COAL ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT: Panorama North 2017 Assessment Report

TOTAL COST:

AUTHOR(S): Daniel Campbell
SIGNATURE(S):

NOTICE OF WORK PERMIT NUMBER(S)/DATE(S): CX-1-005

YEAR OF WORK: 2017

PROPERTY NAME: Panorama North

COAL LICENSE(S) AND/OR LEASES ON WHICH PHYSICAL WORK WAS DONE:
417526, 417527, 417299, 417086, 417084, 417292, 418958, 417525, 417296, 418957, 418961, 418953

MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN:

MINING DIVISION: Omineca
NTS / BCGS: 104A15
LATITUDE: 47 ° 51 ' 16 "
LONGITUDE: 128 ° 38 ' 51 " (at centre of work)
UTM Zone: 9 EASTING: 526360 NORTHING: 6300179

OWNER(S): Atrum Coal Panorama Inc.

MAILING ADDRESS: 780 - 580 Hornby St.
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OPERATOR(S) [who paid for the work]: Atrum Coal Panorama Inc.

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

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:

SUMMARY OF TYPES OF WORK IN THIS REPORT		EXTENT OF WORK (in metric units)	ON WHICH TENURES
GEOLOGICAL (scale, area)			
	Ground, mapping	73 km2	all
	Photo interpretation		
GEOPHYSICAL (line-kilometres)			
	Ground		
	(Specify types)		
	Airborne		
	(Specify types)		
	Borehole		
	Gamma, Resistivity,	771.0	417084, 417525
	Resistivity	219.5	417084
	Caliper	1088.0	418958, 417084, 417525
	Deviation	536.5	418958, 417084
	Dip	219.5	417084
	Others (specify) Density	1088.0	418958, 417084, 417525
DRILLING			
	Core	1244.00	all
	Non-Core		
SAMPLING AND ANALYSES			
	Proximate		
	Ultimate		
	Petrographic		
	Vitrinite reflectance		
	Coking		
	Wash tests		
PROSPECTING (scale/area)			
PREPARATORY/PHYSICAL			
Line/grid (km)			
Trench (number, metres)			
Bulk sample(s)			

2017

Panorama North Project

2017 ASSESSMENT REPORT

ATRUM COAL PANORAMA INC.

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1 Introduction

1.1 Location and Physiographic Setting

The Panorama North project (Panorama North) is positioned on the southern extent of the historic Groundhog Coalfield, within the Bowser Basin in northwestern British Columbia (Figure 1.1). Located within the Cassiar Land District, the property is situated approximately 130 km northeast of Stewart, 500 km north-west of Prince George, and 900 km north-west of Vancouver. Panorama is located east of the Nass River, at the north end of the Groundhog Range in the Skeena Mountains. Operations for Panorama are based at the Groundhog Camp adjacent to the Kluatantan Airstrip.

1.2 Access

Primary access to Panorama North for the 2017 exploration program was by helicopter from the Groundhog Camp. Panorama North is located 35 km west of the Kluatantan Camp, an approximately 10-minute helicopter flight, weather-dependent. The Kluatantan Camp is accessed by aircraft at the Kluatantan airstrip and is located 240 km north of Smithers, BC.

