Report On

1972 Diamond Drilling and Trenching Program

Nordenskiold Coal Area, Yukon

Arjay Kirker Resources Ltd.

Yukon Territorial Coal Licenses
10 ( SE Quarter - NTS 115H/8)
11 ( NE Quarter - NTS 115H/8)
12 ( SW Quarter - NTS 105E/5)

M.P. Phillips

January, 1973
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**Appendix**

Table 1 - Results of Coal Analysis - Birtley Engineering (Canada) Ltd., Calgary, Alberta

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Log Hole 1, 2, 3, 4, 5, 6

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Figure 5 - Cross section DDH 2, Scale 1"=20 feet
Figure 6 - Cross-section DDH 3, Scale 1"=20 feet
Figure 7 - Cross-section DDH's 4 & 5, Scale 1"=20 feet
Figure 8 - Cross-section DDH 6, Scale 1"=20 feet
Figure 9 - Cross-section A-B, Scale 1"=20 feet
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             1"=100 feet horizontal
SUMMARY AND RECOMMENDATIONS

Proven reserves totalling 2.8 million tons of bituminous coal were outlined by diamond drilling on the Cairnes seam in the Nordenskiold River area, southern Yukon during 1972. These reserves occur within Yukon Territorial Coal License 10, issued to Arjay Kirker Resources Ltd. The average analyses of the two drill sections is 31.3 per cent ash, 2.0 per cent residual moisture, 19.7 per cent volatile matter, 47.1 per cent fixed carbon, 0.48 per cent sulphur with a colorific value of 9,400 BTU/lb. The seam varies in width from 15 to 30 feet and dips 70°. The potential for increasing the reserves appears to be excellent, but no further work should be carried out until markets for the coal can be found. A number of narrow seams above and below the Cairnes Seam were also intersected.
INTRODUCTION

During the period August 18 to October 21, 1972, Arjay Kirker Resources Ltd. constructed access roads, performed minor bulldozer trenching and diamond drilled six core holes, totalling 3435 feet, on coal leases in the Nordenskiold River area, southern Yukon. The program was managed by R.J. Kirker, P. Geo. of Calgary, and was supervised by R. Allan from August 18 to September 14 and by the writer M.P. Phillips, of Archer, Cathro & Associates Ltd. from September 14 to October 21. P. Dyson, P. Geo., consulting coal geologist of Calgary made two visits to the property.

PROPERTY

The property consists of Territorial Coal Licenses 10, 11, and 12, which form an L-shaped block with a total area of 675 square miles. The licences were issued to Arjay Kirker Resources Ltd. on April 9, 1970 and expire on April 9, 1973. Most of the 1972 program was conducted on License 10.

LOCATION AND ACCESS

The coal licenses are located fifty miles northwest of Whitehorse and cover the following NTS map-sheets:

License 10 - southeast quarter - 115H/8
11 - northeast quarter - 115H/8
12 - southwest quarter - 105E/5

Whitehorse is located at the terminus of the 120 mile narrow gauge White Pass & Yukon Route railway from the port of Skagway, Alaska.

The closest all-weather road is the Klondike Highway between Whitehorse
and Dawson City, which crosses the northeast side of the licenses.

The nearest settlement is Braeburn at M.P. 55 on the Klondike Highway. It has lodging, eating and gas facilities and a 5000 foot gravel airstrip. The Whitehorse-Faro power line passes through Braeburn.

Access to the property is provided by a seventeen mile trail suitable for four-wheel drive vehicle only. The trail follows the old Whitehorse-Dawson Road for the first thirteen miles. A new four mile road was built to the property in 1970 and was upgraded in 1972. Water crossings are made at the north end of Braeburn Lake, at Joe Creek and in two places over Klusha Creek. None of the crossings are difficult except for the last one on the Klusha Creek, where culverts were installed in 1972.

TOPOGRAPHY

The Licenses lie within the Yukon Plateau. Relief is moderate, consisting of rolling hills and broad flat valleys. Elevations varying from about 2500 feet to 4000 feet in the eastern and southern part of the licenses. In the northwest part of the licenses, along the Nordenskiold River, relief exceeds 5000 feet and is more rugged.

Glacial till exceeding 100 feet in thickness forms terraces along the valleys below the 5000 foot elevation. In places, deep ravines and creeks have cut through the glacial till and exposed bedrock. Above the 3000 foot contour glacial till cover is thin and bedrock is more common.

Permafrost conditions exist below spruce and pine covered north facing slopes. Grass covered south facing slopes often have a light cover of poplar.
Forest fires have burnt over large parts of the licenses at frequent intervals.

**HISTORY**

In 1907, D.D. Cairnes of the Geological Survey of Canada mapped and sampled three coal seams which outcrop in an east-trending ravine located 1.25 miles north of Division Mountain. This ravine has been named Teslin Creek. Another coal outcrop was located by Cairnes at the base of Red Ridge, three miles northwest of Teslin Creek. Cairnes was examining the coal potential for a possible smelter on the Whitehorse Copper Belt. Old claim posts found in the area probably date from this period.

During 1970 and 1971, Arjay Kirker Resources Ltd. carried out bulldozer trenching, mapping, sampling and test I.P. surveys over the coal outcrops on Teslin Creek located on License No. 10. Reconnaissance geological mapping was carried out on the remainder of the coal licenses. Clearing and upgrading of stream crossings along the old Dawson-Whitehorse road from Braeburn was carried out to provide access. Details of this work for this period is covered in reports by Joseph F. Hlavay, P.Eng. September 1970 and R.J. Kirker, February, 1971.

**GEOLOGY**

**Regional**

Interbedded sandstone and shales containing coal seams and minor pebble conglomerate of the Jurassic Laberge Series are disconformably overlain by chert and volcanic cobble conglomerate of the lower Cretaceous Tantalus Formation. Cretaceous Hutshi Group lavas and breccias cover the sedimentary rocks and form sills and dykes in the Laberge Series. Laberge and Tantalus
rocks were folded in Mid Cretaceous time along a northwest-southeast trending axis. Axial folds are steep or slightly overturned.

**Teslin Creek**

Outcrops of Laberge Series along Teslin Creek occur on the northeast limb of a syncline. Beds strike about N50°W and dip about 70° to the southwest. A thirty foot wide coal seam, (the Cairnes Seam) is exposed in Teslin Creek and occurs a minimum of 1500 feet stratigraphically below the base of the Tantalus Formation. The Red Ridge coal outcrops, three miles northwest of Teslin Creek, are only 800 feet below the base of the Tantalus Formation.

Dark green dykes and sills of Hutshi Group andesite cut the Laberge Series. These rocks are aphanitic to fine grained with bleached borders and chilled contacts and contain scattered fine grained phenocrysts of chloritized hornblende and feldspar. Some bands of andesite contain scattered medium-sized quartz amygdales. In places, narrow quartz and carbonate filled fractures are present. The andesite forms sills up to fifty feet wide along incompetent shale and coal horizons. Black xenoliths of coal are sometimes present in the sills.

Drilling cut a 1900 foot stratigraphic section of Laberge Series sediments, extending 400 feet below and 1500 feet above the Cairnes coal seam. The following is a description of the rock types intersected in the drill holes:
Laberge Series

**Sandstone** - is moderately indurated, light grey, coarse grained to gritty textured, commonly crossbedded, and has a high feldspar content. Shale bands, and casts and coal partings are common. Narrow pebble bands or loosely packed conglomerates are rare.

**Shale** - is mostly purple colored, massive, and arenaceous. The rock could probably be called a siltstone because of its arenaceous and non fissile nature. Soft, black, fissile, carbonaceous shale is common only in the coal seams. Strippy bands of interlaminated purple shale and light colored calcareous sandstone are common. A 200 foot band was intersected in Hole 2.

**Coal** - is dull black and often contains partings and narrow bands of carbonaceous shale and black shale.

**Cairnes Seam**

At Teslin Creek, the seam is 30 feet thick (locally bulges to 40 feet) and contains two narrow, purple, arenaceous shale bands. Southeast of Teslin Creek, trenching only partially exposed bedrock and did not cut the seam. The swing in seam strike and minor faulting in trenches immediately northeast of Teslin Creek may reflect a northeast-southwest fault along the creek. Northwest of Teslin Creek, at 16N, a trench shows the seam has narrowed to about 24 feet in thickness. Another trench to the northwest did not intersect bedrock. Hole 6 shows that bedrock is covered by some 100 feet of glacial till.

In Hole 1 the seam has a true thickness of 31.6 feet. However
in Hole 6, 1500 feet to the northwest, the seam has separated into two beds, the upper 1.9 feet thick and the lower 15.4 feet thick, separated by 11.4 feet of interbedded shale and sandstone. Northwest of Teslin Creek, the seam gradually decreases in width. Downdip, a facies change or local disconformity has reduced the width by about half. Southwest of Teslin Creek a fault may have displaced the seam.

Footwall Seam

The footwall seam occurs 25 stratigraphically feet below the Cairnes Seam. Based on drill results this seam appears to have a consistent true thickness of 6.5 feet. In Hole 1, an eleven foot andesite sill has displaced it 36 feet from the Cairnes seam.

Hanging Wall Seams

A total of 27 seams, called HW1 to HW27, were intersected in drill holes above the Cairnes Seam. Their thickness varies from 0.6 to 8.2 feet. Tentative correlation of these seams between holes indicates the individual seams vary widely downdip.

CORE LOGGING AND SAMPLING

All core was transported to Whitehorse by truck where it was logged, sampled and stored at the Core Library of the Yukon Resident Geologist, Department of Indian Affairs and Northern Development. Logs for the holes are included in the Appendix of this report. Whole core samples were collected on all seams. Samples from Hole 1 and parts of Hole 2 were collected in the field and the remainder of the holes were sampled after the core was moved to Whitehorse. Samples of interest were sent to Birtley Engineering (Canada) Ltd. of Calgary, Alberta for analysis.
Other samples which were not of immediate interest were given to the Yukon Resident Geologist. They were then forwarded to Dr. P.A. Hacquebard, coal petrologist with the Geological Survey of Canada, who plans to carry out reflectance rank determination tests on all samples and proximate analysis on the thicker coal sections. Sample pulps have also been sent from Birtley Engineering to Dr. Hacquebard for stratigraphic correlation.

**COAL ANALYSIS**

Results of Birtley Engineering's analysis, shown in Table 1, indicate that the Cairnes and FW Seams fall into the bituminous groups according to the A.S.T.M. rank classifications.

**DIAMOND DRILLING**

Drill contractor and camp operator was E. Caron Diamond Drilling of Whitehorse, which used a Longyear '38' drill machine and ancillary equipment. In October 1972, an additional machine was added to the program but was never used due to the lack of drillers. Coring charges were $8.25 per foot for NQ size and $9.25 per foot for HQ size. Other work was charged at cost plus rates. A D7 bulldozer was used to move the drill. Six wire line holes totalling 3435 feet were completed during the period August 28 to October 21, 1972. Only one hole (Hole 4) was stopped by caving ground conditions before it reached the planned depth.

Holes 1 to 4, inclusive, and the top 434 feet of hole 5 were drilled NQ size. The balance of Hole 5 was drilled BQ size. Hole 6, the only hole with a thick section of overburden, was cased to bedrock using a tricone bit and cored NQ size in bedrock.
Until freeze-up on October 5, 1972, drill water was supplied from Teslin Creek through waterline. After freeze-up, a 1000 gallon water truck was used to transport water from the Nordenskiold River to the drill sites. A drilling mud solution was used as a circulation medium. Drilling mud from the hole was run into settling tanks and then recirculated. Various additives were added to reduce mud losses in fractures and stabilize caving ground conditions. Fresh mud was prepared when needed.

