, rare polished fracture surface	JLG						044224-044230		
									661.42	661.51	0.09		0.09	CL																				
139-140	662	665	3	2.15	72%	-0.85	0.93	31%																			JLG							
									661.51	662.65	1.14	1.14		CO	K	DM	F		F-B							hard, crushed, blocky bands, minor shearing	JLG							
									662.65	663.50	0.85		0.85	CL																				
									663.50	664.51	1.01	1.01		MS	G	D	F	FF	F							minor coal bands up to 5cm thick in lower 20cm of interval	JLG					044231		
140	665	668	3	3.02	101%	0.02	2.21	74%																			JLG							
									664.51	666.40	1.89	1.89		MS-XM	G	D	F	FF	F							same as above, interbedded with carbonaceous bands, and coal bands up to 2cm throughout	JLG							
									666.40	667.41	1.01	1.01		ST	G	E	F	FF	F	WL	Fracture - 50	8			minor MS laminations, sporadic coal bands up to 4cm, rare mm-scale calcite veinlets	JLG								
									667.41	667.50	0.09	0.09		XM	G	D	F	FF	F						minor coaly lenses and calicte veinlets	JLG								
									667.50	667.52	0.02	0.02		CO	K	DD	F		C						sheared, fissile and broken	JLG	K1							
141	668	671	3	2.45	82%	-0.55	1.86	62%																		JLG								
									667.52	667.77	0.25	0.25		CO	K	DD	F		B		fracture 90				blocky, hard fragments, crushed bands, banded, minor shearing	JLG								
									667.77	668.32	0.55		0.55	CL																				
									668.32	668.67	0.35	0.35		MS	G	D	F	FF	F						minor carbonaceous bands, highly sheared on fracture surfaces, sporadic coaly lenses	JLG								
									668.67	669.03	0.36	0.36		SS	G	A	F	FF	S						minor silty band, sporadic mm-scae coaly lenses	JLG			Not logged Hole Blocked					
									669.03	669.33	0.30	0.30		MS	G	D	F	FF	S						rare mm-scale coaly lense	JLG								
									669.33	669.95	0.62	0.62		ST	G	E	F	FF	S			15		minor SS and MS laminations	JLG									
									669.95	670.52	0.57	0.57		XM	G	D	F	FF	F					minor coaly nands up to 2cm, rare calcite veinlet, one fracture with sheared, crushed carbonaceous material	JLG									
141-142	671	674	3	2.65	88%	-0.35	1.24	41%																		JLG								
									670.52	670.85	0.33	0.33		CO	K	DD	F		B		Fracture 90				hard, blocky, minor rock band MS(3cm) within rubble, minor cleating	JLG	K2							
									670.85	671.62	0.77	0.77		MS	G	D	F	FF	S						rare coaly lense, massive	JLG					044232			
									671.62	671.65	0.03	0.03		XM	G	D	F	FF	S						coaly lenses throughout	JLG								
									671.65	672.92	1.27	1.27		CO	K	DM	F		F		Fracture 85				hard, mostly competent and solid, cleated, minor polish on fracture surfaces, banded	JLG	K3				044233-044234			
									672.92	673.02	0.10	0.10		XM	G	D	F	FF	F					coaly lenses throughout, up to 5mm, polished and sheared on fracture surfaces	JLG									
									673.02	673.17	0.15	0.15		MS	G	D	F	FF	S	FU				grading to ST	JLG									
142	674	676.23	2.23	2.23	100%	0.00	2.15	96%																	a few feet of core left in the tube while rods are stuck in the hole	JLG					044235			
									673.17	673.66	0.49	0.49		SS	G	A	F	FM	S			10		minor MS and ST laminations	JLG									
									673.66	674.32	0.66	0.66		ST	G	E	F	FF	S					minor MS laminations	JLG									
									674.32	675.40	1.08	1.08		MS	G	D	F	FF	S					silty, rare lamination	JLG									