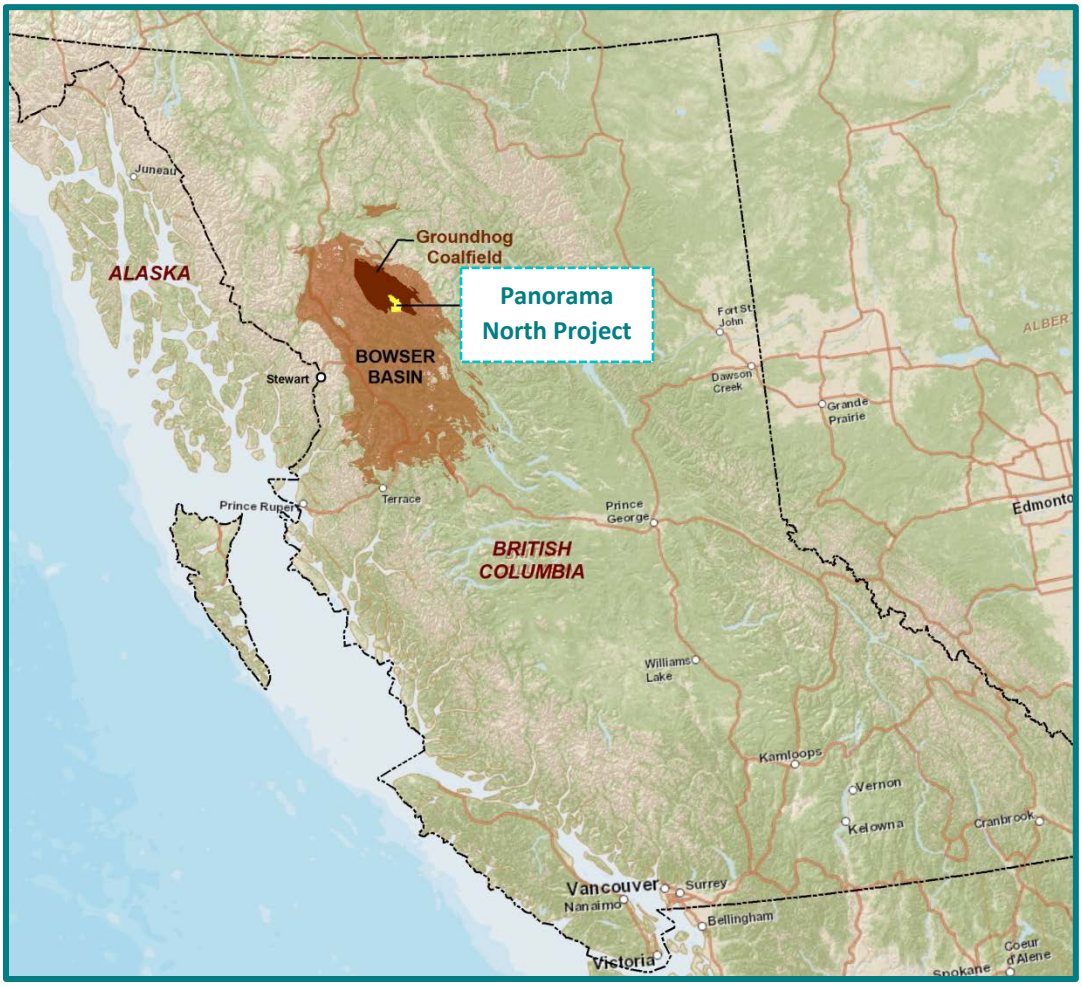

FIGURE 1.1 LOCATION MAP OF THE PANORAMA NORTH PROJECT IN BRITISH COLUMBIA, CANADA

1.3 History

The initial description of the Groundhog Coalfield was conducted by V.H. DuPont in 1900. In 1903, James McEvoy and W. W. Leach staked the first claims in the Groundhog Coalfield and continued to conduct geological reconnaissance from 1910 to 1912. G. S. Malloch, reporting for the Geological Survey of Canada in 1912, described coal occurrences and introduced a stratigraphy for the coalfield, including the Panorama area. Further work was conducted by J. M. Black in 1968 and W. D. Tompson, D. M. Jenkins, and M. W. Roper in 1970 and presented in industry reports.

In 1979, Gulf acquired tenures for the Panorama Coal Project. The company held 37 tenures, totalling an area of 10,357 ha. Gulf conducted its first exploration program in 1980, consisting of helicopter-supported geological mapping, hand trenching, and coal analyses. Gulf's 1981 exploration program was similar to the previous year, with an additional 6 licences obtained, and formed an inferred resource estimate, following National Research Council 1979 criteria.