Core recovery varied from 98 to 100 per cent but was slightly lower in the wide, soft friable coal.

Acid tests were only carried out in Hole 5 and 6. The test was unsuccessful in Hole 6. No change in the hole dip was found in Hole 5.

In the early stages of the drill program delays were encountered by mechanical breakdowns in the drill machine, metal failure at the connections of the HQ core rod, and improper anchoring of the machine. Delays at the end of the program were mainly due to stuck rods in caving fractured ground. The use of drilling mud, large core size and a five foot core barrel were responsible for the excellent core recovery.

**TRENCHING**

A D7E bulldozer with hydraulic blade and ripper was used to carry out limited trenching on Red Ridge and along the Cairnes seam. Four long shallow trenches were cut over a distance of 2500 feet on the southwest flank of Red Ridge. Bedrock was not exposed in any of the trenches. Three trenches were cut to locate the Cairnes Seam; two northwest and another southwest of Teslin Creek.
ROAD CONSTRUCTION

In August 1972 a 4-mile trail suitable for four-wheel drive vehicles was constructed from the old Whitehorse-Dawson road to the campsite one mile northwest of Teslin Creek. Roads to the drilling sites were built as needed and in September a 2 1/2 mile road was constructed to the southeast flank of Red Ridge.

SURVEYING & LINECUTTING

White, Hosford and Impey, of Whitehorse cut, chained and levelled 4.01 miles of baseline and 4.01 miles of crosslines between September 26 and October 13. Baseline stations at 400 foot intervals and crossline stations at 200 foot intervals were established with wooden hubs and aluminum tags showing the grid co-ordinates. Drill holes and trenches were tied into the grid.

This grid was tied into a government survey monument on Division Mountain. Co-ordinates are based on the Territorial Plane Co-ordinate System and elevations are referred to sea level datum.

COAL RESERVES

Figure 10 shows the method in which the coal reserves were calculated. Strike length totals 2500 feet, 1500 feet between the two holes and a projection of 500 feet southeast of Hole 1 and 500 feet northwest of Hole 6. The reserves have been broken down into three blocks with thicknesses of 30, 20 and 15 feet to show the narrowing of the Cairnes seam from Hole 1 to Hole 6. The down dip component of the seam has been assumed at 1250 feet, or one half the strike length. The reserves total 2.8 million tons and have been classed as proven because of the good continuity of the seam. Surface drilling at 1500 to 2000 foot intervals is common practice in blocking out reserves.
in British Columbia and Alberta. The potential for increasing reserves along strike is excellent.

Respectfully submitted,

ARCHER, CATHRO & ASSOCIATES LTD.
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<th>% Volatile Matter</th>
<th>% Fixed Carbon</th>
<th>% Sulphur</th>
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**NOTE:** A.S.T.M. Rank Classification on Mineral Matter Free Basis. Coal with 69 per cent or more Fixed Carbon on dry mmf basis classified according to Fixed Carbon.
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</table>
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD.
NORDENSKIOLD COAL AREA

COORDINATES 22,321,488.55 N, 188,321.8 E
ELEVATION 2,558.7
DIP 45°
AZIMUTH 040°
SCALE 1.5 in. = 10.0 ft.

OVERBURDEN - GLACIAL TILL + WEATHERED BEDROCK

LABERGE SERIES - GREY, COARSE GRAINED WITH OCCASIONAL PARTINGS OF COAL BLACK SHALE

5.0 - SHALE - STRONGLY ARENACEOUS, LAMINATED

8.7 - SHALE - VARIES FROM A LIGHT GREY, LAMINATED FINE GRAINED ARGILLACEOUS SANDSTONE TO A DARK, LAMINATED ARENACEOUS SHALE WITH OCCASIONAL BANDS OF BLACK MASSIVE SHALE WITH COAL PARTINGS.

10.6 - 45° - SANDSTONE

14.5 - SHALE - MASSIVE ARENACEOUS

33.3 - 70° - SANDSTONE

34.0 - 70° - SHALE - ARENACEOUS, LAMINATED

35.0 - 70° - SANDSTONE

38.0 - 60° - SHALE - MASSIVE ARENACEOUS

40.2 - 55° - SANDSTONE

51.0 - 55° - SHALE - BLACK, ARENACEOUS, LAMINATED MASSIVE

47.0 - 70° - SANDSTONE

48.4 - 65° - SHALE - BLACK MASSIVE ARENACEOUS TOWARDS BOTTOM CONTACT, MINOR COAL PARTINGS

52.3 - 65° - SANDSTONE - MINOR IRREGULAR NARROW ARGILLACEOUS BANDS

55.5 - 55° - SHALE - BLACK, MASSIVE

54.5 - SHALE - BLACK, MASSIVE.
LABERGE SERIES

25.0-70° COAL PARTINGS COMMON
12.5° CHALK, CONCAVE INTERBEDDED
12.1° SHALE, ARENAECOUS, UPPER PORTION LAMINATED, UPPER PORTION GRAINGED INTO BLACK MASSIVE WITH MINERAL ARENAECOUS BANDS

128.4-127.3 SHALE

131.3 SANDSTONE - CLEAN, FINE-MEDIUM GRAINED WITH COAL PARTINGS

140.0 SANDSTONE - BANDY, FINE GRAINED, ARENAECOUS, LAMINATED

143.5-55° GEOTRANSMIONAL SHALE - BLACK MASSIVE, COAL PARTINGS

150.5-60° SHALE - ARENAECOUS, LAMINATED

152.6 SHALE - ARENAECOUS, LAMINATED, STRONGLY ARENAECOUS, LAMINATED WITH BANDING OF FINE GRAINED SANDSTONE TO A DARK ARENAECOUS, SLIGHTLY LAMINATED

173.1-60° SHALE - BLACK, MASSIVE

173.2-20° SANDSTONE - PARTINGS, SHALE COMMON

174.0 SHALE - BLACK, MASSIVE
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES:

DIP:

HOE NO.
PAGE 4 OF 10

180.0
SHALE
LABERGE SERIES
SANDSTONE - WEAK TO MODERATELY ARGILLACEOUS
FAINT BANCS STRONGLY ARGILLACEOUS

186.5 - 185.5
SHALE - BLACK, MASSIVE

185.5 - 185.0
SANDSTONE - EAST SHALE COMMON

185.0 - 184.0
SHALE - VARIES FROM LIGHT COLORED, STRONGLY
ARENACEOUS, WEAKLY LAMINATED TO
WEAKLY ARENACEOUS MASSIVE, TO
DARK MASSIVE, BANDS UPTO 0.5 FT
OF SANDSTONE INCORPORATED COAL - 0.2 FT
AT TOP CONTACT

184.0 - 183.0
SANDSTONE - COARSE GRAINED

183.0 - 182.5
SANDSTONE - FINE GRAINED, WITH NARROW BANDS
AND PARTINGS OF SHALE, ARGILLACEOUS LAMINATED SANDSTONE

182.5 - 182.0
SHALE - BLACK, SLIGHT ARENACEOUS, WITH OCCASIONAL
LAMINATIONS & NARROW BANDS OF FINE GRAINED, ARGILLACEOUS
SLIGHTLY LAMINATED SANDSTONE, OCCASIONAL
PARTINGS OF COAL

210.0 - 206.0
SANDSTONE - DARK, FINE MEDIUM GRAINED, MODERATELY
ARENACEOUS, WITH PARTINGS, S, BANDS
OF BLACK ARENACEOUS, LAMINATED SHALE

216.0
SANDSTONE - LIGHT COLORED, ARGILLACEOUS, WEAKLY LAMINATED
BECOMING MORE LAMINATED, GRADING TO SHALE TOWARDS

216.0
SHALE - BLACK, MASSIVE, WEAK LAMINATED ARENACEOUS

216.0 - 214.0
SANDSTONE - MEDIUM GRAY, ARGILLACEOUS PARTINGS

234.6 - 230.0
SHALE - BLACK MASSIVE

230.0 - 226.0
SANDSTONE - MEDIUM GREY, ARGILLACEOUS PARTINGS

231.6
SANDSTONE - STRING BLACK, ARGILLACEOUS

232.7 - 230.0
CONTACT 14' FALLING TO BEDDING

HUITSHI GROUP - ANDESITE - DARK GREEN
AMYANITHIC WITH ABUNDANT TO 2MM
CHLORITE AND FELDSPAR SPECKLING
### Drill Hole Log

**Arjay Kirker Resources Ltd**
**Division: Mountain Coal Prospect**

**HOLE NO. 1**
**Pages of 10**

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>252.0</td>
<td>Shale - Black Massive, Highly Broken</td>
</tr>
<tr>
<td>255.0</td>
<td></td>
</tr>
<tr>
<td>258.0</td>
<td>Shale - Black Massive</td>
</tr>
<tr>
<td>258.5</td>
<td></td>
</tr>
<tr>
<td>271.5</td>
<td>Contact Gneiss - 60°</td>
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<tr>
<td></td>
<td>Sandstone - 0.3 ft Shale to Contact</td>
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<tr>
<td>273.0</td>
<td>Shale - Black Massive, Highly Broken</td>
</tr>
<tr>
<td></td>
<td>Coal Partings Occasionally Present</td>
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<tr>
<td>280.0</td>
<td>Coal Bands to 0.2 ft Common</td>
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<tr>
<td>281.7</td>
<td>Shale - Arenaceous, Weakly Laminated</td>
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<tr>
<td>289.5</td>
<td>Sandstone - Light-Band Banded Grey, Medium Grained, Black, Speckled With Partings of Coal</td>
</tr>
</tbody>
</table>
DRILL HOLE LOG
ARJAY KIEKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES:  
DIP:  

HOLE NO. 1
PAGE 8 OF 10

LABELING SERIES

305.0 - GREY BANDS BECOME COMMON

CORELESS - 3.0 FT

- SHALE - BLACK MASSIVE WITH COAL PARTINGS

218.0 - 40°
- SANDSTONE - GREY, IN PLACERS, BANDED

323.8 - 50°
- SHALE - ALENACEOUS, LAMINATED

330.5
- COAL - SHALE BANDS COMMON

332.0
- SHALE WITH COAL PARTINGS

335.0 - 50°
- SHALE - WEAK-MODERATELY LAMINATED ALENACEOUS

352.0
- SHALE - BLACK MASSIVE

342.6
- COAL

349.0
- SANDSTONE - GREY MEDIUM GRAIN, BLACK SPECKLED AND WEAKLY BANDED

591.0 - 60°
- SHALE - ALENACEOUS, MASSIVE - WEAKLY LAMINATED OCCASIONALLY BLACK MASSIVE
SHALE BANDS UP TO 0.3 FT GREY, WEAK, LAMINATED, FINE GRAINED SANDSTONE, HINGE COAL PARTINGS.
392.0 - COAL PARTINGS BECOME COMMON, PEBBLE BANDS ABSENT, FINER, GRAINED
395.0 - SHALE, BLACK, MASSIVE

