

Report on 2013 Exploration and Development Drilling Program

Quinsam Coal Mine

Campbell River

British Columbia

Quinsam Coal Fee Simple Holdings

Mine Permit # C-172

Exploration Approval # 11-0800001-0902

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Campbell River, BC

March 30, 2014

Appendix 4 of this report remains confidential under the terms of the Coal Act Regulation, and has been removed from the public version.

http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/free/10_251_2004#section2

Table Of Contents

	Page No.
1. Summary	2
2. Disclaimer	2
3. Property Description, Location and Accessibility	3
4. History	5
5. Exploration	5
6. Drilling	
a. Equipment Used and Method of Operation	8
b. Scope of Work	9
c. Costs	10
7. Sampling Method and Approach	11
8. Summary	12
9. References	13

List of Figures

Figure 1: Map showing the Fee Simple and Coal License Boundaries	4
Figure 2: Map of all drillholes in and around the site	6
Figure 3: Map of 2013 Drillholes	7
Figure 4: Map showing only the 2013 holes that required site disturbance	9

List of Tables

Table 1: Fee-Simple Coal Lands at Quinsam Mine	3
Table 2: Coal Licenses at Quinsam Mine	4
Table 3: Summary of surface disturbance per drillhole	8
Table 4: Drillhole ID's, depths, and Locations	10
Table 5: 2013 Drill Program costs	10

List of Appendices

Appendix 1: Core Logs	
Appendix 2: Geophysical Logs	
Appendix 3: Sample Inventories: Coal and Rock	
Appendix 4: Coal Quality Data Sheets	
Appendix 5: Rock Quality Data Sheets	
Appendix 6: Rock Strength Information: Sample Information and Sample Results	

1. Summary

A total of 23 vertical holes were drilled at the Quinsam Coal Mine site. Of these 23 holes, 5 holes were drilled in the 4-South Area (4S), and 18 were drilled in the 6-South Area (6S) and the 7-South Mining Area (7S). Five of the drillholes were drilled as 25cm outer diameter holes allowing for a 15cm core, and the other 18 holes were drilled as a 15cm outer diameter hole allowing for a 7cm core. All of the drillholes were planned to assist with resource estimating on the #3 Seam, as well as providing coal and rock quality information in anticipation of possible water and waste management planning. Of the holes drilled in the 6S area, 7 of them interested the #4 seam which is currently being mined in the 7-South Mine.

Over the course of the exploration program, 2,111.53m were drilled, 37.18m of which was cased through overburden, 330m were cored through the coal zones, and the balance were completed as open hole drilling.

All of the drillholes were geophysically logged using a standard gamma-density-resistance-caliper coal logging suite, as well as a dipmeter and downhole deviation suite.

All of the drillholes were surveyed by Quinsam Coal surveyors, and tied into the 'mine grid' co-ordinate system that is used on the Quinsam Coal Mine site. For the purpose of this report, UTM co-ordinates will be provided.

The core that was recovered was geologically mapped by the Mine Geologist (author). The coal seams, as well as a representative roof and floor sample, were sampled and shipped to either ALS Coal Lab (Richmond), or SGS Canada Inc. (Burnaby BC), based on the analytical work required. Representative samples were also sent to the Golder Associated Ltd Burnaby Laboratories for strength testing.

During the drilling process, water airlift yields were recorded. Based on this information, an Environmental Consulting company used this information to propose a hydrogeological study, which will utilise some of the open drillholes from this program to monitor ground water using various methods. This program has only been proposed, and as such, details will not be included in this report. The holes that were proposed for this program will remain open, and the sites and access roads will not be reclaimed. Other drillholes have been fully cemented, and sites are set to be reclaimed.

The overall costs of this drill program, including all of the work described above, was \$444, 906, at an overall cost per metre of \$210.70. These costs are elevated from other metreage costs in the past, based on the extra costs of drilling large diameter holes.

2. Disclaimer

The author will not be including the following sections in this report as none of this information has changed or needs updating since the last report;

Local Resources, and Infrastructure, Climate and Physiography, Geologic Setting, Deposit Type, Mineralisation

For this information, please refer to the 2001 report; **Report on 2001 Exploration and Development Drilling Program**, Stephen Gardner (2001).

3. Property Description, Location, and Accessibility

The Quinsam Coal Mine is located roughly 20km west of the City of Campbell River on Vancouver Island, British Columbia, at Latitude 49 degrees, 55 minutes North, Longitude 125 degrees, 27 minutes West. Access to the Quinsam Mine from Campbell River is via Highway 28 (Gold River Highway) for 18km, and then 7.5km along the Argonaut Main, which is a paved for the first 0.2km. At 7.5km on the Argonaut Main, there is an access gate to the mine site, and a 0.5km paved road to the Quinsam Coal Mine Site.

The Quinsam Mine Property consists of fee simple coal lands, and coal licenses, and the boundaries of these are shown in Figure 1. The details of the Fee-Simple holdings are shown in Table 2 and the details of the two coal licenses are shown in Table 3. Figure 1 and Tables 2 and 3 were taken from the **Geological Report on Quinsam Mine**, Cathyl-Bickford (2007).

Table 1: Fee-simple coal lands at Quinsam Mine

FEE-SIMPLE AREA	LEGAL LAND DESCRIPTION	COMMENTS
	Block 26, Comox Land District	Entire.
	Block 41, Comox Land District	Parts of the southern portion, north and south of eastern portion of Block 120 (a)
	Block 98, Comox Land District	Portion lying north of southern boundary of District Lot 242.
	Block 120 (a), Comox Land District	Only portion lying east of east boundary of Block 148.
	Block 148, Comox Land District	Entire.
	Block 149 (a), Comox Land District	Portion lying north of southern boundary of District Lot 242.
	Block 149 (b), Comox Land District	Portion lying north of southern boundary of District Lot 242.
	District Lot 242 E&N, Comox Land District	Entire.
<i>3094 hectares</i>	<i>Total area within property boundary</i>	

Table 2: Coal licenses at Quinsam Mine

Tenure No.	Former Coal License No.	Area (hectares, more or less)	Anniversary date	-- Annual rental charge per hectare	-- overall	Lands covered
327676	CL 3670	259	January 31	\$25.00	\$6475	Parts of Bks 98, 149 and 149(a)
327690	CL 6874	102	January 31	\$25.00	\$2550	Parts of Bks 98 and 149 (b)
Totals		361 hectares			\$9025	

The coal licenses are in good standing until January 31, 2015.

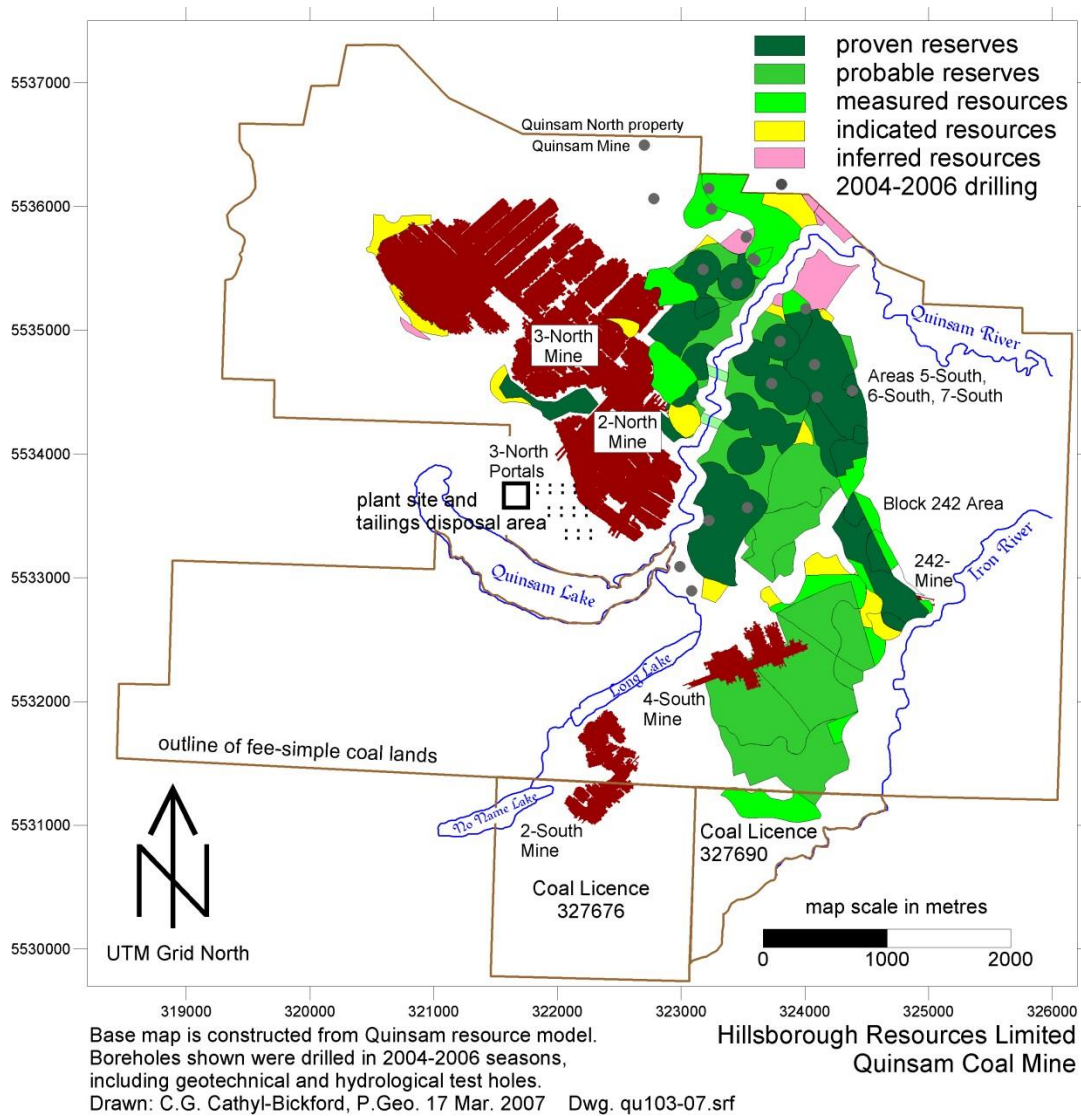


Figure 1: Map showing the Fee Simple and Coal License Boundaries

4. History

Please refer to Stephen Gardner's 2001 report for the early history of the Quinsam Coal Property and mines.

Mining has continued in the 2-North/5-South mine to the #1 seam mineable limits, which were reached in 2012. Since that point, the efforts in this mine has been retreat mining, 'backing out', expecting a full 2-North/5-South mine closure in 2016.

In 2012, a portal pit was constructed in the 7-South Mine Area, targeting the #4 Coal Seam. Underground mining commenced immediately, and continues today in the 7-South Mine. Mining will commence in the 7-South Area 5 in 2014.

5. Exploration

Since 1975, over 750 holes (including 2013) have been drilled in and around the Quinsam Coal Property, as shown in Figure 1. The 23 holes that were drilled within the 2013 calendar year were located within the 4S/6S/7S areas as shown in Figure 2. These holes were specifically targeting the #3 coal seam, but also intersected the overlying #4 seam in a number of holes. All of the coals from the #3 seam were cored and sampled, and the #4 seam was cored when in the currently proposed and permitted mining area. The #3 seam was targeted in anticipation of a mine permit application; holes specifically located where coal quality information was lacking, or geologic structure was predicted. The #4 seam intersects provided both quality and structural information.

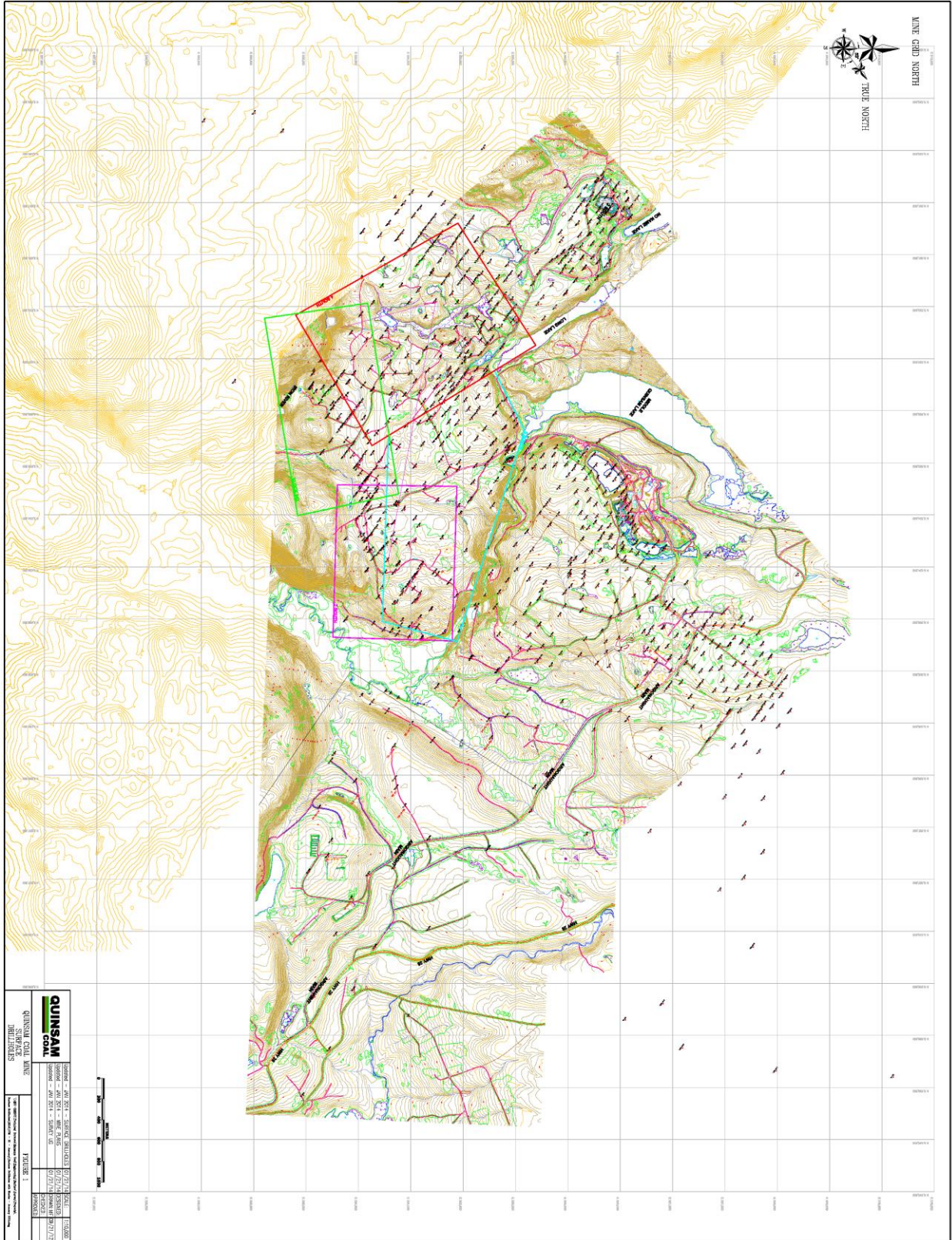
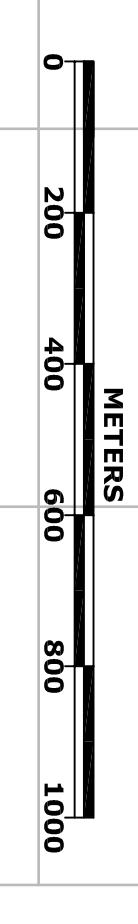
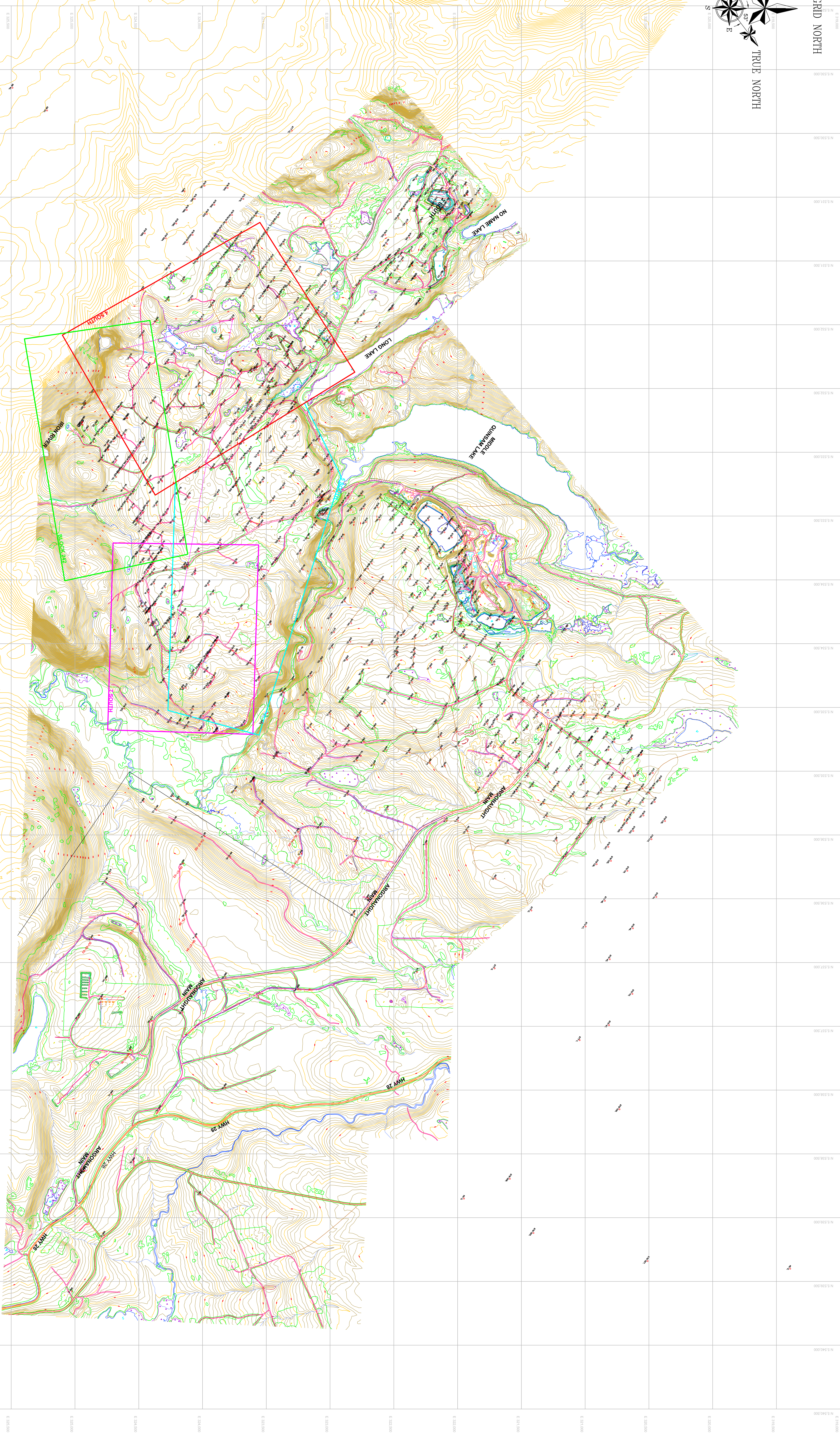
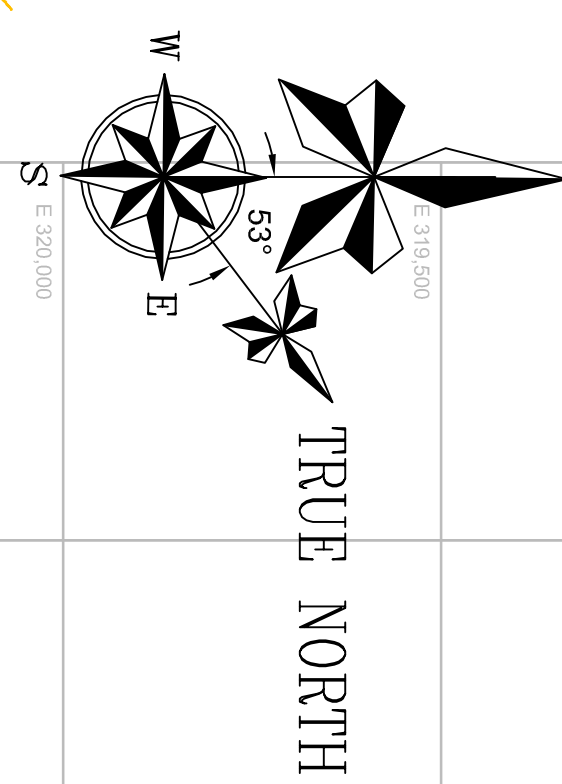


Figure 2: Map of all drillholes in and around the site.

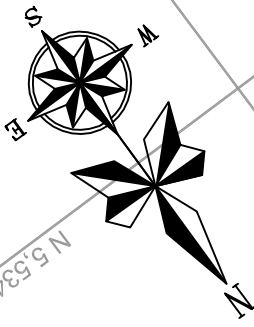
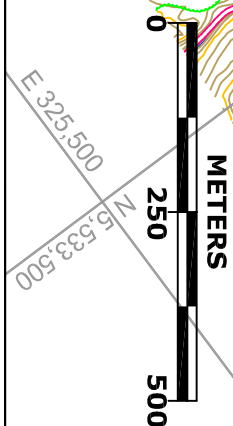
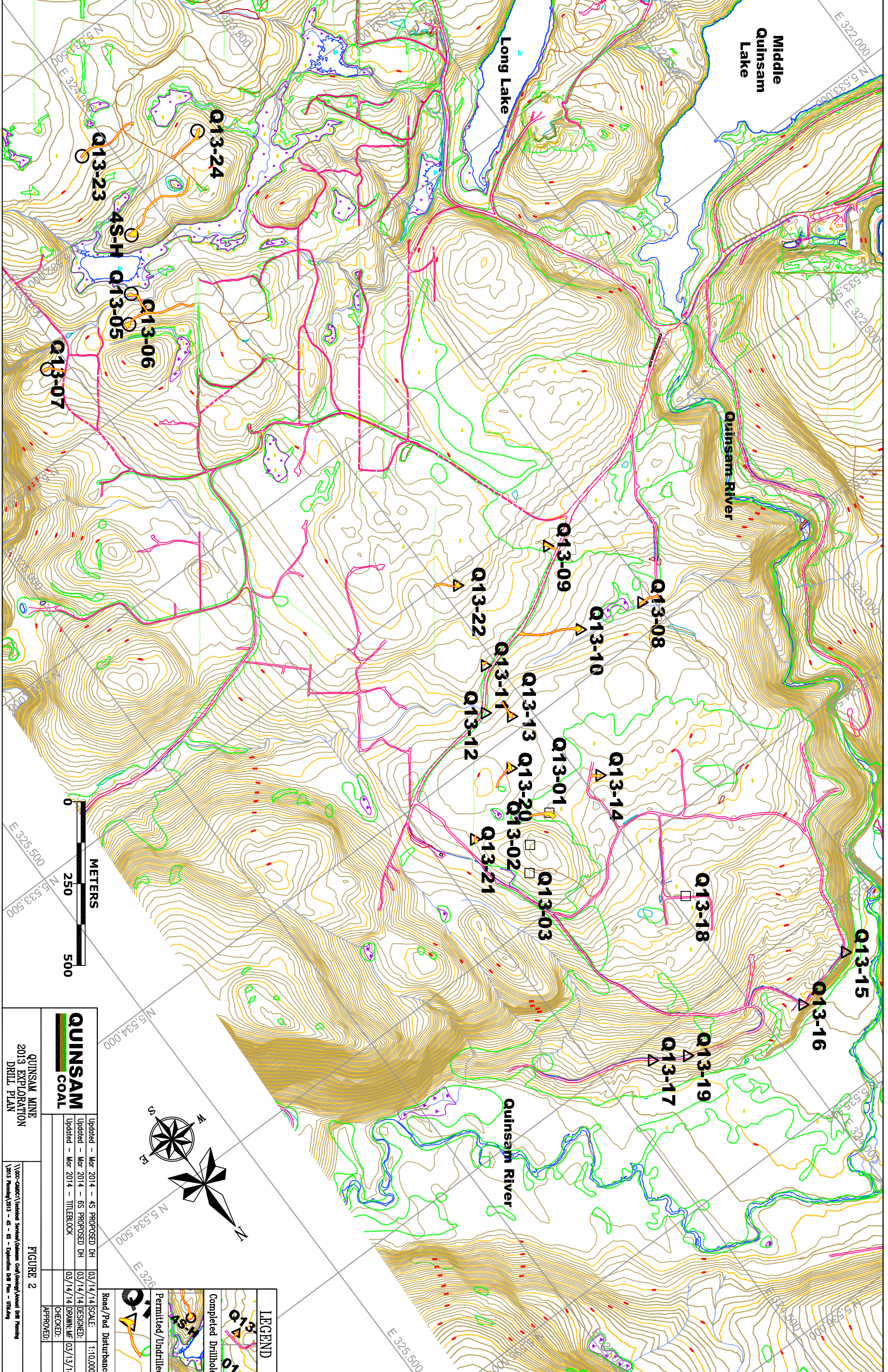


QUINSAM COAL MINE
SURFACE DRILLHOLES

Updated - JAN 2014 - SURFACE DRILLHOLES 01/21/14 SCALE: 1:10,000
Uploaded - JAN 2014 - MINE PLANS 01/21/14 (REVISION) 09/21/12
Updated - JAN 2014 - SURFACE 03/01/14 (REVISION) 09/21/12
CHECKED: [Signature]
APPROVED: [Signature]

FIGURE 1

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QUINSAM MINE 2013 EXPLORATION DRILL PLAN	
Updated - Mar 2014 - 4S PROPOSED DH	03/14/14
Updated - Mar 2014 - 6S PROPOSED DH	03/14/14
Updated - Mar 2014 - TITLEBLOCK	03/14/14
CHECKED:	03/13/14
APPROVED:	

	Road/Pad Disturbance
	Completed Drillhole
	Permitted/Undrilled

FIGURE 2
 \\000-C:\QDC\1\Technical Services\Quinsam Coal\Geology\Annual Drill Planning
 \2013 Planning\2013 - 4S - 6S - Exploration Drill Plan - UTM.dwg

6. Drilling

a. Equipment and Methods

The majority of the proposed drillholes were planned to be drilled off of currently constructed roads to minimize disturbance, although a number of holes fell in currently unlogged areas. Following consultation with the companies that held the timber rights, roads and pads were constructed using a method to minimize any damage to salvageable timber, which was confirmed to be nil.

Ben VanDyk Trucking Ltd. was used to construct the access roads, pads, and sumps. The work was done using a 320C Cat Excavator. The total disturbed ground was 0.7972 hectares, and is described in Table 1, and shown in Figure 3.

Disturbed Ground 2013					
Area	Drill Hole #	Area (m²)	Hectares (ha)	Easting	Northing
1	Q13-14	185.9	0.0186	323954.1590	5534260.0880
2	Q13-01	616.6	0.0617	324142.9242	5534260.9336
3	Q13-21	124.1	0.0124	324374.7318	5534195.2848
4	Q13-20	429.2	0.0429	324157.1961	5534079.9521
5	Q13-13	276.7	0.0277	324059.3290	5533950.6430
6	Q13-11	86.6	0.0087	324033.4315	5533777.2559
7	Q13-10	952.5	0.0953	323736.9910	5533863.7676
8	Q13-09	260.3	0.0260	323660.3247	5533605.7351
9	Q13-22	395.3	0.0395	323952.1111	5533539.5387
10	Q13-05	1537.3	0.1537	324222.0337	5532227.1244
	Q13-06	part of above	part of above	324278.7800	5532297.2600
11	Q13-07	309.5	0.0310	324563.7780	5532257.9400
12	Q13-24	626.5	0.0627	323762.3423	5531953.6730
13	Q13-23	780.1	0.0780	324084.9862	5531801.4865
14	4S-H	1391.0	0.1391	324111.0000	5532085.0000
	TOTAL	7971.6	0.7972		

Table 3: Summary of surface disturbance per drillhole

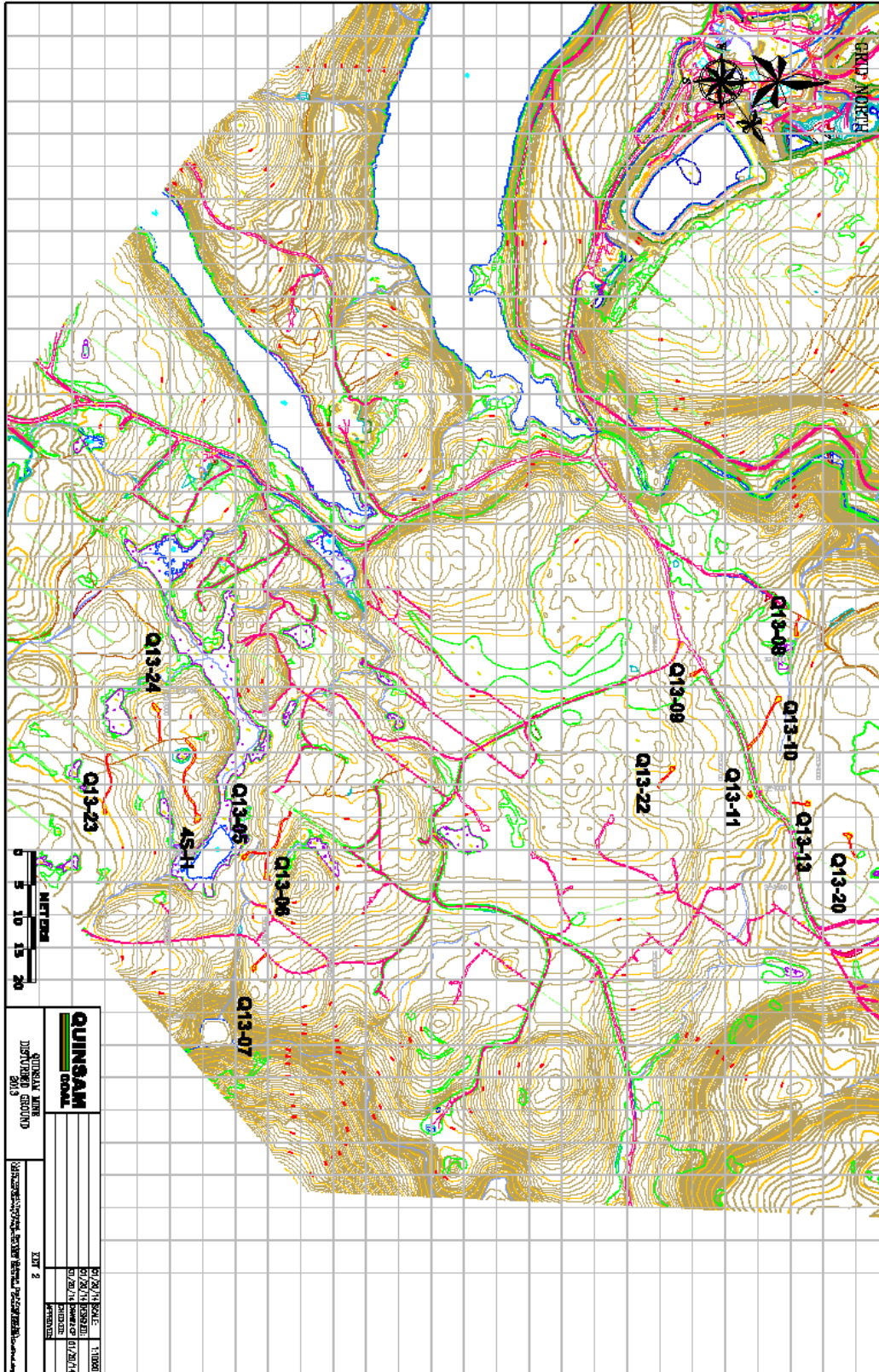
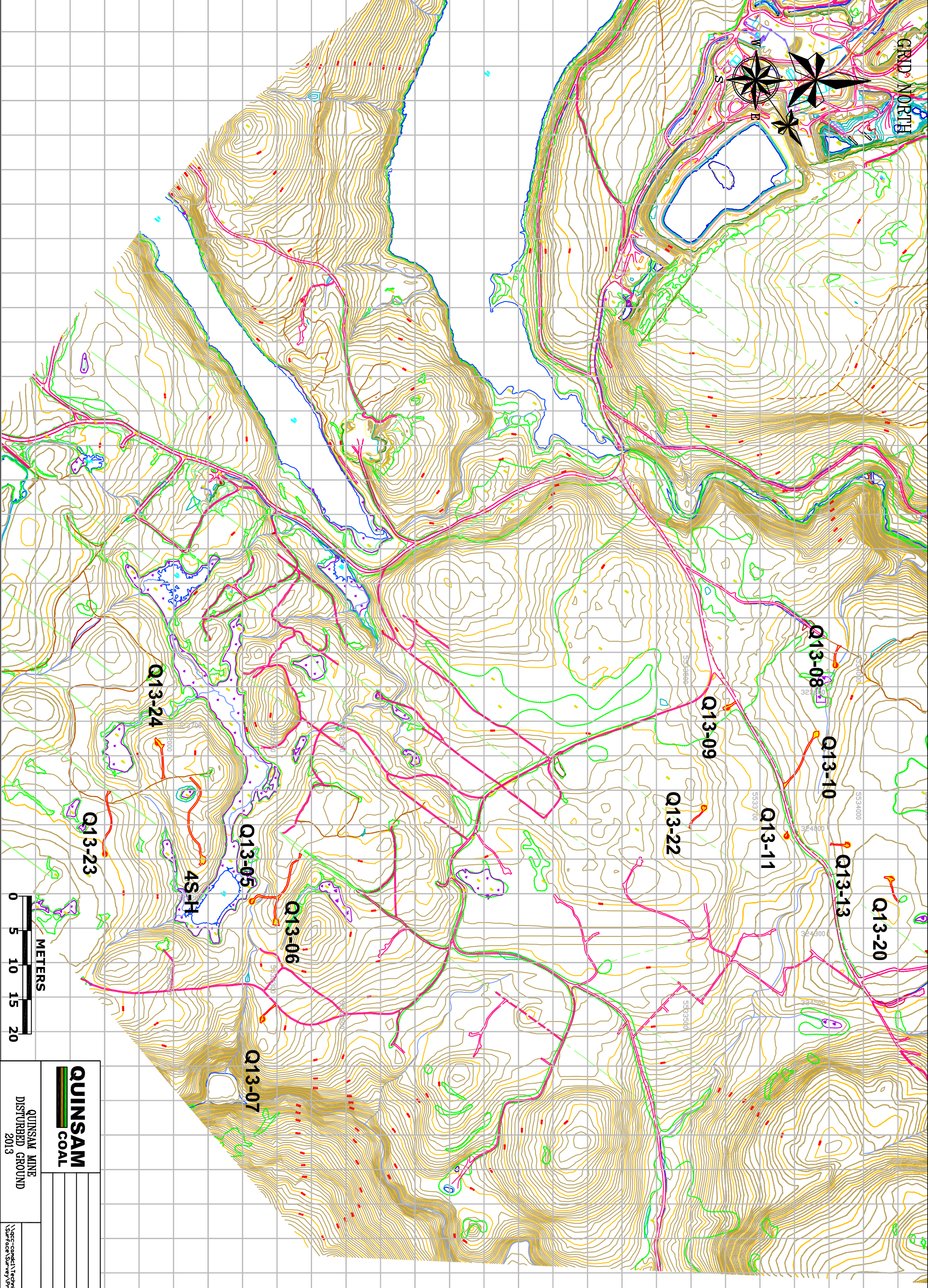


Figure 4: Map showing only the 2013 holes that required site disturbance



QUINSAM COAL

QUINSAM MINE
DISTURBED GROUND
2013

01/20/14	SCALE:	1:10000
01/20/14	DESIGNED:	
01/20/14	DRAWN: CP	01/20/14
	CHECKED:	
	APPROVED:	

KEY 2

\\sfc-candict\Technical_Services\Quinsam_Coal\Engineering\Surface_Survey\Projects\2013_Disturbed_Ground\20130120\Drawn\m.dwg

Two companies were used to provide the drilling services; RC Drilling Ltd. and Drillwell Enterprises Ltd. RC Drilling used a Prosepector-I drill. Drillwell Enterprises used a DR12 Dual Rotary Drill.

The process of recovery starts with installing casing to the top of bedrock to keep overburden from caving into the hole, followed by open hole drilling to a predetermined core point. Coring takes place through the roof rock of the prospective coal seam, the seam, and the floor rock. Where deemed necessary holes were left open for further investigation.

Downhole geophysical logging was performed by Century Wireline Services, which uses a wireline unit mounted in a 4x4 pickup. Two tools were used. The first tool measures gamma, density, resistance, and caliper. The second tool measures hole deviation and structure, i.e. bedding, joint, and fault measurements.

Any drillhole that intersected the proposed mine workings of the 7-South Mine, or any holes deemed unnecessary for the hydrogeological study, were cemented using a neat cement slurry provided by Uplands Readymix. This is done in a way that any groundwater that has collected in the hole is pumped out at the same time as the slurry goes in, ensuring a full cement column from the base of the hole into the surface casing, which remains in the ground.