Panorama Coal Corp., a subsidiary of Anglo-Pacific Corp., acquired coal titles for the Panorama Coal Project in 2004. No field exploration programs were carried out by Anglo-Pacific during their holding of the tenures. In 2010, Anglo-Pacific hired Moose Mountain Technical Services to produce a technical, geological review of the Panorama area. At this time, Anglo-Pacific owned 12 licences and 5,172 ha that made up the Panorama Coal Project, and one licence application of 1,136 ha. Moose Mountain's technical report states:

> "… The Panorama property has potential to host significant coal resources and is also a property of merit, worthy of further exploration." (2010)

In 2012, Atrum Coal Groundhog Inc., a wholly owned subsidiary of Atrum Coal Ltd. (Atrum), acquired its first two tenures of 850 ha for its Panorama Project. In 2014, Anglo-Pacific transferred ownership of its Panorama Property to Atrum Coal. In the same year, Atrum Coal acquired 10 coal licence applications, consisting of 13,875 ha.

Panstone Mines and Minerals Inc. (Panstone) obtained 10 coal licence applications, totalling 6,937 ha, in the Panorama area in 2012. Panstone sold the tenures to Atrum Coal Groundhog Inc. in 2014, which were then transferred to Atrum Coal Panorama Inc. (Atrum), which currently holds 100% interest of the Panorama North tenures.

Atrum Coal Panorama Inc. completed a five drillhole program in 2016, totalling 1234.90 m of HQ3 drillcore with geophysical testing performed on three of the drillholes. Coal quality indicated the coal seams intersected were anthracite in rank. A resource evaluation was not completed following the drill program but each drillhole intersected anthracite coal. The coal seams are speculated to be laterally continuous across the Panorama North property.

1.4 New Work Performed

The 2017 Panorama North exploration program consisted of field mapping, two shallow hand-trenches, and six fully-cored drillholes totaling 1244.00 m, including one shallow re-drill. LiDAR was flown at the completion of the exploration program.

1.5 Acknowledgements

The work undertaken at Panorama North for the 2017 field season was conducted by various contractors, consultants and staff under the management and supervision of Atrum staff. This report was prepared by Mr. Daniel Campbell and Ms. Holly Hetherington of Atrum Coal with input from the following groups:

- Local First Nation's for their support and involvement in the project
- GEEL Enterprises for camp management and construction, pad building, and first aid services
- JOGMEC for their continued support of the exploration program
- Birtley Coal & Mineral Testing
- Silverking Helicopters for helicopter field support
- Century Wireline for downhole geophysical logging
- Tsayta Aviation for fixed wing air support
- Tower Communications for radio and satellite communications
- Driftwood Diamond Drilling for core drilling services
- Ecofor for archaeological investigations
- A & B Mylec for coal quality interpretation and advice

Mr. Campbell holds a B.Sc. in Geology from the University of Manitoba and has extensive exploration experience in the Groundhog Coalfield. He has been developing and advancing Anthracite projects with Atrum Coal for 5 years at the time of writing this report. Mr. Campbell was at the Panorama North Project for the entirety of the 2017 data collection and supervised exploration methods and data interpretation.

1.6 Tenure

Panorama North consists of 12 contiguous wholly owned coal licences covering an area of 7,359 ha.

The Panorama North coal licences are 100% owned by Atrum Coal Panorama Inc., a wholly owned subsidiary of Atrum Coal Ltd. The coal licences are summarised in Table 1.1 and Figure 1.2. All 12 titles were included in the Mineral and Coal Exploration Activities and Reclamation Permit.