395.5 - SHALE, MODERATELY STRONGLY ARENACEOUS, WEAKLY BANDED
401.7 - SEDIMENTAL, FINE- GRAINED, Banded, with narrow arenaceous, arcilaceous, limy, lenses, with thinning of coal.
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<th>Depth (ft)</th>
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<tr>
<td>422.0-45°</td>
<td>Coal</td>
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<tr>
<td>423.8</td>
<td>Shale: Black, moderate- strongly arenaceous, laminated with occasional to 0.8 ft sandstone band grades to black masses in lower 2 ft.</td>
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<tr>
<td>432.4-76°</td>
<td>Sandstone</td>
</tr>
<tr>
<td>433.8-60°</td>
<td>Sandstone: arenaceous, laminated. Shale: Black, masses with coal bands to 0.8 ft.</td>
</tr>
<tr>
<td>437.2-60°</td>
<td>Sandstone: gritty, fine grained to certy with arenaceous banding and occasional narrow black shale bands. Sandstone: y-bedded.</td>
</tr>
<tr>
<td>449.0-70°</td>
<td>Sandstone: arenaceous, laminated, masses black towards bottom contact.</td>
</tr>
<tr>
<td>454.3-60°</td>
<td>Sandstone</td>
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<tr>
<td>457.0-55°</td>
<td>Sandstone: arenaceous, laminated, masses black towards bottom contact.</td>
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<tr>
<td>463.0</td>
<td>Sandstone: light gray, massive.</td>
</tr>
<tr>
<td>463.0-65°</td>
<td>Black, masses</td>
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<tr>
<td>465.0-60°</td>
<td>Shale: Black, masses.</td>
</tr>
<tr>
<td>474.0-63°</td>
<td>Shale: Arenaceous, laminated.</td>
</tr>
<tr>
<td>470.2-70°</td>
<td>Shale: Arenaceous, laminated.</td>
</tr>
<tr>
<td>472.0-70°</td>
<td>-</td>
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<tr>
<td>474.1</td>
<td>Shale: Black, slightly laminated.</td>
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<tr>
<td>475.0</td>
<td>Sandstone: dark, strong arenaceous, black, speckled.</td>
</tr>
<tr>
<td>476.0</td>
<td>Sandstone: dark, strong arenaceous, black, speckled.</td>
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</tbody>
</table>
| 477.0     | Sandstone: arenite, 0.8 ft. Shale: Black, masses to arenaceous, laminated with bands up to 0.6 ft no coal - highly bituminous.
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES: DIP:

HOLE NO 1
PAGE 3 OF 10

SHALE - HIGHLY BROKEN
DIP:
482.3 - 48°
ORIENTATION

LABERGE SERIES
HUTSHI GROUP - ANDESITE - PALE
GREEN, CHLORITE SPECKLED WITH LENSES. BANDS OF SHALE

142° - 70°
170° - PLATTED
493 - 65° IRREGULAR
491.3 - 65° PARALLEL BEDDING

495.4 - 55°
SHALE - INDIURATY - COAL BANDS TO 1 FT. COMMON

LABERGE SERIES
SOLO
502.0

CAIRNES SEAM - COAL

635.7
SHALE - BLACK, MASCUG, ARCELONG
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES: DIP:

HOLE NO 1
PAGE 10 OF 10

LABERGE SERIES

540.0 - 60° - SANDSTONE - LIGHT - DARK BANDED TO LAMINATED
ARCSILLACEOUS, FINE GRAINED
SANDSTONE

550.0 - MEASIA ZONE - 0.2 FT.

553.0 - IRREGULAR CONTACT - ORIENTATION PARALLEL TO BEDDING

HUTSHI GROUP - ANDESITE
DARK GREEN WITH FINE QUARTZ;
FELDSPAR, PHENOCYSTS, STEEP
DIPPING QUARTZ, CARBONATE, FELDSPAR
FILLED FRACTURES COMMON

565.0 - CHILLED - ORIENTATION?

SANDSTONE - COARSE GRAINED, GYTT
WITH BLACK SPECULUS

572.0 - 45° - SHALE - MASSIVE, STRONGLY ALENACEOUS
WITH SANDSTONE BANDS

574.0 - 70° - GRAADATIONAL
SANDSTONE - AS PREVIOUS

578.0 - 45° - COAL

585.0 - SHALE - BLACK MASSIVE

590.0 - SHALE - LAMINATED, ARENASCEOUS

587.5 - GRAADATIONAL
SANDSTONE - LIGHT GREY, FINE GRAINED, GYTT
WEAK - MODERATELY ARCSILLACEOUS, BANDED

600.0 - END OF HOLE
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD.
NORDENSKJOLD COAL AREA

COORDINATES 22°32'41.0"N 188°7'12.6"E
ELEVATION 2608.7
DIP -50°
AZIMUTH 040°
SCALE 1/5 in. = 10.0 ft.

OVERBURDEN - GLACIAL TILL & WEATHERED BEDROCK

LABERGE SERIES
SHALE - PURPLE, BEDDED - MASSIVE, WEAKLY ARENACEOUS

SHALE - PURPLE, ARENACEOUS, MASSIVE WITH MANY LIGHT COLORED STRIPPY PARTING TO NARROW BANDS OF VERY FINE GRAINED SANDSTONE

FAULT? - HIGHLY FRACTURED & WEATHERED

HIGHLY WEATHERED

SHALE - PURPLE STRIPPY

SHALE - PURPLE, STRIPPY

SHALE - INTERLAMINATED PURPLE SANDY SHALE, LIGHT GREY, FINE GRAINED

SANDSTONE
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES 1
DIP -

HOLE NO 2
PAGE 2 OF 10

LABERGE SERIES
SANDSTONE - GREY, FINE - MEDIUM GRAINED
BLACK SHALE SPNECKLED

SHALE - BANDS OF PURPLE - GREY
INTERLAMINATED SHALE.

40.5 -
PAINTS & NARROW BANDS OF SHALE

74.5 - 70°
SHALE - BLACK ABNORMAL WITH WEAK
INTERLAMINATIONS OF GREY
FINE GRAINED SANDSTONE

101.0 -
SANDSTONE - FRAGMENTS IN NARROW
BANDS OF SHALE

104.0 - 60° -
BANDS FROM 0.140 0.5 FT OF SANDSTONE BECOME
COMMON.

113.0 -
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES:          DIP:

PAGE 3 OF 10

LABERGE SERIES

SHALE

124.5-56° — —
SANDSTONE — GREY, FINE TO MEDIUM
GRAINED WITH CONFORMED
FOLDED NARROW BANDS
OF INTERLAMINATED BLACK
SHALE & GREY, FINELY GRAINED
SANDSTONE

PARTINGS LEANING UP TO 0.3 FT
OF GREY FINE GRAINED SANDSTONE
COMMON.

132.0-70° — —

SHALE — BLACK, ABSENCE OIL WITH WELL
SPACED LAMINATIONS (OCASIONAL MARKED)
BANDS TO 0.2 FT OF GREY FINE GRAINED
SANDSTONE. LAMINATION AT 0.2 FT
INTERVAL

141.5 — —

LAMINATIONS & BANDS UP TO 0.3 FT
WIDTH BECOME COMMON.

141.0 — —
DRILL HOLE LOG.
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES: DIP -

HOLE NO 2
PAGES OF 10

LABERGE SERIES - SHALE
BLACK ARENACEOUS SHALE WITH
LAMINATIONS OF GREY, VERY FINE
GRAINED SANDSTONE, AU 1 TT PER
0.1 FT. OCCASIONAL BANDE TO 0.1 FT.

225.0 - 60° BANDS UP TO 0.3 FT OF
GREY FINE GRAINED
SANDSTONE BECOME COMMON

260.0 - 60° - SANDSTONE - FINE GRAINED, GRADING INTO GRETY
260.5 - 70° SHALE LAMINATED 2. SANDSTONE - FINE GRAINED
INTERBEDDED.

273.0 - 60° - SANDSTONE - FINE MEDIUM GRAINED

2700 - 60° - SANDSTONE - 0.6 FT GREY, FINE GRAINED

285.0 - 60° BANDS OF GREY, FINE GRAINED
SANDSTONE UP TO 0.2 FT 'PRESHT'

285.4 - 60° - SANDSTONE - GREY, FINE GRAINED WITH
MINOR BANDS TO 0.2 FT. PARTINGS OF BLACK ARENACEOUS

293.0 - - CRADIAL SHALE - - - -
SANDSTONE - GREY, MASSIVE, MEDIUM TO
COARSE GRAINED

296.0 - CASTS OF BLACK LAMINATED SHALE COMMON

320.3 - SANDSTONE - FINE GRAINED, FINE CHIPS OF SHALE AND COAL.
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES:

HOLE NO. 2
PAGE 6 OF 10

LABERGE SERIES

SANDSTONE - GREY, MEDIUM GRAINED, PARTINGS OF SHALE & MEDIUM GRAINED
COMMON

300.3 - SPLAY - INTERLAMINATED
SANDSTONE - FINE GRAINED, PARTINGS OF SHALE & MEDIUM GRAINED
COMMON

303.5 - SPLAY - CASTEE SHALE
COMMON

305.0 - SPLAY - LAMINATED

310.0 - SANDSTONE - FINE GRAINED, PARTINGS LENSES OF SHALE COMMON

311.5 - SHALE - LAMINATED WITH BANDS UP TO 1 FT. OF GREY FINE GRAINED SANDSTONE, SHALE CAST COMMON
NEAR TOP CONTACT

315.0-60" - SANDSTONE - SHALE CASTS COMMON

SANDSTONE - GREY FINE GRAINED

320.0 - GRADATIONAL
SANDSTONE - GREY, MEDIUM GRAINED, CARDANATE, FILLED FRACTURES

325.0 -60" SHALE & SANDSTONE INTERBEDDED TO FED UPTO 0.5 FT

330.0 -60" SANDSTONE - GREY, FINE - MEDIUM GRAINED, OCCASIONAL SHALE CAST

333.0 - SHALE - MASSIVE, AERUGINOUS

334.0 - KREULACE -
SANDSTONE - GREY, MEDIUM GRAINED, LARGE CIST OF LAMINATED, SHALE COMMON

339.0 -60" SHALE - SANDSTONE INTERLAMINATED GREY, FINE GRAINED SANDSTONE & INTERLAMINATED GREY, FINE GRAINED SANDSTONE & BLACK ARENAUS
SHALE - BANDS 0.1 TO 1 FT wide

358.5 - SHALE - BLACK AERUGINOUS
WITH FINE GREY SANDSTONE

358.1 - LAMINATIONS

358.1 - SANDSTONE - GREY, FINE GRAINED, WITH PARTINGS OF SHALE & MINOR COAL

358.1 SHALE
DRILL HOLE LOG
ABJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES:

HOLE NO 2
PAGES 8 OF 10

HUTSHI GROUP - ANDESITE

430.5 - 70°
SANDSTONE - GREY, SLIGHTLY HOLOCORETLY ARCTILEAGOUS, FINE-MEDIUM GRAINED, MINOR TO 0.05 FT SHALE FRAGMENTS

443.5 - 60° SHALE - 0.2 FT

445 - 60° --
SANDSTONE - DARK GREY, FINE GRAINED IN PLACES STRONGLY ARCTILEAGOUS GRADING TO NARROW INTERLAMINATED SHALE, OCCASIONAL CASTS OF SHALE