None of the 2013 drill sites have been reclaimed to date.

b. Scope of Work

A total of 23 holes were drilled in 2013. 5 of these holes were located in 4-South, and 18 of the holes were drilled in 6-South. Of the 18 holes, 6 fall within the 7-South Mine Area.

A total of 2,211.81 metres were drilled, 37.18m of which was through overburden. Table 2 shows the drill hole ID's, locations, and total depths.

Drill Hole	Easting (m)	Northing (m)	Elevation (m)	Total Depth (m)
QU-13-01	324142.92	5534260.93	303.022	109.12
QU-13-02	324249.03	5534304.08	315.78	109.75
QU-13-03	324302.14	5534372.29	312.147	100.58
Q13-05	324222.03	5532227.12	334.56	103.94
Q13-06	324278.78	5532297.26	329.77	108
Q13-07	324563.78	5532257.94	317.69	100.89
Q13-08	323537.52	5533919.24	291.21	62.33
Q13-09	323660.32	5533605.74	306.59	80.44
Q13-10	323736.99	5533863.77	294.54	82.66
Q13-11	324033.43	5533777.26	304.25	100.4
Q13-12	324114.39	5533906.48	301.58	107.82
Q13-13	324059.33	5533950.64	304.30	113.13
Q13-14	323954.16	5534260.09	302.23	125.43
Q13-15	323672.43	5535129.91	234.12	111.84
Q13-16	323891.02	5535188.15	220.95	117.6
Q13-17	324349.13	5535048.91	211.22	27.61
Q13-18	323963.26	5534713.88	283.07	121.16
Q13-19	324248.99	5535107.03	218.00	42.98
Q13-20	324157.20	5534079.95	308.20	125.4
Q13-21	324374.73	5534195.28	306.99	86.87
Q13-22	323952.11	5533539.54	321.48	88.85
Q13-23	324084.99	5531801.49	349.41	84.73
Q13-24	323762.34	5531953.67	344.33	100.28

Table 4: Drillhole ID's, depths, and Locations

c. Costs

Table 3 summarises the costs of the 2013 drill program from the site prep to the receipt of results.

Expense	Total Cost
Pad Prep (Ben)	\$12,127.50
Drilling (RC Drilling)	\$252,692.00
Fuel/Hotel	\$1,078.53
Drilling (Drillwell)	\$60,098.30
Geophysical (Century)	\$48,786.61
Coal Quality (ALS)	\$40,749.29
ABA Work (SGS)	\$25,548.00
Strength Testing (Golder)	\$3,826.01
Total	\$444,906.24

Table 5: 2013 Drill Program costs

The cost of drilling was \$270.10 per metre.

7. Sampling Method and Approach

Each drillhole provided an opportunity to gather an abundance of geologic and geochemical information on the coal and the surrounding rocks, as well as physical strength information, in anticipation of mining the coal seam. As the core is recovered, basic geotechnical information is gathered on the geologic section, starting in the roof material, the coal zone (coal seams and partings), as well as the coal zone floor rocks. The lithology's are mapped and described, and anything anomalous is recorded in a Core Log (Appendix 1). The Core Logs are then combined with the Geophysical Logs (E-logs) (Appendix 2), in an effort to determine exact contact information to the accuracy of a centimetre. The combination of the two logs assists in determining the exact location of any possible 'lost core' during the coring process. Based on these contacts, a common set of sampling steps was followed to create consistency with our results. The basic roof and floor sampling steps were as follows:

2 samples from the roof rock: 0-0.1m in the immediate roof, and 0.1-0.3m above the coal roof.

1 sample from the floor rock: 0-0.1m in the immediate floor of the coal zone.

The purpose of the roof and floor samples is to represent possible mining dilution, or rock that would be exposed if the coal was mined out. These samples were sent to SGS Canada.

The basic strategy for sampling the coal was to sample the independent ply's (coal seams and rock partings). In select holes, we assumed a 2.0 metre mining height and added an extra sample break, in an effort to imitate quality data we would receive from an active mining height. These samples were sent to ALS Coal Lab.

The sample inventory's for both the roof/floor rock and the coal samples can be found in Appendix 3.

Coal analysis varied depending on the size of the core recovered (15 or 7cm diameter), and coal analysis from each hole can be found in Appendix 4. Once the requested coal analysis was completed, certain samples that represented a mining height were sieved to provide a 'fines sample, and then washed at a specific SG so as to provide a 'float' and a 'sink' sample that would represent a 'product' and 'coarse coal reject' sample. These representative samples were then forwarded to the SGS Canada lab to accompany the floor and roof rock samples.

SGS Canada performed Acid Based Accounting (aba) testing as well as metals analysis on all samples received. The results are provided in Appendix 5.

In addition to the rock and coal quality sampling, three drillholes were chosen to have various strength tests performed by the Golder Associated Ltd Burnaby Laboratory. Samples were taken from the floor of the coal zone, the immediate roof of the coal zone, and 2-5m above the roof of the coal zone. The sample inventories and the test results can be found in Appendix 6.

8. Summary

All of the drillholes were planned to target the #3 coal zone, and each of the drillholes intersected that coal zone. In each case, coal quality information was acquired from the coal zone, and ABA analysis was performed on the roof and floor rock. In addition to the quality information, structural data was collected from both the geophysical logs as well as the recovered core, which was logged by the mine geologist (author). Compilation of the data, and utilising the data for resource estimating, is ongoing to date, therefore an interpretation of results will not be provided in this report. A follow up drill program has been planned for 2014.

9. References

1. GARDNER, S.; "Report on 2001 Exploration and Development Drilling Program", 2001, Gardner Exploration Consultants Ltd.; for Quinsam Coal Corporation.
2. Cathyl-Bickford; "Geologic Report on Quinsam Mine", 2007, Dunsmuir Geoscience; for Hillsborough Resources Limited.

I, Nick Bazowski, declare that

- I am a geologist and have been employed in the fields of mineral exploration and mining since 2007.
- I graduated from the University of Victoria, in Victoria, British Columbia, with a Bachelors of Science degree in Earth Sciences in 2007.
- I am a Member of the Association of Professional Engineers and Geoscientists of BC, currently as a Geologist in Training (#160214).
- I am currently the Mine Geologist at the Quinsam Coal Mine, working for Quinsam Coal Corporation.
- I supervised and took part in all on site aspects of the 2013 Quinsam Coal exploration and development program.

April 4, 2014

Nick Bazowski



Appendix 1 – Core logs

QU-13-01		Feb, 2013		Deepened in April, 2013		Logged by: Nick Bazowski and Sarah Shi						
UTM: 324142.9 mE 5534260.9 mN 303.022 m Elev.				Mine Grid: 101043.916 mE 101647.136 mN 303.022m Elev.				Total Depth:	109.12m			
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)				Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)	
				Core Geolog								
0-1.83m			Overburden	Overburden; Bedrock at 6' (1.83m)								
1.83-45.87m				Hammer Drilled								
	25.93-26.40m		5	5 Seam Coal as picked on the e-log, density at 1.4								
	26.40-26.62m		5-5L Ptg	5-5L coaly siltstone parting as picked on the e-log, density at 1.6								
	26.62-27.21m		5L	5L Coal as picked on the e-log, density at 1.5								
45.87-49.73m				Sandstone; Medium to coarse grained, common bands or zones with interstitial silts +- pyrite. The sandstone is generally dirty. There is a ~25cm zone that exhibits bioturbations, <i>macaronichnus</i> . At 47.19m, there is a natural slightly sinuous break, and another at 47.24m. At 49.23m there is a natural fracture at 23 degrees. Bedding is at 8 degrees.					3.86		23-fracture 8-bedding	
49.73-51.50m	49.46-51.23m	K813595	4	Coal; 49.73-49.78m, The top 5cm is semi massive pyrite and rooty coal within sandstone, ~50% SS. Erosional slightly wavy basal contact with the main seam at 6 degrees. 49.78-49.80m, Sandstone, medium brown, fine grained, pyritic. 49.80-49.97m, broken dirty pyritic dirty coal. 49.97-50.24m, Solid intact coal, with local 1-2cm thick permineralised bands with calcite. Bands at 4 degrees. 50.24-50.42m, Broken rubble coal zone, with minor sands. 50.42-51.5m, solid intact clean coal.					1.77	49.46	6-bedding	
51.50-51.78m	51.23-51.51m	K813596	4-4L	SS/Coal/SS/Coaly Siltstone; 51.5-51.6m, Medium grained brown sandstone with a thin coaly section mid band. 51.6-51.78m, Coaly mudstone, thin laminae of coal within the mudstone, pinch and swell, slightly sinuous.					0.28	51.23		

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
51.78-53.315m	51.51-53.815m	K813597	4L	Coal with partings; 51.78-51.98m, Silty coal, dull and bright banded, dominantly coal, banding is wavy at 0-5 degrees. 51.98-52.03m, coaly mudstone. 52.03-52.39m, Coal, with trace speckled platy pyrite on cleats, with a 1.5cm sandstone band at 2 degrees. 52.39-52.405m, Sandstone, brown, wispy, fine grained, with erosional contacts. 52.405-52.455m, Coal, clean, bright. 52.455-52.63m, Sandstone, fine to medium grained, medium brown, with wisps of coal. 52.63-52.73m, Coaly sandstone, soft, with 2 broken planes, natural. 52.73-52.76m, Broken coal. 52.76-53.02m, Intact coal, basal contact at 3 degrees. 53.02-53.175m, Sandstone, medium brown 53.175-53.315m, Coal, intact basal contact.		1.535	51.51	2-bedding 3-bedding
53.315-53.60m			4L Sandstone	Sandstone, part of the 4L?; Sandstone, medium grained		0.285		
53.60-54.085m		K813598	4L	Coal, part of the 4L?; Coal, with 5cm coaly sandstone, with interstitial muds. This may be part of the 4L Coal seam.		0.485		
54.085-54.52m				Coaly Siltstone; Coaly Siltstone, with wisps of coal at 0-5 degrees.		0.435		
54.52-55.29m				Sandstone; Grey, coarse grained, dirty with interstitial silts and muds. There is a high angle intact fracture at 70 degrees to core axis. There is also a hairline laminae of coal at 12 degrees near the base of the unit.		0.77		70-fracture 12-bedding
55.29-55.60m				Dirty Sandstone; Dirty sandstone with minor rooty coal and abundant interstitial silts. Natural breaks at the top and the bottom.		0.31		
55.60-57.15m				Sandstone; Coarse, solid, except for 2 open fractures at 70 and 40 degrees tca, with minor calcite. At the base, the bottom 20cm is a fault zone at 30 degrees tca. Minor ground up material, gouge.		1.55		70-fracture 40-fracture 30-fault
				Hole Size reduced to 3" size, hammer drilled to 95.71m				
57.15-95.71m				Hammer Drilled				
	67.02-67.60m		4b	4b Coal seam as picked on the e-log, density around 1.5 SG		0.58	67.02	
95.71-97.49m				Sandstone; Fine grained, medium pinkish grey due to carbonate alteration throughout, strong fizz. The unit is very hard due to the alteration. There is a hairline calcite veinlet, irregular, vertical through most of the unit. There are also 'clouds' of interstitial silts randomly throughout. Broken 3 times within this interval, planar at 4 degrees. Gradational basal contact.				4-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
97.49-100.25m				Sandstone; Fine grained, tight, dark grey sandstone. Hairline silt and pyrite laminae throughout the unit, mark bedding at 5 degrees, and cross bedding at 32 degrees. Solid intact unit. Below 98.65m, there are far fewer laminations, and they are weaker interstitial silts, more of a salt and pepper colour. Erosional sharp basal contact.				5-bedding 32-x-bedding
100.25-101.48m				Sandstone; Dark grey, fine to medium grained. The top 20cm has wisps of interstitial silt, broken twice, once at 2 degrees, once at 35 degrees. At 101m, there is an elongate spar or hairline wisp of coal rimmed by pyrite. The basal 2cm is rubble, strongly pyritic.				2-bedding 35-x bedding
101.48-103.56m	101.20-103.35m		3R/3	3R/3 seam Coal 0.17m intact coal, appears clean but dull 0.02m coal rubble 0.58m coal, dominantly intact coal, broken 3 times naturally, pyrite noted in the top 2cm only, permineralised calcite noted throughout. Dominantly dull. 0.07m soft rubbly bright coal, with a break at the base at 35 degrees. 0.56m dull and brightly banded coal, dominantly bright, clean, intact, with permineralised calcite throughout, abundant. 0.03m massive pyrite within coal 0.27m, dull and brightly banded coal, dominantly dull, intact. 0.20m, 75% coal rubble, dull, with a small intact chunk of dull coal 0.18m intact dull and bright banded coal, duller towards the base, with 2 strong vertical calcite filled fractures/cleats, 85 degrees. Basal contact at 2 degrees.	0.07	2.08 / 2.15	101.2	35-fracture 2-bedding
103.56-104.16m	103.35-104.32m		3-3L Ptg	Coaly Siltstone; laminated with coal throughout, often wavy, often pyritic.		0.95 / 0.97	103.35	
104.16-104.35m			3-3L Ptg	Sandstone; Fine grained, tight, intact, medium grey.				
104.35-104.51m			3-3L Ptg	Coaly Siltstone; The top 12cm is rubble, and the basal 1cm.	0.02			
104.51-104.98m	104.32-105.04m		3L	3L Coal Seam; Dominantly intact, broken 3 times on bedding, 4 degrees. Dull and bright, mostly dull in the top half, mostly bright and cleated in the bottom half, cleats are often plated with pyrite and brown carbonates, and calcite. Rubbly basal contact.		0.77 / 0.72	104.32	4-bedding
104.98-105.28m			3L	Coaly Siltstone; Broken multiple times.				
105.28-107.09m				Muddy Siltstone; Often laminated with coal. <1/2cm thick, often wavy. Bedding is at 6 degrees. Often pyritic.				6-bedding
107.09-107.21m				Coaly Siltstone				
107.21-107.25m				Siltstone				
107.25-109.12m				Sandstone; Medium grey, grading into light grey. Fine grained, all intact.				
				EOH at 109.12m				

Q13-02		Feb, 2013		Deepened in April, 2013		Logged by: Sarah Shi and Nick Bazowski				
UTM: 324249.0 mE 5534304.1 mN 315.78m Elev.				Mine Grid: 101142.0 mE 101588.0mN 315.78 m Elev.				Total Depth:	109.75m	
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
0-0.3m		N/A	Till					0.3		
0.3-35.97m		N/A	Bedrock	Sandstone; light grey, at 7.32m, water shows						
	35.36-36.01m			5 Upper Coal, as picked on the e-log, SG of 1.55					35.36	
	36.01-36.68m			5-5L Parting, sandstone as picked on the e-log, SG of 2.05					36.01	
	36.68-37.14m			5 Lower Coal, as picked on the e-log, SG of 1.60					36.68	
35.97-37.8m		N/A	5+5L	Coal (from chips); at 36.6m, water shows				1.83	35.97	
37.8-55.89m		N/A	5L-4	Sandstone; Medium to coarse grained, intact, dark grey, except for at 46.25m, there is a natural fracture, which dips at 5 degree; at 46.56m, natural broken plan; at 50.77m, there is another fracture at 25 degrees. At 52.10m, the core is naturally broken, open at 80 degrees tca; at 48.04-55m, water shows when coring, solid sandstone				18.09	37.8	5-fracture 25-fracture 80-fracture
55.89-57.90m	55.35-57.36m	K813599	4	Coal; The top contact is intact, but pyrite enriched in the coal. The hole started making water at the top of this coal seam. 55.89-55.93m, top of the coal seam 4, pyrite-rich, loose coal. 55.93- 57.42m, intact coal. 57.42-57.43m, naturally broken coal plane. 57.43-57.61m, calcite band. 57.61- 57.78m, loose silty coal. 57.78- 57.9, intact coal				2.01	55.35	
57.90-58.00m	57.36-57.46m	K813600	4-4L	Sandstone; With a minor coaly interbed.				0.1	57.36	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
58.00-60.45m	57.46-59.91m	K813601	4L	<p>Coal; 58-58.42m, intact coal. 58.42-58.5m, loose coal. 58.5-58.59m, intact coal. 58.59-58.62m, coaly silty interbed. At 58.98m, there is a fracture in the coal, at ~2 degrees. Between 59.08-59.17m, the coal is broken, and loose. Between 59.17-59.28m, intact coal. 59.28-59.30m, silty coal 59.3-59.43m, sandstone with coal scattered 59.43-59.49m, loose sandy dirty coal. 59.49-59.63m, intact coal, with a natural break on bedding at 3 degrees. 59.63-59.74m, sandstone with coal scattered 59.74-60.45m, intact coal, with 2.5cm of siltstone, and 1 cm of slightly loose silty coal within.</p>		2.45	57.46	2-bedding 3-bedding
60.45-61.01m		K813605	4L-Lower Leaf Ptg/4L floor dilution	<p>Siltstone, and Coal; Muddy coaly siltstone, with a dirty coal band at the base, coaly muddy sandstone interbeds. 60.45-60.5m, muddy coaly siltstone. 60.5-60.54m, dirty coal band. 60.54-61.01m, coaly muddy sandstone, interbed of coal and sandstone.</p>		0.56	60.45	
61.01-62.06m			4L-Lower Leaf Ptg	Sandstone; Solid, intact		1.05	61.01	
62.06-62.33+m			Lower Leaf	Coal; Lower leaf, not the base of the coal, just not drilled further.		0.27	62.06	
				**Hole Deepened in April, reduced from 6" to 3", and cored through the underlying 3 seam				
62.33-95.71m				Hammer Drilled				
92.71-101.20m		ABA 130201 (30cm) & 130202 (basal 10cm)		<p>Sandstone; Medium grained, medium grey, massive, almost completely intact. At 97m, there is a sub vertical rough surfaced fracture at 83 degrees. Between 97.6m to 97.87m, there are coal spars in a fabric of 28 degrees, flattening to 22 degrees at the base, bedding or cross bedding? At 97.45m there is a fracture at 38 degrees. by 99.3m, the bedding has flattened to 6 degrees. The basal 2cm is slightly coaly, dirty, pyritic and crumbly.</p>			92.71	83-fracture 28-fabric 22-fabric 38-fracture 6-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
101.20-101.99m	100.90-101.69m	K813632		3R Coal Seam; 0.16m intact dull and bright coal, bedding at 6 degrees. 0.03m muddy dirty soft coal 0.60m intact dull and brightly banded coal, slightly dirty due to hairline silt and pyrite wisps throughout on bedding. There are a couple 1cm bright bands with stronger cleating. There are 2 bands with permineralised calcite.		0.79	100.9	6-bedding
101.99-102.10m	101.69-101.80m			3R-3 Parting; Dull and bright dirty coal, not quite coaly mud, slightly arbitrary parting pick, just noticeably dirtier here, with a 1cm rubble zone mid interval.		0.11	101.69	
102.10-103.46m	101.80-103.16m			3 Seam Coal; 0.89m dull and bright coal, all intact, dominantly bright. There are sub vertical calcite veinlets, plating hairline fractures or cleats, as well as calcite in thin 1-3mm permineralised bands. No noted pyrite. 0.05m, dirty coal rubble, almost powder 0.04m, clean bright coal, intact 0.02m, dirty coal, brown scratch 0.04m clean bright coal, intact 0.04m 2 cm dirty coal rubble and 2cm of silty coal with brown scratch 0.17m dull and bright dirty coal, intact.		1.36	101.8	
103.46-104.28m	103.16-103.98m	K813633		3-3L Parting; 0.53m coaly siltstone, dark brown, intact, dense with hairline coal laminae, some laminae are densely permineralised. Bedding is at 4 degrees. 0.08m dirty coal, brown scratch 0.07m sandstone, fine grained, medium to dark grey, hard, intact 0.17m coaly mudstone, the basal 7cm of which is rubble.		0.82	103.16	4-bedding
104.28-104.81m	103.98-104.51m	K813634		3L Coal Seam; Dull and brightly banded coal, slightly dirty, broken on bedding at 5 degrees every 6-10cm, with a 1cm massive pyrite band mid interval. Slightly fissile basal contact.		0.53	103.98	5-bedding
104.81-105.30m				Coaly Mudstone; Broken in the top 15cm, the rest is intact, moderate amount of coal laminae at bedding of 4 degrees. Pyritic laminae towards the base.		0.49	104.81	4-bedding
105.30-105.42m				Mudstone; Dark brown at the top, beige in the base.		0.12	105.3	
105.42-106.16m				Coal Siltstone; Dark brown, with regular 1-2mm coal laminae every 1cm. Broken 7 times, with a rubble zone at the base. Semi massive pyrite near the base.		0.74	105.42	
106.16-106.40m				Dirty Coal; ~40% mudstone as interbeds. Minor pyrite noted on cleats and within, 1 pyrite lamination near the base.		0.24	106.16	
106.40-106.49m				Gouge mud zone, very soft.		0.09	106.4	
106.49-106.57m				Coaly Siltstone; Hard, intact.		0.08	106.49	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
106.57-109.75m				Sandstone; Salt and pepper appearance, fin to medium grained, massive, intact.		3.18	106.57	
				EOH @ 109.75m				

Q13-03		Feb, 2013		Deepened April, 2013		Logged by: Nick Bazowski					
UTM: 324302.1 mE		5534372.3 mN		312.147 mElev.		Mine Grid: 101228.4 mE 101586.3 mN 312.147m Elev.			Total Depth:	100.58m	
Depth (based on drillers footage)	Depth (based on E-log)	Sample # ALS Coal Lab	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)				Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog							
0-2.74m				Overburden: Cased to 11'.							
	38.81-39.17m		5 Upper	As picked on the e-log, Coal at 1.45SG					0.36	38.81	
	39.17-39.70m		5-5L	As picked on the e-log, Coaly Siltstone at 1.65SG					0.53	39.17	
	39.70-40.10m		5L	As picked on the e-log, Coal at 1.45SG					0.4	39.7	
44.50-47.93m				Sandstone; Massive, not logged due to lack of water for washing. Massive, completely intact, no fractures or faults or bedding breaks. 100% RQD and recovery.					3.43	44.5	
47.93-49.94m		K813602	4	Coal: 13cm intact clean bright coal 4cm broken coal, with minor light to medium brown silt, bedding at 3 degrees. 85cm intact coal, trace permineralised bands with calcite, minor platy pyrite within cleats. Basal break at 0 degrees. 79cm as above. 5cm fissile dull and brightly banded coal, rubbly zone, bedding at 0 degrees. 15cm as above, but intact. The basal contact is intact, bedding at 2 degrees.					2.01	47.93	3-bedding 0-bedding 2-bedding
49.94-50.05m		K813603	4-4L Parting	Coaly Sandstone; Black coaly sandstone, but dominantly sand. Scratches brown.					0.11	49.94	
50.05-52.51m		K813604	4L	Coal: 25cm clean coal, bright, with minor permineralised calcite. 15cm clean bright coal, with moderate cleats. Intact, trace pyrite. 8cm fissile slightly silty coal, dull and bright banded, intact. 44cm intact coal, minor dirty bands and minor permineralised bands. Basal contact at 4 degrees. 4cm silty sandstone, medium grained, brown. 38cm intact banded coal, dominantly clean. Wavy erosional base. 8cm silty sandstone, with minor rooty coal. 22cm coal, dull and bright banded, intact. 17cm sandstone, medium grained, brown, with trace coaly trash disseminated throughout 4cm fissile rubbly coal 5cm intact dull coal 3cm mudstone, brown, with bedding at 3 degrees. 53cm intact solid coal, trace platy pyrite.					2.46	50.05	4-bedding 3-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample # ALS Coal Lab	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
52.49-53.30m			4L-Lower Leaf Ptg	Coaly Siltstone; 57cm of coaly siltstone, minor coal laminae, brown. 4L floor. 24cm coaly siltstone, moderate coal laminae, with a 4cm mud band at the top. Bedding is at 4 degrees.		0.81	52.49	4-bedding
53.30-54.44m			4L-Lower Leaf Ptg	Sandstone; Coarse grained, medium grey, massive.		1.14	52.3	
54.44-54.69m			Lower Leaf	Coal: Intact coal, top and bottom contact are sharp at 2 degrees, intact.		0.25	54.44	2-bedding
54.69-54.86m				Coaly Sandstone		0.17	54.69	
				****Everything Below 54.86m is deepening the hole with 3" coring****				
54.86-89.61m				Hammer Drilled				
	60.29-60.82m		4b	As picked on E-log, coal at ~1.45 SG		0.53	60.29	
89.61-92.72m				Sandstone; Laminated often, by hairline medium to dark grey bands at both bedding and cross bedding. Light to medium grey, darkening with depth, fine grained. Bedding is at 7 degrees, cross bedding is at 20 degrees. At 90.9m, there is a sub vertical rough surfaced fracture or opening, at ~78 degrees. Towards the base, the laminations on bedding start to contain hairline coal wisps. The basal 13cm contains rooty coal, semi massive pyrite blebs and two 2-3cm rubble zone of coal, pyrite and sandstone.		3.11	89.61	7-bedding 20-x-bedding 78-fracture
92.72-95.09m	3R: 92.50-93.39m 3R-3 Ptg: 93.39-93.45m 3: 93.45-94.87m	K813629	3R/3	3R/3 Coal Zone; 0.28m dull and bright coal with 2 short 3cm rubble zones, clean 0.07m of clean coal 'biscuits', bedding at 9 degrees. 0.33m solid coal, mostly dull, possibly slightly dirty based on scratching. Trace pyrite blebs noted, and one 1/2cm zone with dendritic permineralised calcite 0.09m dirty coal, slightly brown scratch, top and bottom are small rubble zones 1.06m solid intact dull and bright banded coal, mostly bright, mostly clean. Both platy pyrite and platy calcite noted on cleats. Bedding is at 6 degrees. 0.18m slightly dirty intact coal, appears clean, but slight discolouration when scratched 0.01m coaly siltstone band 0.15m slightly dirt intact solid coal, appears clean, but slight discolouration when scratched 0.20m solid intact coal, dirty with a hairline pyrite laminae, and slight brown scratch. Permineralised pyrite within zone. Intact basal contact at 5 degrees.		2.37	3R: 92.5 Ptg: 93.39 3: 93.45	9-bedding 6-bedding 5-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample # ALS Coal Lab	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
95.09-95.81m	94.87-95.59m	K813630	3-3L Ptg	3-3L Parting; 0.20m siltstone, medium grey brown, with trace coaly laminae. 0.14m coal, dirty, dull 0.15m coaly mudstone with a 1.5cm massive pyrite band. Bedding is at 4 degrees. 0.08m sandstone, fine grained, light grey 0.15m mudstone with minor coal laminae on bedding at 5 degrees. Intact basal contact at 5 degrees.		0.72	95.09 / 94.87	4-bedding 5-bedding
95.81-96.40m	95.59-96.23	K813631	3L	3L Coal Seam; 0.39m intact solid coal, appears dirty, dull and bright, with multiple zone or bands, dense with permineralised calcite. Trace pyrite near the base. 0.02m mudstone, medium grey brown. 0.18m, dull and bright coal, mostly bright, trace pyrite, platy, on cleats. Intact basal contact at 5 degrees.	0.05	0.59 / 0.64	95.81 / 95.59	5-bedding
96.40-96.62m				Mudstone; Medium to dark brown, fissile at the top with hairline coal laminae, rubbly and soft at the base.		0.22	96.4	
96.62-97.73m				Coaly Siltstone; Medium grey brown siltstone, dense with hairline coal laminae throughout, and the odd banded up to 2-3cm thick. Bedding is at 5 degrees. The unit is broken often on bedding, every 1-10cm's.	0.1	1.11	96.62	5-bedding
97.73-100.58m				Sandstone; Massive, uniform, all 1 piece, fine grained, medium grey.		2.85	97.73	
				EOH @100.58m				

Q13-05		Apr, 2013	Logged by: Nick Bazowski							
UTM: 324222.033 mE 5532227.124 mN 334.563 m Elev.			Mine Grid: 99462.336 mE 100366.026 mN 334.563 m Elev.				Total Depth:	103.94m (341')		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
0-0.61m				Overburden						
0.61-6.10m				Casing: Cased through overburden and into bedrock.						
6.10-91.74m				Hammer Drilled: Drilled down to a core point (301'). Notes: 135' (41.15m), the hole started making water. 155' (47.24m) the hole is making more water, ~50-60gpm.						
91.74-91.88m				Lithic Sandstone; Fine to medium grained, moderately to poorly sorted. Medium grey. Basal contact at 11 degrees.					91.74	11-bedding
91.88-93.17m				Laminated Sandstone; Fine to medium grained, medium grey, dense with 3-20mm laminations or bands of heavy mineral matter, pyrite+?, ~1 per 3cm. Bedded at 9 degrees, crossbedded at 18 degrees. Competent, but with 2 breaks on bedding with trace clay/gouge within. Sharp basal contact on bedding.					91.88	9-bedding 18-cross bedding
93.17-96.60m				Sandstone; Medium to fine grained, medium to dark grey, with few laminations on bedding at 6 degrees, 1/15-20cm. Competent unit, semi hard and tight to ~95m, then often broken on bedding and cross bedding, 1/20cm, but 2-3 breaks per zone. The basal contact is marked by a fracture at 78 degrees, lined with pyrite and ground up rock, and trace calcite (fault).					93.17	6-bedding 78-fault
96.60-96.98m				Lithic Sandstone; Poorly sorted, dominantly medium grained with lithics zones, tightly packed. The unit contains blebs of semi massive pyrite. The basal 6cm is a sandstone cemented breccia with rock fragments up to 1.5cm sized. Sharp irregular basal contact, erosional?					96.6	
96.98-97.99m	96.88-97.96m	K813659	3R	3R Coal Seam; 8cm bright cleated clean coal. <i>58cm lost core, possibly here</i> 15cm coal, moderate pyrite, the top 11cm is intact, the rest is broken, almost flaky. 5cm coaly mud, slightly fissile, broken up. <i>15cm lost core, possibly here</i>			0.80m	1.08	96.88	
97.99-98.32m	97.96-98.37m	K813660	3R-3 Ptg	Siltstone; 33cm broken up siltstone with minor coal fragments, no bands of rock >1.5cm. bedding close to 5 degrees.			0.08	0.41	97.96	5-bedding
98.37-98.84m	98.37-98.84m	K813661	3	3 Seam Coal; 46cm of coal, with a 1.5cm and a 1/2cm pyrite band near the top. Dominantly competent, one strong open cleat at 55degrees, bedding at 7 degrees. Dominantly dull. There is pervasive permineralised calcite as hairline calcite veinlets.			0.01	0.47	98.37	7-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
98.69-100.10?m	98.84-100.25m	K813662	3-3L Ptg	3-3L Parting 6cm rubby coal 17cm siltstone, medium brown, with trace coal laminations <i>33cm lost core, possibly here.</i> 85cm dark brown siltstone/mudstone, with large broken rubby zones. Trace coal laminae throughout. <i>6cm lost core, possibly here</i>	0.33	1.41	98.84	
100.10-101.65?m	100.25-101.63	K813663	3L	3L Coal; <i>10cm lost core, possibly here</i> 14cm interbedded coal and siltstone, bedding is at ~4 degrees. 27cm coal, intact, with multiple pyrite stringers throughout, making up ~3%. Bedding (from the pyrite) is at 20 degrees, cross bedding? 8cm siltstone rubble 48cm of mud, wet, very fine grained 16cm silty mudstone 10cm silty coal, intact 10cm coal and siltstone rubble	0.1	0.38	100.25	4-bedding 20- cross bedding?
101.65-101.98m				Sandstone; Intensely bioturbated, silty in the top 25cm, with minor rooty coal. Fine to medium grained and medium grey, bioturbations are black. The unit is intact.		0.33	101.65	
101.98-103.94m				Sandstone; Medium grained, medium grey, uniform. Intact.			101.98	
				EOH @ 103.94m				

Q13-06		Apr, 2013		Logged by: Nick Bazowski						
UTM: mE mN m Elev. (not surveyed yet)		Mine Grid: mE mN m Elev. (not surveyed yet)			Total Depth:	108.00m (354'4)				
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
0-0.61m				Overburden						
0.61-3.05m				Casing						
3.05-98.76m				Hammer Drilled: Notes: 140' (42.67m), 3-4 gpm of water 190' (57.91m), the drillers reported a small mud band (4b or 4 seam?) 240' (73.15m), the drillers reported a small mud band (4b seam?)						
	61.42-61.90m			Fault/Cave in , recognised on the caliper and density log, and reported by drillers as a small mud band.					61.42	
98.76-101.04m				Sandstone ; Moderately hard, competent, dominantly intact, broken rarely on bedding planes, 7 degrees, often lined with dark grey brown silts +- pyrite, 1/50cm. The unit is massive. There are lightly discoloured bands, the unit is medium grey, but the bands are medium to dark grey, due to interstitial material.						7-bedding
101.04-101.51m				Lithic Sandstone ; Fine grained at the top, coarsening down to medium grained lithics near the base. There are multiple bands of interstitial pyrite. Harder unit. The basal contact is at 18 degrees, slightly wavy.						18-basal contact
101.51-103.17m	101.36-103.02m	K813664	3R/3	3R/3 seam coal zone (0.24m) 101.51-101.75m, intact coal, moderately dull, with trace pyrite bands near the top. There are a few permineralised cleats at 30 degrees, and one open fracture at 40 degrees with pyrite within in the top 8cm. (0.08m) 101.75-101.83m, broken rubbly clean coal (0.27m) 101.83-102.10m, Coal, dominantly dull, broken every 1-3cm, on bedding at 7 degrees. (0.30m) 102.10-102.40m, lost core (I think) (0.61m) 102.40-103.01m, dull and brightly banded coal, dominantly dull, dominantly in pieces 2-8cm sized, broken on bedding, 5 degrees. There are 2 pyrite bands, one is 7mm thick, one is 2mm thick. Dominantly clean. (0.16m) 103.01-103.17m, lost core			0.46	1.66	101.36	30-cleats? 40-fracture 7-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
103.17-104.25m	103.02-104.00m	K813665 (103.02-103.36m) K813666 (103.36-104.0m)	3-3L Ptg	3-3L parting (and fault); (0.33m) 103.17-103.50m, lost core. (0.17m) 103.50-103.67m, mud and medium brown siltstone/mudstone fragments up to 2cm sized. Possible fault. (0.09m) 103.67-103.76m, coaly siltstone, small 'biscuits' of core, dense, siltstone with coaly laminae, 0% RQD, no piece larger than 13mm. (0.28m) 103.76-104.04m, dirty sandstone, trace coaly, mostly silts, fine and medium grained,. Bedding is at 11 degrees. (0.06m) 104.04-104.10m, waxy mudstone, fragments of dark brown mudstone with slickenside surfaces. (0.10m) 104.10-104.20m, lost core (Not according to e-log) (0.05m) 104.20-104.25m, coaly sandstone, fine grained, trace coal laminae.	0.33	1.08	103.02	10-bedding
104.25-104.80m	104.0-104.55m	K813667	3L	3L Coal Seam; (0.47m) 104.25-104.72m, coal, dominantly intact, with thin bands <1cm thick with dense hairline dendritic permineralisation veinlets, filled with calcite. There are some zones of bright cleated coal. No pyrite observed. Bedding is at 10 degrees. (0.08m) 104.72-104.80m, broken waxy coal fragments.	0	0.55	104	10-bedding
104.80-105.00m				Bone Coal; ~40% coal, 60% rock.				
105.00-105.51m				Coaly Siltstone; medium grey.				
105.51-105.84m				Mudstone; Dense with coal laminations at 5 degrees.				5-bedding
105.84-107.09m				Bioturbated Sandstone; with rooty coal and coal trash. Moderate pyrite throughout.				
107.09-108.00m				Sandstone; Fine grained, tight, hard, uniform, slightly pinkish, k altered? Medium grey.				
				EOH @ 108.00m (354'4)				

Q13-07/7a		Apr, 2013		Logged by: Nick Bazowski						
UTM: 324563.778mE 5532257.94mN		317.688m Elev.		Mine Grid: 99691.638mE 100110.762mN 317.688m Elev.			Total Depth:	100.89m (292')		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
80.77-81.65m				Sandstone; Fine grained sandstone, medium grey, massive, uniform except for some coal spars and a natural break mid interval. Bedding is at 2 degrees. Sharp basal contact.						2-bedding
81.65-83.74m				Salt and Pepper Sandstone; Fine to medium grained, salt and pepper coloured, but medium grey, tight, intact competent massive unit, with a couple heavy mineral bands at ~82.7m at 4 degrees.						4-bedding
83.74-84.03m				Sandstone/Mudstone Interbeds; Wavy mudstone stringers through fine to medium grained sandstone, with trace rooty coal. Transitional unit.						
84.03-84.28m	83.39-83.70m	K813653	3R 'coal' zone?	Coaly Mudstone; Dark brown mudstone, with 2 1cm coal bands and multiple hairline coal laminae. Bedding at 2 degrees.				0.31	83.39	2-bedding
84.28-84.42m	83.70-84.85m		3R-3 Ptg	Dirty Sandstone; Fine grained, dense with hairline silt/mud laminae, dark grey.				1.15	83.7	5-bedding
84.42-85.04m				Coaly mudstone; Medium to dark brown, with 3 1cm planar coal bands at 5 degrees, and a few hairline laminae. The unit is broken often on bedding at 5 degrees. Soft.						
85.04-85.40m				Dirty Sandstone; Dark grey brown, fine to medium grained, dense with irregular interbeds of muds and silts, dominantly interstitial bands. Rooty coal at the base of the unit.						
85.40-85.49m				Coaly mud; Very soft with few fragments. Fault, no orientation.						
85.49-85.75m	84.85-86.91m		3 'coal' zone?	Coaly Mudstone; Dark brown, ~25% coal as laminae. Often broken, but harder than the muds above.				0.26	84.85	6-bedding
85.75-86.48m				Siltstone; Dark brown, with hairline coaly silts throughout, and one 3cm coal band with permineralised calcite within.				0.73		
86.48-87.55m				Coaly Siltstone/Mudstone; as above, but with more coal laminations, ~5-10%. In the basal 30cm, there are 2 zones of brown coarse grained sandstone/ or lithic bands, at 6 degrees, bedding.				1.07		
87.55-88.42m				Lithic Sandstone; with a rooty coal zone at the base, lithics up to 2mm sized, otherwise poorly sorted, all grain sizes. Distorted unit.						
88.42-89.00m				Lithic Sandstone; As above, but without any coal.						
89.00-89.17m				Lithic Sandstone; Coarse grained lithics with a couple rock fragments up to 2cm sized. Sharp basal contact at 31 degrees.					2-bedding	
89.17-89.39m				Mudstone; Medium to dark brown, with a 1.5cm coal band, mid interval at 2 degrees dip.					2-bedding	
89.39-90.01m				Lithic Sandstone; Poorly sorted, all less than coarse grained, dirty. Trace rooty coal and coal trash throughout, and moderate interstitial silt zones. Wavy sub horizontal erosional contact.						