454 - 60° --
SANDSTONE - GREY, FINE-MEDIUM GRAINED

461 - 60° --
SANDSTONE - GREY, COARSE GRAINED, WITH NUMEROUS ANGULAR QUARTZ SHALE PEPPLES TO 9½ INCH

470 - 65°
SANDSTONE - DARK, ARCTILEAGOUS, FINE GRAINED WITH FAINT SHALE PARTINGS AND WISPS INTERLAMINATED IN NARROW BANDS OF BLACK SHALE

479.2 - 70°
SHELL - BLACK, ARCTILEAGOUS, WITH PARTING OF FINE GRAINED SANDSTONE
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
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<tbody>
<tr>
<td>480.4</td>
<td>Shale - Grey, fine-grained, with minor grit bands up to 1 ft</td>
</tr>
<tr>
<td>480.0</td>
<td>Shale - Interbedded fine-grained sandstone</td>
</tr>
<tr>
<td>488.7</td>
<td>Sandstone - Dark brown, fine-grained, strongly argillaceous, with narrow bands of shale partings and shale chips</td>
</tr>
<tr>
<td>490.6</td>
<td>Shale - Black, arenaceous with laminations and occasional narrow bands up to 0.2 ft of grey, fine-grained sandstone</td>
</tr>
<tr>
<td>518.0</td>
<td>Bands up to 0.5 ft of grey, fine-grained sandstone become common</td>
</tr>
<tr>
<td>514.0</td>
<td>Sandstone - Grey, medium-grained, gritty with scattered, angular pebbles from 1/4&quot; to 3/4&quot; width</td>
</tr>
<tr>
<td>512.5</td>
<td>Gradational - Sandstone - Dark grey, fine-grained with spaced partings of black shale in center</td>
</tr>
<tr>
<td>522.5</td>
<td>Gradational - Sandstone - Grey, medium-grained, gritty with scattered, angular pebbles from 1/4&quot; to 3/4&quot; width</td>
</tr>
<tr>
<td>526.5</td>
<td>Gradational - Sandstone - Grey, medium-grained, gritty with scattered, angular pebbles from 1/4&quot; to 3/4&quot; width</td>
</tr>
<tr>
<td>534.2</td>
<td>Shale - Laminated</td>
</tr>
<tr>
<td>535.0</td>
<td>Shale - Black, laminated, arenaceous with bands up to 0.5 ft of fine, medium-grained quartzite</td>
</tr>
<tr>
<td>536.2</td>
<td>Shale - Black, laminated, arenaceous with bands up to 0.5 ft of fine, medium-grained quartzite</td>
</tr>
<tr>
<td>530.0</td>
<td>Sandstone</td>
</tr>
</tbody>
</table>
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES

LABERGE SERIES

SANDSTONE - BROWN, FINE GRAINED, OCCASIONALLY MEDIUM GRAINED, OFTEN WITH PARTINGS OF BLACK SHALE & COAL

552.0 - TRANSITION

554.2 - SANDSTONE - GREY, FINE-COARSE GRAINED UPTO 2 FT ARGILLACEOUS GRIT BANDS

571.8 - GRADATIONAL -
GRIT DARK, STRONGLY ARGILLACEOUS, COARSE GRAINED SANDSTONE WITH ABUNDANT 1/4 ANGULAR QUARTZ PEBBLES

574.2 - GRADATIONAL -

575.5 - SANDSTONE WITH COAL & SHALE PARTINGS

576.0 - SANDSTONE - GREY, STRONGLY ARGILLACEOUS, COARSE GRAINED, GRAINED-GRITTY WITH STRONG TEXTURING & WEATHERING

586.0 - SHALE - BLACK INTERLAMINATED WITH FINE GRAINED SANDSTONE

587.4 - SANDSTONE - FINE GRAINED, WITH OCCASIONAL BLACK SHALE PARTING

592.2 - SANDSTONE - MEDIUM-COARSE GRAINED WITH SCATTER PEBBLES TO 0.1 FT

595.3 - SANDSTONE - FINE GRAINED, WITH 0.1 TO 0.5 FT BANDS WITH COAL & SHALE LAMINATIONS

620.4 - END OF HOLE
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD.
NORDENSKJOOLD COAL AREA

COORDINATES 22,321,783.18N, -150,435.16E
ELEVATION 2,166.3
DIP -50°
AZIMUTH 040°
SCALE 1.5in=10.0ft

CORE SIZE HQ 0-400FT
HOLE STARTED 14 SEPTEMBER, 1972
HOLE COMPLETED 21, SEPTEMBER, 1972
LOGGED BY M.P. PHILLIPS

OVERBUDDEN - GLACIAL TILL & WEATHERED BEDROCK

120
SHALE - PURPLE, MASSIVE, ARENACEOUS

LABERGE SERIES

150-70°
SANDSTONE - FINE GRAINED, LIGHTLY BANDED

180-70°
SHALE - PURPLE, MASSIVE, ARENACEOUS, LIGHT COLORED, LAMINATIONS

215
SANDSTONE - GREY, MASSIVE, FINE- MEDIUM GRAINED

310-70°
SHALE - BLACK, HIGHLY BROKEN

323 - CONTACT LOST

HUTSHI GROUP - ANDESITE - PALE GREEN, APHANITIC, SCATTERED UP TO 5MM QUARTZ FILLED AMEDEALES, HIGHLY WEATHERED

58T-17° ORIENTATION

310 - SHALE - BLACK, MASSIVE, 0.3 FT SANDSTONE

410 - ON BOTTOM CONTACT

423 - SANDSTONE - STRONGLY ARENACEOUS WITH BANDS OF PURPLE SHALE

440-70° -

460 - SHALE - BLACK MASSIVE

475 - SANDSTONE

520
COAL - SHINY, BLACK, 13 FT RECOVERY

570-70°
SANDSTONE - FINE- MEDIUM GRAINED WITH NARROW BANDS
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES: DIP:
HOE NO 3
PAGE 2 OF 10

LABERGE SERIES

21.0 — SANDSTONE - COARSE GRAINED - GRITY
MASSIVE - SLIGHTLY BANDED

145-70 —

COAL

61.5 - 70 —

SANDSTONE - FINE-MEDIUM GRAINED WITH DARK NARROW
ARENACEOUS BANDS
SANDSTONE - BLACK, MASSIVE, COAL AND SANDSTONE PARTING

57.0 —

SANDSTONE - MEDIUM - COARSE, PAINT ARENACEOUS BANDS

55.0 —

SANDSTONE

57.0 —

SANDSTONE - ARENACEOUS, WEAKLY LAMINATED BANDED

58.1 - 70 —

SANDSTONE - COARSE GRAINED

100.7 —

COAL

102.6 —

SANDSTONE - SHALE - ALTERNATING BANDS, PARTING UP TO 10 FT., AVERAGE 0.3 FT.

109.2 - 70 —

COAL

109.6 —

SANDSTONE - ARENACEOUS, WEAKLY LAMINATED

113.3 —

COAL - 0.3 FT.

149.4 —

SHALE
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES:  

DIP:  

HOLE NO. 3  
PAGE 3 OF 10

LABERGE SERIES

1210.50 - SANDSTONE - 0.3 FT
  SHALE - LAMINATED, ARENAECOUS, OCCASIONAL COAL PARTING,
  OFTEN LIGHT COLORED, STRONGLY ARENAECOUS BANDS

1240 - SANDSTONE - 0.8 FT

1341 -  
  COAL

1345 - SHALE - 0.5

1373 -  

1426 - 65° - SANDSTONE - MEDIUM - COARSE GRAINED, WEAKLY
  BANDED

1470 - SHALE - ARENAECOUS, MODERATE - STRONGLY BANDED

1548 -  
  SANDSTONE - STRONG Y-BEDDING, BANDED

1570 - SHALE - ARENAECOUS, WEAKLY LAMINATED

1610 -  
  SANDSTONE - FINE GRAINED, OFTEN TO
  ARENAECOUS SHALE

1625 -  

1685 - SANDSTONE - FINE GRAINED, OFTEN
  BLENDING TO NARROW BANDS OF STRONGLY
  ARENAECOUS SHALE

1735 -  

1790 -  SANDSTONE
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
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<tbody>
<tr>
<td>133.7</td>
<td>SANDSTONE - GREY, FINE, MEDIUM-GRAINED. LAMELLAR SERIES. SHELL, MODERATELY, AMEABILIZED, WITH OCCASIONAL NARROW BANDS OF PARTINGS OF SHALE.</td>
</tr>
<tr>
<td>181.1</td>
<td>SANDSTONE - GREY, MEDIUM-GRAINED.</td>
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<tr>
<td>194.1</td>
<td>SHALE - ARENALIZED LAMINATED, WITH NARROW BANDS OF COAL AND SANDSTONE.</td>
</tr>
<tr>
<td>197.0</td>
<td>SANDSTONE.</td>
</tr>
<tr>
<td>200.0</td>
<td>SHALE - BLACK, MASSIVE, IN PLACES WEAKLY ARENALIZED, LAMINATED.</td>
</tr>
<tr>
<td>202.5</td>
<td>SANDSTONE.</td>
</tr>
<tr>
<td>205.0</td>
<td>PARTINGS NARROW SHALE - ARENALIZED LAMINATED, OPEP BANDS OF COAL, STRONGLY ARENALIZED.</td>
</tr>
<tr>
<td>207.7</td>
<td>SANDSTONE - DUNE, STRONGLY, AREALIZED.</td>
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<tr>
<td>212.4</td>
<td>SHALE - ARENALIZED LAMINATED, OF SET COAL, TOP CONTACT.</td>
</tr>
<tr>
<td>212.7</td>
<td>SANDSTONE.</td>
</tr>
<tr>
<td>215.8</td>
<td>SHALE - LAMINATED, AREALIZED.</td>
</tr>
<tr>
<td>218.8</td>
<td>SANDSTONE - BLAULINI, MODERATELY, AREALIZED.</td>
</tr>
<tr>
<td>218.9</td>
<td>SHALE - ARENALIZED, WEAK - MODERATELY AREALIZED, WEAKLY, MODERATELY, LAMINATED, RARE PARTING OF COAL.</td>
</tr>
<tr>
<td>224.8</td>
<td>SANDSTONE - GREGITY.</td>
</tr>
<tr>
<td>230.3</td>
<td>-</td>
</tr>
<tr>
<td>237.0</td>
<td>SANDSTONE - STRONGLY AREALIZED.</td>
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</tbody>
</table>
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION: MOUNTAIN COAL PROSPECT
COORDINATES:

HOLE NO 3
PAGE 5 OF 10

DIP: 45°

240.0 - SANDSTONE - WEAKLY AERCILLACEOUS BANDED

242.0 - SHALE - WEAKLY ARENACEOUS LAMINATED

245.6 - SANDSTONE - PARTINGS SHALE COMMON

247.8 - SHALE - ARENACEOUS, WEAKLY LAMINATED
MINOR NARROW BANDS OF SANDSTONE

255.2 - SANDSTONE - LIGHT GREY MEDIUM GREY
MINOR PARTINGS & BANDS OF SHALE

259.6 - SHALE - ARENACEOUS, GRADING TO AERCILLACEOUS
SANDSTONE, WEAKLY LAMINATED

262.8 - SANDSTONE - GREY, WEAKLY ARENACEOUS
MINOR SHALE BANDS

266.8 - SHALE - LIGHT COLORED, STRONGLY ARENACEOUS
GRADING INTO AERCILLACEOUS LAMINATED

269.0 - SANDSTONE - GREY COARSE GRANULE, GRAITY
WITH AERCILLACEOUS BANDS & NARROW
BANDS & PARTINGS OF COAL

276.8 - SHALE - ARENACEOUS LAMINATED

279.0 - SANDSTONE - AERCILLACEOUS, PARTING OF
SHALE & COAL

282.0 - SHALE - BLACK, PARTINGS OF COAL

283.8 - SHALE - ARENACEOUS, LAMINATED, OCASIONAL
PARTINGS OF SANDSTONES

285.4 - SHALE - ARENACEOUS, LAMINATED

287.0 - PARTING OF ARENACEOUS SHALE
COMMON

293.8 - SHALE - ARENACEOUS, WEAKLY LAMINATED

296.8 - SANDSTONE - LIGHT GREY, GRAITY
DRILL HOLE LOG
AJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES

HOLOE NO 3
PAGE 6 OF 10

DIP: 65°

SANDSTONE

LABERGE SERIES

201.3 - SHALE - DARK, ARENACEOUS, MASSIVE, GRADING TO LIGHT STRONGLY ARENACEOUS LAMINATED, OCCASIONAL NARROW BANDS OF SANDSTONE, PARTING OF COAL, COMMON.