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
90.01-90.15m				Coaly Mudstone; Medium to dark brown mudstone, dense with 2-3mm coal laminae. Erosional basal contact.				
90.15-90.16m				Sandstone; alike 89.39-90.01m, erosional basal contact.				
90.16-90.20m				Coaly Mud band; Dense with permineralised calcite.				
90.20-90.34m				Sandstone; alike 89.39-90.01m.				
90.34-90.37m				Coal; Clean bright coal, sub horizontal.				
90.37-90.46m				Sandstone; Alike 89.39-90.01m.				
90.46-90.48m				Coal; Bright, cleated, and some cleats are plated with pyrite.				
90.48-98.15m				Lithic Sandstone; dense with sedimentary features such as silt laminae, coarse lithic zones, rooty coal and coal trash, mud bands, as well as small breccia zones. Very disturbed distorted unit. After 96m, there begins to be a zone of coarse grained white sandstone, still altered though. Is this all part of a 'basement contact zone'?				
98.15-100.89m				Sandstone breccia; Sandstone cemented, with fragments of sedimentary units. Not typical to the Benson conglomerate member though.				
				EOH @ 100.89m (292')				

Q13-08		Apr, 2013	Logged by: Nick Bazowski						
UTM: 323537.515mE 5533919.244mN		291.21m Elev.	Mine Grid: 100407.7557mE 101927.4408mN 291.21m Elev.			Total Depth:	62.33m (204'6)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)		Lost Core determined by Drillers footage and E-Log combined	Thickness (m): E-Log	Depth to Top (m): E-log	Structure (dip to horizontal)
				Core Geolog					
0-0.91m				Overburden; Casing to 10' (3.05m)					
0.91-49.68m				No water, no additional notes.					
49.68-53.36m				Dirty Lithic Sandstone; In some sections, the unit is a poorly sorted clast supported breccia, but most often a fine to medium grained medium grey sandstone. In the top 50cm, there are bands of interstitial pyrite +- silts, <1.5cm thick, at 18 degrees, bedding. by 52m, bedding changes to 6 degrees. Sharp basal contact at 11 degrees.				49.68	18-bedding 6-bedding
53.36-53.55m	53.32-53.51m	K813654	3R Rider ply	Coal; Intact, dominantly clean coal. 53.36-53.51m, intact dominantly clean coal 53.51-53.53m, pyritic muddy coal 53.53-53.55m, silty coal, broken, bedded at 4 degrees.			0.19	53.32	4-bedding
53.55-54.00m	53.51-53.96m	K813655	Mudstone ptg	Mudstone/Siltstone Parting; 53.55-53.71m, siltstone, intact, medium brown. 53.71-54.0m, coaly siltstone, with mudstone interbeds, bedding at 4 degrees.			0.45	53.51	4-bedding
53.36-54.74m	53.96-54.85m	K813656	3R	3R Coal Seam; 54.0-54.09m, bright intact coal 54.09-54.31m, dirty coal with a pyritic mudstone interbed 1cm thick, broken on interbed. Bedding at 4 degrees. 54.31-54.41m, dirty rubbly coal. 54.41-54.74m, intact coal, with 3 permineralised bands <1cm thick, and a few hairline pinch and swell mud laminae.		0.15	0.89	53.96	4-bedding
54.74-55.41m	54.85-55.37m	K813657	3R-3 Ptg	3R-3 Seam Coal; 0.13m, coaly mudstone. 0.34m, coaly mudstone, with a 10cm section at the base that is very pyritic, and slightly sandy, otherwise medium to dark brown with 3 hairline and 1 8mm coal bands within. Intact basal contact at 2 degrees, bedding.		0.05	0.52	54.85	2-bedding
55.41-56.13m	55.37-56.09m	K813658	3	3 Seam Coal; All intact, dull and brightly banded, dominantly dull coal, with noted platy pyrite on cleats in the top 20cm, and as a thin band near the base. Calcite is notes as vertical and horizontal veinlets, vertical would be on cleats. Mid interval, there is a blebby pyrite band up to 1.4cm thick, and as thin as 4mm. The basal contact is sharp and intact.			0.72	55.37	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): E-Log	Depth to Top (m): E-log	Structure (dip to horizontal)
56.13-58.74m	56.09-58.90m		3-3L Ptg	<p>3-3L Parting; 56.13-56.24m, Coaly Siltstone, bedded at 2 degrees. Coal is as hairline interbeds. Note blebby pyrite. 56.24-58.06m, Siltstone, dominantly solid core, broken on bedding at 2 degrees, every 5-20cm, with a fault at 57.04m, at 70 degrees, rough surfaced, but planar, no gouge. At 57.65 to 57.76m, there is a hard alteration band, strong effervesce, with a calcite/coal fragment within, late carbonate alteration or bioturbation? 58.06-58.29m, Coaly siltstone, hairline to thin coal, laminae at 5-7 degrees. basal contact at 7 degrees. 58.29-58.32m, Coal band, clean, intact. 58.32-58.74m, Siltstone; grading into sandy siltstone with rooty coal and coal laminae to the contact, which is erosional.</p>	0.2	2.81	56.09	2-bedding 70-Fault 5-7 bedding
58.74-59.44m	58.90-59.60m		3L	<p>3L 'Coal' zone; Coaly mudstone, medium to dark brown mudstone with coal laminae up to 1cm, increasing in density towards the base, but dominantly mudstone. The unit is intact, and competent. The coal laminae at the base of the unit contains pyrite. bedding is at 9 degrees.</p>		0.7	58.9	9-bedding
59.44-60.27m				<p>Sandy Siltstone; Dark brown, intact, competent, with thin sandstone interbeds towards the base, as well as hairline coal laminae, and semi-massive pyrite at the intact basal contact at ~4 degrees.</p>			59.6	4-bedding
60.27-62.33m				<p>Sandstone; Fine grained, dark grey at the top, cleaning up to light to medium grey at the base, with 'dusty' bands of interstitial dark grey material.</p>			60.27	
EOH @ 62.33m (204'6)								

Q13-09		Apr, 2013	Logged by: Nick Bazowski					
UTM: 323660.324mE 5533605.735mN 306.588m Elev.			Mine Grid: 100230.1875mE 101641.3645mN 306.588m Elev.			Total Depth:	80.44m (263'11)	
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): E-log	Structure (dip to horizontal)
				Core Geolog				
0-6.40m				Overburden.				
6.40-57.61m				Hammer drilled to core point; Notes: Casing to 30' water encountered at 165' (50.29m) Coal encountered at 58-62' (17.68-18.90m), 4b coal seam? Coal stringer encountered at 163'				Bedding ranges 9-12 degrees
57.61-64.80m				Sandstone; Medium grained, moderately soft, broken every 6-8cm, with multiple hairline veinlets, or fractures, filled with clays, but cemented, no fizz, not calcite. The unit is medium grey. All breaks in the unit are natural, but not always planar. Between 58.45-59.05m, there are 3 parallel fault planes with thin white clay gouge within, at 25 degrees dip. Below 59.05m, the unit becomes more competent, and has more localised zones where the sand is less sorted, and locally coarser grained. At 60.9m, there is 2 fault planes/fractures together, one at 4 degrees, with white clay gouge, the other at 35 degrees, sharp and planar. After 61.3m, there is a fracture at 25 degrees, regularly, on 15-25cm spacing's. Sharp basal contact at 15 degrees.			57.61	25-Faults 4-Fault 35-Fault Bedding ranges 15-25 degrees (dipmeter) 15-basal contact
64.80-65.42m				Sandstone; Fine grained, very tight, very hard, almost silicified with dendritic fractures filled with calcite. Alteration zone. Gradational basal contact.			64.8	
65.42-67.15m				Sandstone; Fine to medium grained, medium grey, with a few dendritic fractures infilled with calcite up to 66.3m. Between 67.3-67.6m, there are multiple fractures and thin rubble zones with minor calcite, fault zone, possibly angle is less than 10 degrees. Below this zone there is more minor fracturing with calcite.			65.42	10? Fault zone
67.15-69.84m	66.78-69.47m		FAULT	Sandstone; Tight, fine grained, medium grey, with hairline and thick fractures filled with calcite, both dendritic and steep planar fractures at 53 degrees. The unit is mostly competent despite the fractures, hard and cemented. The basal contact is sharp and intact at 64 degrees. According to the dipmeter, there are 2 fault structures measured, one at 143/46, and one at 099/55.		2.69	66.78	53-fractures 143/46-fault 099/55-fault 64-basal contact
69.84-70.25m	69.47-69.88m		FAULT	Mudstone, fault zone; Dark brown, soft, fault zone. Intact top contact, crushed gouge basal contact 3cm thick. The fault is at 64 degrees. See the fault details above.		0.41	69.47	64-Fault
70.25-70.30m	69.88-69.93m		FAULT	Siltstone; Medium to dark brown, broken up, with minor coal fragments.		0.05	69.88	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): E-log	Structure (dip to horizontal)
70.30-71.80m	69.93-71.43m		FAULT	Faulted Mudstone; Very soft, with 4 rubble zones and multiple gouge zones, fault at 50 degrees. The entire unit is the fault zone, but the basal 30cm is just gouge and rock fragments. Sharp basal contact at 60 degrees. According to the dipmeter, this fault base is measured at 088/51.			69.73	088/51-Fault 60-basal contact
				**** 088/51 (base of the fault zone measurement) intersects the drill hole 05-16W, which contains very similar 3R/3/3L coal thicknesses, where as other dh's in the area don't.				
71.80-72.56m			FAULT	Sandstone; Faulted, medium grained, dirty grey brown, fractured intensely in the top 20cm, infilled with black and brown clays. The basal 20cm has muddy interbeds at 5 degrees. Basal contact is 6cm of fault gouge.				5-bedding
72.56-72.70m	72.33-72.47m	K813648	FAULT	Complete Gouge Zone; Mix of pasty white clays, then medium brown muds, then mix of mud and coal gouge at the base.		0.14	72.33	
72.70-72.92m	72.47-72.94m	K813649	3R	3R Coal; Dirty coal, dense with permineralised calcite, fissile in the top 6cm, competent in the middle, rubble in the basal 6cm.	0.25	0.47	72.47	
72.92-73.29m	72.94-73.31m	K813650	3R-3 ptg	Coaly Mudstone; soft, medium to dark brown, with coal laminae at 15 degrees.		0.37	72.94	15-bedding
73.29-74.05m	73.31-74.07m	K813651	3	3 Seam Coal 73.29-73.37m, pyritic coal. 73.37-74.05m, dominantly intact coal with a thin 3mm pyrite band and permineralised calcite zones at 17 degrees, bedding. Sharp planar contact at 10 degrees.		0.76	73.31	17-bedding 10-bedding
74.05-74.81m		K813652 (74.07-74.33m)	3-3L ptg	Mudstone; The top 7cm is rubble, then there is 2 zones <2cm thick with gouge and rock fragments at 16 degrees. Minor coal within one of the zones. The bottom 15cm is sandy mudstone. Sharp basal contact at 35 degrees.			74.07	16-fault 35-basal contact
74.81-75.12m			3-3L ptg	Dirty Sandstone; fine grained, medium to dark grey brown due to interstitial silts.			74.81	
75.12-75.47m	75.0-75.35m		3-3L ptg	Coaly Mudstone; soft, medium to dark brown, with coal laminae at 24 degrees.		0.35	75	24-bedding
75.47-77.16m			3-3L ptg	Sandstone; dirty due to interstitial silts giving a fabric at ~35 degrees. Commonly fractured, irregular though, not quite planar, but at ~35-40 degrees. Fine to medium grained, medium brown,. The base contains mud 'veins' from the lower unit intruding the sands, alike a conglomerate.			75.35	35-fabric
77.16-77.67m			3-3L ptg	Mudstone; Intact, with elongate irregular blebs or fragments of the above sandstone within, as well as coal spars near the base. The basal 15cm is broken up, somewhat rubbly.			77.16	
77.67-77.99m	77.65-77.97m		3L	Coaly muddy sandstone; broken up mottled unit of dirty sandstone with interstitial muds and silts and coal laminae at 25 degrees. Sharp basal contact at 10 degrees.		0.32	77.65	25-bedding 10-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): E-log	Structure (dip to horizontal)
77.99-80.44m				Sandstone; Medium grained, medium grey, dirty in some sections due to interstitial silts. There are dendritic calcite veins every ~50cm, irregular. At 79.3m, there is a 15cm section that contains rooty coal. Intact unit. At 79.9-80.1m, there are some irregular calcite veinlets with minor orange realgar within, localised, below a 4cm rubble zone.			77.99	
				EOH @ 80.44m (263'11)				

Q13-10		Apr, 2013	Logged by: Nick Bazowski							
UTM: 323736.99mE 5533863.77mN		294.54m Elev.	Mine Grid: 100482.76mE 101734.46mN 294.54m Elev.				Total Depth:	82.68m (271'3)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
0-3.96m				Overburden						
3.96-68.28m				Hammer Drilled; Notes: Casing to 20' 2 gpm of water at 90', not noted when originally intersected, but developed with more drilling						
	41.48-41.80m		4b	4b Coal Seam as picked on the e-log, density of ~1.8				0.32	41.48	
68.28-71.93m				Sandstone; Massive, all competent and intact, medium grained, medium grey but with a salt and pepper colour throughout due to mafic grains disseminated throughout. Bedding is at 6 degrees. Intact basal contact.				3.65		6-bedding
71.93-72.22m				Bioturbated Sandstone; Dense with <i>macaronichnus</i> , medium grained, medium grey, intact, with a sharp intact planar basal contact at 3 degrees.				0.29		3-bedding
72.22-73.58m				Sandstone; Solid massive sandstone, medium grained, medium grey. Pyrite and trace coal spars noted in the bottom 6cm. Sharp contact at 4 degrees.				1.36		4-bedding
73.58-74.89m	73.22-74.53m		3R	3R Coal Seam; 73.58-73.72m, intact dull and brightly banded coal, with trace pyrite blebs. 73.72-73.84m, coaly mudstone, dark brown, with thin coal bands. 73.84-73.99m, sandy siltstone with trace coal fragments. 73.99-74.07m, coaly siltstone, interbeds of dark brown siltstone and coal laminae. 74.07-74.49m, intact coal, with permineralised calcite, both vertically on cleat/fractures, and horizontally in bands 74.49-74.51m, mud band with trace coal fragments. 74.51-74.68m, Dirty coal, trace pyrite, broken on bedding, and rubbly 74.68-74.89m, dirty coal, with minor muds and platy carbonates on the minor amount of cleats.				1.31		
74.89-75.02m	74.53-74.87m		3R-3 Ptg	Siltstone, 3R-3 Parting; siltstone rubble, trace b=pyrite and bright coal fragments. Is the basal 3 cm part of the coal seam below (check e-log).			0.21	0.34		
75.02-75.77m	74.87-75.65m		3	3 Seam Coal; Intact, dull and brightly banded, with semi massive pyrite blebs and pyrite stringers. There are zones with stockwork calcite. Rubbly basal contact.			0.03	0.75 / 0.78		

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
75.77-77.92m	75.65-77.52m		3-3L Ptg	3-3L Parting; 75.77-76.88m, Mudstone, fissile and rubbly, with pyrite disseminations and coaly laminae throughout. Lost core here. 76.88-77.3m, sandy siltstone, dark brown, trace coal laminae, with increasing sands towards the base. 77.3-77.92m, muddy sandstone, fine grained dirty brownish grey, with coal and mud laminae throughout. Bedding at 5 degrees.	0.08	2.15 / 1.87		5-bedding
77.92-79.33m	77.52-79.10m		3L	3L "coal" zone; 77.92-78.04m, dirty coal, intact with minor pyrite. 78.04-78.73m, coaly mudstone, with multiple rubble zones. Coal is as hairline wisps, and rooty coal. 78.73-78.83m, permineralised coal bands with a mudstone band mid interval. 78.83-79.05m, fissile broken siltstone. 79.05-79.09m, coal band at 6 degrees. 79.09-79.19m, coaly siltstone. 79.19-79.33m, dirty pyritic coal.	0.17	1.41 / 1.58		6-bedding
79.33-79.46m				Lost Core in the sequence above, accounted for here when logging the core	0.13			
79.46-79.71m				Coaly Siltstone; Bands of coal <1/2 cm thick cut through the intact siltstone.		0.25	79.46	
79.71-80.62m				Siltstone; Medium brown, uniform.		0.91	79.71	
80.62-80.90m				Coaly Siltstone; bright coal laminae at 4 degrees, cut through medium brown siltstone.		0.28	80.62	4-bedding
80.90-81.71m				Sandstone; Dirty muddy sandstone, very pyritic, fine grained, with mudstone laminae throughout.		0.81	80.90	
81.71-82.68m				Siltstone; With coal laminae every 5-10cm. Intact, competent unit.		0.97	81.71	
				EOH @ 82.66m (271'3)				

Q13-11		Apr, 2013	Logged by: Nick Bazowski							
UTM: 324033.43mE 5533777.26mN 304.2488m Elev.			Mine Grid: 100590.96mE 101445.23mN 304.2488m Elev.				Total Depth:	100.63m (330'2)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
0-9.75m				Overburden						
9.75-83.52m				Hammer Drilled; Notes: Casing to 40' water noted at 150'						
	12.49-12.68m		5	As picked on the e-Log				0.19	12.49	
	14.50-14.82m		5L	As picked on the e-Log				0.32	14.5	
	35.24-35.60m		4	As picked on the e-Log				0.36	35.24	
	41.81-42.14m		4L	As picked on the e-Log				0.33	41.81	
	60.22-61.28m		4b	As picked on the e-Log				1.06	60.22	
83.52-85.87m				Sandstone; medium to dark green, fine grained, hard. At 84m, there is a partially healed fault at 66 degrees. Bedding is at 5 degrees. At 85 and 85.55m, there a 1mm calcite veins at 5 degrees. Intact to 85m, then broken every 5-15cm in 'biscuits' to 85.5m.						66-Fault 5-bedding 5-veins
85.87-88.43m				Sandstone; Light to medium grey fine to medium grey, often laminated by faint pinkish bands or various grey bands. Very hard high fizz throughout. At 86m, there is a 6mm wavy pyrite band followed by calcite, sub horizontal. Bedding is at 14 degrees. Between 86.2-86.55m, there is a subvertical calcite veinlet 1-2mm thick through the core, not planar. At 88.43m, there is a rough faced open fracture at 70 degrees, otherwise the unit is intact, hard, and competent.						14-bedding 70-fracture
88.43-88.82m				Sandstone; Fine grained, super tight, hard, medium greenish grey.						
88.82-91.15m				Sandstone; Medium grained, medium grey, with a rough surfaced planar fault at 78 degrees through the middle, as well as non planar rough surfaced open fractures throughout the unit. The open planar fault is lines with black material, may be manganese, coal, pyrite? The basal 8cm contains interbeds of both pyrite and coal. Sharp basal contact at 5 degrees.						78-Fault 5-bedding
91.15-91.31m	91.00-91.16m		3R Rider Ply	3R Rider Ply Coal seam; Bright cleated coal.				0.16	91	
91.31-91.92m	91.16-91.77m		3R Rider Ply Ptg	Coaly Siltstone; Medium to dark brown, with hairline coal laminae throughout. Bedding at 9 degrees.				0.61	91.16	9-bedding
91.92-92.76m	91.77-92.55m	K813684	3R	3R Seam Coal; 91.92-92.32m, dirty coal, intact, with moderate pyrite. 92.32-92.56m, coal and siltstone rubble. 92.56-92.76m, lost core, is it here?			0.06m	0.84 / 0.78	91.77	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
92.76-93.81m	92.55-93.60m	K813685	3R-3	3R-3 Seam Parting; 92.76-92.88m, siltstone rubble. 92.88-93.26m, coaly siltstone, coal laminae throughout, with semi massive pyrite blebs and bands. 93.26-93.81m, siltstone, broken on bedding every 4cm.		1.05	92.55	
93.81-94.84m	93.60-94.63m	K813686	3	3 Seam Coal; 93.81-94.5m, coaly siltstone, coal laminae throughout, with semi massive pyrite blebs and bands. 94.5-94.66m, Silty coal, bright coal with siltstone interbeds, and a 4cm rubble zone in the middle. 94.66-94.84m, coaly siltstone, with moderate pyrite blebs. Siltstone with wavy coal laminae. Bedding at 10 degrees.		1.03	93.6	10-bedding
94.84-95.95m	94.63-95.74m		3-3L	3-3L Seam Parting; 94.84-95.95m, medium brown mudstone, intact,.		1.11	94.63	
95.95-97.02m	95.74-96.81m		3L	3L Seam Coal Zone; 95.95-96.42m, coaly siltstone, interbeds of medium to dark brown siltstone and 2-6mm bands of bright coal. 96.42-96.66m, sandstone, fine grained, tight, hard, intact. 96.66-97.02m, par of 3L coal zone?; Coaly siltstone, interbeds of 3-6cm siltstone, and 1-8mm coal bands, with pyrite laminae at the base. Bedding is at 4 degrees. Often broken.		1.07	95.74	4-bedding
97.02-98.66m	96.81-		3L Floor	3L "coal" Zone Floor; 97.02-97.90m, mudstone, with coal interbeds and laminae up to 0.5cm thick, dominantly wavy. Unit is often broken. Medium brown. 97.90-98.01m, coal, almost missive rooty coal, with irregular contacts, with permineralised calcite throughout. 98.01-98.45m, coaly siltstone/coaly mudstone, intact. Sharp basal contact at 6 degrees. 98.45-98.66m, dull and brightly banded coal with platy pyrite on cleats. Siltstone interbeds in the basal 4 cm.		1.64	96.81	6-bedding
98.66-100.38m				Coaly Siltstone; Coal laminae and interbeds throughout the competent intact unit. Strong pyrite throughout. Erosional basal contact, wavy.				
100.38-100.63m				Sandstone; Medium grey, medium grained, uniform.				
				EOH @ 100.63m				

Q13-12		Apr, 2013	Logged by: Nick Bazowski						
UTM: 324114.389mE 5533906.48 mN		301.5754m Elev.	Mine Grid: 100742.9389mE 101457.7618mN 301.5754m Elev.			Total Depth:	107.82m (353'9)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)	
				Core Geolog					
0-2.44m				Overburden					
2.44-84.73m				Hammer Drilled; Notes: water at 150' Small cave in at 237' (72.24m) Coal noted at 55', 115', 125', 149', and 180'					
	15.62-15.88m		5	5 Seam coal as picked on the e-log, density around 1.8		0.26	15.62		
	34.78-34.99m		4R	4 Rider coal as picked on the e-log, density around 1.55		0.21	34.78		
	38.30-38.51m		4	4 Seam coal as picked on the e-log, density around 1.5		0.21	38.3		
	38.51-39.89m		4	4 Seam Sandstone as picked on the e-log		1.38	38.51		
	39.89-41.61m		4	4 seam coals and partings as picked on the e-log, density around 1.7		1.72	39.89		
	41.61-44.83m		4-4L Ptg	4-4L sandstone parting as picked on the e-log		3.22	41.61		
	44.83-45.01m		4L	4L Coal as picked on the e-log, density around 1.75		0.18	44.83		
	45.01-46.73m		4L	4L sandstone parting as picked on the e-log		1.72	45.01		
	46.73-47.35m		4L	4L coaly siltstone as picked on the e-log, density around 1.9		0.62	46.73		
	64.49-64.99m		4b	4b coal as picked on the e-log, density around 1.7		0.5	64.49		
	71.38-71.62m		Fault	Fault; As noted on the caliper and density of the e-log. According to dipmeter, fault at 032/23 (dip direction of 122 degrees).		0.24	71.38	Fault 032/23	
84.73-89.78m				Sandstone; Medium to coarse grained, light grey, solid. At 87.6m, there is a 6cm rubble zone. At 88.25m, there is a fracture with minor gouge at 23 degrees. Bedding is at 10 degrees. The unit is massive. Basal contact is intact, at 16 degrees, planar.		5.05	84.73	23-fault 10-bedding 16-contact	
89.78-90.56m				Sandstone; Fine grained, tight, very hard, dark pinkish grey coloured, into medium green, with a fracture at 60 degrees at 90.3m. Basal contact at 27 degrees.		0.78	89.78	60-fracture 27-contact	
90.56-91.63m				Sandstone; Coarse grained, medium grey, with a fault mid interval at 19 degrees, with a 2mm quartz vein and realgar smeared high slickenside, slightly brownish orange. Intact but, but a non planar basal contact.		1.07	90.56	19-Fault	
91.63-91.75m				Sandstone; Medium grained, light brown grey. Intact unit, hard, with bedding at 23 degrees.		0.12	91.63	23-bedding	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
91.75-93.55m				Sandstone; Medium grained, massive, intact. There is a calcite smeared fracture with trace orange brown mineral (realgar?) smeared at 24 degrees. Sharp basal contact at 14 degrees.		1.8	91.75	24-fault 14-contact
93.55-94.00m				Sandstone; Fine grained, tight, hard, intact except for 1 fracture at 26 degrees, smeared with slicken side calcite. Sharp basal contact at 10 degrees.		0.45	93.55	26-fault 10-bedding
94.00-99.18m				Sandstone; Medium grained light grey, massive, with one open fracture at 16 degrees. After 95m, there are a few zones that darken due to interstitial silts, and between 97.1-97.25m, there is elongate coal spars following a coal and pyritng lined fracture (leaf mat), at 16 degrees. There are 2 zones with subvertical fractures, first between 95.7-95.9m, rough surfaced, in and down the core, and then curls back out, and then a more planar but still rough surfaced fracture at 73 degrees at 96.85m. The unit is massive, competent, intact, except for the mentioned fractures. Sharp slightly rough contact at 10 degrees.		5.18	94	16-fractures 73-fracture 10-bedding
99.18-100.58m	98.96-100.40m	K813641, 642	3R	3R Coal Seam; 99.18-99.28m, clean bright intact coal 99.28-99.44m, mudstone, dark brown 99.44-99.96m, intact dirty coal, with multiple hairline laminations of pyrite, dull and brightly banded coal. 99.96-100.04m, coaly mudstone, mostly rubble 100.04-100.58m, dull and brightly banded dirty coal, intact.	0.04	1.44	98.96	
100.58-100.79m	100.40-100.61m	K813643	3R-3	3R-3 Parting; 100.58-100.63m, coaly muds, intact,. (3R-3 ptg) 100.63-100.73m, fissile silty coal (3R-3 ptg) 100.73-100.79m, brown siltstone (3R-3 ptg)		0.21	100.4	
100.79-101.62m	100.61-101.59m	K813644	3	3 Seam Coal; 100.79-100.81m, intact clean coal 100.81-101.11m, intact coal, dominantly clean 101.11-101.23m, coal rubble zone. 101.23-101.56m, possibly missing core. 101.56-101.62m, intact dull coal, intact basal contact at 4 degrees.	0.48	0.98	100.61	4-bedding
101.62-103.05m	101.59-103.02m		3-3L Ptg	3-3L Parting; 101.62-102.34m, siltstone, solid, intact. 102.34-102.88m, coaly siltstone 102.88-103.05m, sandstone, fine grained, dirty, with semi massive pyrite at the top.		1.43	101.59	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
103.05-103.82m	103.02-103.79m		3L	3L "Coal" Zone; 103.05-103.3m, silty dirty coal, dull and brightly banded, almost interbeds, but dominantly coal. Bedding at 4 degrees. 103.3-103.75m, coal, dull and brightly banded, dominantly intact. 103.75-103.82m, coaly siltstone		0.77	103.02	4-bedding
103.82-105.02m				Siltstone; Medium brown, 90% rubbly with a few 2-6cm pieces of core. Bedding is at 6 degrees.		1.20	103.82	6-bedding
105.02-105.50m				Coal; Dull and brightly banded, dominantly dirty but with some bright cleated clean sections. Dominantly broken up and rubbly, basal 8cm is intact, with an intact basal contact at 4 degrees, pyritic.		0.48	105.02	4-bedding
105.50-107.82m				Sandstone; Solid, massive, medium grained, medium grey.		2.32	105.5	
				EOH @ 107.82 (353'9)				

Q13-13		Apr, 2013	Logged by: Nick Bazowski				Total Depth:	113.13m (371'2)		
UTM: 324059.329mE 5533950.643mN 304.301m Elev.		Mine Grid: 100745.341mE 101528.303mN 304.301m Elev.								
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)		Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)	
				Core Geolog						
0-7.62m				Overburden						
7.62-99.06m				Hammer Drilled; Notes: Coal noted at 66-68', 115' (5 seam?), 129-131' (4 seam), 132-135' (4L Seam), 147-150' (4b seam) Water encountered at 140', trace amounts						
	18.80-19.30m		5	5 Seam as picked on the e-log, 1.85 SG			0.5	18.8		
	39.48-40.02m		4 Rider	4 Rider Coal as picked on the e-log, 1.65 SG			0.54	39.48		
	44.06-45.70m		4	4 Seam Coal as picked on the e-log, SG at ~2. Very poor quality.			1.64	44.06		
	45.70-51.55m		4-4L Ptg	4-4L Parting as picked on the e-log				45.7		
	51.55-54.22m		4L	4L Coal zone as picked on the e-log, very poor quality, ~2-2.2SG				51.55		
	72.53-73.48m		4b	4b Coal zone as picked on the e-log, SG of 1.8-1.95			0.95	72.53		
99.06-103.69m				Sandstone; Massive, competent, medium to coarse grained, medium grey. At 99.06m, there is a hairline calcite veinlet at 76 degrees. Between 99.29-99.35m, there is a zone or band that is slightly peachy pink, and alteration zone, with strong contrast to the surrounding rock, with uneven contacts, and strong effervesce, where surrounding rock doesn't, carbonate alteration? At 99.53m, there is an open fracture at 11 degrees with minor calcite and a faint pinkish alteration halo on the hanging wall. Bedding is at 9 degrees. There are short ~15cm zones that are slightly darker grey due to interstitial material. Between 102-102.3m, there are multiple 1-2cm bands, dense with interstitial silts +- pyrite, dark grey, bands at 18 degrees. At 102.95m, there is a 4cm rubble zone. Basal contact is sharp, intact, at 17 degrees.					76-vein 11-fracture 9-bedding 18- x bedding 17-basal contact	
103.69-103.88m	103.40-103.59m			Rider Coal; dull and brightly banded, cleated at the top, strongly pyritic in the bottom 1cm. Intact contact at 5 degrees.			0.19	103.4	5-basal contact	
103.88-104.11m	103.59-103.81m			Mudstone; Medium brown.			0.22	103.59		

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
103.69-105.11m	103.81-104.81m	K813637	3R	3R Coal Seam; 104.11-104.20m, coal and siltstone interbeds. 104.20-104.27m, clean bright coal. 104.27-104.32m, siltstone, bedding at 4 degrees. 104.32-104.75m, dull and bright banded coal, dominantly intact except for a fracture at 70 degrees at the base. There is a 4mm pyrite band mid interval, and a 3mm band of permineralised calcite. 104.75-104.82m, mudstone beds, half are dark brown, half are beige brown. 104.82-105.11m, dull and brightly banded dirty coal. Bedding is at 6 degrees.		1	103.81	4-bedding 70-fracture 6-bedding
105.11-105.57m	104.81-105.04m	K813638	3R-3	Coaly Siltstone; ~30-40% coal interbeds within brown siltstone, bedding at 5 degrees. *****Sample separately just in case is part of 3R		0.23	104.81	5-bedding
105.57-105.73m	105.04-105.54m	K813639	3R-3	Mudstone; Medium brown, broken 4 times on bedding.		0.5	105.04	
105.73-105.84m			3R-3	Coaly Mudstone; fragments of rock only.				
105.84-106.65m	105.54-106.41m	K813640	3	3 Seam Coal Zone; 105.84-106.15m, coal, with a 4cm massive pyrite band near the top, the basal 8cm is rubble, dirty coal. 106.15-106.20m, siltstone 106.20-106.65m, dirty coal, with a 4cm mudstone band mid interval, and siltstone rubble. Dull and brightly banded coal.	0.06	0.81 / 0.87	105.54	
106.65-107.16m	106.41-107.92m		3-3L	Mudstone; Very pyritic, dark brown.		1.51	106.41	
107.16-108.16m			3-3L	Mudstone; Dominantly soft, in pieces of 4-8cm, with trace coaly laminae.				
108.16-108.37m	107.92-109.20m		3L	Silty Coal; Part of the 3L coal zone? Fissile coal and siltstone interbeds, ~50% of both, bedding is at 10 degrees.		1.28	107.92	10-bedding
108.37-108.50m		3L	Sandy Siltstone; Basal contact at 19 degrees.		19-contact			
108.50-108.71m		3L	Coal; Dull and brightly banded dirty coal, silty, ~50% coal.					
108.71-109.07m		3L	Coal; Dull and brightly banded, with a 1.5cm band of pyrite mid interval, competent.					
109.07-109.11m		3L	Mudstone; Beige.					
109.11-109.21m		3L	Coal; Rubbly, with minor siltstone fragments.					
109.21-109.36m		3L	Mudstone					
109.36-109.42m		3L	Coal; Bright, cleated coal.					
109.42-109.68m		3L	Siltstone; Medium brown, with bedding at 5 degrees.		5-bedding			
109.68-109.73m		3L	Coal; Dirty, rooty.					

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Lost core, not sure where in the above sequence it was lost.	15cm			
109.73-109.88m				Accounted for lost core				
109.88-110.25m				Coaly Siltstone; Often broken on bedding every 3-10cm, locally fissile near the base, bedding is at 8 degrees.				
110.25-110.52m				Faulted Mudstone; The top 12cm is gouge and rock fragments, the rest is coal and mudstone fragments.				
110.52-113.13m				Sandstone; Medium grained, medium grey, massive.				
				EOH @ 113.13m (371'2)				

Q13-14		Apr, 2013	Logged by: Nick Bazowski			Total Depth:	125.43m (411'6)		
UTM: 323954.159mE 5534260.088mN		302.229m Elev.	Mine Grid: 100930.215mE 101797.818mN 302.229m Elev.						
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)	
				Core Geolog					
0-19.8m				Overburden; Cased to 70'.		19.8			
	30.90-31.49m		5	5 Seam Coal; As picked on the E-log		0.59			
	47.51-47.85m		4R	4R Coal Seam; The drillers reported ~3' of coaly material, the elog shows a coal kick, as well as a caved in section of the hole.		0.34			
48.16-48.18m				4R Coal Seam; The base of the 4R, sandy coal. Wavy, wispy intact basal contact.		0.02	48.16		
48.18-53.21m				Sandstone; Fine grained, competent, intact, medium grey, with dirty zones. At 48.85m there is rooty coal, with dirtier sandstone. Between 49.92m to 50.11m, there is a zone that is dark grey due to interstitial silts, with a wavy fabric at 20 degrees. Another similar zone between 52.24-52.37m. The bottom contact is sharp, sub-horizontal, slightly irregular.		5.03	48.18	20-fabric	
53.21-53.37m				Coaly Sandy Siltstone; Very pyritic, with a fault plane through the middle at 63 degrees. Bedding is at 8 degrees.		0.16	53.21	63-fault 8-bedding	
53.37-53.78m				Sandstone; Mostly dirty due to interstitial carbonaceous silts in the top 10cm and bottom 15cm. Fine grained, tight, hard. Sharp basal contact, at 30 degrees.		0.41	53.37	30-basal contact	
53.78-54.26m	53.38-53.86m		4	4 Seam Coal Zone; Dirty coal, mostly bright, but with bands of bone coal, or sandy coal, as well as hairline ash or mud laminae. Mostly dull and sandy at the base. Bedding is at 18 degrees. Sharp basal contact.		0.48	53.38	18-bedding	
54.26-55.21m	53.86-54.81m		4	Sandstone; Fine grained, competent, intact, medium grey, massive. The bottom 5cm is brown silty sandstone. Basal contact at 15 degrees.		0.95	53.86	15-bedding	
55.21-55.31m			4	Coal; Bright, intact.					
55.31-55.42m	54.81-55.08m		4	Sandstone; With coaly laminae and rooty coal, fine grained, medium grey.		0.27	54.81		
55.42-55.48m			4	Coal; Dirty, with trace pyrite noted.					
55.48-55.67m	55.08-55.27m		4	Sandstone; Dirty, with hairline carbonaceous wisps throughout, fine grained, hard.		0.19	55.08		

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
55.67-56.99m	55.27-56.59m		4	4 Seam Coal Zone; 15cm dull and brightly banded coal 1cm sandstone, medium grained, brown 14cm dull and brightly banded coal 7cm bone coal 2cm fine grained sandstone, medium grey 5cm dirty coal, sandy 13cm coaly sandstone 3cm bone coal 6cm dull and bright fissile coal 5cm sandstone, brown, fine to medium grained 7cm clean bright intact coal 1cm brown sandstone 26cm dull and bright dirty coal 15cm sandstone, locally coaly, medium grained, intact 12cm bright coal and bone coal, bands of both, wavy basal contact at 15 degrees		1.32	55.27	15-bedding
56.99-58.52m			4-4L	Sandstone; Intact, medium grey, medium grained, bedding is at 4 degrees.		1.53	56.99	4-bedding
				Stopped to hammer drill to the 3R Seam				
	62.99-65.71m		4L	4L Coal Seam; As picked on the e-log. 62.99-63.39m, poor quality coal, high ash. 63.39-64.31m, sandstone 64.31-64.40m, bone coal, or coaly sandstone 64.40-64.70m, coaly sandstone 64.70-65.13m, poor quality coal, high ash. 65.13-65.31m, coaly sandstone, slightly lower ash than the previous parting. 65.31-65.71m, poor quality coal, high ash.		2.72	62.99	
	85.20-86.17m		4b	4b Coal Seam; As picked on the e-log.		0.97	85.2	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)		
110.95-118.33m		Cemi 131401 (117.03-118.03m) Cemi 131402 (118.03-118.33m)		Sandstone; Medium grained, medium grey, dominantly uniform and massive, but broken every 10-30cm, rarely over 30cm. At 114m, there is an open fracture at 58 degrees. The rest of the breaks are irregular, uneven, and random. Between 115.25-116m, there are multiple irregular fractures, infilled with grey gouge or clays, but cemented. Between 116.3-118.3m, the unit is competent, intact, except for a fracture at 116.64m at 40 degrees, a rubble zone at 116.9m due to 2 intersecting fractures at 45 and -25 degrees, and a fracture at 117.15m at 55 degrees. The basal 2cm is rooty pyritic coal, interfingering into the sandstone, and will be sampled with the lower coal. Basal contact is at 1 degree.		7.38	110.95	58-fracture 40-fracture 45-fracture -25-fracture 55-fracture 1-bedding		
118.33-120.29m	118.18-120.92m	k813606 (118.18-118.47m)	3R	3R Coal Zone; (0.29m) 3R Rider Coal Ply 118.33-118.62m, intact dull and bright coal, slightly dirty, trace pyrite. (0.55m) 3R Rider Mudstone Ply 118.62-119.17m, mudstone, intact, soft. (0.12m) 3R Coal starts here 119.17-119.29m, dull and brightly banded dirty pyritic coal, intact. Bedding is at 5 degrees. (0.09m) 119.29-119.38m, dull coal, with semi massive pyrite, broken up slightly. (0.14m) 119.38-119.52m, clean dull coal, intact, with a sub vertical cleat running through the ply, not in the coal above or below. (0.13m) 119.52-119.65m, intact dull clean coal. (0.04m) 119.65-119.69m, rubbly zone, but blocky coal fragments, clean (0.60)119.69-120.29m, dull and bright coal, dominantly intact, broken twice on bedding at 3 degrees, dense with bands of permineralised calcite. There is one semi-massive pinch and swell band of pyrite mid interval.	17cm	2.74	118.18	5-bedding 3-bedding		
120.29-120.31m		k813607 (118.47-119.02m)							3R-3	3R-3 Ptg (kind of); Dirty coal, slight brown scratch, intact.
120.31-120.92m		K813608 (119.02-120.92m)							3	3 Seam Coal Zone; (0.25m) 120.31-120.56m, intact clean coal, dominantly bright, with minor calcite. (0.22m) 120.56-120.78m, coal rubble with 2 small zones of blocky pieces, coal appears to be clear, bright. (0.14m) 120.78-120.92m, dull and bright banded coal, dominantly bright, all clean.

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
120.92-122.17m	120.92-122.17m	K813609 (120.92-121.77m) K813610 (121.77-121.97m) K813611 (121.97-122.17m)	3-3L	3-3L Partings; 120.92-121.21m, coaly mudstone, laminations of bright coal throughout. 121.21-121.71m, mudstone, brown, dominantly intact, with a 1.5cm massive pyrite band. 121.71-121.77m, coaly mudstone 121.77-121.97m, Muddy coal, interbeds of coal and mudstone, sandy towards the base, very pyritic. 121.97-122.17m, sandstone, fine grained, light grey, hard.		1.25	120.92	
122.17-122.88m	122.17-123.04m	K813612 (122.17-123.04m)	3L	3L Coal Zone; 122.17-122.21m, coal dirty 122.21-122.67m, dull and brightly banded coal, dominantly bright, blebby pyrite noted, intact. 122.67-122.87m, coal rubble, both dull and bright fragments noted, dominantly bright. Appears clean. Pyritic at the very base.	17cm	0.71 / 0.87	122.17	
122.87-125.43m		CEMI 131403 (123.04-123.34m)		Mudstone; All intact, various browns, with coal laminae sporadically in the top 60cm, then rare, but noted throughout. Semi massive pyrite blebs noted mid interval, as well as sandy sections. Bedding is at 8 degrees.		2.56	122.87	8-bedding
				EOH @ 125.43m (411'6)				

Q13-15		01-May-13	Logged by: Nick Bazowski							
UTM: 323672.425 mE 5535129.911 mN 234.121m Elev.			Mine Grid: 101458.197mE 102544.277mN 234.121m Elev.				Total Depth:	111.84m (366'11)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-Log	Structure (dip to horizontal)
				Core Geolog						
0-37.19m				Overburden; Cased to 38.40m				37.19		
38.40-40.70m				Sandstone; Fine grained, medium grey, directly under the overburden, broken every 10-30cm, with oxidised brown surfaces. In the top metre, there are multiple sub horizontal calcite veinlets. At 40m, there is a rough surfaced possible fracture at ~60 degrees. At 40.48m, there is a fracture at 53 degrees, lined with coaly clays, and minor rock fragments. The basal 5 cm in broken up chunks of sandstone.				2.3	38.4	60-fractures 53-fracture
40.70-40.73m				Dirty Coal; A thick root? The top contact is planar and sub horizontal, the basal contact is very wavy, but sharp. Dull coal.				0.03	40.7	
40.73-41.86m				Sandstone; Fine to medium grained, light to medium grey, with wispy pyritic coal spars in the top 10cm, and a massive coal rimmed or lined pyrite bleb near the base, 2x5cm. Mid interval there is a fracture at 40 degrees, followed by 3cm of rubble. The unit is broken 6 times. Bedding is at 6 degrees. At the base, there is a 4cm band of bone coal followed by 7cm of coaly sandstone, broken and rubbly. Basal contact is at 16 degrees.				1.13	40.73	40-fracture 6-bedding 16-basal contact
41.86-42.37m	41.83-42.34m		4 Rider	Coal; 41.86-41.97m, dull and brightly banded coal, with a 1/2cm band of pyrite at the top, dominantly bright. 41.97-42.05m, coaly mud or clay, intact, very soft. 42.05-42.32m, blocky broken coal, very easily broken, bright and dull, cleated.				0.51	41.83	
42.37-43.15m				Muddy Sandstone; Fine grained, medium to dark grey and brown. Sandstone has wispy erratic mud laminae and bands of interstitial muds throughout, giving a fabric of 30 degrees. Broken 5 times.				0.78	42.37	30-fabric
43.15-44.03m				Sandstone; Massive, intact, fine to medium grained, light grey, but with zones of dark grey due to interstitial material, dusty 'clouds'. Sharp basal contact at 4 degrees.				0.88	43.15	4-bedding
44.03-44.15m				Muddy Sandstone; Dark brown, fine grained, with interstitial muds throughout, and 1 4mm coal band. Bedding is at 4 degrees.				0.12	44.03	4-bedding
44.15-44.39m				Mudstone; Medium to dark brown, intact.				0.24	44.15	
44.39-44.66m				Dirty Sandstone; muddy with minor coal laminae. Dark brown. Sharp basal contact at 5 degrees.				0.27	44.39	5-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
44.66-46.63m	44.64-46.67m	K813613	4	<p>4 Seam Coal; 0.37m, dull and brightly banded coal, dull coal turns to bone coal in the basal 10 cm. Bedding is at 9 degrees. Broken 3 times on bedding ply's, otherwise intact. 0.07m, sandstone, light grey, fine grained, intact, basal contact is at 19 degrees, the top is t 9 degrees. 0.12m, fissile intact coal. 0.01m, sandstone, brown. 0.07m, bright coal, not intact. 0.10m, dirty sandstone, fine grained, coaly 0.28m, bright clean coal rubble. 0.02m, lost core (coal) 0.11m, dull coal, 5 'biscuits', bedding at 7 degrees. 0.12m, sandstone, first 7cm is beige brown, very fine grained, then coaly sandstone the rest. 0.09m, dirty dull coal, slightly sandy 0.04m, coaly sandstone and plain sandstone 0.06m, dull clean coal 0.06m, sandstone 0.30m, fissile dull and bright coal, broken a few times on bedding at 10 degrees. 0.04m, lost core (coal) 0.13m, sandstone, dirty with carbonaceous silts, and a coal laminae, bedding is at 10 degrees. 0.04m, bright clean coal.</p>		1.97m / 2.03m	44.64	9-bedding 19-contact 7-bedding 10-bedding
46.63-46.88m			4-4L Parting	Carbonaceous Sandstone; Fine to medium grained, with rooty coal at the base.		0.25	46.63	
46.88-47.48m			4-4L Parting	Sandstone; Intact, medium grained, light grey.		0.6	46.88	
47.48-47.93m			4-4L Parting	Dirty Sandstone; Fine grained, dirty with interstitial calcareous silts. Broken on hairline rooty coal.		0.45	47.48	
47.93-48.46m			4-4L Parting	Sandstone; Light grey, hard, fine grained.		0.53	47.93	
Stopped to hammer to the next core point, 88.09m								

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
	51.87-53.81m		4L	4L Coal Seam as picked on the e-log. Very poor quality, the coal appears worse than the 4 seam. 51.87-52.60m, coaly siltstone. 52.60-53.01m, sandstone 53.01-53.21m, silty coal band 53.21-53.68m, coaly siltstone 53.68-53.81m, dull coal		1.94	51.87	
	74.89-75.63m		4b	4b Coal Seam as picked on the e-log. 74.89-75.25m, clean coal (likely pyritic) 75.25-75.38m, coaly mudstone 75.38-75.63m, dull coal, possibly slightly silty		0.74	74.89	
88.09-88.33m				Sandstone; Fine grained, hard, medium brownish grey. Strong fizz. Sharp basal contact at 7 degrees. Intact.		0.24	88.09	7-bedding
88.33-88.68m				Sandstone; Fine to medium grained, hard, light to medium grey, sharp basal contact at 38 degrees. Intact.		0.35	88.33	38-basal contact
88.68-88.98m				Sandstone; Slightly pinkish grey, medium to coarse grained, very strong fizz, carbonate altered.		0.3	88.68	
88.98-96.70m				Sandstone; Fine grained, light grey, locally has a green tinge. Between 89.55-89.75m, there are bioturbations, <i>macaronichnus</i> , throughout. Bedding through the unit is at 6 degrees. The unit is fractured throughout densely, dominantly steeply at 75-80 degrees, with one fracture at 90m, coated with realgar , orangey pink mineral. At 90.31m, there is a slightly healed fault zone at 42 degrees, with dark grey material and healed fractures through the ~6cm zone. Between 89-91.3m, is a very low RQD zone. Between 92.9-93.9m, there are multiple sub vertical dendritic calcite veinlets, a healed fault/fracture zone. At 94.5-94.6m, there is a crushed rock zone above a fault at 22 degrees. Between 92-95m, the unit is only broken every 30-40cm. After 95m, there are 4 breaks, all lined with fine crushed rock, breaks at 15 and 25 degrees. Rapid but gradational basal contact.		7.72	88.98	6-bedding 75-80-fractures 42- fault 22- fault 15-fractures 25-fractures
96.70-98.36m				Sandstone; Fine grained, very hard, high fizz, medium grey, with hairline calcite veinlets throughout, dominantly sub vertical, not planar. The top 30cm is broken often, then broken every 15-20cm.		1.66	96.7	
98.36-102.20m				Sandstone; All intact, medium grained, medium to dark grey. At 98.88m there is a 1cm band that is dark grey due to dusty pyrite, interstitial, followed by a 6cm 'macaronichnus' bioturbation zone, bedding is at 4 degrees. After 101m, there begins to be dark grey bands due to interstitial material. Rooty coal and semi massive pyrite in the bottom 5cm.		3.84	98.36	4-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
102.20-102.36m	101.99-102.15m		3R?	Rooty Coal within Sandstone; ~90% coal, with elongate blebs of sandstone. Rubbly in the basal centimetre.		0.16	101.99	
102.36-103.76m	102.15-103.55m	CEMI 131501, 131502	3R?	Mudstone; Dark brown, all intact, with rooty coal and coal laminae in the top 30cm, then rarely throughout the rest. Trace to minor blebs of pyrite noted throughout the unit. Sharp basal contact at 3 degrees.		1.40	102.15	3-bedding
103.76-104.71m	103.55-104.50m	k813614	3R	3R Coal Seam; 5cm, coaly mudstone, intact 38cm, clean coal, intact with permineralised calcite in moderate amounts. 4cm, blocky cleated bright coal. 41cm, intact coal, dominantly dull, with a 1cm massive pyrite band mid interval 7cm, dull and bright dirty coal, slight brown scratch, intact.		0.95	103.55	
104.71-105.25m	104.50-105.10m	k813615	3R-3	3R-3 Parting, Mudstone; The top 4.5cm is rubble, the rest is intact. In the basal 6cm, there is a 1cm coal band, and a 1.5cm pyrite band.		0.54	104.5	
105.25-105.95m	105.10-105.80m	k813616	3	3 Seam Coal; 5cm dull and bright banded dirty coal, slight brown scratch. 50cm intact dull and brightly banded coal, with a massive elongate pyrite bleb mid interval, 1x3.5cm, and trace permineralised calcite in bands throughout. Bedding is at 4 degrees. 4cm slightly broken clean coal, cleated 11cm dull and brightly banded coal, slightly dirty.		0.70	105.1	4-bedding
105.95-108.26m	105.80-108.29m	K813617 (105.8- 107.1m) / K813618 (107.1- 107.58)	3-3L	3-3L Parting, Mudstone; dark brown, intact, with rare 1-10mm coal bands, rooty and planar. The bottom 10cm is sandy.		2.31	105.8	
108.26-108.44m		K813619 (107.58- 108.29m)	3-3L	3-3L Parting, Sandstone; fine grained, dirty, with coaly laminae towards the base. Bedding is at 2 degrees.		0.18		2-bedding
108.44-109.05m	108.29-108.90m	K813620	3L	3L Coal Seam; 7cm dirty fissile coal 50cm dull and brightly banded intact coal, with dirty silty laminae throughout, platy pyrite in moderate amounts. 4cm dirty coal, bedding at 3 degrees		0.61	108.29	3-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
109.05-110.73m				Mudstone; With minor coal laminae. Blebs of pyrite noted throughout. Bedding is at 5 degrees, broken 8 times. Between 110.31-110.73m, the unit is sandy.		1.68	109.05	5-bedding
110.73-111.72m				Sandstone; Dirty with interstitial muds throughout, fine grained, solid. Dirty dark grey.		0.99	110.73	
111.72-111.84m				Sandy Mudstone.		0.12	111.72	
				EOH @ 111.84m (366'11)				

Q13-16		May, 2013	Logged by: Nick Bazowski							
UTM: 323891.023mE 5535188.154mN		220.95m Elev.	Mine Grid: 101635.731mE 102404.068mN 220.95m Elev.				Total Depth:	117.60m (386'5)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
0-25.00				Overburden						
25.00-26.89m				Casing						
26.89-68.58m				Hammer Drilled						
	45.45-48.31m		4	4 Seam Coal as picked on the E-log				2.86	45.45	
	48.31-48.72m		4-4L Ptg	4-4L Sandstone Parting as picked on the E-log				0.41	48.31	
	48.72-51.28m		4L	4L Seam Coal and sandstone partings, as picked on the E-log				2.56	48.72	
	67.73-68.68m		4b	4b Seam Coal as picked on the E-log				0.95	67.73	
68.58-68.69m				Sandstone; Parting within the 4b seam? Fine to medium grained, dirty black in the top, medium grey elsewhere.				0.11	68.58	
68.69-69.21m				4b coal; Dirty, rubbly, silty in the base. Pyritic.				0.52	68.69	
69.21-70.54m				Siltstone; Medium to dark grey, sandy, broken often, with rooty coal sections.				1.33	69.21	
70.54-71.43m				Dirty Sandstone; Fine grained, intact, massive, dirty grey due to cloudy interstitial silts, bioturbations?				0.89	70.54	
71.43-75.57m				Sandstone; Massive, medium grained, light grey. At 73.35m there is a 1mm calcite vein at 2 degrees, bedding. The bottom contact is a fault contact.				4.14	71.43	2-bedding
75.57-76.28m				Fault zone in Sandstone; The top 6cm is blocky calcite, fault plane at the top is at 26 degrees. The rest of the zone is fractured and broken, with minor calcite veinlets. Sandstone is fine grained, medium grey.				0.71	75.57	26-fault
76.28-76.94m				Sandstone; Medium grained, medium grey. Intact.				0.66	76.28	
76.94-79.53m				Sandstone; Coarse grained, light grey, solid, intact. Massive.				2.59	76.94	
79.53-82.83m				Sandstone; Fine to medium grained, fairly uniform, broken often on bedding of 0 degrees, 1/3-30cm, sometimes lined with dark grey clays. At 82.2m, there is a fracture at 60 degrees, slightly rough surfaced, but planar.				3.3	79.53	0-bedding 60-fracture
82.83-88.67m				Sandstone; Fine to medium grained, light grey, massive, competent and intact, with sporadic dark grey to black pebbles, 2 noted, 1 is 1x1.5cm, angular, the other is 3x4cm, rounded. Between 85.35-85.4m, there is wispy coal and pyrite spars in a fabric at 14 degrees. Between 85.7-86.5m, there are a few sub horizontal veinlets of calcite with orangey brown discolouration, realgar? At 87.1-87.35m, there is moderate amounts of bioturbations, <i>macaronichnus</i> .				5.84	82.83	14-fabric

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
88.67-89.80m				Sandstone; Tight, hard, very fine grained, intact except in the top 20cm.		1.13	88.67	
89.80-90.40m				Fault Zone in Sandstone; Multiple sub horizontal calcite veins and veinlets up to 1cm thick are irregularly across the core, with a 2cm crushed rock zone at the base. The sandstone is fine grained, light grey.		0.6	89.8	
90.40-91.32m				Sandstone; medium to coarse grained, broken 7 times, light grey.		0.92	90.4	
91.32-91.84m				Bioturbated Sandstone; Dense with <i>macaronichnus</i> , fine to medium grained, medium grey.		0.52	91.32	
91.84-94.40m				Sandstone; Coarse grained, light grey, with 2 fractures mid interval at 63 degrees. The basal 55cm is broken every 3-4cm, and often lined with dark grey silts of rock flour.		2.56	91.84	63-fractures
94.40-94.85m				Sandstone; Fine grained, light grey.		0.45	94.4	
94.85-95.30m				Bioturbated Sandstone; Dens with <i>macaronichnus</i> , fine grained, intact.		0.45	94.85	
95.30-100.25m				Sandstone; Fine grained, light grey, broken often, steep fractures at 40 degrees, and sub vertical fractures that 'round' out of the core, i.e.. Like a 'j'. Between 98.7-98.85m, there are multiple fractures at 35 degrees, then competent for 1m.		4.95	95.3	40-fractures 35-fractures
100.25-107.86m				This interval has not yet been logged.		7.61	100.25	
107.86-107.98m	107.47-107.59m		3R Rider	3R Rider? Coal; Dominantly bright and intact, with 2 1/2cm sand band. Sharp basal contact at 3 degrees.		0.12	107.86 / 107.47	3-bedding
107.98-108.47m	107.59-108.08m			Siltstone; Dark grey, with coal laminae throughout. Sharp intact basal contact at 10 degrees.		0.49	107.98 / 107.59	10-bedding
108.47-109.41m	108.08-109.02m	K813625	3R	3R Coal Seam; 50cm dull and bright coal, dirty, but no pyrite and trace calcite. 5cm, coal rubble 39cm dull and bright coal, dominantly competent but broken on bedding 6 times at 10 degrees. There is a 4mm pyrite band mid interval.		0.94	108.47 / 108.08	10-bedding
109.41-109.61m	109.02-109.22m	K813626	3R-3 Ptg	3R-3 Coaly Siltstone Parting; Dark grey, with minor sands within and hairline coaly laminae.		0.20	109.41 / 109.02	
109.61-110.33m	109.22-109.94m	K813627	3	3 Seam Coal; 44cm dull and brightly banded coal, with moderate permineralised calcite, fissile. 12cm intact clean coal 16cm biscuits of bright coal, 1-1.3cm thick.		0.72	109.61 / 109.22	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
110.33-111.83m	109.94-111.35m	K813628 (109.94-110.11m)	3-3L Ptg	Siltstone; Dark grey, with rare hairline coal. In the top 17cm, the coal laminae are more common, ~5-10 pinch and swell coal laminae <1/2cm thick.		1.5 / 1.41	110.33 / 109.94	
111.83-112.00m	111.35-111.60m		3L?	Silty Coal; Dull and brightly banded dirty coal, ~80% coal.		0.17 / 0.25	111.83 / 111.35	
112.00-112.55m	111.60-112.14m		3L?	Sandy Siltstone; with large pyrite blebs as well as hairline coal laminae.		0.55 / 0.54	112.00 / 111.60m	
112.55-113.45m	112.14-113.04m		3L	3L Coal Seam 7cm dull and brightly banded dirty coal, interbeds of mudstone 16cm bright coal, with a steep break at 75 degrees, and multiple cleats at 60 degrees. 31cm bright coal, clean, with multiple cleats at 60 degrees, mostly intact. 7cm mudstone 19cm dirty coal, mostly broken.		0.90	112.55 / 112.14	75-fracture? 60-cleats
113.45-115.97m				Siltstone; Medium grey, often broken, with sandy silt sections, as well as minor coal zones. At 114.5m, there is a 30cm fissile zone with a vertical break throughout.		2.52	113.45	
115.97-117.60m				Sandstone; Medium grained, intact, light to medium grey.		1.63	115.97	
				EOH at 117.60m (386'5)				

Q13-17		May, 2013	Logged by: Nick Bazowski							
UTM: 324349.133mE 5535048.91mN 211.215m Elev.			Mine Grid: 101798.501mE 101953.78mN 211.215m Elev.				Total Depth:	27.61m (90'7)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
0-20.73m				Overburden						
20.73-21.03m				Casing						
				****see below for the e-log picks						
0.94	21.08-22.02m	K813621	3R-3 ptg & 3 seam	3 Seam Coal 78cm bright coal, both rubbly and in 4-5cm sections. 10cm coal rubble 6cm dirty coal						
0.21	22.02-22.68m	K813622	3	3 Seam rubb 21cm Coal and siltstone rubble						
0.19		K813623	3-3L	Sandstone; Fine grained, intact, medium grey.						
0.85	22.68-23.53m	K813624	3L	3L Coal; Dominantly intact, with minor mud bands at the end. Bedding is at 13 degrees.						13-bedding
0.63				Mudstone; With coal laminae and a few chunks, broken throughout.				0.63		
0.93				Siltstone to Sandy Siltstone to silty sandstone; Broken more than once per cm, with rubble zones. The siltstone at the top is dark brown and beige, everything else is dark brown. Sharp basal contact at 21 degrees, making ~20gpm of water at this point, the hole is under enough pressure to be flowing from surface.				0.93		21-basal contact
1.66				Sandstone; Medium grained, mostly intact, broken roughly 6 times.				1.66		
				***** Just E-log picks below						
	20.01-21.08m		3R	3R Coal Seam; as picked on the e-log. The coal appears to be lower grade to ~20.90m, likely oxidised.				1.07	20.01	
	21.08-21.20m		3R-3 Ptg	3R-3 Ptg, silty Coal; as picked on the e-log. The core was recovered, and is just dirty coal			0.12	0.12	21.08	
	21.20-21.86m	K813621	3	3 Seam Coal; as picked on the e-log. The core was recovered, and is quite rubble and broken up.				0.66	21.2	
	21.86-22.02m		3	3 Seam Coal; as picked on the e-log. The core was recovered, and is quite dirty as shown on the log.				0.16	21.86	
	22.02-22.32m	K813622	Pt of 3	Part of 3 seam according to analysis; as picked on the e-log. Coal and siltstone rubble, analysis will determine if it's part of the 3 seam or the parting			0	0.30	22.02	
	22.32-22.68m	K813623	3-3L Ptg	3-3L Parting; as picked on the e-log. Sandstone			0.17	0.36	22.32	
	22.68-23.53m	K813624	3L	3L Coal Seam; as picked on the e-log, core recovered.				0.85	22.68	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Once the rods were pulled, the hole was making 20gpm from the collar. Three bags of bentonite were trickled into the hole, and the hole was plugged.				
				EOH at 27.61m (90'7)				

Q13-18		May, 2013	Logged by: Nick Bazowski							
UTM: 323963.26mE 5534713.88mN		283.072m Elev.	Mine Grid: 101299.12mE 102062.24mN 283.072m Elev.				Total Depth:	397'6 (121.16m)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog						
				This hole 9" diameter (to get 6" core) down to 54.10m, then 4.5" hole (to get 2.5" core) to the base.						
0-2.74m				Overburden; Cased to 3.05m (10')						
2.74-47.24m				Hammer Drilled. Stopped to core the 4 seam.						
	25.31-25.82m		5	5 Seam; SG of 1.55, as picked up on the e-log					25.31	
	25.82-26.05m		5-5L	5-5L Parting; Coaly Mudstone, as picked up on the e-log					25.82	
	26.05-26.47m		5L	5L Seam; SG of 1.55, as picked up on the e-log					26.05	
47.24-49.59m				Sandstone; Intact, fine to medium grained, light grey at the top, medium grey by 48m. Very hard, strong effervesce, late calcareous alteration. There are hairline laminae of pyrite, wispy and slightly wavy, 20cm above the basal contact. Sharp intact but irregular horizontal basal contact.						
49.59-51.96m	49.36-51.73m	K813671	4	4 Seam Coal; 0.42m intact coal, clean, dull and brightly banded 0.03m coal rubble, bright 0.05m dirty sandstone, fine grained, brown 0.27m dull and brightly banded coal, sub vertical cleats noted, 1 break on bedding at 0 degrees 0.315m dull and brightly banded coal, with permineralised calcite throughout 0.03m coaly sandstone, fine grained, brown 0.395m dull and bright banded coal, intact except for the basal 8cm, but maybe broken when removed from the core tube 0.04m coaly mudstone 0.04m very fine grained brown sandstone 0.03m silty coal, slight brown scratch 0.01m sandstone, brown, fine grained 0.06m bright coal 0.025 mud band, brown streak, intact 0.295 intact coal, dull and bright banded with moderate permineralised calcite 0.015m dirty coal 0.435m intact dull and brightly banded coal with minor permineralised calcite.				2.37m	49.36	0-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
51.96-52.22m	51.73-51.99m	K813672	4-4L	4-4L Parting 0.165m sandstone, fine grained, with wispy coal, medium brown, dirty, basal 1cm is very pyritic 0.045m bright cleated coal 0.05m dull and bright coaly mud, brown streak, dark brown		0.26	51.73	
52.22-53.75m	51.99-53.52m	K813673	4L	4L Coal Seam; 0.18m fissile dull and brightly banded coal, broken once on bedding at 3 degrees. Trace pyrite 0.22m sandstone, dirty in the top 6cm, the rest is fine grained, medium grey, with a sharp basal contact at 3 degrees 0.16m dirty coal, bedding steepens to 8 degrees, minor pyrite, moderate interstitial sands 0.18m sandstone, fine to medium grained, medium brown with a wavy basal contact, erosional? with rooty coal within 0.235m, dirty coal, trace pyrite, basal contact at 9 degrees 0.02m dirty fine grained sandstone 0.04m bone coal 0.105m sandstone, fine grained, medium grey, sharp open basal contact at 0 degrees 0.12m dominantly bright intact coal 0.01m sandy mud with abundant pyrite 0.13m dull and bright dirty intact coal 0.13m dull dirty coal, wavy basal contact.		1.53m	51.99	3-bedding 9-bedding 0-bedding
53.75-54.10m				Sandstone; Fine to medium grained, medium grey.				
54.10-101.04m				Hammer Drilled				
	69.98-70.78m		4b	4b Coal Seam; 1.55-2.0SG, as picked on the e-log.			69.98	
	76-81m			Bedding/Fault; According to the dipmeter, local bedding changes from 203/05 to 182/11, and there is a local fault/fracture at 81m at 275/53				203/05-bedding 182/11-bedding 275/53-fault
101.04-104.09m				Sandstone; Fine grained, light to medium grey. The top 90cm is broken often on bedding at 6 degrees, and fractures at 50 degrees, often calcite filled, 1/7cm. Near the base, one steep fracture at 75 degrees is filled with orange and realgar , dense. After 102.5m, there are still rare calcite veinlets within the unit, but the unit is no longer broken on these planes.				6-bedding 50-fractures 75-fractures

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
104.09-108.47m				Sandstone; Solid, intact unit, fine grained, tight, light grey, but with 'dirty' sections due to trace spars and interstitial silts, often as bands, at a bedding of 10 degrees. Between 106.7-107.2m, the bands increase in density.				10-bedding
108.47-112.80m				Sandstone; Fine to medium grained, medium grey, with 'clouds; of dark grey due to interstitial silts. All intact solid rock. Sharp basal contact, but wavy and irregular, rooty, with semi massive pyrite blebs.				
112.80-112.995m	112.48-112.68m		3R Rider Ply	Coal; Bright, but dirty. The basal 2cm is rubble.		0.195/0.2m	112.48	
112.995-113.235m	112.68-113.48m		3R Rider Mud	Mudstone; Broken up often, with coaly laminate at the top.	0.56m	0.24/0.80m	112.68	
113.235-115.06m	113.48-114.34m	K813668	3R	3R Coal Seam; 0.125m coal, rubble, clean 0.585m coal, with a mud section within, a sub vertical cleat is at 75 degrees. Coal is dull and brightly banded with minor permineralisation 0.10m dull and brightly banded intact coal, dirty	0.12	0.860	113.48	75-cleat
	114.34-114.88m	K813669	3R-3 Ptg	3R-3 parting; 0.56m siltstone, grey, competent, but broken on bedding every 6-8cm.		0.56/0.54m	114.34	
115.06-115.72m	114.88-115.52m	K813670	3	3 Seam Coal; Dirty dull ad brightly banded coal, broken 6 times with multiple permineralised calcite zones.		0.66/0.64m	114.88	
115.72-117.115m	115.52-116.83m		3-3L Ptg	3-3L Ptg; 0.90m mudstone, with trace to minor hairline coal laminae throughout, irregular and waxy. 0.23m coaly mudstone grading into muddy coal, with abundant pyrite at the top and the base. Banded. 0.265m dirty pyritic muddy sandstone, bedding at 13 degrees. Basal contact at 4 degrees.		1.395/1.31m	115.52	4-bedding
117.115-117.75m	116.83-117.45m		3L	3L Coal; Dull and bright coal, with semi-massive pyrite as a band, bedding at 9 degrees, coal is bright, but dirty		0.635/0.62m	116.83	9-bedding
117.75-118.105m				Coaly Mudstone; Mudstone with coal laminae throughout, with a large calcite band.				
118.105-118.175m				Sandstone; Grey, fine grained.				
118.175-119.03m				Siltstone; Intact, brown.				
119.03-120.30m				Sandstone; Fine grained, grey, dirty.				
120.30-121.16m				Mudstone; Trace coal within, broken zones and minor sandstone at the base. There is a 10" fault zone within, all clay and rubble, 8cm above the base, no orientation. According to the dipmeter, the fault is at 074/46.				074/46-fault
				EOH at 397'6 (121.16m)				

Q13-19		May, 2013	Logged by: Nick Bazowski						
UTM: 324248.987mE 5535107.0337mN		217.995m Elev.	Mine Grid: 101785.092mE 102068.791mN 217.995m Elev.			Total Depth:	42.98m		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)	
				Core Geolog					
0-10.67m				Overburden; Casing to 12.19m					
10.67-37.69m				Hammer Drilled; Water noted at 32.92m Coal noted at 38.1m					
37.69-39.93m			3, 3-3L, 3L	<p>0.135m 3 seam coal, broken twice, dull, base of 3 seam</p> <p>0.505m mudstone, broken often, pyritic at the top, with a small 4cm rubble zone mid interval. Trace coaly laminae, increasing towards the base.</p> <p>0.16m coaly mudstone, with a massive 7mm pyrite band near the base, otherwise interbedded coal and muds</p> <p>0.165m sandstone, medium brownish grey, fine grained, solid, with a wavy erosional basal contact.</p> <p>0.38m 3L Coal, dominantly intact, dominantly dull, with trace to minor platy pyrite noted.</p> <p>0.09m 3L Mudstone, intact, basal contact at 6 degrees.</p> <p>0.16m 3L Coal, very dirty with a sharp fracture at 65 degrees through it, and a 1/2cm of rubble along it.</p> <p>0.37m mudstone, trace rooty coal, dominantly intact.</p> <p>0.07m coaly mudstone</p>				65-fracture 6-bedding	
39.93-42.98m			3L repeat (fault)	<p>0.35m Mudstone, with coaly laminae, mostly at the top. The unit is broken often.</p> <p>0.23m Rubble, 90% mudstone fragments, 10% coal, mostly at the base. Appears to be a structure with a basal contact at 65 degrees.</p> <p>0.16m beige mudstone, intact, ash? With a hairline coal laminae mid interval.</p> <p>0.30m 3L Coal, a repeat of the 3L, intact, trace to minor platy pyrite, with a 5mm massive pyrite band 3cm above the base.</p> <p>0.095m 3L rubble zone, fault? Mudstone</p> <p>0.15m 3L coal, intact, dull, with semi massive pyrite 2cm above the base, basal contact at 2 degrees.</p> <p>1.70m Sandstone, medium grained, dense, competent, broken 7 times, medium brown.</p>				65-fault 2-bedding	
				BELOW ARE THE e-LOG PICKS, USED FOR MODELLING					
	36.2-37.57m		3R			1.37	36.2		

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
	37.57-38.40m		3R-3 Ptg			0.83	37.57	
	38.40-39.20m		3			0.8	38.4	
	39.20-40.60m		3-3L			1.4	39.2	
	40.60-41.15m		3L			0.55	40.6	
				EOH at 42.98m				

Q13-20		May, 2013	Logged by: Nick Bazowski								
UTM: 324157.20mE		5534079.95mN	308.195m Elev.	Mine Grid: 100907.51mE 101527.34mN 308.195m Elev.				Total Depth:	125.40 (411'5)		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)				Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog							
0-3.05m				Overburden; Casing to 4.27m							
3.05-48.13m				Hammer Drilled							
	26.99-27.36m		5	5 Seam; As picked on the e-log, 1.85SG					0.37	26.99	
	27.36-27.57m		5-5L	5-5L Parting; As picked on the e-log					0.21	27.36	
	27.57-28.04m		5L	5L Seam; As picked on the e-log, 1.65SG					0.47	27.57	
48.13-49.15m				Sandstone; Medium grained, medium grey, with 'dusty' bands, dark grey, across the unit, ~2-4cm thick. Intact.							
49.15-49.29m				Coaly Sandstone; Rooty wavy coal across the unit, at a fabric of ~15 degrees. Very pyritic coal. Broken once.							15-fabric
49.29-50.86m				Sandstone; Intact, medium grained, massive, light grey. Dusty clouds of interstitial silts randomly throughout.							
50.86-50.90m				Sandstone; With rooty pyritic coal interfingering through it.							
50.90-51.50m				Sandstone; Fine to medium grained, medium grey, with wavy coaly mudstone, 6cm thick, 2cm above the base. The basal 2cm is beige mudstone, ash? Sharp basal contact at 8 degrees.							8-bedding
51.50-53.10m	51.58-53.18m	K813696	4	4 Seam Coal; 0.18m interbeds of coal, coaly mud, and mudstone, intact, except for the basal 4cm, which is fissile, dirty, bedding at 0 degrees. 0.325m dull and brightly banded intact coal, clean. 0.045m sandstone, fine grained, brown, bedding at 4 degrees. 0.49m intact clean coal 0.01m dirty coaly sandstone 0.14m intact coal, with moderate platy pyrite on cleats 0.025m coaly sandstone 0.295m dull and brightly banded dirty coal with trace to minor platy pyrite. 0.09m dirty coal, moderate pyrite.					1.6	51.58	0-bedding 4-bedding
53.10-53.34m	53.18-53.42m	K813697	4-4L	4-4L Parting; 0.11m of coaly mudstone 0.09m of very fine grained muddy sandstone 0.04m of silty coal, or coaly siltstone					0.24	53.18	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
53.34-56.11m	53.42-56.19m	K813698 (53.42-53.78m) K813699 (53.78-56.19m)	4L	<p>4L Coal Seam; 0.38m dirty coal, no pyrite, the top 15cm broke up when handled, exposing wavy slick surfaces, otherwise intact, dull and brightly banded 0.055m coaly muds, bedding at 8 degrees 0.095m dirty coal 0.05m coaly sandstone 0.14m clean bright coal 0.12m dull and bright coal, dirty at the base 0.05m dirty dark brown sandstone 0.035m sandy coal, dirty 0.625m, sandstone, fine grained, grey, intact 0.24m dirty coal, minor pyrite, with a 1cm bone coal band mid interval, bedding at 5 degrees 0.13m sandstone, very fine grained 0.11m dirty coal, sandy mid interval 0.25m sandstone, very fine grained, with a 2cm bone coal band at 3 degrees near the top of the interval. 0.24m dirty coal, silty and sandy in sections, moderate amount of platy pyrite. 0.06m very fine grained sandstone, wavy basal contact. 0.19m bright very pyritic coal, one break mid interval, dull, fissile basal 2cm, slightly wavy sub horizontal basal contact.</p>		2.77	53.42	8-bedding 5-bedding 3-bedding
56.11-56.56m				Siltstone; With minor hairline coal laminae throughout, moderate rooty coal at the base.				
56.56-57.08+m				Sandstone; Medium grey, fine to medium grained.				
57.08-89.00m				Hammer Drilled				
	75.15-75.89m		4b	4b Coal Seam; As picked on the e-log, SG ~1.5 at the peak		0.74	75.15	
89.00-90.26m				Sandstone; Medium to coarse grained, with spars of carbonaceous silts throughout, shallow bedding at ~6-7 degrees. Light greyish brown. Broken twice. Near the base are a couple of dark grey to black semi rounded siltstone pebbles.				6-bedding
90.26-90.57m				Fault Zone in Sandstone; Fine to medium grained, medium greyish brown with interstitial silt laminae forming bands at 5 degrees, but are offset by a cemented fracture, dip-slip fault, which is at 65 degrees. There is also a later staged calcite filled and cemented slightly dendritic fracture crossing everything at 80 degrees.				5-bedding 65-Fault 80-fracture
90.57-91.25m				Sandstone; Fine to medium grained, light grey, soft.				