311.9 - SANDSTONE

312.6 - SHALE - MASSIVE, ARENACEOUS, BLACK, WHITE, SPECKLED

314.2 -

322.0 - SHALE - ARENACEOUS, MASSIVE - WEAKLY, LAMINATED, KOAL PARTINGS, COMMON

325.8 - SANDSTONE - COARSE GRAINED, GRADATION FINE GRAINED - ARENACEOUS TOWARDS BOTTOM

339.8 - SHALE - DARK COLORED, WEAK TO LIGHT STRONGLY ARENACEOUS, LAMINATED, OCCASIONAL, KOAL PARTINGS, IRREGULAR, NARROW SANDSTONE BANDS

339.6 - SANDSTONE - BLACK SHALE PARTINGS, COMMON

340.1 -

346.0 - SANDSTONE - LIGHT GREY, FINE GRAINED

347.7 - SHALE - LIGHT STRONGLY ARENACEOUS, DARK, WEAK, ARENACEOUS, LAMINATED
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD
DIVISION: MOUNTAIN COAL PROSPECT

COORDINATES:

DIP -

HOLE NO 3

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LABERGE SERIES

SHALE - SEE PAGE 6

362.0 - - SANDSTONE - LIGHT GREY, FINE-
MEDIUM GRAINED

367.8 - - SHALE - BLACK, SLIGHTLY ARENAECOUS TO
LIGHT COLORED, STRONGLY ARENAECOUS
LAMINATED SHALE WITH PARTINGS
OF SANDSTONE, OCC. GRADING TO IRREGULAR

371.3 - - SANDSTONE - GREY, FINE GRAINED
ARCULAECOUS SANDSTONE
BANDS

372.5 - - SANDSTONE

375.6 - -

377.0 - -

380.8 - - SANDSTONE - LIGHT GREY, MEDIUM GRAINED
COAL PARTINGS COMMON

396.2-60 SHALE - BLACK, MASSIVE WITH COAL PARTINGS

397.5-GRADATIONAL -

- SHALE - ARENAECOUS, WEAKLY LAMINATED - MASSIVE

404.7 - - SANDSTONE - MEDIUM-COARSE GRAINED WITH
SHALE PARTINGS

411.3 - - SHALE - MASSIVE, WEAKLY ARENAECOUS TO
STRONGLY ARENAECOUS, MASSIVE, WEAKLY LAMINATED
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES:

HOLE NO: 3

COARSE GRAINED, OCCASIONAL SHALE PARTINGS

SANDSTONE - MASSIVE, MEDIUM-COARSE

SHALE - DARK, MODERATELY STRONGLY ARENACEOUS
LAMINATED SHALE

TRANSITION - FINE-GRANULAR, ARZILLACEOUS SANDSTONE

SANDSTONE - WEAKLY TO STRONGLY ARZILLACEOUS, LAMINATED
WITH NARROW BANDS OF BLACK SHALE

SANDSTONE - DARK MASSIVE SLIGHTLY ARENACEOUS, WITH
REGULAR BANDS OF LAMINATED, STRONGLY ARENACEOUS SHALE GRADING TO ARZILLACEOUS
SANDSTONE.

SANDSTONE - FINE-MEDIUM GRAINED, WEAKLY BANDED

SHALE - MASSIVE ARENACEOUS.
DRILL HOLE LOG

ABJAY KIRKER RESOURCES LTD
DIVISION: MOUNTAIN COAL PROSPECT

COORDINATES:

DIP:

HOLE NO. 3

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LABERGE SERIES

SANDSTONE - DARK, MASSIVE, STRONGLY AERIALACEOUS

1%40 -

961.0 - SANDSTONE - LIGHT GREY, MEDIUM GRAINED

SANDSTONE - AERIALACEOUS, LAMINATED

49.5 -

SANDSTONE - AERIALACEOUS BANDING, HIGHLY WEATHERED, 492.0 - 496.0 FT

1960 -

SANDSTONE - AERIALACEOUS WEAKLY LAMINATED.

COAL PARTING, GRADING TO MASSIVE TOWARDS BOTTOM CONTACT

500.5 -

SANDSTONE - LIGHT GREY FINE-MEDIUM GRAINED WITH AERIALACEOUS BANDING IN UPPER SECTION, OCCASIONAL SHALE, COAL PARTINGS

513.9 -

SANDSTONE - LIGHT GREY, OCCASIONAL SHALE, COAL PARTING

518.5 -

SANDSTONE - LIGHT GREY, OCCASIONAL SHALE, COAL PARTING

522.0 -

SANDSTONE - GREY, MASSIVE WITH AERIALACEOUS BANDING TOWARDS BOTTOM CONTACT

527.5 -

SANDSTONE - MASSIVE, AERIALACEOUS

530.0 -

SANDSTONE - MASSIVE, AERIALACEOUS

531.0 -

SANDSTONE - STRONGLY AERIALACEOUS, LAMINATED

SANDSTONE - AERIALACEOUS, WEAKLY LAMINATED, MASSIVE TOWARDS BOTTOM CONTACT WITH COAL PARTINGS

535.0 -

SANDSTONE - GRADATIONAL
DRILL HOLE LOC.
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES: DIP -

HOLE NO 3 PAGE 10 OF 10

SANDSTONE - GREY COARSE GRAINED WITH ARGILLACEOUS BANDS & PARTINGS, COMMON

LABERGE SERIES

SANDSTONE - COARSE GRAINED, CRITTY, HIGHLY WEATHERED ALONG FRACTURES

504 -- SHALE - ARGILLACEOUS LAMINATED

563.2 -- SANDSTONE - DARK, WITH BLACK SHALE SPOTTING

567 -- SHALE - BLACK, ARGILLACEOUS

570 -- SANDSTONE - FINE-MEDIUM GRAINED, ARGILLACEOUS & BLACK SPOTTED SHALE - BLACK ARGILLACEOUS MASSIVE

570.0 -- SANDSTONE - DARK, FINE GRAINED, ARGILLACEOUS

571.7 -- SHALE - BLACK, ARGILLACEOUS, MASSIVE OCCASIONALLY WEAKLY LAMINATED

571.8 -- SANDSTONE - DARK CHLORIDE, BLACK SHALE SPOTTED

581.2 - 70° CHILLED CONTACT

MUTSHT GROUP - ANDESITE
PALE GREEN BORDER, DARK GREEN CHLORITE SPOTTED WITH NUMEROUS CARBONATE FILLED FRACTURES
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD.
NORDENSKIOLD COAL AREA

COORDINATES 22.321,629.36N;196.156.44E
ELEVATION 2402.5
DIP -50°
AZIMUTH 040°
SCALE 1.5 in. = 10.0 ft.

CORE SIZE HQ 0-82.0 FT
HOLE STARTED 22 SEPTEMBER, 1972
HOLE COMPLETED 27 SEPTEMBER, 1972
LOGGED BY M.P. PHILLIPS

133

HUTSHI GROUP ANDESITE - DARK GREY
WITH BLEACHED BORDES, APHANITIC
WITH OCCASIONAL FINE WHITE FELDSPATHO
PHENOCYSTS

LABURGE SHALE
SANDSTONE - DARK COLORED, MEDIUM
GRAINED WITH NUMEROUS BLACK
CARBONACEOUS SHALE FRAGMENTS
BAND 1-2".

24.3 - CONTACT LOST

29.0 - HIGHLY WEATHERED TO SAND

32.0 CONTACT LOST

35.0 CONTACT LOST

44.5

COAL - CRUNCHY, DULL BLACK WITH
PARTS & NARROW BANDS OF
BLACK SHALE

51.0

SHALE - DULL BROWN-BLACK, SLIGHTLY
ARENACEOUS WITH LENSES OF
DARK COLORED CARBONACEOUS
SANDSTONE UP TO 0.2 FT. SHEARED?

54.0 -

SANDSTONE - DARK COLORED, FINE TO
MEDIUM GRAINED SANDSTONE
WITH UP TO 0.5 FT BANDS OF
BLACK SHALE - HIGHLY BROKEN
SLICKENSIDES @ 30° COMMON

SILICEOUS SHALE IN
PARTS SLIGHTLY ARENACEOUS
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES:
DIP:

HOLE NO 4.
PAGE 2 OF 2

LABERGE SERIES - SHALE - DARK COLORED
MASSIVE SLIGHTLY SANDY SHALE WITH OCCASIONAL TO 0.2 FT DARK COLORED SANDSTONE

74 FT - BLACK SANDY SHALE - HIGHLY CRUMBLY

NO RECOVERY.