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
91.25-91.59m				Fault through Sandstone; densely fractured and calcite cemented, erratically, but with a dark grey black rock flour face at 20 degrees, likely the fault plane. Sandstone is as above.				20-Fault
91.59-95.28m				Sandstone; Fine to medium grained, light grey. At 92.3m, there is a sharp open fracture at 72 degrees, and at 93.23m, there is minor gouge on an open fracture, also at 70 degrees.				72-Fault 70-Fault
95.28-95.95m				Sandstone; Fine grained, high fizz, slight pinkish grey, hard. One fracture is at 24 degrees.				24-Fault
95.95-100.90m				Sandstone; Medium grained, medium grey, with a small fault zone at 16 degrees, with very soft slightly crushed up roof and floor rock, ~10-15cm on either side, at 97m. Between 98-101m, there are 5 fractures at 45-65 degrees. There are also breaks on coaly silt mats, sometimes pyritic, often at 20-30 degrees, 7 zones with 1 or more band or zone.				16-Fault 45-65, fractures 20-30, silt mats
100.90-101.02m				Sandstone; Medium grained, medium grey, with dolomitised fractures at 25 degrees, healed or cemented.				25-Fault
101.02-102.60m				Sandstone; Fine grained, tight, hard, slight pinkish grey, high fizz. In the basal 30cm, there is a vertical slightly dendritic hairline calcite veinlet. The basal 6cm is dense with hairline carbonaceous silt bands, horizontal.				
102.60-105.17m				Sandstone; Medium to coarse grained, light grey. Intact.				
105.17-107.70m				Sandstone; Fine grained, light grey, with faint bedding laminae at 7 degrees.				7-bedding
107.70-117.53m				Sandstone; Medium grained, light to medium grey, sometimes with dusty interstitial silt bands and trace pyritic coal spars. Mostly intact, but with some random breaks, rough surfaced fractures. After 113.3m, there are very steep bands of interstitial material, at 65 degrees, through to 114.8m, then back to sub horizontal. Bedding after 116m is faintly noted at 30 degrees.				65-cross bedding? 30-bedding
117.53-118.84m				Sandstone; Medium grey, medium grained, solid, intact roof rock except for one open fracture at 65 degrees. Bedding is at 30 degrees throughout the unit, but flattens to 7 degrees in the basal 20cm. The unit contains faint silt +- pyrite bands throughout, and pyritic coal spars in narrow zones every 20-30cm. The basal 20cm is dense with pyrite and coal spars. The bottom contact is erosional.				65-fracture 30 grading to 7- bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
118.84-119.83m	118.78-121.07m	K813700	3R	3R Coal Zone; 0.04m interfingered sandstone and coal, dense with pyrite. 0.21m dull and brightly banded intact coal, mostly bright bands, trace pyrite, slightly dirty, bedding at 4. 0.05m mudstone, with pyrite and coal, fissile and broken up. 0.15m dull banded coal, broken only due to drill 0.54m dull banded coal, broken 6 times on bedding, slightly dirty, trace permineralised calcite in thin bands, minor pyrite		1.29	118.78	4-bedding
119.83-119.93m			3R-3	3R-3 Parting; Coaly Mudstone, fissile, broken on bedding, hairline coal laminae throughout.		0.00		
119.93-121.13m			3	3 Seam Coal Zone; 0.07m bright coal, vertically cleated 0.15m bright and dull dirty coal, broken up at the top, pure rubble at the base. 0.62m dull and brightly banded coal, mostly bright, with abundant pyrite. Broken 5 times on bedding at 2 degrees. 0.20m broken up rubble and biscuits of dirty coal 0.16m intact bright clean coal		1.00	120.07	2-bedding
121.13-121.84m	121.07-122.01m	K813701	3-3L	3-3L Parting; 0.42m coaly mudstone, moderate pyrite at the base, broken often. 0.06m sandy muddy coal 0.19m dirty muddy coal 0.04m sandstone and coal rubble, possible lost core	0.23	0.94	121.07	
121.84-122.44m	122.01-122.61m	K813702	3L	3L Coal zone; 0.38m dull intact coal, with moderate calcite in bands of permineralisation, at 4 degrees. 0.02m beige mudstone 0.20m dull and brightly banded dirty coal, intact, with silts and pyrite in interlaminations.		0.60	122.01	4-bedding
0.4				Coaly Mudstone; densely laminated with coal, broken often on bedding	0.71			
0.52				Coaly mudstone; but only moderately laminated with coal, with a massive pyrite band 1.5cm thick at the top.				
0.94				Coaly mudstone; With zones that are coaly, strongly pyritic, broken often on bedding.				
0.1				Dirty Sandstone; Very pyritic, transition out of the #3 coal zone.				
0.29				Sandstone; Fine grained, medium grey.				
EOH @ 125.40m (411'5)								

Q13-21		May, 2013	Logged by: Nick Bazowski					
UTM: 324374.73mE 5534195.28mN		306.991m Elev.	Mine Grid: 101130.13 mE 101422.17 mN 306.991m Elev.		Total Depth:	88.87m (285')		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog				
0-6.71m				Overburden; Casing to 9.14m				
6.71-24.99m				Hammer Drilled				
	24.61-25.07m		5			0.46	24.61	
	25.07-25.31m		5-5L			0.24	25.07	
24.99-25.83m	25.31-25.69m		5L	5L Coal Seam; Dirty, banded with hairline silts, bedding is at 2 degrees. The unit is broken often, and rubbly over short zones.		0.38	25.31	2-bedding
25.83-26.25m				Coaly Mudstone; Coal laminae through muds, broken 6 times on bedding at 2 degrees.				2-bedding
26.25-28.10m				Siltstone; Medium brownish grey, broken often on bedding. Sharp basal contact, intact at 2 degrees.				2-bedding
28.10-30.03m				Sandstone; Dominantly intact and competent except for one planar fracture at 70 degrees. Coarse grained, medium grey, with clouds of interstitial silts and pyrite, trace pyritic coal spars too.				70-fracture
30.03-31.25m				Sandstone; Medium grained, medium grey, soft. Between 30.4-30.75m, the rock is very broken up and soft, between fractures at 74 degrees, rough surfaced and not quite planar.				74-fractures
31.25-34.86m				Sandstone; Medium grey, medium to coarse grained, soft, but solid and intact, with local 3-10cm zones of bioturbations, which are semi rounded 1cm blebs of white medium grained sands. At 33.04m, there is a fracture at 60 degrees. The basal cm is quite pyritic. Very competent roof.				60-fracture
34.86-	34.71-36.51m	K813674	4	4 Seam Coal; 0.085m clean bright cleated coal 0.035m dirty coal, light brown streak. 0.08m clean coal rubble 0.80m intact dull and brightly banded coal, mostly bright bands, bedding is at 10 degrees, with minor platy pyrite and multiple thin permineralised calcite bands. 0.55m dull and brightly banded coal, mostly bright, clean, with a sub vertical wavy cleat through the top half. 0.25m dull and bright banded , mostly dull, slightly dirty at the base.		1.8	34.71	10-bedding
	36.51-36.84m	K813675	4-4L	4-4L Parting; 0.14m dirty silty coal 0.14m dull and bright silty coal/coaly silt 0.05m very fine grained sandstone, brown.		0.33	36.51	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
	36.84-39.29m	K813676	4L	<p>4L Coal; 0.34m coal rubble, appears dirty, some fragments are silty. 0.09m intact bright coal within minor platy pyrite. 0.04m blocky bright intact coal rubble 0.13m cleated bright intact coal 0.09m coal rubble 0.455m dull and bright banded coal, mostly bright, broken 6 times on bedding at 3 degrees, platy pyrite throughout 0.055m bone coal 0.16m dull and bright coal, mostly dull 0.035m coal rubble 0.055 intact dull and bright coal 0.04m dirty coal rubble 0.13m dirty fissile coal 0.02m sandstone 0.185m dull and bright coal, mostly rubble 0.195m sandstone, with coaly mud at the base, fine grained, brown 0.43m dull and bright coal, mostly bright</p>		2.45	36.84	3-bedding
39.71-39.98m				Mudstone; coaly				
39.98-40.23m				Coaly Siltstone				
40.23-41.09m				Sandstone; Fine to medium grained, medium grey, pyritic.				
41.09-41.32m			Lower Leaf	4L Lower Leaf Coal; Bright, with a calcite plated cleat at 60 degrees. Quite broken up throughout.				60-cleat
41.32-41.50m				Siltstone; Medium brown, with coaly laminations.				
41.50-61.57m				Hammer Drilled to next core point				
	48.22-49.20m		4b	4b Coal Seam; As picked on the e-log		0.98	48.22	
61.57-62.30m				Dirty Sandstone; Dirty due to interstitial material, wavy fabric but horizontal, fine grained, intact.				
62.30-65080m				Sandstone; Fine grained, dominantly intact except broken every 15cm in the basal 1.3m. The unit is dirty with wilt spars and hairline laminae throughout, otherwise light to medium grey.				

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
65.80-67.50m				Sandstone; Fine grained, hard, slight pink tinge, high fizz. Broken every 15-20cm, not fractures. At 67.36m, there is ~5-10cm of sandstone pebbles, semi rounded, and the hole is now making water , likely from here.				
67.50-68.05m				Sandstone; Medium grained, light to medium grey, broken 10 times, appears like the surfaces were rough and are now slightly smoothed out, possible due to water flow. Bedding is at 8 degrees. Minor silt spars throughout the unit.				8-bedding
68.05-70.36m				Sandstone; Intact, fine grained, hard, slightly pink grey, shallow bedding at 8 degrees, and cross bedding at 30 degrees, noted by thin faint interstitial silt bands.				8-bedding 30-x bedding
70.36-71.90m				Sandstone; Fine grained, hard, tight, light to medium grey with pinkish dolomitised zones, hairline laminae randomly throughout at 19 degrees, sometimes the core is broken on these planes. There is a 25cm fracture zone at the base, each fracture (4 of them) is lined with dark grey rock flour, fractures are at 15 degrees.				19-x bedding 15-fractures
71.90-73.50m				Sandstone; Fine to medium grained, tight, slightly pinkish grey, altered, intact except for a 17cm fault zone at 73m, at 75 degrees, broken up between fault plane, gouge and rock fragments are dark grey to black.				75- Fault
73.50-80.95m				Sandstone; Fine to medium grained, light to medium grey, tight, with local zones of hairline laminae of silts or carbonaceous silts, bedding is at 20 degrees. At 75.4m, there is a dark grey to black rock flour lined fracture/ fault plane at 72 degrees. At 78.8m, there is a planar fracture at 68 degrees. The basal 10cm is rubble, pyritic, and coaly.				20-bedding 72- fault 68-fracture
80.95-	80.69-82.19m	K813677	3R	3R Coal Seam; 0.08m coal rubble, basal fracture at 40 degrees 0.615m bright banded coal with trace platy pyrite, minor calcite, both platy and in permineralised bands, broken 7 times at ~5 degrees, otherwise intact. 0.04m coal rubble. 0.035m Sandstone, very fine grained, brown. 0.115m dull and brightly banded coal, rubbly at the base 0.07m coaly mudstone, intact 0.065m coal rubble	0.48	1.50	80.69	40-fracture 5-bedding
	82.19-82.69m	K813678	3R-3 Ptg	3R-3 Parting; 0.055m mudstone, with trace coaly laminae 0.035m muddy coal, dirty. 0.225m sandstone, fine grained, grey erosional basal contact. 0.185m coaly siltstone, rubble		0.50	82.19	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
	82.69-83.95	K813679	3	3 Seam Coal; 0.48m intact coal, dull banded with trace noted pyrite, minor calcite. 0.055m mudstone 0.035m bright coal 0.055m mudstone 0.035m dirty coal 0.14m laminated siltstone 0.08m cleated pyritic coal 0.38m soft coaly mud, soft to the touch, with a basal fracture at 22 degrees		1.26	82.69	22-fracture
	83.95-84.65m		3-3L	Coaly mudstone; into coaly siltstone, bedding is at 10 degrees, gradationally less and thinner coal laminae to the base		0.70	83.95	10-bedding
	84.65-84.88m		3L	3L Coal Seam; Silty coal/coaly siltstone.		0.23	84.65	
	84.88-85.34m			Coaly Siltstone; little to no coal laminae towards the base, very thin.			84.88	
85.34-86.87m				Sandstone; Medium grained, medium grey with sub vertical rock flour covered fractures at 80-90 degrees.				80-90, fractures
				EOH @ 86.87m (285')				

Q13-22		May, 2013		Logged by: Nick Bazowski						
UTM: mE mN m Elev.		Mine Grid: mE mN m Elev.			Total Depth:		88.28m			
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)			Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): E-log	Structure (dip to horizontal)
				Core Geolog						
0-1.22m				Overburden; Casing to 3.05m						
1.22-81.69m				Hammer Drilled						
	46.92-47.22m		4b	4b Coal seam, as picked on the e-log						
	79.60-79.74m		3R Rider Ply	As picked on the e-log				0.14	79.6	
	79.24-80.98m		3R Rdr Ply Ptg	As picked on the e-log				1.24	79.24	
	80.98-81.96m		3R	0.12m biscuit rubble of dirty coal 0.055m intact dull and bright coal 0.09m clean coal rubble 0.07m pyritic intact dull coal			0.145	0.98	80.98	
	81.96-82.26m	K813680	3R-3 Ptg	0.30m rubble mostly clean coal, some fragments of sandy coal (part of 3R-3 Ptg)				0.3	81.96	
	82.26-83.30m	K813681	3	0.19 rubble, mostly clean coal, some fragments of sandy coal (part of 3R-3 ptg) 0.17m intact clean bright coal 0.13m coal biscuits, dull banded 0.46m coal, dull and brightly banded, broken 3 times on bedding at 2 degrees, with moderate platy pyrite on cleats 0.06m coal and mud mush, very soft 0.03m intact bright coal, with permineralised calcite			0.32	1.04	82.26	2-bedding
	83.30-83.65m		3-3L Siltstone Ptg	0.05m coaly siltstone, dark brown with wavy coal laminae 0.30m dark greyish brown siltstone, broken often, one slip plane at 35 degrees				0.35	83.3	35-fracture, slip plane
	83.65-84.02m		3L Coal and Muds	0.18m coal and mudstone interbeds, dense with coal, one fracture at 35 degrees 0.19m brightly banded coal, slightly dirty, with abundant permineralised calcite throughout				0.37	83.65	35-fracture
	84.02-84.45m		3L muds and sands	0.06m mudstone, intact, dark brown 0.37m sandstone, the basal 15cm is slightly broken up and healed with erratic calcite veinlets, a healed fault zone				0.43	84.02	
	84.45-85.11m		3L Coal	0.66m intact coal, broken only once on bedding of 2 degrees, fissile in the basal 6cm, dull and bright, mostly bright, with a 1cm massive pyrite band near the top.				0.66	84.45	2-bedding
	84.11-			0.03m mud zone, very softy and 'gougey' 0.27m siltstone, broken 8 times					84.11	

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): E-log	Structure (dip to horizontal)
				0.89m mudstone, broken often on bedding at 2 degrees, minor pyrite (3cm from run above) 0.41m mudstone, with trace to minor coaly laminae, broken often on bedding at 2 degrees 0.16m coaly mudstone 0.38m dark brown mudstone, broken often on bedding at 2 degrees and throughout the unit due to a sub vertical fracture at ~85 degrees. 1.24m sandstone, fine grained, dominantly				2-bedding 85-fracture
				EOH @ 88.28m				

Q13-23		June, 2013	Logged by: Nick Bazowski						
UTM: 324086.12mE 5531801.43mN		349.2m Elev.	Mine Grid: 99040mE 100220mN 349.2m Elev.			Total Depth:	84.73m (278')		
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)		Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
				Core Geolog					
0-2.13m				Overburden; Cased to 4.88m					
2.13-72.85m				Hammer drilled to core pt. 53.34m, dark sandstone 57.91m, the hole started making 7 gpm of water					
72.85-72.97m				Base of Fault Zone; Cemented breccia with a 4 cm rubble zone at the base, clast supported, with abundant calcite, base at 10 degrees.					10-bedding
72.97-75.43m				Sandstone/Lithic Sandstone/Pebbly Conglomerate; Poorly sorted beds of sandstones, lithic sandstones, and pebble conglomerates, broken every 15-20cm, beds are 1-20cm thick, medium to dark grey, fine to medium grained sands. In the top 50cm there are multiple hairline calcite, slightly wavy, sub horizontal, below the top 50cm, there are fewer, but are still present. At 73.2m, there is a sharp fracture plane at 52 degrees. After 73.8m, the unit is strongly broken up, rubbly, with bedding at 12 degrees, and at 75.3m, there is a sub vertical calcite lined fracture through the core, with minor orange realgar .					52-fracture 12-bedding 85-vein
75.43-75.50m				Banded Sandstone; Interbeds of very fine grained silty sandstone, dark grey, 1-4mm and fine grained medium grey 5-15mm sandstone. Bedding is at 8 degrees. Water is up to 60gpm here.					8-bedding
75.50-78.18m				Fault Zone In various units; Fault zone through poorly sorted interbeds of conglomerate fine to medium grained dirty sandstone and laminated sandstone with silty pyritic laminae towards the base. The entire interval is fractured often, infilled with calcite 1-10mm thick, often steep at 55 degrees, and shallower at 30 degrees. At 77.8m there is a sharp fault plane at 64 degrees, with rubble on the up dip side. Bedding with the beds that aren't effected by faults are at 16 degrees. All veins that contact bedding planes show offsets, not measureable.					55-fault zone 30-fault zone 64-fault plane 16-bedding
78.18-78.65m				Lithic Sandstone/Conglomerate Interbeds; fractured towards the base, but dominantly intact, broken 5 times, 3 of which in the basal 6cm, no calcite. Bedding is at 11 degrees. Sharp basal contact at 6 degrees.					11-bedding 6-bedding

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
78.65-80.34m	78.87-80.55m	K813687	3R	3R Coal Seam 1cm soft coal 9cm dirty coal and muds, very soft 3cm bright clean coal fragments 1.3m of intact bright coal, with multiple hairline pyrite laminae and subvertical veinlets on cleating, and a localised crackle breccia mid interval, where the coal was shattered, and cemented by calcite, associated with a vertical hairline calcite veinlet that runs the length of the seam. 2cm fissile silt band 24cm intact dirty coal, slightly brown scratch.		1.69	78.87	
80.34-80.405m	80.55-80.625m	K813688	3R-3	Sandstone; Fine grained, medium brown grey.		0.065	80.55	
80.405-81.355m	80.625-81.575m	K813689	3	3 Seam Coal; 0.365m Intact, bright, with trace platy pyrite and calcite. 0.18m clean coal, dominantly intact. Bedding is at 8 degrees. 0.14m coal rubble, broken, but still clean 0.04m fault zone, calcite filled at 50 degrees 0.225m dirty coal, brown scratch		0.95	80.625	8-bedding 50- fault
81.355-81.49m	81.575-81.71m	K813690	3-3L	3-3L Parting; 8cm carbonaceous muds 5.5cm brown medium grained sandstone, bedding is at 6 degrees.		0.135	81.575	6-bedding
81.49-82.00m	81.71-82.22m	K813691	3L	3L Coal; Dirty throughout, with massive blebs and bands of pyrite, permineralised calcite in bands, coal scratches brown.		0.51	81.71	
82.00-84.73m				Sandstone; Medium grained, light grey, dirty brown in the top 30cm, densely pyritic at the top, massive, intact. At 83.92m, there is a ~15cm zone of sandy muds with rooty coal within. At 84.5m there is a slightly healed fault plane at 75 degrees.				75- fault
				EOH @ 84.73m (278')				

Q13-24		June, 2013		Logged by: Nick Bazowski						
UTM: mE mN m Elev.		Mine Grid: mE mN m Elev.			Total Depth:	100.22m				
Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)		
				Core Geolog						
0-1.22m				Overburden; Cased to 2.44m						
0-80.01m				Hammer Drilled to core point						
80.01-81.15m				Sandstone; Medium grey, with dirty sections due to interstitial silts +- lithics +- pyrite. Bedding is at 2 degrees. The unit is poorly sorted, dominantly fine to medium grained, with some zones with 1/2-1mm lithics. Uneven basal contact, alteration contact?				2-bedding		
81.15-81.50m				Sandstone; Slightly pink, dolomitised, very hard, fine grained.						
81.50-82.90m				Sandstone; Dominantly fine grained, light to medium grey, with zones that are slightly darker due to interstitial material, as well as zones that are poorly sorted lithic sandstone, with lithics up to 1-2mm.						
82.90-84.16m				Sandstone; Medium grey, poorly sorted beds, dominantly fine grained, but more common lithic zones, where lithics make up 10% over ~5-10cm sections. Bedding is at 12 degrees. At 83.7m there is a fracture at 65 degrees, intact. Below this, although the sandstone is all intact, it has dendritic fractures, all cemented or healed, a shatter zone when the fault occurred. Sharp basal contact at 11 degrees.				12-bedding 11-bedding		
84.16-84.90m				Sandstone; Still with the cemented dendritic fracturing as described above. Fine grained, medium to dark grey, more of a uniform unit.						
84.90-85.41m				Sandstone; Still with the cemented dendritic fracturing as described above. Fine to medium grained, medium to dark grey, with faint 1/2-1cm bands every 6-8cm, of darker grey due to interstitial material, banding at 16 degrees.				16-bedding		
85.41-87.87m				Sandstone; Fine to medium grained, medium grey, dark grey in the top 23cm, and fractured as above in the top 1.2m. Dominantly uniform unit. Fractured dendritically in the basal 50cm due to the underlying fault zone. Erosional healed brecciated contact.						
87.87-89.46m				Fault Zone in Sandstone; Light grey, fine to medium grained, fractured throughout, shattered actually, but healed with calcite. Between 88.09 to 88.68m, there is no fracturing and calcite, and then dense calcite filled fracturing again to 89.46m, subvertical dominantly. Between 89-89.46m, there are multiple lithic fragments up to 1.5cm sized, angular, grey and black siltstone, and 1 coal fragment, <<1%. There are 6 natural breaks, bedding is at 2 degrees.				2-bedding		

Depth (based on drillers footage)	Depth (based on E-log)	Sample #	Seam Designation	Core Description: (Lithology; grain size, colour, modifiers, minor constituents, sedimentology, palaeontology, tectonic features, physical condition, basal contact, as well as formation changes)	Lost Core determined by Drillers footage and E-Log combined	Thickness (m): Drillers / E-Log	Depth to Top (m): Drillers / E-log	Structure (dip to horizontal)
89.46-92.20m				Poorly Sorted Sandstone; Medium grained, medium to dark grey, with zones of lithics throughout, lithics make up ~1-2% in localised 1-5cm zones every 5-10cm, lithics up to 4mm sized. Bedding is at 3 degrees. One thin healed calcite filled fracture goes through the run subvertically, wavy.				3-bedding
92.20-94.02m				Sandstone; Fine to medium grained, medium grey, with faint laminations starting at ~93.4m, bedding at 6 degrees. In the basal 20cm, there are blebs of pyrite within the sands up to 1cm sized. Sharp uneven basal contact.				6-bedding
94.02-95.63m	94.25-95.86m	K813692	3R	3R Coal; 0.93m dominantly dull coal, intact over 10-15cm sections, cleating is at 80-90 degrees, rare. Coal is very pyritic, dirty towards the base. 0.68m as above, but more broken, with blocky sections.		1.61	94.25	80-cleats
95.63-95.78m	95.86-96.01m	K813693	3R-3	3R-3 Parting, Mudstone; Granular muds, soft, almost sands.		0.15	95.86	
95.78-96.98m	96.01-97.21m	K813694 (0.24m) K813695 (0.96m)	3	3 Seam Coal; 0.54m coal, dominantly bright clean coal, very broken, breaks to the touch, strong vertical fabric 0.66m intact dull and bright banded coal, with abundant pyrite, as blebs, mid interval. Bedding is at 2 degrees.		1.20	96.01	2-bedding
96.98-97.59m	97.21-97.92m		3-3L	3-3L Parting; 0.16m coaly siltstone, bedding is at 2 degrees. 0.45m mudstone, with abundant pyrite mid interval, and rare coal laminations.		0.61	97.21	2-bedding
97.59-97.89m	97.92-98.28m		3L	3L Coaly Siltstone; 0.10m coaly siltstone 0.20m silty coal or coaly siltstone, dark brown, commonly broken on bedding at 3 degrees.		0.30	97.92	3-bedding
97.89-98.30m				Siltstone; Dark greyish brown, with a few coal laminae 1/2-1.5cm thick.				
98.30-99.06m				Sandstone; With rooty coal throughout, fine to medium grained, light to medium grey.				
				EOH @ 100.22m				

Appendix 3 – Sample Inventories

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-01			E-Log Corrected					
3R, 3R-3 Ptg, 3 seam	K813635		101.2	103.35	2.08	0.07	2.15	3R, 3R-3 Ptg, 3 seam
3L Coal	K813636		104.32	105.04	0.72	0.00	0.72	3L Coal

**ROCK SAMPLE INVENTORY FOR ABA
ANALYSIS - 6 SOUTH EXPLORATION
PROJECT**

E-Log Corrected

Drillhole Q13-01	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	130101	100.91	101.1	0.19	
	130102	101.1	101.2	0.1	3R Seam Roof
	130103	105.04	105.37	0.33	3 Seam Floor

******130103 is being 'strength tested' at a Levelton lab in Nanaimo, and will be shipped to you once completed. Please wait to start this sample shipment so that you can analyse and report all 3 of these samples together.**

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-02			E-Log Corrected					
3R, 3R-3 Ptg, 3 seam	K813632		100.9	103.16	2.26	0.00	2.26	3R, 3R-3 Ptg, 3 seam
3-3L Parting	K813633		103.16	103.98	0.82	0.00	0.82	3-3L Parting
3L Coal	K813634		103.98	104.51	0.53	0.00	0.53	3L Coal

Drillhole Q13-02	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	130201	100.5	100.8	0.3	
	130202	100.8	100.9	0.1	3R Seam Roof

**ROCK SAMPLE INVENTORY FOR ABA
ANALYSIS - 6 SOUTH EXPLORATION
PROJECT**

E-Log Corrected

Drillhole Q13-03	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	130301	92.13	92.37	0.24	
	130302	92.37	92.5	0.13	3R Seam Roof

******Please crush 130302 to the coarsest material possible to still get a representative split. Once analysis has been done on 130302, please send all of the remaining split (retain) to ALS (11171 Coppersmith Place, Richmond, BC, V7A 5H1), with instructions to contact me (nwb@quinsam.com) once the sample arrives.**

**SAMPLE INVENTORY - 4 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-05			E-Log Corrected					
3R Coal	K813659		96.88	97.96	0.28	0.80	1.08	3R Coal
3R-3 Ptg	K813660		97.96	98.37	0.33	0.08	0.41	3R-3 Ptg
3 Seam Coal	K813661		98.37	98.84	0.46	0.01	0.47	3 Seam Coal
3-3L Ptg	K813662		98.84	100.25	1.08	0.33	1.41	3-3L Ptg
3L Coal and Muds	K813663		100.25	101.63	1.28	0.10	1.38	3L Coal and Muds

***Please determine SG for all samples

Do raw coal analysis on all samples.

Please do LT% on K813659, 660, and 661.

Drillhole Q13-05	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	130501	96.68	96.82	0.14	Pyritic Lithic Sandstone
	130502	96.82	96.88	0.06	3R Seam Roof (Pyritic coaly SS breccia)

**SAMPLE INVENTORY - 4 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-06			E-Log Corrected					
3R and 3, no ptg	K813664		101.36	103.02	1.20	0.46	1.66	3R and 3, no ptg
3-3L Ptg	K813665		103.02	103.36	0.34	0.00	0.34	3-3L Ptg
3-3L Ptg	K813666		103.36	104	0.31	0.33	0.64	3-3L Ptg
3L Coal and Muds	K813667		104	104.55	0.55	0.00	0.55	3L Coal and Muds

***Sample K813665 has been sent to SGS, and will be forwarded to you upon ABA completion, please don't report any results until all samples are received and complete.

***Do raw coal analysis on all samples.

***Please determine SG for all samples

***Please do Sulfur Forms on Sample K813664

Drillhole Q13-06	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	130601	101.06	101.26	0.2	
	130602	101.26	101.36	0.1	3R Seam Roof
	K813665	103.02	103.36	0.34	3 Seam Floor

**SAMPLE INVENTORY - 4 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
			E-Log Corrected					
Drillhole Q13-07								
3R/ptg/3	K813653		83.39	86.91	3.52	0.00	3.52	
								3R/ptg/3

Please do raw coal analysis (ash, s, moistures)

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-08			E-Log Corrected					
3R Rider Coal Ply	K813654		53.32	53.51	0.19	0.00	0.19	3R Rider Coal Ply
3R Rider Mudstone Ply	K813655		53.51	53.96	0.45	0.00	0.45	3R Rider Mudstone Ply
3R Coal	K813656		53.96	54.85	0.74	0.15	0.89	3R Coal
3R-3 Parting	K813657		54.85	55.37	0.47	0.05	0.52	3R-3 Parting
3 Seam Coal	K813658		55.37	56.09	0.72	0.00	0.72	3 Seam Coal

Please determine SG on K813654, 655, 656

Please crush K813656-K813658 to 1/2", do raw coal analysis (ash, S, moistures) on a split of each of the samples. With the remaining material, please composite the samples, sieve to 1/2"x1mm, and 1mm minus. Float the 1/2"x1mm at 1.6SG, report weight %'s to us, and send the float, the sink, and the 1mm minus to SGS (3260 Production Way, Suite F, Burnaby BC, V5A 4W4), with instructions to do "modified ABA corrected for siderite, and full metals analysis" on each sample. Please label each sample '13-08 3R/ptg/3-Float', '13-08 3R/ptg/3-Sink' and '13-08 3R/ptg/3-Fines'

For K813654 and K813655, crush to whatever size necessary and do raw coal analysis on them

Drillhole Q13-08	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	130801	53.66	53.86	0.2	1/2 core
	130802	53.86	53.96	0.1	3R Seam Roof (1/2 core)
	130803	56.09	56.19	0.1	3 Seam Floor (3-3L Ptg) (whole core)

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-09			E-Log Corrected					
3R Roof (gouge)	K813648		72.33	72.47	0.14	0.00	0.14	This sample is at SGS and will be forwarded to you upon completion of ABA
3R Coal	K813649		72.47	72.94	0.22	0.25	0.47	
3R-3 parting	K813650		72.94	73.31	0.37	0.00	0.37	3R-3 parting
3 Coal	K813651		73.31	74.07	0.76	0.00	0.76	3 Coal
3-3L Siltstone (part of mining height), 3 seam floor	K813652		74.07	74.33	0.26	0.00	0.26	This sample is at SGS and will be forwarded to you upon completion of ABA

****Please do not start these samples until all of the samples have arrived (2 will be sent from SGS upon their completion with a split)

****Do the raw coal analysis on each sample seperately (ash, sulphur, moistures), and then composite all of the samples, and do the same raw coal analysis on the composite. Report the composite as 'Mining Height Composite', in the same report, but on a new tab in excel.

Drillhole Q13-09	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	130901	72.23	72.33	0.1	
	K813648	72.33	72.47	0.14	3R Seam Roof
	K813652	74.07	74.33	0.26	3 Seam Floor (3-3L Ptg)
	130904	74.33	74.43	0.1	part of 3-3L parting

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-10			E-Log Corrected					
3R Rider Coal and Mudstone, 3R Coal	K813645		73.22	74.53	1.31	0.00	1.31	3R Rider Coal and Mudstone, 3R Coal
3R-3 Ptg	K813646		74.53	74.87	0.13	0.21	0.34	3R-3 Ptg
3 Seam Coal	K813647		74.87	75.65	0.75	0.03	0.78	3 Seam Coal

Please do LT% on each sample, along with raw coal analysis (ash, s, moistures)

Drillhole Q13-10	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131001	72.92	73.12	0.2	
	131002	73.12	73.22	0.1	3R Seam Roof
	131003	75.65	75.75	0.1	3 Seam Floor (3-3L Ptg)

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-11			E-Log Corrected					
3R	K813684		91.77	92.55	0.72	0.06	0.78	3R
3R-3 Ptg	K813685		92.55	93.6	1.05	0.00	1.05	3R-3 Ptg
3	K813686		93.6	94.63	0.98	0.05	1.03	3

****Please crush all samples to 1/2", and run raw coal analysis on a split, retain the rest of the material for a float sink. Once the raw coal analysis is complete, please composite the 3 samples, and sieve to 1/2"x1mm, and 1mm minus. Float sink the 1/2"x1mm at 1.6 SG. Send the float, the sink, and the 1mm minus to SGS Canada (3260 Production Way, Suite F, Burnaby BC, V5A 4W4) with instructions to contact me (nwb@quinsam.com) upon their arrival. Please label these 3 samples as '13-11 Comp-float', '13-11 Comp-sink', and '13-11 Comp-Fines', and label the shipment somehow associated with the drillhole ID Q13-11.

ROCK SAMPLE INVENTORY FOR ABA ANALYSIS - 6
SOUTH EXPLORATION PROJECT

E-Log Corrected

Drillhole Q13-11	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131101	91.47	91.67	0.2	
	131102	91.67	91.77	0.1	3R Seam Roof
	131103	94.63	94.73	0.1	3 Seam Floor
	13-11 Comp-Float				Sample coming from ALS
	13-11 Comp-Sink				Sample coming from ALS
	13-11 Comp-Fines				Sample coming from ALS

****'13-11 Comp-float', '13-11 Comp-sink', and '13-11 Comp-Fines' are samples that will be coming from ALS Coal, once the samples have been created. Please await the arrival of these samples, and report all 6 samples at the same time.

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
E-Log Corrected								
Drillhole Q13-12								
3R Rider Coal and Mudstone	K813641		98.96	99.22	0.26	0.00	0.26	3R Rider Coal and Mudstone
3R Coal	K813642		99.22	100.4	1.14	0.04	1.18	3R Coal
3R-3 Ptg	K813643		100.4	100.61	0.21	0.00	0.21	3R-3 Ptg
3 Seam Coal	K813644		100.61	101.59	0.50	0.48	0.98	3 Seam Coal

***Please determine SG for samples K813641 and K813642

Do raw coal analysis on all samples.

Please do LT% on K813642, 643, and 644.

Drillhole Q13-12	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131201	98.66	98.86	0.2	
	131202	98.86	98.96	0.1	3R Seam Roof
	131203	101.59	101.69	0.1	3 Seam Floor (3-3L Ptg)

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
			E-Log Corrected					
Drillhole Q13-13								
3R Rider Coal	K813637		103.81	104.81	1.00	0.00	1.00	3R Rider Coal
3R? Or pt of 3R-3 Ptg?	K813638		104.81	105.04	0.23	0.00	0.23	3R? Or pt of 3R-3 Ptg?
3R-3 Ptg	K813639		105.04	105.54	0.50	0.00	0.50	3R-3 Ptg
3	K813640		105.54	106.41	0.81	0.06	0.87	3

Please do raw coal analysis on all of the samples, and determine SG on K813637, 638, and 639.

Drillhole Q13-13	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131301	103.41	103.71	0.3	
	131302	103.71	103.81	0.1	3R Seam Roof
	131303	106.41	106.51	0.1	3 Seam Floor (3-3L Ptg)

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.
			(From)	(To)			
E-Log Corrected							
Drillhole Q13-14							
3R Rider Coal	K813606		118.18	118.47	0.29	0.00	0.29
3R Rider Mudstone	K813607		118.47	119.02	0.55	0.00	0.55
3R/3 Seam Coal	K813608		119.02	120.92	1.73	0.17	1.90
3-3L Siltstone	K813609		120.92	121.77	0.85	0.00	0.85
3-3L Coaly Siltstone	K813610		121.77	121.97	0.20	0.00	0.20
3-3L Sandstone	K813611		121.97	122.17	0.20	0.00	0.20
3L Coal	K813612		122.17	123.04	0.70	0.17	0.87

Drillhole Q13-14	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131401	116.88	117.88	1	
	131402	117.88	118.18	0.3	3R Seam Roof
	131403	123.04	123.34	0.3	3L Seam Floor

Drillhole Q13-15	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131501	102.25	103.25	1	
	131502	103.25	103.55	0.3	3R Seam Roof

Drillhole Q13-16	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131601	107.98	108.08	0.1	3R Seam Roof
	131602	110.11	110.21	0.1	3 Seam Floor
	131603	110.21	110.51	0.3	

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-18			E-Log Corrected					
3R Coal	K813668		113.48	114.34	0.74	0.12	0.86	3R Mudstone
3R-3 Parting	K813669		114.34	114.88	0.54	0.00	0.54	3R-3 Parting
3 Seam Coal	K813670		114.88	115.52	0.64	0.00	0.64	3 Seam Coal
4	K813671		49.36	51.73	2.37	0.00	2.37	4 (5 bags)
4-4L Ptg	K813672		51.73	51.99	0.26	0.00	0.26	4-4L Ptg (1 bag)
4L	K813673		51.99	53.52	1.53	0.00	1.53	4L (3 Bags)

Notes:

- 1) For samples K813668-670, please do raw coal analysis, reporting moisture, ash, sulphur, and retain weights.
- 2) For samples K813671-673, please refer to the newest (sent with this email) 6" core sampling process. After completing Steps 1 and 2, composite K813672 and 673, and proceed with the resulting 2 samples (K813671 and composite)

Drillhole Q13-18	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131801	113.08	113.38	0.3	3R Seam Roof
	131802	113.38	113.48	0.1	3R Seam Roof
	131803	115.52	115.62	0.1	3 Seam Floor

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
			E-Log Corrected					
Drillhole Q13-19								
3R-3 Parting	K813682		37.57	38.4	0.83	0.00	0.83	3R-3 Parting
3 Seam Coal	K813683		38.4	39.2	0.63	0.17	0.80	3 Seam Coal

Notes:

1) For samples K813682-683, please do raw coal analysis, reporting moisture, ash, sulphur, and retain weights.

Drillhole Q13-19	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	131901	39.2	39.3	0.1	3 Seam Floor

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-20			E-Log Corrected					
4	K813696		51.58	53.18	1.60	0.00	1.60	4
4-4L Ptg	K813697		53.18	53.42	0.240	0.00	0.240	4-4L Ptg
4L (Part of)	K813698		53.42	53.78	0.36	0.00	0.36	4L (Part of)
4L (Part of)	K813699		53.78	56.19	2.41	0.00	2.41	4L (Part of)
3R/3 (No parting present)	K813700		118.78	121.07	2.290	0.00	2.290	3R/3 (No parting present)
3-3L Parting	K813701		121.07	122.01	0.71	0.23	0.94	3-3L Parting
3L Coal	K813702		122.01	122.61	0.60	0.00	0.60	3L Coal

******Notes**

1) Samples K813696 through 699 shall be processed as described in the most recent 6" core process document. Once Step 3 is reached, the composite will consist of K813696, 697, and 698. The rest of the instructions in the 6" core process document will refer to the 1 composite, as well as sample K813699, for 2 samples.

2) Please crush K813700 to 1/2", and run raw coal analysis on a split, retain the rest of the material for a float sink. Of the retain material, sieve to 1/2"x1mm, and 1mm minus, please report weight %. Float sink the 1/2"x1mm at 1.6 SG. Send the float, the sink, and the 1mm minus to SGS Canada (3260 Production Way, Suite F, Burnaby BC, V5A 4W4) with instructions to contact me (nwb@quinsam.com) upon their arrival. Label these 3 samples as '13-20 Comp-float', '13-20 Comp-sink', and '13-20 Comp-Fines' please, and label the shipment somehow associated with the drillhole ID Q13-20.

3) Samples K813701 and K813702 can be crushed to any size and will only have raw coal analysis done on it.

**ROCK SAMPLE INVENTORY FOR ABA ANALYSIS -
6 SOUTH EXPLORATION PROJECT**

E-Log Corrected

Drillhole Q13-20	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	132001	118.48	118.68	0.2	
	132002	118.68	118.78	0.1	3R Seam Roof
	13-20 Comp-Float				Sample coming from ALS
	13-20 Comp-Sink				Sample coming from ALS
	13-20 Comp-Fines				Sample coming from ALS

******'13-20 Comp-float', '13-20 Comp-sink', and '13-20 Comp-Fines' are samples that will be coming from ALS Coal, once the samples have been created. Please await the arrival of these samples, and report all 5**

Drillhole Q13-21	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	132101	80.39	80.59	0.2	3R Seam Roof
	132102	80.59	80.69	0.1	3R Seam Roof
	132103	83.95	84.05	0.1	3 Seam Floor

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-21			E-Log Corrected					
4	K813674		34.71	36.51	1.80	0.00	1.80	4
4-4L	K813675		36.51	36.84	0.33	0.00	0.33	4-4L
4L	K813676		36.84	39.29	2.45	0.00	2.45	4L
3R Coal	K813677		80.69	82.19	1.02	0.48	1.50	3R Coal
3R-3 Parting	K813678		82.19	82.69	0.50	0.00	0.50	3R-3 Parting
3 Seam Coal	K813679		82.69	83.95	1.26	0.00	1.26	3 Seam Coal

Notes:

1) For samples K813674-679, please do raw coal analysis, reporting moisture, ash, sulphur, and retain weights.

Drillhole Q13-22	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	132201	83.3	83.4	0.1	3 Seam Floor

**SAMPLE INVENTORY - 6 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
			E-Log Corrected					
Drillhole Q13-22								
3R-3 Parting	K813680		81.96	82.26	0.30	0.00	0.30	3R-3 Parting
3 Seam Coal	K813681		82.26	83.3	1.04	0.00	1.04	3 Seam Coal

Notes:

1) For samples K813680-681, please do raw coal analysis, reporting moisture, ash, sulphur, and retain weights.

**ROCK SAMPLE INVENTORY FOR ABA ANALYSIS -
4 SOUTH EXPLORATION PROJECT**

E-Log Corrected

Drillhole Q13-23	Sample No.	Sample Interval (From) (To)		Sample Thick. m.	Comments
	Sample #	From (m)	To (m)	Total (m)	
	132301	78.57	78.77	0.2	
	132302	78.77	78.87	0.1	3R Seam Roof
	K813690	81.575	81.71	0.135	3-3L Parting (mining floor)
	13-23 Comp-Float				Sample coming from ALS
	13-23 Comp-Sink				Sample coming from ALS
	13-23 Comp-Fines				Sample coming from ALS

******Please crush K813690 to the coarsest material possible to still get a representative split. Once analysis has been done on K813690, please send all of the remaining split (retain) to ALS (11171 Coppersmith Place, Richmond, BC, V7A 5H1), with instructions to contact me (nwb@quinsam.com) once the sample arrives. I have included an extra bag and tag for this.**

**SAMPLE INVENTORY - 4 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
Drillhole Q13-23			E-Log Corrected					
3R	K813687		78.87	80.55	1.68	0.00	1.68	3R
3R-3 Ptg	K813688		80.55	80.625	0.075	0.00	0.075	3R-3 Ptg
3	K813689		80.625	81.575	0.95	0.00	0.95	3
3-3L Parting	K813690		81.575	81.71	0.135	0.00	0.135	3-3L Parting
3L Coal	K813691		81.71	82.22	0.46	0.05	0.51	3L Coal

****Sample K813690 is having ABA work done on it first, then will be sent to you. In the meantime, please crush K813687, K813688 and K813689 to 1/2", and run raw coal analysis on a split, retain the rest of the material for a float sink. Samples K813690 (when it arrives) and K813691 can be crushed to any size and will only have raw coal analysis done on it. Of the retained material from the first 3 samples, please composite K813687, 688, and 689, and sieve to 1/2"x1mm, and 1mm minus, please report weight % (I expect a high sink %). Float sink the 1/2"x1mm at 1.6 SG. Send the float, the sink, and the 1mm minus to SGS Canada (3260 Production Way, Suite F, Burnaby BC, V5A 4W4) with instructions to contact me (nwb@quinsam.com) upon their arrival. Please label these 3 samples as '13-23 Comp-float', '13-23 Comp-sink', and '13-23 Comp-Fines' please, and label the shipment somehow associated with the drillhole ID Q13-03.

**SAMPLE INVENTORY - 4 SOUTH EXPLORATION PROJECT
HILLSBOROUGH RESOURCES LTD.**

Seam Designation	Sample No.	Lab ID	Sample Interval		Sample Thick. m.	Missing Core m.	Total Thick. m.	Comments
			(From)	(To)				
			E-Log Corrected					
Drillhole Q13-24								
3R Coal	K813692		94.25	95.86	1.61	0.00	1.61	3R
3R-3 Parting	K813693		95.86	96.01	0.15	0.00	0.15	3R-3 Parting
3 Seam Coal	K813694		96.01	96.25	0.24	0.00	0.24	3 Seam Coal
3 Seam Coal	K813695		96.25	97.21	0.96	0.00	0.96	3 Seam Coal

Notes:

For all samples K813692-695, please refer to the newest (sent with this email) 6" core sampling process. After completing Steps 1 and 2, composite K813692, 693 and 694, and proceed with the resulting 2 samples (K813695 and composite)

Appendix 5 – Rock Quality

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-01
 Test : 08122
 Date : 20-Aug-13

: Quinsam Coal
 : Quinsam Coal
 : 08122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm		
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1		
130101	100.91	101.1	0.19	Dark Grey Sandstone	1.38	38.65	3.68	97.9	20	27.6	18.7	335	4.43	62.5	0.4	3.3	1.4	17.4	0.17	0.35	0.17	103	0.19	0.004	7.8	82	0.45	31.1	0.004	<20	0.25	0.008	0.05	<0.1	10	0.11	3.03	17	<0.1	<0.02	1.1		
130102	101.1	101.2	0.1	3R Seam Roof, Sandstone, with strong pyritic base	1.88	29.73	5.14	79.2	14	30.7	22.6	409	4.7	58.1	0.5	0.7	2.5	19.8	0.16	0.26	0.2	113	0.22	0.006	11.4	103.2	0.46	29.7	0.003	<20	0.31	0.008	0.05	<0.1	11.1	0.13	3.58	<5	<0.1	0.02	1.1		
130103	105.04	105.37	0.33	3L Seam Floor, muddy siltstone	4.4	160.54	2.42	95.4	91	68.4	40.3	338	10.02	21.5	2.3	<0.2	0.9	73.7	0.18	0.15	0.09	155	0.82	0.007	5.6	51.6	0.4	19.3	0.023	31	0.39	0.016	0.05	<0.1	19.5	<0.02	9.86	123	0.9	0.06	3.4		
Duplicates																																											
130103					4.4	157.08	2.35	89.4	94	70.4	37.8	349	9.71	21.7	2.3	<0.2	1	74	0.19	0.13	0.08	151	0.79	0.006	5.7	50	0.39	21.1	0.022	37	0.38	0.016	0.05	<0.1	20.1	<0.02	9.7	107	0.7	0.05	3.5		
QC																																											
DS9					13.11	109.54	140.75	338.1	2169	42.2	7.7	598	2.43	26.2	3.2	104.9	7.6	78.9	2.54	4.82	6.15	41	0.74	0.086	14	127.1	0.65	340.2	0.11	<20	0.97	0.086	0.42	3.2	2.6	5.86	0.15	209	5.9	5.56	4.8		
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59		
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20		

CLIENT Quinsam Coal
PROJECT 6 South Exploration
SGS Project # Q13-02
Test
Date 17-Jun-13

: Quinsam Coal
: Quinsam Coal
: Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)	Modified NP with Siderite
Sample ID					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.	Modified/
Method Code					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A	0.5
LOD													
130201	100.5	100.8	0.3	Sandstone	5.36	2.08	47.3	3.47	0.34	3.02	0.11	94.4	20.4
130202	100.8	100.9	0.1	3R Seam Roof: SS, partially coaly, dirty, pyritic	4.59	1.19	27.0	11.25	0.54	10.4	0.31	325.0	5.8
Duplicates													
130201									0.32	3			
130202						1.14		11.14					
QC													
RTS-3A										2.4			
PD-1									4.48				
GS311-1								2.36					
CSC						1.34							
NBM-1													52.4
Certified Values						1.49		2.35	4.27	2.34			49.6
Tolerance +/-						-		0.11	0.3	0.23			4.5
SUM					9.95								
MEAN					4.98	1.45	37.16	5.11	1.71	3.57	0.21	209.69	26.54

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Calc.	Sobek				
#N/A	#N/A				
-74.0	Slight	0.57	0.22	0.2	0.50
-319.2	Slight	0.32	0.02	0.0	0.08
	Slight				
	Slight				
-393.18	-	0.89	0.23	0.23	0.58
-196.59	-	0.45	#REF!	#DIV/0!	#DIV/0!

CLIENT
PROJECT
SGS Project #
Test
Date

Quinsam Coal
6 South Exploration
Q13-03
25-Jun-13

: Quinsam Coal
: Quinsam Coal

: Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples				Comments	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)
Sample ID	Method Code	LOD									
					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.
					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A
Comp 130302/K813629-fines				Roof, 3R, 3R-Ptg, 3 seam (2.5m total), crushed at 1/2", 1mm minus after sieve	7.13	3.91	88.9	2.56	0.09	1.52	0.95
Comp 130302/K813629-float				Roof, 3R, 3R-Ptg, 3 seam (2.5m total), crushed at 1/2", floated at 1.6	7.80	0.99	22.5	1.99	0.02	0.9	1.07
Comp 130302/K813629-sink				Roof, 3R, 3R-Ptg, 3 seam (2.5m total), crushed at 1/2", sank at 1.6	6.17	3.52	80.0	7.18	0.36	6.05	0.77
Duplicates											
Comp 130302/K813629-fines										1.54	
Comp 130302/K813629-float									0.02		
Comp 130302/K813629-sink					6.22			7.13			
QC											
RTS-3A										2.43	
PD-1									4.32		
GS311-1								2.31			
CSC						1.29					
NBM-1											
Certified Values											
Tolerance +/-											
SUM					27.32						
MEAN					6.83	2.24	63.79	3.38	1.34	2.14	0.93

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

AP (t/1000)	Modified NP with Siderite	Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Calc. #N/A	Modified/ 0.5	Calc. #N/A	Sobek #N/A				
47.5	108.8	61.3	Moderate	1.07	2.29	2.3	1.87
28.1	41.3	13.2	Moderate	0.27	1.47	1.5	0.80
189.1	97.2	-91.9	Moderate	0.96	0.51	0.5	0.42
	97.5		Moderate				
	50.6		Slight				
	49.6		Slight				
	4.5						
		-17.39	-	2.30	4.27	4.27	3.09
88.23	64.21	-5.80	-	0.77	#REF!	#DIV/0!	#DIV/0!

CLIENT Quinsam Coal
 PROJECT 6 South Exploration
 SGS Project # Q13-03
 Test
 Date 17-Jun-13

: Quinsam Coal
 : Quinsam Coal
 : Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)	Modified NP with Siderite
Sample ID					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.	Modified/
Method Code					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A	0.5
LOD													
130301	92.13	92.37	0.24	Laminate sandstone (SS)	4.99	1.77	40.2	3.2	0.18	2.7	0.32	84.4	16.2
130302	92.37	92.5	0.13	3R Seam Roof: SS with rooty coal and semi massive pyrite	4.27	0.35	8.0	12.28	0.36	11.3	0.62	353.1	3.9
Duplicates													
130301									0.21	2.66			
130302						0.36		12.35					
QC													
RTS-3A										2.26			
PD-1									4.07				
GS311-1								2.3					
CSC						1.46							
NBM-1													52.4
Certified Values						1.49		2.35	4.27	2.34			49.6
Tolerance +/-						-		0.11	0.3	0.23			4.5
SUM					9.26								
MEAN					4.63	1.09	24.09	5.43	1.57	3.58	0.47	218.75	25.32

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Calc.	Sobek				
#N/A	#N/A				
-68.2	Slight	0.48	0.19	0.2	0.48
-349.2	None	0.10	0.01	0.0	0.02
	Slight				
	Slight				
-417.40	-	0.58	0.20	0.20	0.50
-208.70	-	0.29	#REF!	#DIV/0!	#DIV/0!

CLIENT Quinsam Coal
 PROJECT 4 South Exploration
 SGS Project # Q13-05
 Test
 Date 26-Jun-13

: Quinsam Coal
 : Quinsam Coal
 : Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)	Modified NP with Siderite
Sample ID					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.	Modified/
Method Code					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A	0.5
LOD													
130501	96.68	96.82	0.14	Pyritic Lithic Sandstone	4.45	0.28	6.4	6.56	0.38	5.46	0.72	170.6	10.2
130502	96.82	96.88	0.06	3R Seam Roof (Pyritic coaly SS breccia)	6.18	0.39	8.9	8.14	0.43	6.9	0.81	215.6	17.5
Duplicates													
130501					4.56	0.27			0.39	5.64			9.8
130502						0.38		8.19					
QC													
RTS-3A										2.35			
PD-1									4.21				
GS311-1								2.37					
CSC						1.29							
NBM-1													50.6
Certified Values						1.49		2.35	4.27	2.34			49.6
Tolerance +/-						-		0.11	0.3	0.23			4.5
SUM					15.19								
MEAN					5.06	0.68	7.61	4.62	1.66	3.82	0.77	193.13	23.70

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Calc.	Sobek				
#N/A	#N/A				
-160.4	Slight	0.08	0.06	0.1	0.04
-198.1	Slight	0.11	0.08	0.1	0.04
	Slight				
	Slight				
	Slight				
-358.55	-	0.18	0.14	0.14	0.08
-179.28	-	0.09	#REF!	#DIV/0!	#DIV/0!

CLIENT Quinsam Coal
 PROJECT 4 South Exploration
 SGS Project # Q13-06
 Test
 Date 26-Jun-13

: Quinsam Coal
 : Quinsam Coal

: Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)
Sample ID												
Method Code					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.
LOD					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A
130601	101.06	101.26	0.2	Lithic Pyritic sandstone	6.20	0.99	22.5	7.01	0.46	6.08	0.47	190.0
130602	101.26	101.36	0.1	3R Seam Roof, lithic pyritic sandstone	6.09	0.57	13.0	7.41	0.4	6.35	0.66	198.4
K813665	103.02	103.36	0.34	3 Seam Floor, mudstone/siltstone	6.34	0.75	17.0	9.51	0.31	8.03	1.17	250.9
Duplicates												
K813665								9.31	0.31	8.04		
QC												
RTS-3A										2.36		
PD-1									4.23			
GS311-1								2.39				
CSC						1.29						
NBM-1												
Certified Values						1.49		2.35	4.27	2.34		
Tolerance +/-						-		0.11	0.3	0.23		
SUM					18.63							
MEAN					6.21	1.02	17.50	5.44	1.47	4.78	0.77	213.13

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Modified NP with Siderite	Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Modified/0.5	Calc. #N/A	Sobek #N/A				
27.5	-162.5	Slight	0.27	0.14	0.1	0.12
18.8	-179.6	Slight	0.16	0.09	0.1	0.07
24.9	-226.0	Slight	0.20	0.10	0.1	0.07
50.6		Slight				
49.6		Slight				
4.5						
	-568.18	-	0.63	0.34	0.34	0.25
29.32	-189.39	-	0.21	#REF!	#DIV/0!	#DIV/0!

CLIENT
PROJECT
SGS Project #
Test
Date

Quinsam Coal
6 South Exploration
Q13-08
08-Jul-13

: Quinsam Coal
: Quinsam Coal

: Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Description				PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)	Modified NP with Siderite
Sample ID					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.	Modified/
Method Code					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A	0.5
LOD					6.62	3.99	90.7	5.41	0.29	4.06	1.06	126.9	107.6
13-08 3R/ptg/3-Fines	Composited 3R, Ptg, and 3 seam, crushed to 1/2", sieved to 1mm (fines).				6.95	1.23	28.0	2.58	0.07	1.47	1.04	45.9	43.4
13-08 3R/ptg/3-Float	The 1mm + was floated at 1.6SG, to create a float and sink sample. Total section is 2.13m, the projected mine height here.				5.88	2	45.5	15.1	0.71	13.2	1.19	412.5	52.2
13-08 3R/ptg/3-Sink													
Duplicates													
13-08 3R/ptg/3-Fines					6.60				0.29	3.92			107.1
13-08 3R/ptg/3-Float								2.52					
QC													
RTS-3A										2.25			
PD-1									4.41				
GS311-1								2.25					
CSC						1.29							
NBM-1													52.3
Certified Values						1.49		2.35	4.27	2.34			49.6
Tolerance +/-						-		0.11	0.3	0.23			4.5
SUM					26.05								
MEAN					6.51	2.00	54.70	4.33	1.48	3.92	1.10	195.10	59.53

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Calc.	Sobek				
#N/A	#N/A				
-19.3	Moderate	1.09	0.85	0.8	0.71
-2.5	Slight	0.34	0.94	0.9	0.61
-360.3	Moderate	0.55	0.13	0.1	0.11
	Moderate				
	Slight				
	Slight				
-382.11	-	1.97	1.92	1.92	1.43
-127.37	-	0.66	#REF!	#DIV/0!	#DIV/0!

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-08
 Test : 08122
 Date : 12-Jul-13

: Quinsam Coal
 : Quinsam Coal
 : 08122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1
130801	53.66	53.86	0.2	(Dirty SS)	1.68	154.38	2.88	91	68	65	31.4	375	6.36	119.5	1.2	0.2	0.9	81	0.1	0.24	0.13	134	1.88	0.016	5.2	31.2	0.65	32.4	0.01	43	0.35	0.051	0.04	<0.1	20	<0.02	6.44	50	0.4	0.03	2.6	
130802	53.86	53.96	0.1	3R Seam Roof (Dirty SS)	2.86	138.09	3.11	85.7	92	59.5	26.2	209	7.89	163.8	1.9	0.3	0.8	43.2	0.14	0.22	0.12	105	0.7	0.007	3.2	25.9	0.26	19.2	0.019	43	0.31	0.052	0.04	<0.1	16.1	<0.02	8.64	85	0.7	0.04	2.8	
130803	56.09	56.19	0.1	3 Seam Floor (3-3L Prg) (Coaly Siltstone)	0.74	159.57	2.12	51.8	74	60.5	24.3	169	5.69	4.4	0.7	0.2	0.7	43.9	0.03	0.15	0.08	154	0.65	0.006	4.4	32.4	0.49	27.2	0.017	43	0.33	0.06	0.04	<0.1	20.4	<0.02	4.92	35	0.2	<0.02	2.1	
Duplicates																																										
130803					0.7	161.23	2.04	51	68	61	23.9	163	5.74	4.4	0.7	<0.2	0.7	43.7	0.04	0.11	0.06	155	0.66	0.006	4.4	34.4	0.49	26.4	0.017	40	0.31	0.059	0.04	<0.1	20.1	<0.02	4.96	35	<0.1	<0.02	2	
QC																																										
DS9					11.67	105.62	130.6	304.8	1643	38.9	7.3	546	2.24	25.5	2.6	99.2	6.2	67.7	2.24	5.03	6.14	38	0.67	0.079	11.2	108.2	0.6	310.2	0.099	<20	0.89	0.074	0.38	2.6	2	5	0.16	215	4.9	4.71	4.2	
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59	
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20	

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-09
 Test : 06122
 Date : 12-Jul-13

: Quinsam Coal
 : Quinsam Coal
 : 06122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
130901	72.23	72.33	0.1	Sandstone with mud interbeds, pt of flt zone	3.53	145.8	2.68	100.3	70	74.3	45.6	727	11.7	294.2	1	1.9	0.3	39.8	0.13	7.44	0.09	120	0.47	0.006	0.9	66.4	0.61	27.7	0.005	23	0.35	0.045	0.08	<0.1	17.8	0.34	8.63	42	0.6	<0.02	1.7	
K813648	72.33	72.47	0.14	3R Seam Roof, mud gouge zone, fault zone	0.75	192.4	1.89	101.4	101	73.7	40.9	603	10.58	340.5	1	1.4	0.6	37	0.1	6.14	0.05	134	0.44	0.007	0.8	40	0.47	21.2	0.022	35	0.39	0.053	0.06	<0.1	24.8	0.12	8.99	61	0.8	<0.02	2.7	
K813652	74.33	74.33	0.26	3 Seam Floor (3-3L Pkg), mudstone, gougey	26.54	151.77	2.62	117.7	89	76.4	42.4	542	9.75	385.3	1.9	0.8	0.2	40.7	0.1	9.05	0.05	313	0.38	0.003	0.8	38.1	0.37	26.9	0.01	34	0.35	0.055	0.07	<0.1	16.5	0.38	8.3	106	0.8	0.02	2.2	
130904	74.33	74.43	0.1	part of 3-3L parting, dirty ss	0.86	188.89	2.1	92.1	100	70	43	263	8.4	266.8	0.8	0.9	0.3	52.6	0.08	9.59	0.04	327	0.98	0.002	0.7	42.9	0.54	31.1	0.025	38	0.43	0.056	0.06	<0.1	22.5	0.07	7.55	60	0.7	0.07	2.8	
Duplicates																																										
130901					3.54	147.86	2.64	110	70	76.9	46.9	745	12.02	305	1	1.4	0.4	42.2	0.11	7.04	0.08	124	0.49	0.006	1	70.4	0.63	27.6	0.006	<20	0.38	0.047	0.08	<0.1	17.9	0.36	8.83	52	0.5	<0.02	1.9	
QC																																										
D59					14.17	117.3	142.39	345.2	1761	42.8	8.7	637	2.53	27	2.9	114.2	7.4	75.6	2.47	4.67	6.79	42	0.77	0.085	14.6	124.4	0.67	320.2	0.123	<20	1.01	0.086	0.42	2.7	2.8	5.64	0.17	203	5.1	5.01	5	
D59 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59	
D59 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20	

CLIENT Quinsam Coal
 PROJECT 6 South Exploration
 SGS Project # Q13-10
 Test
 Date 25-Jun-13

: Quinsam Coal
 : Quinsam Coal
 : Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)	Modified NP with Siderite
Sample ID					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.	Modified/
Method Code					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A	0.5
LOD													
131001	72.92	73.12	0.2	SS	5.06	1.39	31.6	6.63	0.31	6.05	0.27	189.1	21.4
131002	73.12	73.22	0.1	3R Seam Roof: SS, trace coal and py noted	4.60	0.83	18.9	5.72	0.24	5.08	0.40	158.8	15.3
131003	75.65	75.75	0.1	3 Seam Floor (3-3L Ptg): Mudstone	4.74	1.87	42.5	7.52	0.22	6.69	0.61	209.1	33.1
Duplicates													
131001										6.01			
131003								7.38	0.23				
QC													
RTS-3A										2.33			
PD-1									4.19				
GS311-1								2.39					
CSC						1.29							
NBM-1													50.6
Certified Values						1.49		2.35	4.27	2.34			49.6
Tolerance +/-						-		0.11	0.3	0.23			4.5
SUM					14.40								
MEAN					4.80	1.37	30.98	4.59	1.39	4.10	0.43	185.63	29.08

Note:
 AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.
 NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.
 NET Modified NP = Modified NP - AP
 NET Sobek NP = Sobek NP - AP
 Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.
 Sulphate Sulphur determined by 25% HCL with Gravimetric Finish
 Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish
 Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Calc.	Sobek				
#N/A	#N/A				
-167.7	Slight	0.38	0.11	0.1	0.17
-143.5	Slight	0.23	0.10	0.1	0.12
-176.0	Slight	0.51	0.16	0.2	0.20
	Slight				
	Slight				
-487.08	-	1.12	0.37	0.37	0.49
-162.36	-	0.37	#REF!	#DIV/0!	#DIV/0!

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-11
 Test : 08122
 Date : 21-Aug-13

: Quinsam Coal
 : Quinsam Coal
 : 08122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	Description	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm		
Method Code		1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD		0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	0.11	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
13-11 Comp-Float	The 3R/ptg/3 seam are 2.86m thick, and have a 1.05m parting. The material was crushed to 1/2", with the 1mm minus sieved out, and floated at 1.6SG. The float and sink are the clean coal and CCR representative samples, and the -1mm fines represents tailings	0.74	35.46	1.95	19.5	31	10.9	8.9	63	1.39	29.8	0.3	0.6	0.2	178.6	0.09	0.09	0.11	97	1.93	0.021	3	10.1	0.1	19.8	0.022	165	0.17	0.022	0.01	<0.1	4.6	<0.02	1.84	100	<0.1	<0.02	2.4		
13-11 Comp-Sink		0.63	178.15	2.6	81.8	88	65.2	46.5	196	4.94	16.9	0.6	0.8	1.2	79	0.15	0.07	0.07	131	1.49	0.01	4.2	39	0.5	41.1	0.017	39	0.48	0.034	0.05	<0.1	25.8	<0.02	3.84	88	0.3	<0.02	2.3		
13-11 Comp-Fines		1.22	125.87	3.12	65.9	77	49.3	35.7	161	3.99	17.1	0.6	0.9	0.7	119.8	0.17	0.09	0.06	205	2.36	0.009	3.2	34.9	0.42	42.8	0.029	83	0.32	0.031	0.04	<0.1	17.9	<0.02	3.59	91	0.2	<0.02	3.1		
QC																																								
D59		13.55	113.71	144.09	354.4	1892	43.5	7.9	661	2.54	28.7	3	165.3	7.1	84.3	2.7	4.12	6.47	42	0.76	0.097	14.5	123.7	0.68	359.5	0.115	<20	1.01	0.09	0.43	3	2.3	5.86	0.19	242	5.8	5.29	4.8		
D59 Reference		12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59		
D59 Tolerance %		25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20		

CLIENT Quinsam Coal
 PROJECT 6 South Exploration
 SGS Project # Q13-11
 Test
 Date 14-Aug-13

: Quinsam Coal
 : Quinsam Coal
 : Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples											
Sample ID	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)
Method Code					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.
LOD					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A
131101	91.47	91.67	0.2	Coaly Siltstone	6.76	3.31	75.2	7.1	0.48	5.71	0.91
131102	91.67	91.77	0.1	3R Seam Roof-Coaly Siltstone	3.50	0.51	11.6	12.8	0.83	9.62	2.35
131103	94.63	94.73	0.1	3 Seam Floor (part of 3-3L Ptg)-Mudstone	4.59	1.6	36.4	5	0.28	4.05	0.67
Duplicates											
131101					6.66						
131103										4.19	
QC											
RTS-3A										2.32	
PD-1									4.3		
GS311-1								2.33			
CSC						1.44					
NBM-1											
Certified Values						1.49		2.35	4.27	2.34	
Tolerance +/-						-		0.11	0.3	0.23	
SUM					21.51						
MEAN					5.38	1.67	41.06	4.95	1.74	4.07	1.31

Note:
 AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.
 NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.
 NET Modified NP = Modified NP - AP
 NET Sobek NP = Sobek NP - AP
 Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.
 Sulphate Sulphur determined by 25% HCL with Gravimetric Finish
 Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish
 Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

AP (t/1000)	Modified NP with Siderite	Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Calc.	Modified/	Calc.	Sobek				
#N/A	0.5	#N/A	#N/A				
178.4	45.3	-133.1	Slight	0.90	0.25	0.3	0.42
300.6	1.8	-298.8	None	0.14	0.01	0.0	0.04
126.6	21.4	-105.2	Slight	0.44	0.17	0.2	0.29
	45.4		Slight				
	52.7		Slight				
	49.6		Slight				
	4.5						
		-537.13	-	1.48	0.43	0.43	0.75
201.88	31.53	-179.04	-	0.49	#REF!	#DIV/0!	#DIV/0!

CLIENT Quinsam Coal
 PROJECT 6 South Exploration
 SGS Project # Q13-12
 Test
 Date 25-Jun-13

: Quinsam Coal
 : Quinsam Coal
 : Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)	Modified NP with Siderite	Net Modified NP
Sample ID														
Method Code					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.	Modified/	Calc.
LOD					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A	0.5	#N/A
131201	98.66	98.86	0.2	Massive Sandstone (SS)	6.19	1.99	45.2	4.29	0.39	3.91	<0.02	122.2	31.2	-91.0
131202	98.86	98.96	0.1	3R Seam Roof: Massive SS	4.22	1.49	33.9	8.42	0.57	7.52	0.33	235.0	17.8	-217.2
131203	101.59	101.69	0.1	3 Seam Floor (3-3L Ptg): Siltstone	7.51	4.22	95.9	2.28	0.12	1.96	0.20	61.3	74.5	13.3
Duplicates														
131201									0.39					
131202								8.46						
131203										2.02				
QC														
RTS-3A										2.44				
PD-1									4.33					
GS311-1								2.35						
CSC						1.29								
NBM-1													50.6	
Certified Values						1.49		2.35	4.27	2.34			49.6	
Tolerance +/-						-		0.11	0.3	0.23			4.5	
SUM					17.92									-294.94
MEAN					5.97	2.10	58.33	4.04	1.48	2.92	0.27	139.48	38.03	-98.31

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Sobek #N/A				
Slight	0.54	0.26	0.3	0.37
Slight	0.41	0.08	0.1	0.14
Moderate	1.15	1.22	1.2	1.57
Slight				
Slight				
-	2.10	1.55	1.55	2.08
-	0.70	#REF!	#DIV/0!	#DIV/0!