820 - END OF HOLE - ABANDONED
COORDINATES 222321,220,804;181208,83E
ELEVATION 24577
DIP 60°
AZIMUTH 040°
SCALE 1.5 ins. = 10.0 ft

OVERBURDEN - GLACIAL TILL & WEATHERED BEDROCK

LARGE SERIES
SANDSTONE - DARK COLORED, GRITTY, BLACK SPECKLED WITH OCCASIONAL NARROW BANDS OR BROWN SHALY COARSE GRAINED SANDSTONE

39.2-60° CONTACT - SHALE - SANDY, WEAKLY LAMINATED
39.2-60° CONTACT - SANDSTONE - DARK BROWN, MEDIUM GRAINED
38.0-60° - COAL
32.0-60° - SHALE - BLACK MASSIVE, ARENACEOUS
32.7-60° - COAL - SANDSTONE 0.4 FT, COAL - SANDSTONE - BROWN, FINE-MEDIUM GRAINED, IN PLACES STRONGLY ARENACEOUS & LAMINATED
37.0-60°
38.2-55° - COAL - NARROW BANDS & PARTINGS OF BLACK SHALE
38.2-55° - SANDSTONE - BROWN, ARENACEOUS, MEDIUM-COARSE GRAINED
41.3-70° - SANDSTONE - GREY, COARSE GRAINED TO GRITTY
44.0

46.0 COAL 0.2 FT
46.9 COAL 0.1 FT

49.8 COAL 0.6 FT
52.8 - COAL 0.1 FT - SANDSTONE
52.6-55° - 53.1 COAL 0.1 FT

55.4 - COAL
58.3-40° -
57.7-40° COAL - SANDSTONE

42.1-60° COAL 0.8 FT
43.7-60° - SANDSTONE
45.3-60° -
47.8 - COAL BANDS TO 0.2 FT
47.9 -
49.9 - COAL
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<th>Depth</th>
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<tr>
<td>10.5</td>
<td>Coal</td>
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<td>11.5 - 70° CONTACT</td>
<td>SANDSTONE</td>
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<tr>
<td>15.2 - 70° CONTACT</td>
<td>COAL - 0.2% DULL SANDY</td>
</tr>
<tr>
<td>15°</td>
<td>COAL - DULL SANDY</td>
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<tr>
<td>17°</td>
<td>SHALE - BLACK - COAL PARTICLES</td>
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<tr>
<td>18° - 35° CONTACT</td>
<td>COAL - DULL BLACK, PARTING &amp; BANDS OF BLACK SHALE</td>
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<tr>
<td>20°</td>
<td>COAL - DULL BLACK, PARTING &amp; BANDS OF BLACK SHALE</td>
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<td>85.0 - 70° CONTACT</td>
<td>SANDSTONE - LIGHT GREY, COARSE GRAINED, GRITTY, FERROSPATIC SANDSTONE, PIPE PARTINGS OF AERIGEOUS SHALE</td>
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<td>101.3</td>
<td>SHALE PARTICLES &amp; FINELY SCALE PARTICLES IN SANDSTONE</td>
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<td>104.2 - 60° CONTACT</td>
<td>Coal Parting, Sandstone - Shale Particles in Sandstone Common</td>
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<td>106.0 - 60°</td>
<td>SHALE - INDURATED, CHILLED CONTACT</td>
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<td>106.7 - 95°</td>
<td>CHILLED CONTACT, ANDESITE - PALE GREEN ANDESITE WITH ALKALI CHLORITE &amp; LEUFSKAR, PHENAKITE, VENDEWEIT 0.2% SHALE CONTACTS PARALLEL TO BEDDING</td>
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<td>109.2 - 70°</td>
<td>CHILLED CONTACT, COAL</td>
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<td>110°</td>
<td>SANDSTONE - GREY TO BROWN, CLEAN TO AERIGEOUS MEDIUM, COARSE GRAINED, OCCASIONAL BANDS OF BLACK SPLECKLING</td>
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<tr>
<td>113°</td>
<td>SHALE - BLACK, MASSIVE</td>
</tr>
<tr>
<td>114.5</td>
<td>SANDSTONE</td>
</tr>
<tr>
<td>115</td>
<td>SANDSTONE - DULL BLACK</td>
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<tr>
<td>115.5</td>
<td>SHALE - AREIGEOUS, WEAKLY LAMINATED</td>
</tr>
<tr>
<td>117°</td>
<td>SANDSTONE - DULL, BLACK, SHALE SPECKLING</td>
</tr>
<tr>
<td>118° - 60° CONTACT</td>
<td>CHILLED CONTACT, PARALLEL BEDDING</td>
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<tr>
<td>121.3 - 70° CHILLED CONTACT, PARALLEL BEDDING</td>
<td>SHALE - BLACK, MASSIVE SHALE, PARTINGS</td>
</tr>
<tr>
<td>122.2 - 60°</td>
<td>SHALE</td>
</tr>
<tr>
<td>123°</td>
<td>SHALE - CHILLED</td>
</tr>
<tr>
<td>123.5 - 40°</td>
<td>SHALE</td>
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<tr>
<td>128.4 - 40°</td>
<td>CHILLED CONTACT</td>
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</tbody>
</table>
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES: COAL
DIP:

HOLE NO S
PAGE 2 OF 17

LABURGE SERIES - SHALE

132 - 6' COAL
133 - 0
134 - 8' COAL
137 - 4

139 - SHALE: LAMINATED, ARENAECIOUS
141 - SANDSTONE WITH NARROW BANDS OF BLACK SHALE
142 - BLACK SHALE & SANDSTONE WITH 0.4 FT COAL
143 - SANDSTONE - MEDIUM-SIZE, MEDIUM TO COARSE GRAINED WITH SHALE FRAGMENTS & PARTS OF ARGINACEOUS MATERIAL

145 - 5.60' CHILLED CONTACT PARALLEL TO BOUNDING ANDESITE - BLEACHED
148 - 6.00
149 - 9.60

152 - 6' COAL
153 - 0
154 - 0 - 70

155 - 0 - 40' COAL
159 - 8

163 - 65' SHALE: LAMINATED, CROSS BEDDING, ARGINACEOUS SHALE WITH BANDS OF BLACK SHALE WITH PARTS, AND BANDS UP TO 0.2 FT OF COAL

171 - 5

174 - 0

176 - 65' SHALE - BLACK, MASSIVE SHALE WITH PARTINGS AND BANDS UP TO 0.4 FT OF COAL

182 - 2.80

18.6 - 60' SANDSTONE - LIGHT GREY GRITTY SANDSTONE

19.15 - 6 FT COAL
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES:

DIP:

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LABERGE SERIES - SANDSTONE

191.3 - 40°
192.0 COAL

194.4 - 40°

SHALE - BLACK MASSIVE, WITH
OCcasional ARENACEOUS
PARTINGS - BEDDING 0° - 30°

197.0 -

SANDSTONE & SHALE - INTERBEDDED;
INTERLAMINATED - BEDDING 0° - 30°

188.5 -

SHALE - BLACK MASSIVE.

203.0 - CENOATIONAL.

SHALE - DULL DARK GREY, ARENACEOUS
WEAKLY LAMINATED, SHALE
BEDDING 0° - 20°

212.0 -

SHALE - BLACK MASSIVE, WITH
THIN COAL PARTING
ON WHITE LIMESTONE.

212.4 - 50° -

SANDSTONE - IN PARTS ARENACEOUS
WITH NARROW BANDS OF SHALE

214.8 - COAL - 0.4 FT

SANDSTONE - ARENACEOUS, SHALE GRAD
CHANGE TO DARK, FINE GRAINED
ARENACEOUS SANDSTONE

222.0 - 35° -

SHALE - DARK GREY, MODERATELY ARENACEOUS
WEAKLY LAMINATED.

224.0 - 20° -

SANDSTONE - LIGHT GREY, IN PARTS WEAKLY
ARENACEOUS WITH PARTINGS OF COAL

228.5 - 15° -

SHALE - BLACK MASSIVE TO ARENACEOUS
WEAKLY LAMINATED.

232.0 - 10° -

SANDSTONE - DARK GREY, STRONGLY ARENACEOUS

234.9 - 10° 25° -

COAL - PARTINGS, BANDS OF BLACK SHALE

235.8 -

SANDSTONE - BLACK MASSIVE

237.0 -

COAL - 30° - BANDS OF BLACK SHALE
COMMON

238.10 -

SHALE - INTERLAMINATED STRONGLY ARENACEOUS
SHALES, BLACK, MASSIVE SHALE

246.0 -

SHALE - BLACK, MASSIVE, STRONGLY LAMINATED
FRAGMENTS & BEDDING PLANES.
LABERGE SERIES

314.1 - GRADATIONAL
SANDSTONE - GREY, GRITTY WITH BANDS TO 0.3 FT STRONGLY ARENACEOUS

370.0 - COAL - TWO 0.3 FT BANDS IN BLACK, MASSIVE SHALE AND ARENACEOUS
322.0 - SHALE - BLACK, MASSIVE, ARENACEOUS
333.0 - SHALE - BLACK, MASSIVE, ARENACEOUS WITH SCATTERED GRITS
SANDSTONE - DARK GREY, MODERATELY ARENACEOUS

521.3 - SHALE - ARENACEOUS, LAMINATED
528.2 - SHALE - ARENACEOUS, LAMINATED
530.0 - SHALE - BLACK, MASSIVE
531.5 - SHALE - BLACK, MASSIVE, OCCASIONAL NARROW ARENACEOUS BANDS
532.5 - SHALE - ARENACEOUS, WEAK, MODERATELY LAMINATED

337.0 - SHALE - BLACK, MASSIVE, PARTINGS OF COAL
337.5 - COAL - DULL BLACK
338.0 - SHALE - BLACK, MASSIVE, PARTINGS OF SANDSTONE

341.5 - COAL - PARTING OF SHALE
343.5 - SHALE - ARENACEOUS, WEAKLY LAMINATED
344.0 - SANDSTONE - GREY, COARSE GRAINED, PARTINGS OF ARENACEOUS SHALE

547.6 - SHALE - ARENACEOUS, LAMINATED, MARKED BANDS OF SANDSTONE TO 0.3 FT COMMON TOWARDS BOTTOM
350.5 - SHALE - ARENACEOUS, LAMINATED AND SANDSTONE INTERBEDDED
353.5 - SANDSTONE - GREY, COARSE GRAINED
357.7 - SHALE - BLACK, MINOR PARTINGS OF ARENACEOUS SHALE
357.8 - SHALE - ARENACEOUS, LAMINATED, X-BEDDED

362.0 - COAL - DULL, ARENACEOUS
363.0 - SHALE - ARENACEOUS, LAMINATED, X-BEDDED

366.2 - SANDSTONE
367.2 - COAL - 0.5 FT

DIP
40°
55°
50°

55°
60°
60°

55°
40°
40°

50°
50°
50°

40°
35°
35°

35°
DRILL HOLE LOG
ARTJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
COORDINATES:
DIP:

COORDINATES:
DIP:

SHALE - ARENACEOUS, LAMINATED, Y-BEDDED
OCCASIONAL BANDS UP TO 1 FT. BLACK
MASSIVE AND ARENACEOUS MASSIVE.

LABERGE SERIES:

SHALE - BLACK, MASSIVE, SUECKENSIDIS COMMON

390.00 - SANDSTONE - GREY, MEDIUM GRAINED, NARROW
ARENACEOUS BANDS

393.00 - FAULT:
SHALE - SANDSTONE BRECCIA FRAGMENTS 0.5 FT. WIDE ZONE
SHALE - BLACK, MASSIVE, BROKEN, SUECKENSIDIS COMMON
OCCASIONAL DARK ARENACEOUS
QUARTZITE BAND

396.30 - SHALE & SANDSTONE - INTERBEDDED, ARENACEOUS COARSE
GRAINED SHALE AND SANDSTONE

412.00 - 60°
COAL - DULL BLACK, OCCASIONAL
PARTINGS OF SHALE AND ARENACEOUS SHALE

405.30 - SANDSTONE - 0-10°
406.40 -

410.20 - 10° CONTACT
SANDSTONE - GREY, MEDIUM, COARSE GRAINED, OCCASIONAL
PARTINGS OF COAL.