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-13
 Test : 08122
 Date : 12-Jul-13

: Quinsam Coal
 : Quinsam Coal
 : 08122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppm	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
131301	103.41	103.71	0.3	Mudstone and Rider Ply Coal	1.8	97.25	2.09	57.8	40	40.8	20.2	231	6.83	120.8	0.9	0.4	0.6	60.8	0.05	0.82	0.07	98	1.03	0.005	2.9	27.5	0.51	24.6	0.013	70	0.28	0.016	0.03	<0.1	18.3	0.05	6.29	73	0.2	0.05	2.1	
131302	103.71	103.81	0.1	3R Seam Roof (Mudstone)	1.4	178.62	3.73	120.7	92	70.2	36.2	433	7.67	59.7	1.1	1.5	1.2	45.8	0.07	0.13	0.1	110	0.54	0.009	4.2	37.2	0.66	30.3	0.005	<20	0.44	0.014	0.05	<0.1	31.1	<0.02	5.78	75	0.8	0.02	1.6	
131303	106.41	106.51	0.1	3 Seam Floor (3-3L Pkg) Mudstone	0.63	150.78	2.35	58.2	82	75.9	44.1	170	6.14	5.6	0.7	0.3	0.8	53.5	0.07	0.13	0.06	147	1.13	0.007	2.8	39.1	0.62	34.8	0.023	33	0.39	0.029	0.04	<0.1	24.9	<0.02	4.97	41	0.2	<0.02	2.4	
Duplicates																																										
131303					0.62	144.76	2.21	50.5	80	72.8	41.1	162	5.92	5.8	0.6	0.8	0.8	50	0.05	0.16	0.05	134	1.07	0.007	2.7	35.7	0.6	32	0.021	28	0.36	0.027	0.04	<0.1	23.6	<0.02	4.74	55	<0.1	0.02	2.3	
QC																																										
DS9					12.23	107.23	130.55	324	1827	38.1	7.3	591	2.48	25.1	2.8	116	6.9	76.1	2.5	4.86	6.93	40	0.72	0.09	12.6	121.6	0.64	338.7	0.106	<20	0.97	0.083	0.41	2.9	2.5	5.72	0.17	217	5.4	5.37	5.1	
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59	
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20	

CLIENT Quinsam Coal
 PROJECT 6 South Exploration
 SGS Project # Q13-14
 Test
 Date 17-Jun-13

: Quinsam Coal
 : Quinsam Coal
 : Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)	Modified NP with Siderite	Net Modified NP	Fizz Test
Sample ID					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.	Modified/	Calc.	Sobek
Method Code					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A	0.5	#N/A	#N/A
LOD															
131401	116.88	117.88	1	Sandstone	7.07	5.3	120.5	2.9	0.23	2.33	0.34	72.8	66.1	-6.7	Slight
131402	117.88	118.18	0.3	3R Seam Roof: Sandstone, pyritic base	6.09	3.43	78.0	4.29	0.28	3.56	0.45	111.3	40.6	-70.7	Slight
131403	123.04	123.34	0.3	3L Seam Floor: Mudstone	4.35	0.98	22.3	11.55	0.34	9.33	1.88	291.6	14.6	-277.0	Slight
Duplicates															
131401					7.04			2.81	0.22				65.7		Slight
131402										3.51					
131403						1		11.47							
QC															
RTS-3A										2.27					
PD-1									4.37						
GS311-1								2.29							
CSC						1.41									
NBM-1													52.4		Slight
Certified Values						1.49		2.35	4.27	2.34			49.6		Slight
Tolerance +/-						-		0.11	0.3	0.23			4.5		
SUM					24.55									-354.33	-
MEAN					6.14	2.27	73.56	4.72	1.43	3.37	0.89	158.54	41.93	-118.11	-

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
1.45	0.91	0.9	1.65
0.94	0.36	0.4	0.70
0.27	0.05	0.1	0.08
2.65	1.32	1.32	2.43
0.88	#REF!	#DIV/0!	#DIV/0!

CLIENT Quinsam Coal
 PROJECT 6 South Exploration
 SGS Project # Q13-15
 Test
 Date 17-Jun-13

: Quinsam Coal
 : Quinsam Coal

: Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples	Depth From (m)	Depth To (m)	Total Width (m)	Rock Type	PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)
Sample ID					Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.
Method Code					0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A
LOD												
131501	102.25	103.25	1	Mudstone, trace pyrite	5.38	3.71	84.3	9.74	0.2	8.24	1.30	257.5
131502	103.25	103.55	0.3	3R Seam Roof: Mudstone, with pyrite	4.62	2.27	51.6	11.48	0.24	9.84	1.40	307.5
Duplicates												
131502								11.03	0.24	9.55		
QC												
RTS-3A										2.25		
PD-1									4.3			
GS311-1								2.34				
CSC						1.4						
NBM-1												
Certified Values						1.49		2.35	4.27	2.34		
Tolerance +/-						-		0.11	0.3	0.23		
SUM					10.00							
MEAN					5.00	2.22	67.95	6.18	1.59	5.41	1.35	282.50

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Modified NP with Siderite	Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Modified/0.5	Calc. #N/A	Sobek #N/A				
41.0	-216.5	Slight	1.01	0.16	0.2	0.33
26.9	-280.6	Slight	0.62	0.09	0.1	0.17
52.4		Slight				
49.6		Slight				
4.5						
	-497.10	-	1.63	0.25	0.25	0.50
34.88	-248.55	-	0.82	#REF!	#DIV/0!	#DIV/0!

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-16
 Test : 08122
 Date : 12-Jul-13

: Quinsam Coal
 : Quinsam Coal
 : 08122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm		
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
131601	107.98	108.08	0.1	3R Seam Roof: Siltstone	5.9	142.39	2.76	94.3	91	62.9	33.9	306	10.41	209.5	2.2	<0.2	0.7	42.4	0.26	1.05	0.15	164	0.52	0.002	2.3	46.7	0.34	19.5	0.036	32	0.38	0.022	0.05	<0.1	20.7	0.04	9.97	100	0.9	0.08	3.9		
131602	110.11	110.21	0.1	3 Seam Floor: Siltstone	1.25	214.32	2.36	118.6	118	83.8	42.8	465	9.61	8	0.9	0.3	0.9	70.6	0.12	0.15	0.1	192	0.84	0.012	2.4	56.7	0.73	33.3	0.015	21	0.57	0.026	0.05	<0.1	31.8	<0.02	7.68	79	0.5	<0.02	3.2		
131603	110.21	110.51	0.3	Siltstone	1.51	212.3	2.36	121.9	115	88.1	44.5	538	10.84	13.6	0.9	<0.2	1	69.7	0.14	0.09	0.08	147	0.98	0.014	2.7	52.7	0.79	28.5	0.012	<20	0.59	0.025	0.05	<0.1	31.9	<0.02	8.76	70	0.4	0.03	2.7		
Duplicates																																											
131603					1.56	213.56	2.31	121.2	112	88.4	43.6	518	10.72	13.4	0.9	0.7	1	70.4	0.15	0.09	0.07	145	0.97	0.013	2.5	52.5	0.78	30.6	0.012	<20	0.6	0.025	0.05	<0.1	31.1	<0.02	8.64	67	0.6	0.03	2.8		
QC																																											
DS9					14.03	112.64	146.82	337	1920	39.8	8.1	606	2.48	27.3	3.1	116.3	7.2	83.3	2.41	4.54	6.55	41	0.76	0.085	15.3	118.1	0.65	329	0.116	<20	1	0.088	0.42	2.8	2.7	5.51	0.17	227	5.4	5.25	5		
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59		
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20		

CLIENT
PROJECT
SGS Project #
Test
Date

Quinsam Coal
7 South Exploration
Q13-18
18-Sep-13

: Quinsam Coal
: Quinsam Coal
: Modified Acid-Base Accounting with Siderite Correction and Sobek Neutralization Potential

Core samples				PASTE pH	CO2 %	Carbonate NP (t/1000)	Total Sulphur (%)	Sulphate Sulphur (%)	Pyritic Sulphur (%)	Organic Sulphur (%)	AP (t/1000)
Sample ID	Description			Sobek	2A11HCl	Calc.	2A Leco	CSA07V	CSA08D	Calc.	Calc.
Method Code				0.2	0.02	#N/A	0.02	0.01	0.01	#N/A	#N/A
LOD											
Q13-18-K813671+4mm CCR Sinks	4 seam coal analysis, floated at 1.5SG			6.77	5.45	123.9	2.27	0.06	1.75	0.46	54.7
Q13-18-K813671-4+1mm CCR Sinks				5.79	4.58	104.1	13.77	0.38	12.4	0.99	387.5
Q13-18-K813671-1+0.15mm Tailings Sinks				6.49	16.88	383.6	9.13	0.19	8	0.94	250.0
Q13-18-K813672 73+4mm CCR Sinks	4L seam coal analysis, floated at 1.5SG			7.46	2.03	46.1	1.02	0.04	0.71	0.27	22.2
Q13-18-K813672 73-4+1mm CCR Sinks				6.73	2.14	48.6	3.89	0.11	3.21	0.57	100.3
Q13-18-K813672 73-1+0.15mm Tailings Sinks				7.26	3.2	72.7	1.85	0.05	1.46	0.34	45.6
Duplicates											
Q13-18-K813671+4mm CCR Sinks				6.88			2.31		1.77		
Q13-18-K813672 73+4mm CCR Sinks								0.04			
Q13-18-K813672 73-1+0.15mm Tailings Sinks					2.98						
QC											
RTS-3A									2.34		
PD-1								4.36			
GS311-1							2.4				
CSC					1.51						
NBM-1											
Certified Values					1.49		2.35	4.27	2.34		
Tolerance +/-					-		0.11	0.3	0.23		
SUM				47.38							
MEAN				6.77	4.47	129.85	3.91	0.98	3.42	0.60	143.39

Note:

AP = Acid potential in tonnes CaCO3 equivalent per 1000 tonnes of material. AP is determined from the measured sulphide sulphur content.

NP = Neutralization potential in tonnes CaCO3 equivalent per 1000 tonnes of material.

NET Modified NP = Modified NP - AP

NET Sobek NP = Sobek NP - AP

Carbonate NP is calculated from CO2 originating from carbonate minerals and is expressed in kg CaCO3/tonne.

Sulphate Sulphur determined by 25% HCL with Gravimetric Finish

Sulphide Sulphur determined by Sobek 1:7 Nitric Acid with Gravimetric Finish

Insoluble S is acid insoluble S (Total S - (Sulphate S + Sulphide S)).

Modified NP with Siderite	Net Modified NP	Fizz Test	Inorganic Carbon (%)	Sobeck NP/AP Ratio	Modified Sobeck NP/AP RATIO	Carbonate NP/AP Ratio
Modified/0.5	Calc. #N/A	Sobek #N/A				
132.1	77.4	Moderate	1.49	2.42	2.4	2.26
134.9	-252.6	Moderate	1.25	0.35	0.3	0.27
373.9	123.9	Moderate	4.60	1.50	1.5	1.53
45.3	23.1	Moderate	0.55	2.04	2.0	2.08
42.8	-57.5	Moderate	0.58	0.43	0.4	0.48
67.8	22.2	Moderate	0.87	1.49	1.5	1.59
132.0		Moderate				
50.1		Slight				
49.6		Slight				
4.5						
	-63.51	-	9.35	8.21	8.21	8.23
103.30	-10.59	-	1.56	#REF!	#DIV/0!	#DIV/0!

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-18
 Test : 06122
 Date : 01-Aug-13

: Quinsam Coal
 : Quinsam Coal
 : 06122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm		
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
131801	113.08	113.38	0.3	Rider Ply Coal and mudstone	1.38	145.17	3.24	89	77	62	31.9	361	7.49	120.7	1.1	1.6	1	60.8	0.09	0.17	0.08	137	1.23	0.006	4	55	0.61	51.8	0.012	34	0.51	0.023	0.08	<0.1	23.5	<0.02	6.1	49	0.6	0.03	2.5		
131802	113.38	113.48	0.1	Rider Mudstone: 3R Seam Roof	1.92	210.72	2.41	90	90	75.1	44	377	6.03	27.6	1.3	1.1	0.7	49.1	0.12	0.09	0.06	141	0.68	0.004	2.5	43.8	0.31	36.4	0.015	25	0.6	0.024	0.06	<0.1	21	<0.02	6.18	56	0.5	0.04	3.1		
131803	115.52	115.62	0.1	Mudstone w/ tr. Coaly laminae: 3 Seam Floor	1.4	211.05	1.87	102.6	94	77.9	39.8	320	6.92	4.9	1.1	0.6	0.7	48.1	0.1	0.08	0.04	142	0.55	0.006	2.1	51.7	0.46	43.2	0.02	37	0.51	0.023	0.06	<0.1	25	<0.02	6.44	82	0.5	0.04	2.8		
Duplicates																																											
131803					1.36	210.28	1.9	107.9	101	76.2	38.5	316	6.9	4.9	1.1	0.5	0.7	49.4	0.11	0.08	0.04	144	0.56	0.006	2.2	54.6	0.45	41.6	0.021	38	0.53	0.023	0.06	<0.1	25.1	<0.02	6.45	88	0.7	<0.02	2.8		
QC																																											
DS9					12.72	110.55	120.25	301.8	1755	41.9	7.5	607	2.42	24.8	2.8	96.5	6.2	69.7	2.34	4.1	6.2	41	0.73	0.079	13	111.1	0.64	316.1	0.115	<20	0.97	0.086	0.4	3	2.4	5.19	0.17	194	5	4.74	4.6		
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59		
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20		

CLIENT : Quinsam Coal
 PROJECT : Quinsam Coal
 SCS Project # : 08122
 Test : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish
 Date : 01-Aug-13

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.01	0.02	0.02	5	0.1	0.02	0.1
131901	39.2	39.3	0.1	Mudstone: 3 Seam Floor	1.03	279.81	2.04	108.4	59	88.3	51	277	6.71	37.6	0.7	0.9	0.5	49.2	0.08	0.05	0.05	150	0.41	0.002	0.8	38.5	0.47	31.4	0.007	21	0.62	0.018	0.06	<0.1	29.9	<0.02	5.87	55	0.5	<0.02	2.4
QC																																									
DS9					12.72	110.55	120.25	301.8	1755	41.9	7.5	607	2.42	24.8	2.8	96.5	6.2	69.7	2.34	4.1	6.2	41	0.73	0.079	13	111.1	0.64	316.1	0.115	<20	0.97	0.086	0.4	3	2.4	5.19	0.17	194	5	4.74	4.6
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20

CLIENT Quinsam Coal
PROJECT 6 South Exploration
SGS Project # Q13-20
Test : 06122
Date 22-Aug-13
Test : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	Description	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm				
Method Code		1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	
LOD		0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	0.1	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	1F	0.1			
13-20 Comp-Float	The 3R and 3 seam are 2.29m thick, and have no internal parting. The material was crushed to 1/2", with the 1mm minus sieved out, and floated at 1.6SG. The float and sink are the clean coal and CCR representative smaples, and the -1mm fines represents tailings	0.53	25.37	2.2	5.4	17	7.7	5.7	61	1.49	41.1	0.2	<0.2	<0.1	64.7	0.05	0.14	0.1	33	1.33	0.002	0.9	5.7	0.03	13.3	0.016	175	0.07	0.021	<0.01	<0.1	2.2	<0.02	2	103	0.4	<0.02	1.1				
13-20 Comp-Sink		3.7	81.38	1.51	20.7	54	19.4	12.4	132	6.19	104.6	0.6	<0.2	0.4	69.4	0.12	0.48	0.08	57	2.37	<0.001	1.1	16.3	0.06	37.1	0.016	54	0.24	0.027	0.04	<0.1	4.7	0.13	7.28	206	0.5	0.06	2				
13-20 Comp-Fines		1.07	31.17	2.45	12.4	22	9.6	7.1	150	2.16	63.9	0.3	<0.2	0.1	105.2	0.06	0.25	0.05	47	3.33	0.001	1.5	6.7	0.07	23	0.015	178	0.09	0.022	0.01	<0.1	3.3	<0.02	2.74	113	0.3	<0.02	1.5				
Duplicates																																										
13-20 Comp-Fines		1.08	34.68	2.61	11.1	19	9.1	6.9	144	2.18	63.4	0.3	<0.2	<0.1	104.3	0.09	0.26	0.04	47	3.41	0.002	1.4	7.1	0.07	21.6	0.015	189	0.09	0.022	0.01	<0.1	3.4	<0.02	2.77	128	0.3	0.04	1.4				
QC																																										
D59		13.55	113.71	144.09	354.4	1892	43.5	7.9	661	2.54	28.7	3	165.3	7.1	84.3	2.7	4.12	6.47	42	0.76	0.097	14.5	123.7	0.68	359.5	0.115	<20	1.01	0.09	0.43	3	2.3	5.86	0.19	242	5.8	5.29	4.8				
D59		13.11	109.54	131.49	321.3	2029	41	7.3	576	2.37	28	2.7	113	6.5	73.6	2.59	5.37	6.52	40	0.71	0.088	11.9	125.4	0.62	320	0.108	<20	0.95	0.083	0.41	2.6	2.5	5.76	0.17	219	5.5	5.67	4.8				
D59 Reference		12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59				
D59 Tolerance %		25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20				

CLIENT
PROJECT
SGS Project #
Test
Date

Quinsam Coal
7 South Exploration
Q15-18
19-Sep-13

: Quinsam Coal
: Quinsam Coal
: 08122
: Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	Description	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm		
Method Code		1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD		0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1		
Q13-20-K813696 98-4mm CCR Sinks	4 seam coal analysis, floated at 1.5SG	1.72	27.55	3.08	55.2	22	24.5	15.9	287	3.36	44.7	0.2	<0.2	1	28.7	0.11	0.06	0.09	53	1.16	0.001	2.3	153.3	0.29	32	0.007	<20	0.33	0.004	0.04	<0.1	8.5	<0.02	0.11	27	0.2	0.03	1.3		
Q13-20-K813696 98-4+1mm CCR Sinks		1.25	41.41	8.02	49.3	71	8.6	6.8	247	3.88	126.1	0.4	<0.2	1.6	112.2	0.13	0.16	0.1	27	5.16	0.002	4.6	43.9	0.13	32.8	0.009	46	0.42	0.006	0.04	<0.1	10.1	0.17	3.94	242	0.5	0.07	2.1		
Q13-20-K813696 98-1+0.15mm Tailings Sinks	4L seam coal analysis, floated at 1.5SG	1.77	46.26	3.92	16.4	37	6.2	5	578	3.49	82.8	0.2	1.8	0.8	150.2	0.09	0.08	0.03	28	11.32	0.002	5	56.9	0.32	27.3	0.007	<20	0.31	0.006	0.03	<0.1	17.5	0.08	2.6	153	0.2	<0.02	1.6		
Q13-20-K813699-4mm CCR Sinks		1.62	22.43	5.47	27.9	46	8.4	8.1	180	3.17	109.8	0.4	1.8	1.4	56.1	0.14	0.11	0.07	37	2.9	0.001	4.5	79.6	0.08	31.9	0.01	26	0.39	0.006	0.03	<0.1	6.3	0.1	3.31	276	0.1	0.03	1.9		
Q13-20-K813699-4+1mm CCR Sinks		2.1	22.58	2.88	55.7	19	18.4	12.3	352	3.84	65.2	0.1	2.2	0.9	41.6	0.1	0.07	0.05	42	2.81	0.002	2.8	143.6	0.34	26.1	0.005	<20	0.28	0.004	0.04	<0.1	8.1	0.02	0.57	102	0.2	<0.02	1		
Q13-20-K813699-1+0.15mm Tailings Sinks		3.37	20.77	2.6	48.1	26	20.3	11.5	327	3.72	54.3	0.1	0.8	0.6	36.2	0.13	0.08	0.04	34	2.69	0.002	2.6	183.5	0.34	20.3	0.004	<20	0.25	0.003	0.03	<0.1	8.8	<0.02	0.47	51	0.2	<0.02	0.9		
Duplicates																																								
Q13-20-K813699-4mm CCR Sinks		1.66	22.95	5.27	26.4	51	9	8.4	177	3.24	108.3	0.4	2	1.4	57.5	0.11	0.1	0.07	38	2.94	<0.001	4.4	81.4	0.08	31.7	0.011	22	0.39	0.006	0.03	<0.1	6.7	0.1	3.39	291	0.1	0.05	2		
QC																																								
D59		14.14	111.84	139.36	333.8	1996	45.2	7.6	626	2.58	30.3	2.8	117.6	6.1	71.9	2.62	4.07	6.27	44	0.8	0.089	13.6	124	0.68	352.3	0.117	<20	1.06	0.091	0.42	4	2.7	5.82	0.18	231	6	5.01	5.1		
D59 Reference		12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59		
D59 Tolerance %		25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20	

CLIENT : Quinsam Coal
 PROJECT : Quinsam Coal
 SCS Project # : 08122
 Test : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish
 Date : 01-Aug-13

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1
132101	80.39	80.59	0.2	SS	4.31	33.33	4.2	49.5	22	33	20	303	5.59	41.6	0.3	1.2	1.5	13	0.09	0.47	0.1	49	0.28	0.014	7.3	165.8	0.3	30.9	0.004	<20	0.35	0.017	0.06	<0.1	9.1	0.09	4.54	<5	<0.1	0.02	1.4
132102	80.59	80.69	0.1	Pyritic coal SS: 3# Seam Roof	5.9	43.3	3.08	63.7	33	33.6	21.2	267	11.27	369	0.5	0.6	0.9	25	0.16	2.23	0.08	73	0.26	0.01	4.5	122.3	0.2	22.1	0.01	<20	0.33	0.015	0.05	<0.1	6.4	0.64	>10.00	88	0.6	0.03	2.6
132103	83.95	84.05	0.1	Coaly Mudstone: 3 Seam Floor	2.2	121.3	2.29	44.1	64	52.2	26	64	4.6	5.1	2.1	<0.2	0.7	37	0.1	0.1	0.06	158	0.16	0.004	7.7	27.1	0.06	30.7	0.032	30	0.45	0.023	0.05	<0.1	10.3	<0.02	5.51	113	0.5	<0.02	2.9
QC																																									
DS9					12.72	110.55	120.25	301.8	1755	41.9	7.5	607	2.42	24.8	2.8	96.5	6.2	69.7	2.34	4.1	6.2	41	0.73	0.079	13	111.1	0.64	316.1	0.115	<20	0.97	0.086	0.4	3	2.4	5.19	0.17	194	5	4.74	4.6
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20

CLIENT : Quinsam Coal
 PROJECT : 6 South Exploration
 SGS Project # : Q13-20
 Test :
 Date : 22-Aug-13

: Quinsam Coal
 : Quinsam Coal
 : 08122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
132001	118.48	118.68	0.2	Pyritic Sandstone with coal spars	0.09	33.69	3.87	73.9	25	28.8	19.1	487	4.61	67.1	0.3	0.9	1	20.2	0.1	0.28	0.05	63	0.28	0.007	4.5	97.3	0.55	35.3	0.002	<20	0.32	0.016	0.07	<0.1	10.4	0.16	3.23	15	<0.1	<0.02	1.3	
132002	118.68	118.78	0.1	3R Seam Roof-pyritic sandstone with coal spars	2.22	35.73	3.71	71.5	28	28.3	16.8	289	7.88	120.1	0.3	<0.2	0.9	15.6	0.11	0.9	0.04	54	0.13	0.006	3.9	96.5	0.38	30.3	0.006	<20	0.32	0.019	0.07	<0.1	5.9	0.29	7.49	15	<0.1	<0.02	1.3	
QC																																										
D59					13.55	113.71	144.09	354.4	1892	43.5	7.9	661	2.54	28.7	3	165.3	7.1	84.3	2.7	4.12	6.47	42	0.76	0.097	14.5	123.7	0.68	359.5	0.115	<20	1.01	0.09	0.43	3	2.3	5.86	0.19	242	5.8	5.29	4.8	
D59					13.11	109.54	131.49	321.3	2029	41	7.3	576	2.37	28	2.7	113	6.5	73.6	2.59	5.37	6.52	40	0.71	0.088	11.9	125.4	0.62	320	0.108	<20	0.95	0.083	0.41	2.6	2.5	5.76	0.17	219	5.5	5.67	4.8	
D59 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59	
D59 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20	

CLIENT : Quinsam Coal
 PROJECT : Quinsam Coal
 SCS Project # : 08122
 Test : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish
 Date : 01-Aug-13

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
132101	80.39	80.59	0.2	SS	4.31	33.33	4.2	49.5	22	33	20	303	5.59	41.6	0.3	1.2	1.5	13	0.09	0.47	0.1	49	0.28	0.014	7.3	165.8	0.3	30.9	0.004	<20	0.35	0.017	0.06	<0.1	9.1	0.09	4.54	<5	<0.1	0.02	1.4	
132102	80.59	80.69	0.1	Pyritic coal SS: 3# Seam Roof	5.9	43.3	3.08	63.7	33	33.6	21.2	267	11.27	369	0.5	0.6	0.9	25	0.16	2.23	0.08	73	0.26	0.01	4.5	122.3	0.2	22.1	0.01	<20	0.33	0.015	0.05	<0.1	6.4	0.64	>10.00	88	0.6	0.03	2.6	
132103	83.95	84.05	0.1	Coaly Mudstone: 3 Seam Floor	2.2	121.3	2.29	44.1	64	52.2	26	64	4.6	5.1	2.1	<0.2	0.7	37	0.1	0.1	0.06	158	0.16	0.004	7.7	27.1	0.06	30.7	0.032	30	0.45	0.023	0.05	<0.1	10.3	<0.02	5.51	113	0.5	<0.02	2.9	
QC																																										
DS9					12.72	110.55	120.25	301.8	1755	41.9	7.5	607	2.42	24.8	2.8	96.5	6.2	69.7	2.34	4.1	6.2	41	0.73	0.079	13	111.1	0.64	316.1	0.115	<20	0.97	0.086	0.4	3	2.4	5.19	0.17	194	5	4.74	4.6	
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59	
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20	

CLIENT : Quinsam Coal
 PROJECT : Quinsam Coal
 SCS Project # : 08122
 Test : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish
 Date : 31-Jul-13

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm		
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1		
132201	83.3	83.4	0.1	3 Seam Floor, Siltstone	4.32	170.83	2.13	107.9	94	74.3	41.9	242	9.82	180.7	1.6	0.3	0.5	28.2	0.26	0.21	0.14	140	0.29	0.002	1	41.9	0.13	18.7	0.025	45	0.33	0.031	0.04	<0.1	19.5	<0.02	>10.00	118	1.1	0.05	3.5		
Duplicates																																											
132201					4.49	169.19	2.08	105.1	107	71.9	40.4	243	9.86	184.1	1.7	<0.2	0.4	28.7	0.24	0.19	0.09	145	0.3	0.002	1	43.8	0.13	18.7	0.026	46	0.33	0.031	0.04	<0.1	19.9	<0.02	>10.00	124	0.7	0.05	3.3		
QC																																											
DS9					12.26	106.74	136.05	325.6	1864	39.4	7.1	612	2.39	28.7	2.8	128.8	6.3	76.5	2.47	4.9	6.55	40	0.72	0.09	12.4	114.1	0.61	332	0.109	<20	0.94	0.084	0.4	2.7	2.6	5.45	0.17	217	5.4	5.21	4.5		
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59		
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20		

CLIENT Quinsam Coal
 PROJECT 4 South Exploration
 SGS Project # Q15-23
 Test : 09122
 Date 21-Aug-13

: Quinsam Coal
 : Quinsam Coal
 : 09122
 : Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	From (m)	To (m)	Width (m)	Rock Type	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm	
Method Code					1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F
LOD					0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	<0.1	0.1	0.02	0.02	5	0.1	0.02	0.1	
132301	78.57	78.77	0.2	Lithic sandstone/conglomerate	2.8	29.96	5.38	55.2	29	27.1	17.3	629	4.83	145.7	0.4	2.2	1.7	47.5	0.09	1.49	0.08	94	2.3	0.008	3.1	138.5	0.42	19.5	0.002	<20	0.37	0.014	0.05	<0.1	11.8	0.16	3.45	84	<0.1	<0.02	1.3	
132302	78.77	78.87	0.1	3R Seam Roof-Lithic SS/conglomerate	7.95	29.06	4.85	67.8	30	28.3	16.6	522	4.57	289.8	0.3	0.6	0.9	45.7	0.12	2.31	0.07	87	1.63	0.004	2.1	178.3	0.44	19.2	0.003	<20	0.43	0.013	0.06	<0.1	10.4	0.17	3.64	97	<0.1	<0.02	1.7	
K813690	81.575	81.71	0.135	3-3L Parting (mining floor)-carbonaceous mudstone and sandstone	2.93	54.55	3.53	48.9	39	17.8	12.4	827	1.49	91.2	0.4	1.4	3.6	298.3	0.19	0.57	0.05	53	3.87	0.033	62	143.7	0.89	35.3	0.005	<20	0.47	0.023	0.03	<0.1	7.8	0.06	1.27	79	2.2	<0.02	1.4	
QC																																										
DS9					13.55	113.71	144.09	354.4	1892	43.5	7.9	661	2.54	28.7	3	165.3	7.1	84.3	2.7	4.12	6.47	42	0.76	0.097	14.5	123.7	0.68	359.5	0.115	<20	1.01	0.09	0.43	3	2.3	5.86	0.19	242	5.8	5.29	4.8	
DS9 Reference					12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59	
DS9 Tolerance %					25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20	

CLIENT
PROJECT
SGS Project #
Test
Date

Quinsam Coal
4 South Exploration
Q15-18
19-Sep-13

: Quinsam Coal
: Quinsam Coal
: 08122
: Low-Level Metals by Aqua Regia Digestion with ICP-MS Finish

Sample ID	Description	Mo ppm	Cu ppm	Pb ppm	Zn ppm	Ag ppb	Ni ppm	Co ppm	Mn ppm	Fe %	As ppm	U ppm	Au ppb	Th ppm	Sr ppm	Cd ppm	Sb ppm	Bi ppm	V ppm	Ca %	P %	La ppm	Cr ppm	Mg %	Ba ppm	Ti %	B ppm	Al %	Na %	K %	W ppm	Sc ppm	Tl ppm	S %	Hg ppb	Se ppm	Te ppm	Ga ppm					
Method Code		1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F	1F		
LOD		0.01	0.01	0.01	0.1	2	0.1	0.1	1	0.01	0.1	0.1	0.2	0.1	0.5	0.01	0.02	0.02	2	0.01	0.001	0.5	0.5	0.01	0.5	0.001	20	0.01	0.001	0.01	0.1	0.1	0.02	0.02	5	0.1	0.02	0.1					
Q13-24-K813692 94-4mm CCR Sinks	3R/3 seam coal analysis, floated at 1.8SG	16.25	16.36	1.49	16.3	33	8.2	5.8	104	31.66	1568.4	0.1	<0.2	0.2	21.7	0.1	0.19	<0.02	12	1.17	0.006	0.9	25.9	<0.01	5.4	0.005	<20	0.09	0.012	<0.01	<0.1	1.1	<0.02	>10.00	711	6.8	0.05	0.6					
Q13-24-K813692 94-4+1mm CCR Sinks		23.22	29.7	1.84	26.7	32	18.8	13.3	313	25.54	1064.2	0.2	1.6	0.3	58.5	0.16	0.11	0.02	36	4.05	0.003	0.9	44	0.04	7.6	0.018	<20	0.13	0.009	0.01	<0.1	2.6	<0.02	>10.00	424	4.4	<0.02	1.2					
Q13-24-K813692 94-1+0.15mm Tailings Sinks	3 seam coal analysis, floated at 1.8SG	19.3	51.66	2.36	24.2	34	19.9	14	633	15.51	665.7	0.3	1.7	0.3	108.2	0.13	0.15	<0.02	32	7.49	0.003	1.4	70.9	0.07	11.5	0.017	<20	0.13	0.011	0.01	0.6	3.6	<0.02	>10.00	286	1.8	<0.02	1.1					
Q13-24-K813695-4mm CCR Sinks		6.73	43.07	1	13.5	14	4.3	1.4	199	14.87	661.3	0.2	<0.2	0.3	43.3	0.23	0.06	0.03	40	2.84	0.001	1.4	76.4	0.01	16.3	0.013	36	0.19	0.021	0.01	<0.1	1.7	<0.02	>10.00	469	5.3	0.03	1.4					
Q13-24-K813695-1+1mm CCR Sinks		4.66	31.8	1.63	9.6	17	5.9	3.1	619	8.15	415.8	0.1	1	0.3	133.6	0.1	0.07	0.03	26	11.99	0.001	2.5	88	0.05	19.1	0.011	38	0.12	0.012	0.01	<0.1	2.1	<0.02	9.16	303	2.7	0.07	1					
Q13-24-K813695-1+0.15mm Tailings Sinks		3.83	44.71	4.23	20.5	28	7.1	3.4	974	4.35	312.2	<0.1	0.6	0.2	284.6	0.07	0.09	0.04	20	19.21	0.002	3.6	85.4	0.11	30.8	0.005	21	0.09	0.007	<0.01	<0.1	3.8	<0.02	4.42	125	1.5	0.08	0.7					
QC																																											
D59		14.14	111.84	139.36	333.8	1996	45.2	7.6	626	2.58	30.3	2.8	117.6	6.1	71.9	2.62	4.07	6.27	44	0.8	0.089	13.6	124	0.68	352.3	0.117	<20	1.06	0.091	0.42	4	2.7	5.82	0.18	231	6	5.01	5.1					
D59 Reference		12.84	108	126	317	1830	40.3	7.6	575	2.33	25.5	2.69	118	6.38	69.6	2.4	4.94	6.32	40	0.72	0.0819	13.3	121	0.6165	330	0.1108	#N/A	0.9577	0.0853	0.395	2.89	2.5	5.3	0.1615	200	5.2	5.02	4.59					
D59 Tolerance %		25	15	17	13	23	15	18	15	11	20	30	65	26	30	20	30	30	15	15	15	30	15	12	15	26	#N/A	15	20	15	26	23	20	15	35	18	17	20					

Appendix 6 – Rock Strength

**Levelton Samples
2013 4S/6S Exploration Program**

DH	ID	From	To	Thickness	Location Notes	Sample Description	Analysis Requested			
							Unconfined Compressive Strength	Brazilian Tensile Strength	Stress Strain Curves	Density
Q13-01	Sample 1	97.43	98.15	0.72	Further up the column above the coal	Sandstone, fine grained, tight, med to dk grey, dense with laminae	Yes	Yes	Yes	Yes
Q13-01	Sample 2	100.12	100.91	0.79	Roof of coal	Fine to medium grained sandstone	Yes	Yes	Yes	Yes
Q13-01	Sample 3 (130103)	105.04	105.37	0.33	Floor of coal	Coaly siltstone, laminated with coal (planes of weakness) throughout	Yes	Yes	Yes	Yes

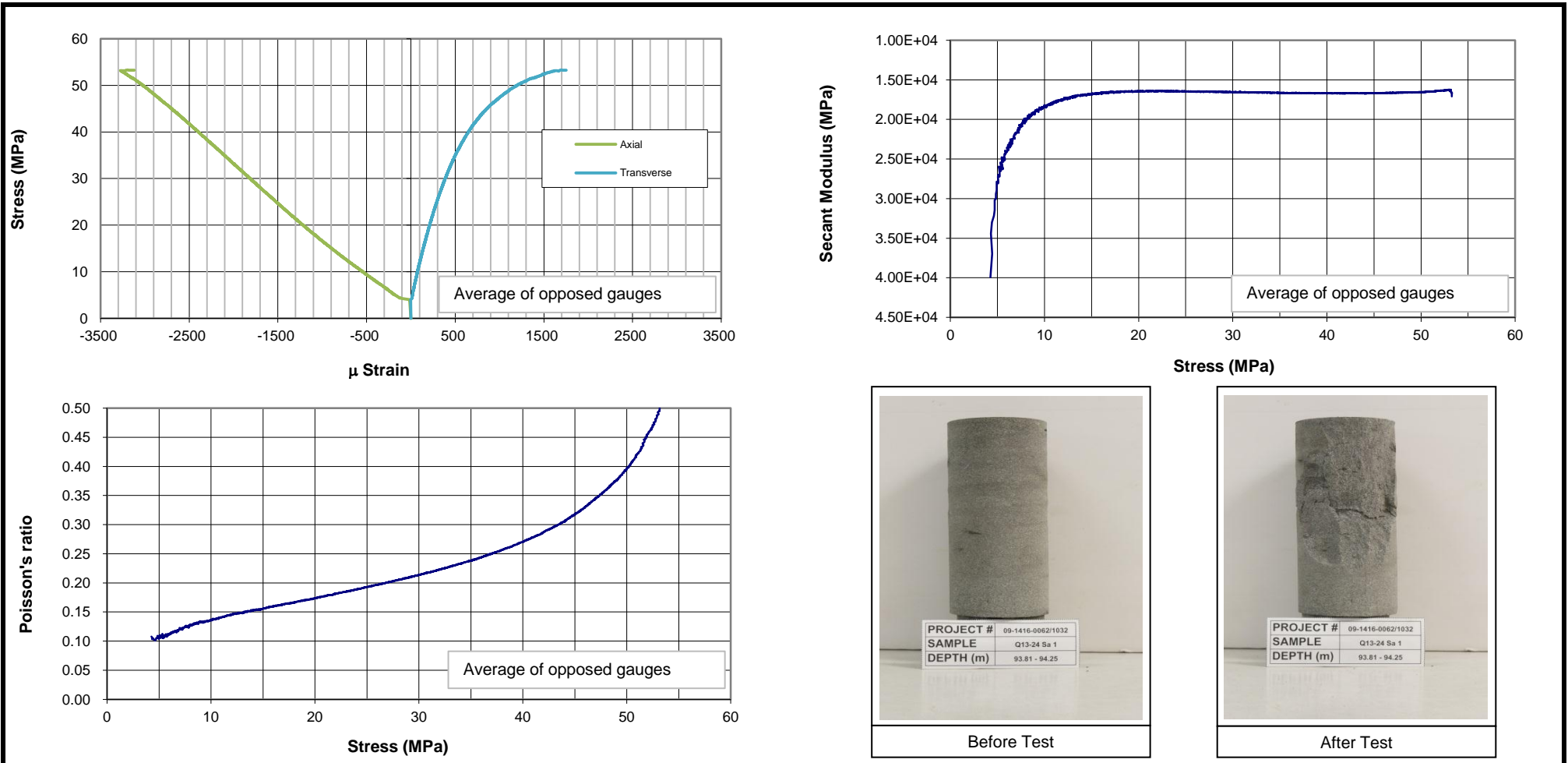
******Once the testing is complete on this sample 3 (130103), please forward the remaining material to SGS Canada, (3260 Production Way, Suite F, Burnaby BC, V5A 4W4), with a sample ID/tag of 130103, and instructions to contact me upon arrival (nwb@quinsam.com)**