414.40 - 6-10°
SHALE - BLACK MASSIVE, HIGHLY BROKEN, 0.5 FT. COAL UPPER CONTACT

420.00 - FAULT ZONE?
421.00 - SANDSTONE
424.00 - SHALE - BLACK MASSIVE, HIGHLY BROKEN
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT
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COORDINATES
DIP

COKE LOSS - 6 FT
SHALE - BLACK, MASSIVE

LABERGE SERIES

432.0

434.5 - 30°
SHALE - BLACK, MASSIVE

442.0
SHALE - BLACK, MASSIVE - HIGHLY BROKEN

449.8 - 30°

451.0 - 30°
SHALE - BLACK, MASSIVE

468.1 - 25°

469.8 - SANDSTONE - ABUNDANT SHALE GEINS

451.2 - WEATHERED SANDSTONE - FAULT

456.0 - AFTER 454.2, NARROW BANDS OF 0.5 FT OF BLACK SHALE COMMON

451.8 - 30°
SHALE - BLACK, MASSIVE - STRONG SLICERIDES ON REDDING, OCCASIONAL NARROW BAND OF COAL AND SANDSTONE

466.0 - SANDSTONE - ACREILLACEOUS TOWARDS BOTTOM CONTACT

469.0
SHALE - BLACK, MASSIVE, SLIGHT AREILLACEOUS PARTING OF COAL

470.0 - 45° IRREGULAR CONTACT
SANDSTONE - BLACK, ACREILLACEOUS, MEDIUM TO ABUNDANT PARTINGS & NARROW BANDS OF BLACK SHALE COMMON

473.6 - SHALE - INTERBEDDED BLACK SHALE & COAL

476.0 - SANDSTONE - DARK COLORED, STRONGLY ACREILLACEOUS

478.6 - 30°
SHALE - BLACK, MASSIVE OCCASIONAL PARTING OF COAL

485.0 - ACREILLACEOUS PARTINGS
494.6

492.0 - 30° & 50° CTS - ANDESITE
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD

DIVISION: MOUNTAIN COAL PROSPECT

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DIP: -

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SHALE

LABERGE SERIES

492.8 - 70° CUTOFF - ORIENTATION?

ANDESITE - PALE GREEN, Aphanitic

490.0 - CONTACT LOST

SANDSTONE

COAL LOSS: 406.0 - 502.0 - 3.6 FT.

SHALE - BLACK, MASSIVE, HIGHLY BIDDEN, OCCASIONALLY ABDUCTED PARTINGS

501.0

SANDSTONE - DARK GREY, STRONGLY ARGILLACEOUS

514.4 - 30°

511.9 - STING LAMINATED - FAULT?

512.0

512.9 - 40° SHALE - GREY AND STRONGLY ARGILLACEOUS

515.4 - 50°

520.8

522.0 - SHALE - BLACK, MASSIVE

524.5 - 45° GRAZITIONAL

524.3 - SEDIMENTARY, MEDIUM-TO-FINE GRAINED, DENSE, LAMINATED

524.5 - 45°

SANDSTONE - MID-TO-FINE GRAINED, MEDIUM-DENSE, LAMINATED

530.0 - SANDSTONE - DARK, FINE GRAINED, ARGILLACEOUS
<table>
<thead>
<tr>
<th>Depth</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>554.2</td>
<td>Shale - Black, massive, minor sandstone fragments</td>
</tr>
<tr>
<td>556.0</td>
<td>Breccia zone - main, large, black shale with sandstone fragments and minor brecciated sandstone</td>
</tr>
<tr>
<td>556.5</td>
<td>Breccia zone - up to 0.3 ft sandstone fragments in black shale</td>
</tr>
<tr>
<td>559.0</td>
<td>Breccia zone - black, massive shale with occasional sandstone fragment</td>
</tr>
<tr>
<td>559.3</td>
<td>Shale - alternating bands, up to 2 ft, of black, massive and argillaceous, laminated shale, occasional breccia fragments, to 0.00 ft</td>
</tr>
<tr>
<td>584.0</td>
<td>Shale - argillaceous, laminated</td>
</tr>
<tr>
<td>590.0</td>
<td>Sandstone - black, shaly matrix</td>
</tr>
<tr>
<td>591.2</td>
<td>Sandstone - light to dark grey, fine-grit sandstone, with irregular, moderate, slaty, argillaceous sandstone bands, occasional, thin, separate lens of coal, shale, interbed, crenulated along features</td>
</tr>
</tbody>
</table>
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES: [ ]

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430 - CRADATIONAL - END OF GRIT BANDS
BANDSTONE - LIGHT TO MEDIUM TO
COARSE GRAINED, WURE -
STRONGLY ARGILLACEOUS
MODERATE FRACTURING
COAL & BLACK SEALS PARTIALLY
PLENGE, COMMON ONTEN
DRAUGHTED

440 - 460 - SLOWLY CHANGE TO
STRONGLY ARGILLACEOUS
DARK COLOURED

4510 - 55 -
SCHIT - MASSIVE ARENACEOUS

4551 - 550 - IRREGULAR PARALLEL BEDDING, CHILLED CONTACT
HUTSHI GROUP - ANDESTE - PALE GREEN
GRADUALLY DARKER, INCOLOR, TOWARDS CENTER,
CHLORITE & QUARTZ - FELDSPAR FILLED
AMPHOCALES COMMON, FAIR CARBONATE - FELDSPAR
VEINING.
DRILL HOLE LOC.
ARJAY KIRKER RESOURCES LTD
DIVISION, MOUNTAIN COAL PROSPECT

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HUTSHI GROUP - ANDESITE

593.7 - 60° SHALE - BLACK MASSIVE

593.5 - 80° SHALE - BLACK MASSIVE

LABERGE SERIES

596.0 - 80° CHILLED CONTACT

597.0 - SHALE - BLACK MASSIVE, SLIGHTLY LAMINATED

SANDSTONE - COARSE GRAINED, GYRTY, STRONGLY WEATHERED

512.0 - 45° SHALE - BLACK, MASSIVE, PARTINGS OF COAL, ARHYNACIOUS AT UPPER CONTACT

517.0 - SANDSTONE

517.7 - SHALE - ABRINACIOUS, WEAKLY LAMINATED, HIND, MASSIVE

519.5 - 50° SHALE - BLACK, MASSIVE, NUMEROUS PARTINGS OF COAL

520.4 - 80° COAL - BLACK

522.4 - 40° SANDSTONE - GREY, GYRTY, OCCASIONAL PARTING OF COAL, GRAINS TO 1/4 INCH
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

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LABERGE SERIES

742.0 - 50' O5 SHALE - ALENACEOUS, LAMINATED

745.0 - 50' SHALE - MASSIVE, SLIGHT ARENAACEOUS

746.0 - SHALE

747.7 - 50' ORPANGATIONAL - SHALE - BLACK, MASSIVE, ARENAACEOUS

748.6 - FAULT - SANDSTONE - LIGHT-MEDIUM GREY, MODERATELY ARENAACEOUS, OCCASIONAL PARTING OR COAL.

753.5 - 50' SUCKENSIDE SHALE

754.6 - 60' SHALE

756.0 - 20' SUCKENSIDE - 0.7 SHALE

762.0 - 60' SHALE - ARENAACEOUS, LAMINATED, STRONG SUCKENSIDES

764.0 - SHALE

767.0 - SHALE - ARENAACEOUS, SLIGHTLY LAMINATED.

777.0 - 60'

779.7 - 80' SHALE - STRONG ARENAACEOUS

786.0 - SHALE

791.0 - 70' SHALE - BLACK MASSIVE

792.0 - SHALE - ARENAACEOUS, LAMINATED

794.0 - 60'

798.5 - SHALE - ARENAACEOUS, SLIGHTY LAMINATED

800.5 - SHALE - ARENAACEOUS, SLIGHTLY LAMINATED
DRILL HOLE LOG
ABJAY KIRKER RESOURCES LTD
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LABERGE SERIES

799.5 SHALE, BLACK, MASSIVE, COAL PARTINGS
791.4 COAL, SHALE PARTING COMMON
793.3-70° SHALE, ALTERNATING BANDS, 1 FT
OF BLACK, MASSIVE SHALE WITH
COAL PARTING, BAND 30 FT, EXTEND
ARENACEOUS, WEAKLY LAMINATED

194.7-70° SANDSTONE
801.4-85° COAL

904.5-65° SHALE, BLACK, GREY, MASSIVE, HIGHLY BROKEN

848.0-65° SHALE, SPONGY, ARENACEOUS,
LAMINATED, BANDS OF FINE-GRAINED SANDSTONE
810.7-65° GRADATIONAL
SANDSTONE, FINE GRAIN, IRREGULAR,
NARROW ARENACEOUS BANDS
815.0-70° SHALE, MASSIVE, ARENACEOUS, 0.5 FT BLACK SHALE
WITH COAL PARTINGS ON BOTTOM CONTACT
815.0 SANDSTONE, GREY, JASPER GRANED-GREY,
WITH PARTINGS OF BLACK, ARENACEOUS SHALE

821.0-30° SHALE, MASSIVE ARENACEOUS

826.0-30° SHALE, ARENACEOUS, LAMINATED
829.1-50° SHALE, BLACK, MASSIVE

837.4 SANDSTONE, GREY - STRONGLY ARENACEOUS
839.4 SHALE, BLACK, MASSIVE, OCEASIONAL ARENACEOUS
MINOR, COAL PARTINGS

848 COAL
843.3 SANDSTONE, WEAK TO STRONGLY ARENACEOUS
844.5 SHALE, BLACK, MASSIVE ARENACEOUS
845.3-60° SANDSTONE, SHALE, BLACK, MASSIVE ARENACEOUS LAMINATED
847.2 SANDSTONE
849.0 SHALE, BLACK, MASSIVE
DRILL HOLE LOG
ABJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

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60°

LABERGE SERIES

805.6
COAL - 0.5 FT

SANDSTONE - DARK, STRONGLY ABBELLACEOUS
GRADING INTO ARENAEGOUS SHALE, HIGHER, COAL PARTINGS
IN PLACES

833.3 - 50°
SANDSTONE - ABBELLACEOUS BANDS TOWARDS BOTTOM CONTACT

854.8 - 60°
SHALE - ARENAEGOUS, WEAKLY LAMINATED WITH NARROW BANDS OF BLACK MASSIVE

908.0
COAL - SHALE PARTING, NARROW BANDS COMMON

862.8
SHALE - BLACK, MASSIVE WITH COAL PARTINGS

883.7
COAL

864.0
SANDSTONE - 0.4 FT

867.0
SHALE - ARENAEGOUS

COAL - BANDS OF BLACK MASSIVE SHALE UP TO 0.2 FT COMMON

870.3 - 60°
SHALE - LIGHT COLORED, ARENAEGOUS, FINE GRAINED
SANDSTONE LAMINATED ARENAEGOUS SHALE

890.0
COAL PARTING BECOME COMMON

892.1
SANDSTONE - STRONGLY ARENAEGOUS, DARK, GRADING INTO LIGHT COLORED, MEDIUM - COARSE GRAINED

904.8 - 0.6 FT SHALE - BLACK, MASSIVE

914.8 - 70°
SHALE - DARK, MASSIVE, WEAK, MODERATELY ARENAEGOUS, COAL PARTINGS COMMON

916.76 - 70°
SHALE - ABBELLACEOUS, FINE GRAINED, SUELLITE, SUELLITE CLAY, LAMINATED ARENAEGOUS SHALE

SHALE - LIGHT TO DARK COLORED, INTERLAMINATED, ARENAEGOUS, FINE GRAINED, SANDSTONE LAMINATED SHALE AND LAMINATED ARENAEGOUS SHALE
## DRILL HOLE LOG

**AJAY KIRKER RESOURCES LTD**
**DIVISION MOUNTAIN COAL PROSPECT**

**COORDINATES**

**DIP**

**HOLE NO 6**

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### LABERGE SERIES

<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
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<tbody>
<tr>
<td>301.2 - 305</td>
<td>SHALE</td>
</tr>
<tr>
<td>312.8 - 316</td>
<td>SHALE - ARNACEOUS, WEAKLY LAMINATED</td>
</tr>
<tr>
<td>314.1 - 316</td>
<td>SHALE - ARNACEOUS, WEAKLY LAMINATED</td>
</tr>
<tr>
<td>316.3 - 316.5</td>
<td>SHALE - ARNACEOUS, WEAKLY LAMINATED</td>
</tr>
<tr>
<td>318.8</td>
<td>GRADING INTO ARNACEOUS LAMINATED</td>
</tr>
<tr>
<td>320.5 - 320.7</td>
<td>SHALE - 0.3 FT</td>
</tr>
<tr>
<td>323</td>
<td>SHALE - BLACK, SLIGHTLY ARNACEOUS WITH BANDS OF ARNACEOUS FINEGRAINED GREY SANDSTONE, MINOR PARTINGS OF COAL</td>
</tr>
<tr>
<td>323.8 - 324</td>
<td>SHALE - BLACK, MASSIVE WITH BANDS GRADATION MASSIVE TO WEAKLY LAMINATED ARNACEOUS</td>
</tr>
</tbody>
</table>

1005 - END OF HOLE
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD,
NORDENSKOOLD COAL AREA

COORDINATES 22,322,503.23N, -161,009.45E
ELEVATION 2381.2
DIP -50°
AZIMUTH 040°
SCALE 1.5 in. = 10 ft

OVERBURDEN - GLACIAL TILL & WEATHERED BEDROCK

LABERGE SERIES
SANDSTONE - LIGHT GREY, COARSE-GRAINED TO SANDY WITH BANDS UP TO 2 FT OF LIGHT BROWN FINE GRAINED, OCCASIONAL PARTINGS & FRAGMENTS OF BLACK SHALE & COAL

SHALE - BLACK, MASSIVE, HIGHLY BROKEN

SHALE & LIGHT - DARK GREY, LAMINATED V-BEDDED SHALE & FINE GRAINED SANDSTONE

SANDSTONE - BROWN, MODERATELY ARGILLACEOUS, FINE - MEDIUM GRAINED WITH PARTINGS & WISPS OF BLACK SHALE

SHALE - BLACK, MASSIVE, MINOR 0.2 FT BANDS OF BROWN ARGILLACEOUS SANDSTONE

SANDSTONE - LIGHT GREY, COARSE GRAINED TO SANDY, PARTINGS, NARROW BANDS AND LENSES OF COAL

SHALE - BLACK, MASSIVE

HOLE NO. 5
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CORE SIZE NQ 0 - 548 FT
HOLE STARTED 1 OCTOBER, 1972
HOLE COMPLETED 21 OCTOBER, 1972
LOGGED BY M.P. PHILLIPS
DRILL HOLE LOG
ARJAY KIRKIN RESOURCES LTD
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SHALE - BLACK MASSIVE
HIGHLY BROKEN
151.7

LABERGE SERIES - SANDSTONE
1

SANDSTONE - GREY, FINE GRAINED
WITH MODERATE LAMINATIONS &
NARROW BANDS OF BLACK SHALE
185.0 - CONTACT LOST
COAL - DULL BLACK
183.6 - CONTACT LOST
195.2
SHALE - BLACK MASSIVE
HIGHLY BROKEN
197.3

SANDSTONE - DARK BROWN TO BLACK,
VERY FINE GRAINED, WEAK TO MODERATELY
LAMINATED ARGILLACEOUS SANDSTONE

214.3 - SANDSTONE - PARTING:
LENSES OF COAL
216.2
COAL - DULL BLACK
IN A BLACK SHALE
216.0

BRENNIGIAN CONTACT
SHALE - BLACK MASSIVE
218.0

BRENNIGIAN CONTACT
SHALE - BLACK MASSIVE
220.0

HUTSHI GROUP - ANDESITE
DARK, GREEN FINE GRAINED INTRUSIVE
WITH CHLORITE AND ALTERED FELDSPAR
SCHISTOSIC, CHLORITE & CALCIOTE
FILLED FRAC TURES 0-30°
233.0 - CHILLED REGULAR CONTACT @ 90°
PARALLEL TO BEDDING
HUTSHE GROUP - ANDESITE

LABERGE SERIES - SANDSTONE L SHALE
LIGHT GREY TO BLACK, INTERLAMINATED, VERY FINE GRAINED, SOME TO MODERATE AERIAL ACCUMULATED SANDSTONE AND BLACK, ABERNAGOUL SHALE STRONGLY X-BEDDDED

265.0 CONTACT GROUND
COAL - HULL BLACK IN PLACES BANDY

266.5 - SHALE - BLACK MASSIVE, MINOR PARTINGS OF COAL

270.0 - SANDSTONE - DARK COLOURED MEDIUM GRAINED X-BEDDDED

271.3 - SHALE - BLACK, MASSIVE WITH FRAGMENTS OF BLACK SHALE X-BEDDDED

GRADATIONAL

276.0 - SHALE - BLACK MASSIVE

278.0 - - -

284.2 65° - - -

284.2 65° - BANDS TO FREEZE COAL WITH SANDSTONE

SANDSTONE - LIGHT GREY, MEDIUM GRAINED TO GYPSY SANDSTONE OCCASIONAL PARTING OF ABERNAGOUL SHALE

288.1 - PARTINGS AND LENSES OF COAL AND SHALE

289.2 - SHALE - BLACK, WEAKLY X-BEDDDED

296.5 CONTACT GROUND
<table>
<thead>
<tr>
<th>Depth (ft)</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>302.0</td>
<td>Coal - black shale with partings and bands of black shiny coal</td>
</tr>
<tr>
<td>304.0</td>
<td>Sandstone - brown medium-grained, moderately to strongly argillaceous, weak laminated</td>
</tr>
<tr>
<td>467.0</td>
<td>Shale - black, massive</td>
</tr>
<tr>
<td>470.0</td>
<td>Shale and sandstone - interbedded</td>
</tr>
<tr>
<td>508.3</td>
<td>Shale - black, massive, occasional argillaceous laminations</td>
</tr>
<tr>
<td>513.0-55</td>
<td>Shale - black, massive</td>
</tr>
<tr>
<td>515.0-55</td>
<td>Shale - black, massive</td>
</tr>
<tr>
<td>519.5</td>
<td>Shale - contact lost</td>
</tr>
<tr>
<td>537.0</td>
<td>Contact lost</td>
</tr>
<tr>
<td>590.2</td>
<td>Sandstone - medium to dark grey, weak to strong argillaceous, laminated, thin-bedded, fine-grained sandstone, partings of coal</td>
</tr>
<tr>
<td>605.0</td>
<td>Sandstone - grey, alternating, narrow bands of coarse-grained, gritty sandstone, partings and lenses of black coal, common</td>
</tr>
<tr>
<td>610.0</td>
<td>Sandstone - fine-grained, very fine-grained sandstone, partings of coal</td>
</tr>
<tr>
<td>614.0</td>
<td>Sandstone - fine-grained, very fine-grained sandstone, partings of coal</td>
</tr>
<tr>
<td>626.0</td>
<td>Sandstone - grey, alternating, narrow bands of coarse-grained, gritty sandstone, partings and lenses of black coal, common</td>
</tr>
<tr>
<td>630.0</td>
<td>Sandstone - fine-grained, very fine-grained sandstone, partings of coal</td>
</tr>
<tr>
<td>635.0</td>
<td>Sandstone - grey, alternating, narrow bands of coarse-grained, gritty sandstone, partings and lenses of black coal, common</td>
</tr>
<tr>
<td>640.0</td>
<td>Sandstone - fine-grained, very fine-grained sandstone, partings of coal</td>
</tr>
<tr>
<td>656.0</td>
<td>Sandstone - grey, alternating, narrow bands of coarse-grained, gritty sandstone, partings and lenses of black coal, common</td>
</tr>
</tbody>
</table>
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES:

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LABERGE SERIES - SANDSTONE - AS

3610 - 45° CONTACT

3710
PARTINGS & NARROW BANDS OF SHALE

375.5 - 45° CONTACT
ARENACEOUS SHALE

3760
SHALE - BLACK MASSIVE

3830 - 45° CONTACT
SANDSTONE - BROWN, MEDIUM TO COARSE GRAINED ARENACEOUS SANDSTONE

387.6 - 45° CONTACT
SANDSTONE & SHALE - INTERLAMINATED AND INTERBANDED BLACK, SLIGHTLY ARENACEOUS SHALE AND GREY, FINE GRAINED SANDSTONE. X-BEDDING AND SLUMPING FEATURES COMMON. SANDSTONE BANDS 0.1 TO 0.5 FT AV 0.2 FT

4145 - 50° CONTACT
SANDSTONE - GREY, FINE GRAINED

470 - 55° CONTACT
BANDS OF SANDSTONE - GREY, FINE GRAINED BECOME LESS COMMON.
DRILL HOLE LOG

ARJAY KIRKER RESOURCES LTD
DIVISION MOUNTAIN COAL PROSPECT

COORDINATES:

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LABERGE SERIES - SANDSTONE

SHALE AS PAGE 5; GREY, FINE GRAINED SANDSTONE LAMINATION NOT AS COMMON

424.4 - CONTACT LOST
SANDSTONE - MEDIUM GREY GRIMY
424.4 - 45° CONTACT

434.0 - BANDS UP TO 0.5 FT OF GREY FINE GRAINED SANDSTONE BECOME COMMON

446.4 - 60° CONTACT
SANDSTONE - FINE TO COARSE GRAINED BANDS WITH BLACK SHALE CASTS AND BANDS FROM 448/8

451.2 - 50° CONTACT
ALTERNATING BANDS OF BLACK SHALE WITH LAMINATIONS OF GREY SANDSTONE AND GREY FINE GRAINED SANDSTONE UP TO 0.5 FT

454.0 - 60° CONTACT
SANDSTONE - GREY FINE GRAINED
OCCASIONALLY COARSE GRAINED, BLACK SPECKLED SANDSTONE MINOR BLACK SHALE BANDS TO 0.1 FT AND UP TO 8 FT BANDS WITH BLACK SHALE LAMINATION, CASTS OF BLACK SHALE SOMETIMES PRESENT

478.4 - 60°
SANDSTONE & SHALE
DRILL HOLE LOG
ARJAY KIRKER RESOURCES LTD
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LABERGE SERIES - SANDSTONE & SHALE
BLACK, SLIGHTLY ARENACEOUS SHALE WITH
HORIZONTAL LAMINATIONS - BANDS UP TO
10.5 FT OF GREY FINE GRAINED SANDSTONE
X-BEDDING & WIDENING COMMON

120.0 - 65° CONTACT
SANDSTONE - GREY, FINE-MEDIUM
GRAINED

474.4 - 55° CONTACT
SANDSTONE

494.2 - 60° CONTACT
SANDSTONE

510.0 - 55° CONTACT
SANDSTONE - GREY, MEDIUM GRAINED
BLACK SPECKLED SANDSTONE

516.0 - 65° CONTACT
SHALE WITH SANDSTONE Casts

520.0 - 65°
SANDSTONE - GREY, FINE-MEDIUM
GRAINED WITH MINOR, PARTING E
LOAD CASTS OF BLACK SHALE

522.2 - 60°
GREY, FINE GRAINED SANDSTONE BANDS, RARE
ABSENT AND LAMINATION NOT PROMINENT