Levelton Samples
2013 4S/6S Exploration Program

DH	ID	From	To	Thickness	Location Notes	Sample Description	Analysis Requested				
							Unconfined Compressive Strength	Brazilian Tensile Strength	Stress Strain Curves	Density	Specific Energy to Cut
Q13-16	Sample 1	111.04	111.18	0.14	~1m below the floor of the coal, or the proposed workings	Dark brown mudstone, with trace amounts of silty laminae	Yes	Yes	Yes	Yes	Yes
Q13-16	Sample 2	107.79	107.92	0.13	~0.2m up from the roof of the coal, or the proposed mine workings	Silty Mudstone, with common hairline pinch and swell coal or carbonaceous laminations <3mm thick, dark greyish brown	Yes	Yes	Yes	Yes	Yes
Q13-16	Sample 3	103.96	104.12	0.16	~4m above the roof of the coal, or the proposed mine workings	Sandstone, fine grained, dirty, light to medium grey, with trace interstitial silts. Massive.	Yes	Yes	Yes	Yes	Yes

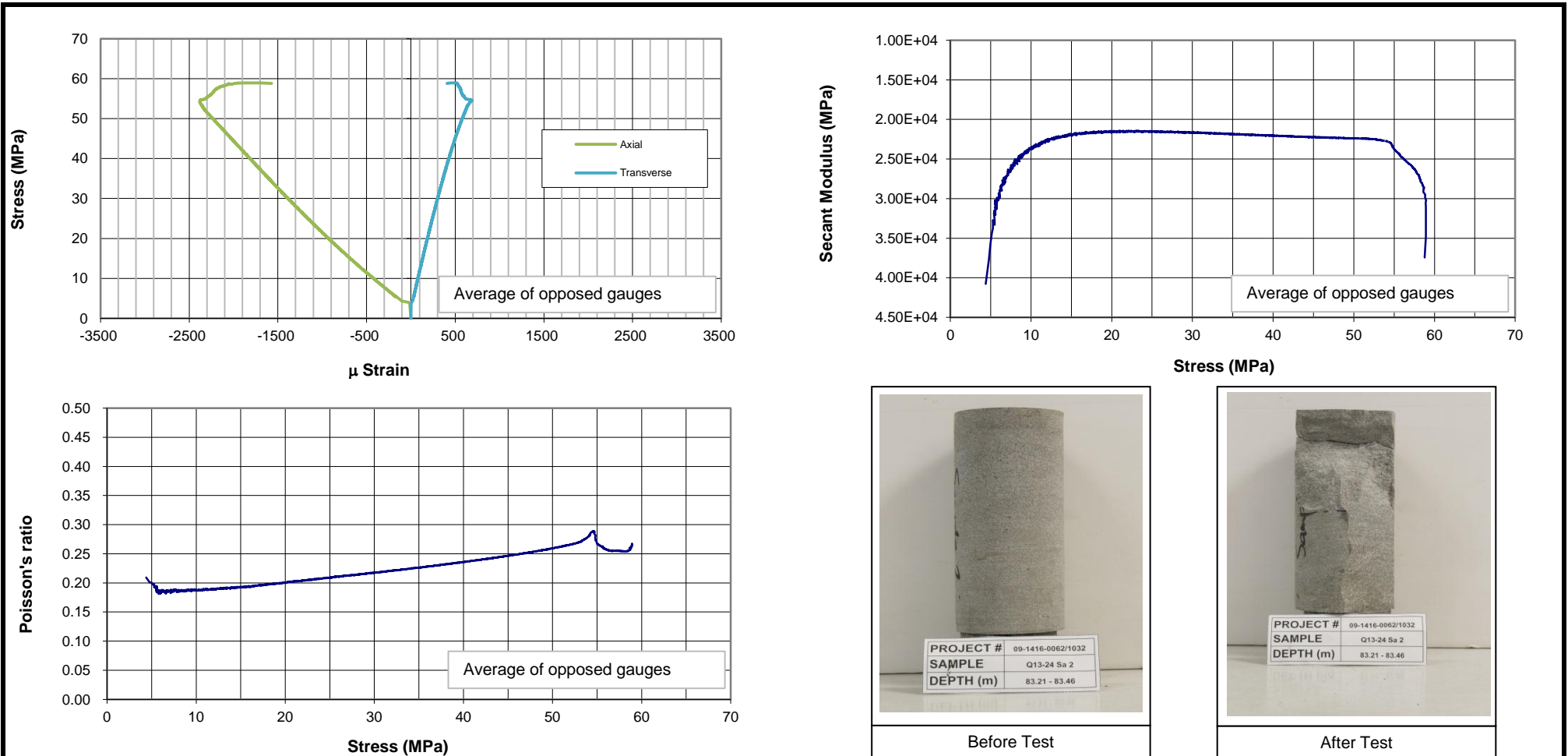
Levelton Samples
2013 4S Exploration Program

DH	ID	From	To	Thickness	Location Notes	Sample Description	Analysis Requested			
							Unconfined Compressive Strength	Brazilian Tensile Strength	Stress Strain Curves	Density
Q13-24	Sample 1	93.81	94.25	0.44	Immediate roof of coal seam	Solid massive sandstone, with minor pyritic laminae, and 'interstitial' blebs of oxidising pyrite within the sandstone	Yes	Yes	Yes	Yes
Q13-24	Sample 2	83.21	83.46	0.25	~10m above the roof of coal seam	Massive Sandstone	Yes	Yes	Yes	Yes



Test Summary		ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	53.3 MPa	Borehole:	Q13-24	Project No.:	09-1416-0062/1032
Secant Modulus, ϵ_{50}	16.5 GPa	Sample:	01	Project:	2013 4S/6S Exploration Program
Poisson's Ratio, ν_{50}	0.20	Depth:	93.81-94.25	Location:	Not Provided
Height:	141.90 mm	Tested By:	G. Patton	Client:	Quinsam Coal
Diameter:	69.24 mm	Reviewed By:	L. Perrey		
Failure Mode:	Spalling				

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.



Test Summary		ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	59.0 MPa	Borehole:	Q13-24	Project No.:	09-1416-0062/1032
Secant Modulus, ϵ_{50}	21.6 GPa	Sample:	02	Project:	2013 4S/6S Exploration Program
Poisson's Ratio, ν_{50}	0.22	Depth:	83.21-83.46	Location:	Not Provided
Height:	146.41 mm	Tested By:	G. Patton	Client:	Quinsam Coal
Diameter:	69.25 mm	Reviewed By:	L. Perrey		
Failure Mode:	Vertical Fracture				

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.: 09-1416-0062/1032	Borehole: Q13-24
Project: 2013 4S/6S Exploration Program	Sample Number: 01-Jan-00
Location: Not Provided	Depth (m): 93.81-94.25
Client: Quinsam Coal	Lab ID No: 138

Testing Results	Sample Measurements
Max Load (MN) <u>0.0241</u>	Diameter (mm) <u>69.28</u>
Tensile Stress (MPa) <u>6.2</u>	Thickness (mm) <u>35.83</u>
	Area (cm ²) <u>37.70</u>
	Volume (cm ³) <u>135.07</u>
	Mass (g) <u>347.20</u>
	Moisture Content (%) <u>1.08</u>
	Wet Density (Kg/m ³) <u>2570.56</u>
	Dry Density (Kg/m ³) <u>2543.13</u>

Failure Mode	Calibration
Type: <u>Vertical Splitting</u>	Machine ID <u>BUR010025</u>
Load Orientation	Transducer ID <u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees <u>90</u>	Ram Area cm ² <u>N/A</u>
	Data Logger <u>N/A</u>

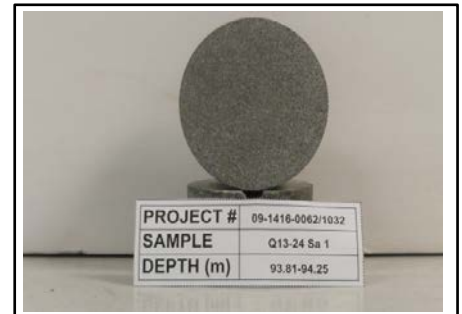
Comments

Lithology: Solid massive sandstone, with minor pyritic laminae, and 'interstitial' blebs of oxidising pyrite within the sandstone

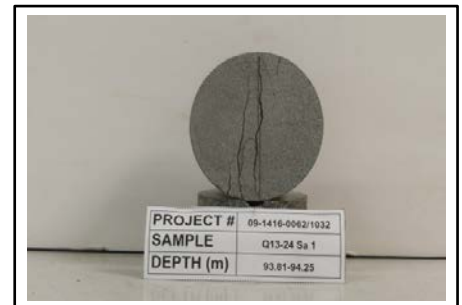
** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



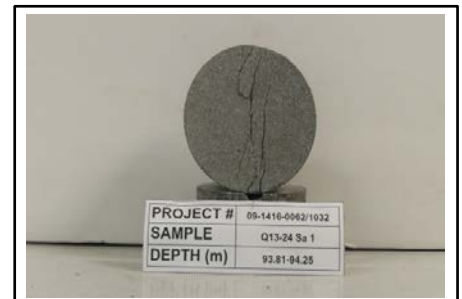
FRONT BEFORE



BACK BEFORE



FRONT AFTER



BACK AFTER

G. Patton	August 6, 2013	L. Perrey	August 7, 2013
TESTED BY	DATE	CHECKED BY	DATE

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.: 09-1416-0062/1032	Borehole: Q13-24
Project: 2013 4S/6S Exploration Program	Sample Number: 02-Jan-00
Location: Not Provided	Depth (m): 83.21-83.46
Client: Quinsam Coal	Lab ID No: 138

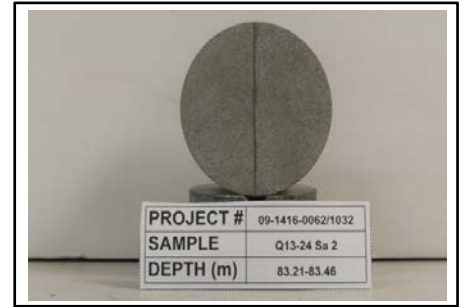
Testing Results		Sample Measurements	
Max Load (MN)	<u>0.0224</u>	Diameter (mm)	<u>69.24</u>
Tensile Stress (MPa)	<u>5.8</u>	Thickness (mm)	<u>35.79</u>
		Area (cm ²)	<u>37.65</u>
		Volume (cm ³)	<u>134.76</u>
		Mass (g)	<u>339.30</u>
		Moisture Content (%)	<u>1.96</u>
		Wet Density (Kg/m ³)	<u>2517.78</u>
		Dry Density (Kg/m ³)	<u>2469.46</u>

Failure Mode		Calibration	
Type:	<u>Vertical Splitting</u>	Machine ID	<u>BUR010025</u>
Load Orientation		Transducer ID	<u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees	<u>90</u>	Ram Area cm ²	<u>N/A</u>
		Data Logger	<u>N/A</u>

Comments

Lithology: Massive Sandstone

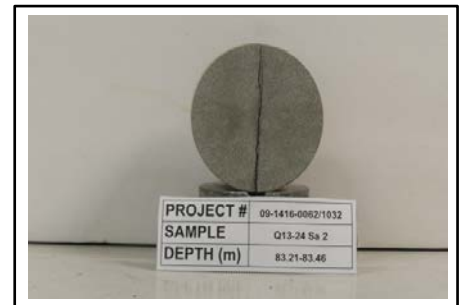
** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



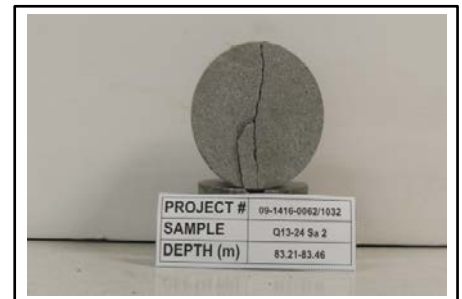
FRONT BEFORE



BACK BEFORE



FRONT AFTER



BACK AFTER

G. Patton	August 6, 2013	L. Perrey	August 7, 2013
TESTED BY	DATE	CHECKED BY	DATE

Tensile Strength By The Brazil Test
Reference
 ISRM 1981 (p120-121)

Project No.:	09-1416-0062/1032	Borehole:	Q13-01
Project:	2013 4S/6S Exploration Program	Sample Number:	1
Location:	Not Provided	Depth (m):	97.43-98.15
Client:	Quinsam Coal	Lab ID No:	138

Testing Results		Sample Measurements	
Max Load (MN)	<u>0.0119</u>	Diameter (mm)	<u>61.12</u>
Tensile Stress (MPa)	<u>3.77</u>	Thickness (mm)	<u>32.92</u>
		Area (cm ²)	<u>29.34</u>
		Volume (cm ³)	<u>96.58</u>
		Mass (g)	<u>246.10</u>
		Moisture Content (%)	<u>0.66</u>
		Wet Density (Kg/m ³)	<u>2548.25</u>
		Dry Density (Kg/m ³)	<u>2531.65</u>

Failure Mode		Calibration	
Type:	<u>Vertical Splitting</u>	Machine ID	<u>BUR010025</u>
Load Orientation		Transducer ID	<u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees	<u>90</u>	Ram Area cm ²	<u>N/A</u>
		Data Logger	<u>N/A</u>

Comments

Lithology: Sandstone, fine grained, tight, med to dk grey, dense with laminae.

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*


FRONT BEFORE

BACK BEFORE

FRONT AFTER

BACK AFTER

G. Patton	July 18, 2013	E. Kostyukov	July 22, 2013
TESTED BY	DATE	CHECKED BY	DATE

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.: 09-1416-0062/1032	Borehole: Q13-01
Project: 2013 4S/6S Exploration Program	Sample Number: 2
Location: Not Provided	Depth (m): 100.12-100.91
Client: Quinsam Coal	Lab ID No: 138

Testing Results	Sample Measurements
Max Load (MN) <u>0.0180</u>	Diameter (mm) <u>61.02</u>
Tensile Stress (MPa) <u>5.82</u>	Thickness (mm) <u>32.33</u>
	Area (cm ²) <u>29.24</u>
	Volume (cm ³) <u>94.53</u>
	Mass (g) <u>231.60</u>
	Moisture Content (%) <u>0.66</u>
	Wet Density (Kg/m ³) <u>2449.89</u>
	Dry Density (Kg/m ³) <u>2433.90</u>

Failure Mode	Calibration
Type: <u>Vertical Splitting</u>	Machine ID <u>BUR010025</u>
Load Orientation	Transducer ID <u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees <u>90</u>	Ram Area cm ² <u>N/A</u>
	Data Logger <u>N/A</u>

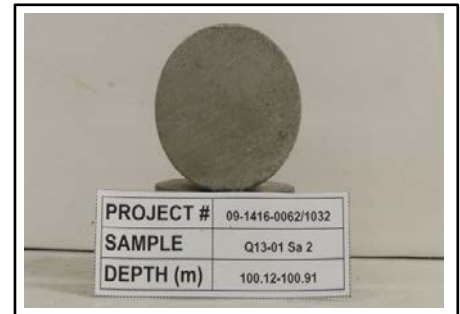
Comments

Lithology: Fine to medium grained sandstone.

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FRONT BEFORE



BACK BEFORE



FRONT AFTER



BACK AFTER

G. Patton	July 18, 2013	E. Kostyukov	July 22, 2013
TESTED BY	DATE	CHECKED BY	DATE

Tensile Strength By The Brazil Test

Reference
 ISRM 1981 (p120-121)

Project No.:	09-1416-0062/1032	Borehole:	Q13-01
Project:	2013 4S/6S Exploration Program	Sample Number:	3
Location:	Not Provided	Depth (m):	105.04-105.37
Client:	Quinsam Coal	Lab ID No:	138

Testing Results		Sample Measurements	
Max Load (MN)	<u>0.0040</u>	Diameter (mm)	<u>61.48</u>
Tensile Stress (MPa)	<u>1.27</u>	Thickness (mm)	<u>32.43</u>
		Area (cm ²)	<u>29.69</u>
		Volume (cm ³)	<u>96.27</u>
		Mass (g)	<u>196.30</u>
		Moisture Content (%)	<u>1.40</u>
		Wet Density (Kg/m ³)	<u>2038.99</u>
		Dry Density (Kg/m ³)	<u>2010.88</u>

Failure Mode		Calibration	
Type:	<u>Vertical Splitting / Disking</u>	Machine ID	<u>BUR010025</u>
Load Orientation		Transducer ID	<u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees	<u>90</u>	Ram Area cm ²	<u>N/A</u>
		Data Logger	<u>N/A</u>

Comments

Lithology: Coaly siltstone, laminated with coal (planes of weakness) throughout.

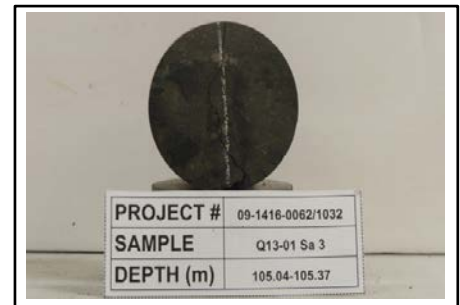
** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*



FRONT BEFORE



BACK BEFORE



FRONT AFTER



BACK AFTER

G. Patton	July 18, 2013	E. Kostyukov	July 22, 2013
TESTED BY	DATE	CHECKED BY	DATE

Tensile Strength By The Brazil Test
Reference
 ISRM 1981 (p120-121)

Project No.:	09-1416-0062/1032	Borehole:	Q13-16
Project:	2013 4S/6S Exploration Program	Sample Number:	1
Location:	Not Provided	Depth (m):	111.04-111.18
Client:	Quinsam Coal	Lab ID No:	138

Testing Results		Sample Measurements	
Max Load (MN)	<u>0.0018</u>	Diameter (mm)	<u>61.02</u>
Tensile Stress (MPa)	<u>0.59</u>	Thickness (mm)	<u>32.32</u>
		Area (cm ²)	<u>29.24</u>
		Volume (cm ³)	<u>94.50</u>
		Mass (g)	<u>225.60</u>
		Moisture Content (%)	<u>1.49</u>
		Wet Density (Kg/m ³)	<u>2387.40</u>
		Dry Density (Kg/m ³)	<u>2352.34</u>

Failure Mode		Calibration	
Type:	<u>Disking along laminations</u>	Machine ID	<u>BUR010025</u>
Load Orientation		Transducer ID	<u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees	<u>90</u>	Ram Area cm ²	<u>N/A</u>
		Data Logger	<u>N/A</u>

Comments

Lithology: Dark brown mudstone, with trace amounts of silty laminae.

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*


FRONT BEFORE

BACK BEFORE

FRONT AFTER

BACK AFTER

G. Patton	July 18, 2013	E. Kostyukov	July 22, 2013
TESTED BY	DATE	CHECKED BY	DATE

Tensile Strength By The Brazil Test

Reference
ISRM 1981 (p120-121)

Project No.:	09-1416-0062/1032	Borehole:	Q13-16
Project:	2013 4S/6S Exploration Program	Sample Number:	2
Location:	Not Provided	Depth (m):	107.79-107.92
Client:	Quinsam Coal	Lab ID No:	138

Testing Results		Sample Measurements	
Max Load (MN)	<u>0.0026</u>	Diameter (mm)	<u>61.38</u>
Tensile Stress (MPa)	<u>0.87</u>	Thickness (mm)	<u>30.99</u>
		Area (cm ²)	<u>29.59</u>
		Volume (cm ³)	<u>91.68</u>
		Mass (g)	<u>201.00</u>
		Moisture Content (%)	<u>1.37</u>
		Wet Density (Kg/m ³)	<u>2192.42</u>
		Dry Density (Kg/m ³)	<u>2162.84</u>



FRONT BEFORE



BACK BEFORE

Failure Mode		Calibration	
Type:	<u>Disking along laminations</u>	Machine ID	<u>BUR010025</u>
Load Orientation		Transducer ID	<u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees	<u>90</u>	Ram Area cm ²	<u>N/A</u>
		Data Logger	<u>N/A</u>



FRONT AFTER



BACK AFTER

Comments

Lithology: Silty Mudstone, with common hairline pinch and swell coal or carbonaceous laminations <3mm thick, dark greyish brown.

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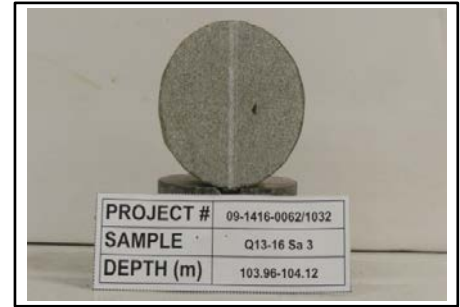
G. Patton	July 18, 2013	E. Kostyukov	July 22, 2013
TESTED BY	DATE	CHECKED BY	DATE

Tensile Strength By The Brazil Test

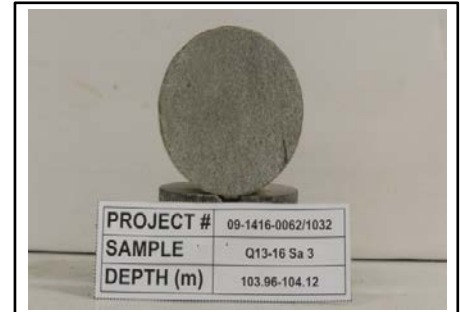
Reference
 ISRM 1981 (p120-121)

Project No.:	09-1416-0062/1032	Borehole:	Q13-16
Project:	2013 4S/6S Exploration Program	Sample Number:	3
Location:	Not Provided	Depth (m):	103.96-104.12
Client:	Quinsam Coal	Lab ID No:	138

Testing Results		Sample Measurements	
Max Load (MN)	<u>0.0090</u>	Diameter (mm)	<u>61.15</u>
Tensile Stress (MPa)	<u>3.63</u>	Thickness (mm)	<u>25.88</u>
		Area (cm ²)	<u>29.37</u>
		Volume (cm ³)	<u>76.02</u>
		Mass (g)	<u>179.80</u>
		Moisture Content (%)	<u>0.67</u>
		Wet Density (Kg/m ³)	<u>2365.30</u>
		Dry Density (Kg/m ³)	<u>2349.46</u>

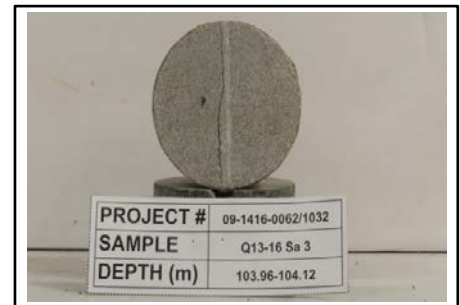


FRONT BEFORE

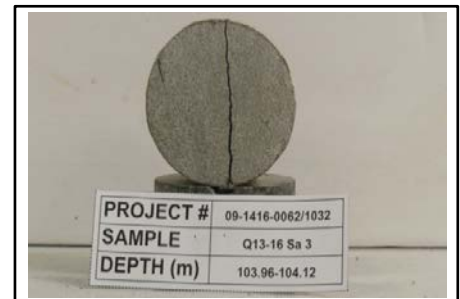


BACK BEFORE

Failure Mode		Calibration	
Type:	<u>Vertical Splitting</u>	Machine ID	<u>BUR010025</u>
Load Orientation		Transducer ID	<u>ELE</u>
Direction of loading axis with respect to bedding or foliation in degrees	<u>0</u>	Ram Area cm ²	<u>N/A</u>
		Data Logger	<u>N/A</u>



FRONT AFTER



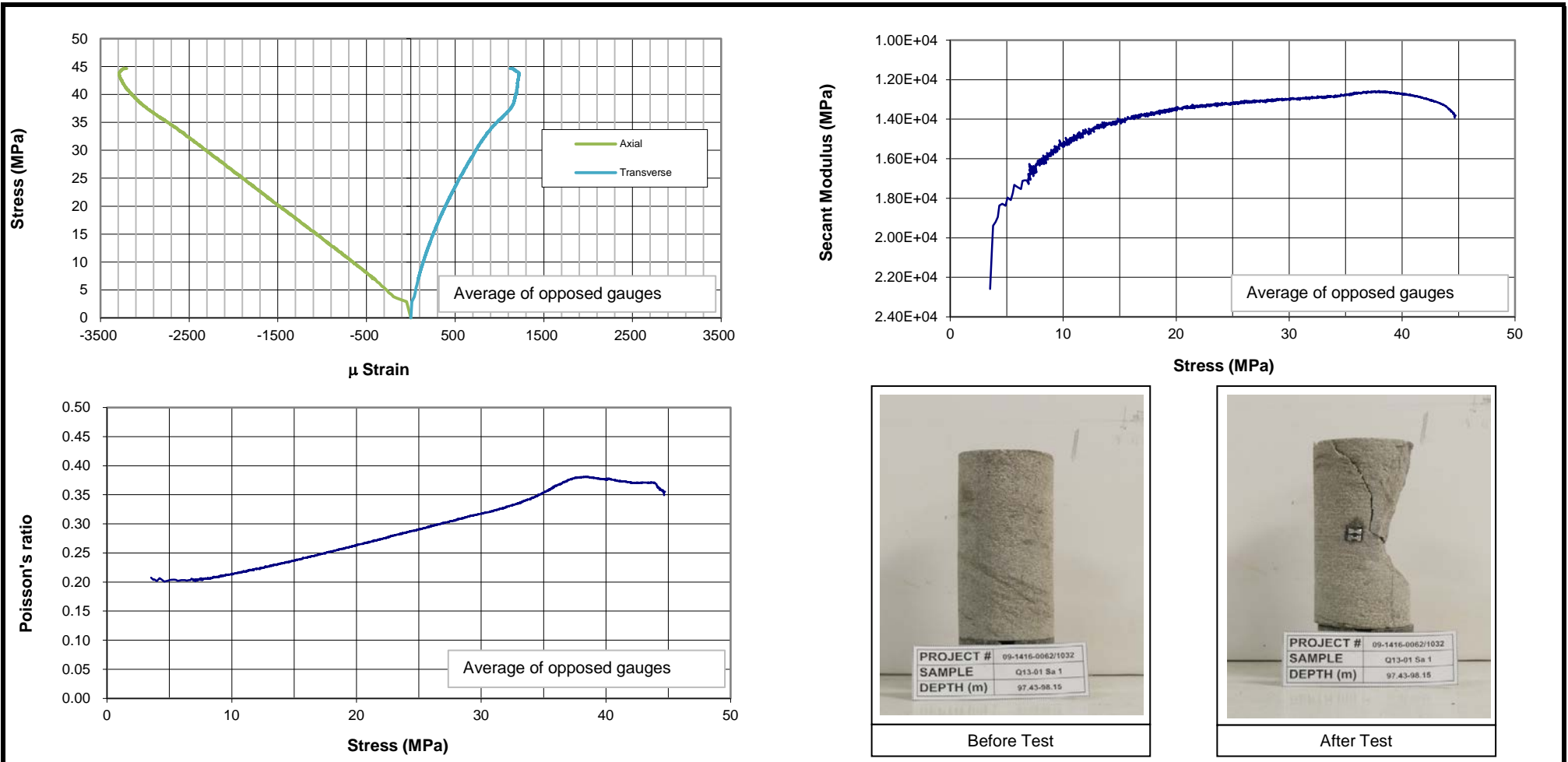
BACK AFTER

Comments

Lithology: Sandstone, fine grained, dirty, light to medium grey, with trace interstitial silts. Massive.

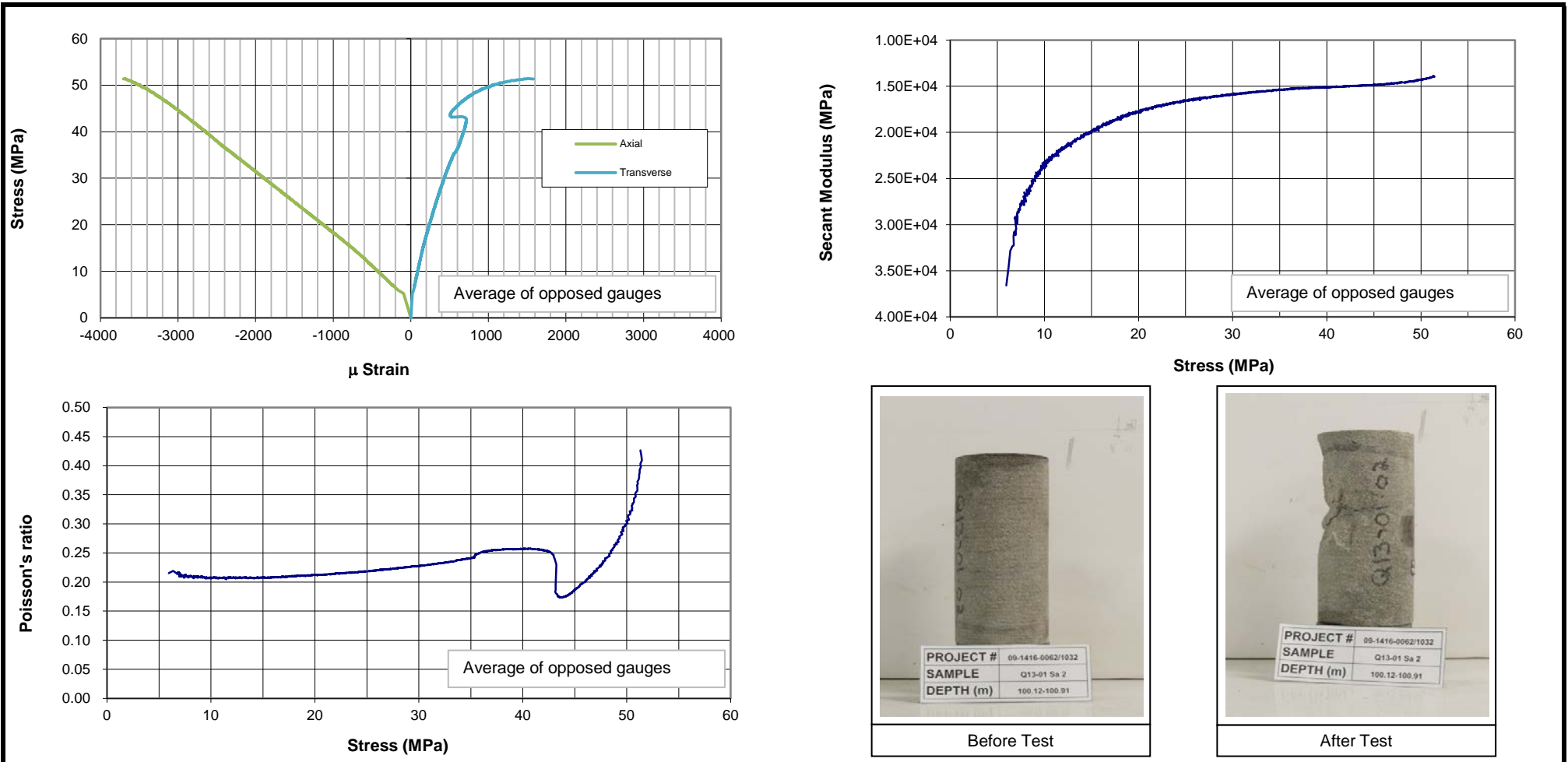
** The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data given here may be provided upon request.*

G. Patton	July 18, 2013	E. Kostyukov	July 22, 2013
TESTED BY	DATE	CHECKED BY	DATE



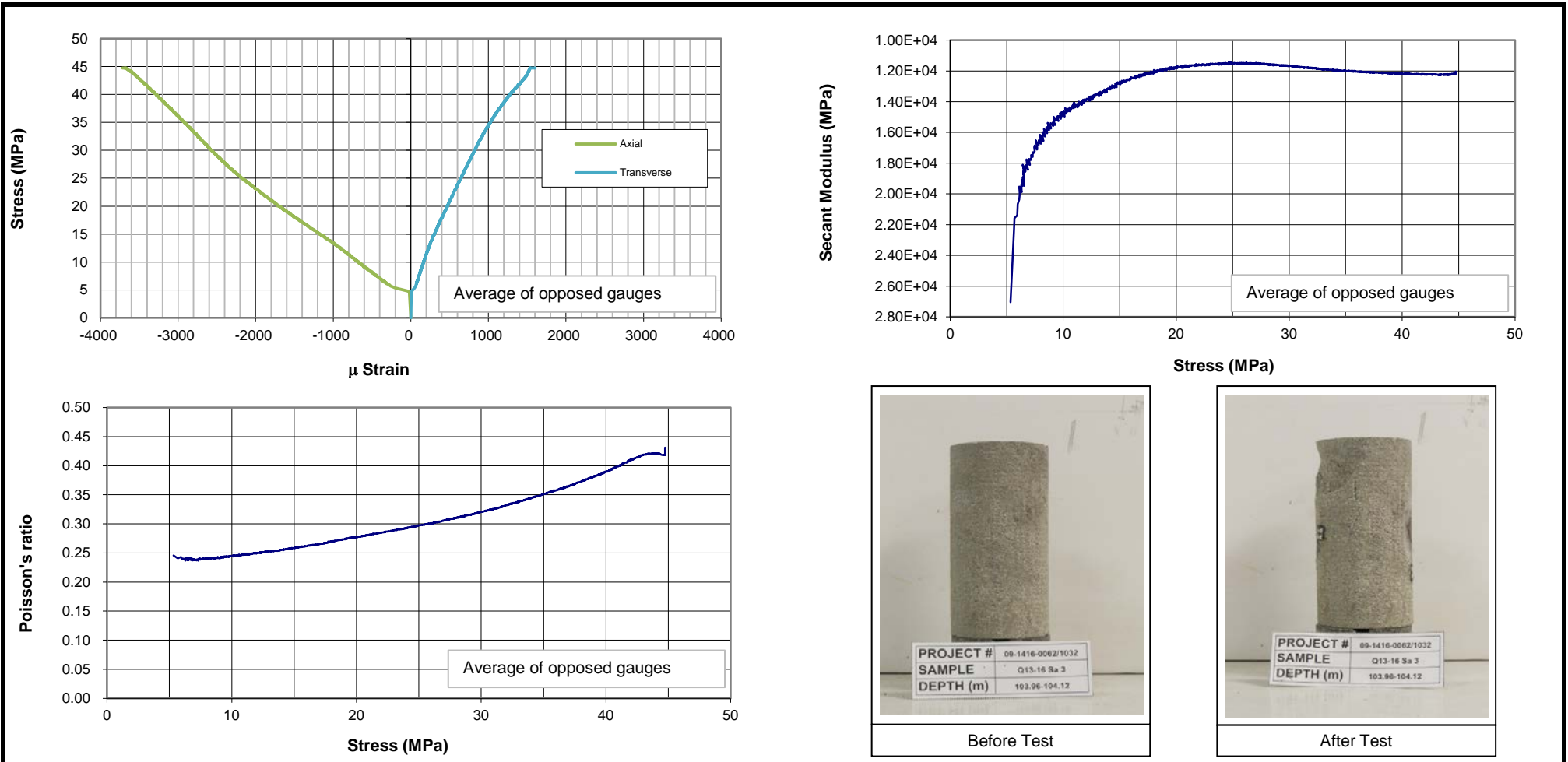
Test Summary		ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	44.7 MPa	Borehole:	Q13-01	Project No.:	09-1416-0062/1032
Secant Modulus, ϵ_{50}	13.4 GPa	Sample:	01	Project:	2013 4S/6S Exploration Program
Poisson's Ratio, ν_{50}	0.28	Depth:	97.43-98.15	Location:	Not Provided
Height:	125.26 mm	Tested By:	G. Patton	Client:	Quinsam Coal
Diameter:	61.17 mm	Reviewed By:	E. Kostyukov		
Failure Mode:	Shear 24°				

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.



Test Summary		ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	51.5 MPa	Borehole:	Q13-01	Project No.:	09-1416-0062/1032
Secant Modulus, ϵ_{50}	16.5 GPa	Sample:	02	Project:	2013 4S/6S Exploration Program
Poisson's Ratio, ν_{50}	0.22	Depth:	100.12-100.91	Location:	Not Provided
Height:	127.97 mm	Tested By:	G. Patton	Client:	Quinsam Coal
Diameter:	61.03 mm	Reviewed By:	E. Kostyukov		
Failure Mode:	Partial Conical				

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.



Test Summary		ASTM D7012-07 Method D Modulus in Uniaxial Compression		Project Details	
Peak Stress σ_{peak}	44.7 MPa	Borehole:	Q13-16	Project No.:	09-1416-0062/1032
Secant Modulus, ϵ_{50}	11.6 GPa	Sample:	03	Project:	2013 4S/6S Exploration Program
Poisson's Ratio, ν_{50}	0.29	Depth:	103.96-104.12	Location:	Not Provided
Height:	124.80 mm	Tested By:	G. Patton	Client:	Quinsam Coal
Diameter:	61.06 mm	Reviewed By:	E. Kostyukov		
Failure Mode:	Partial Conical				

The test data given herein pertain to the sample provided only. This report constitutes a testing service only. Interpretation of the data can be provided upon request.