TABLE 1.1 PANORAMA NORTH COAL TITLES

Tenure Number	Owner	Business Unit	Tenure Type	Area (ha)	Good to Date
418961	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	71.00	08/09/2018
418958	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	1345.00	08/09/2018
418957	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	1415.00	08/09/2018
418953	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	1346.00	08/09/2018
417084	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	708.00	31/05/2018
417086	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	142.00	31/05/2018
417292	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	279.00	31/05/2018
417296	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	71.00	31/05/2018
417299	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	779.00	31/05/2018
417525	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	425.00	31/05/2018
417526	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	707.00	31/05/2018
417527	Atrum Coal Panorama Inc. (100%)	Panorama North	Coal License	71.00	31/05/2018

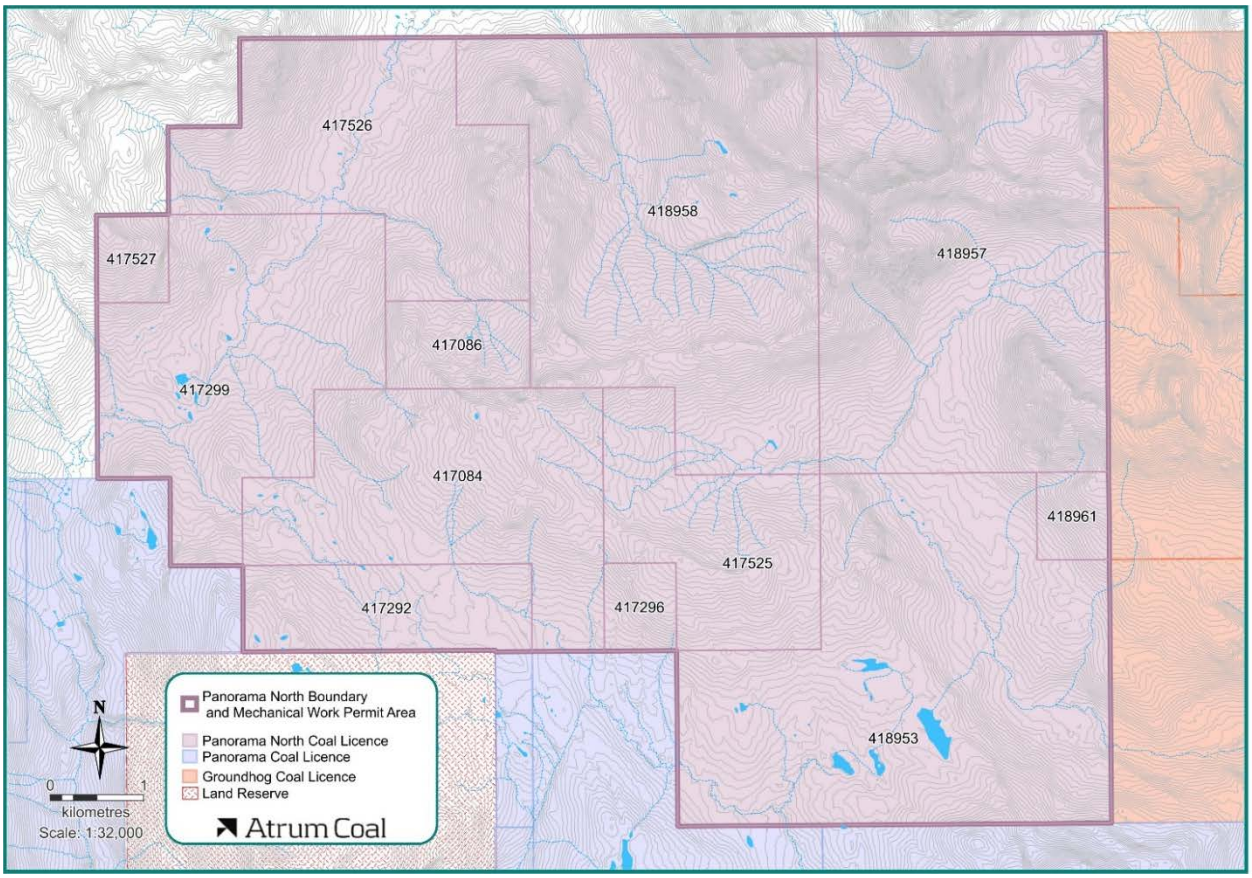

FIGURE 1.2 PANORAMA NORTH COAL TITLES AND EXPLORATION PERMIT AREA

2 Geology

2.1 Regional Geology

Panorama North is situated in the historic Groundhog Coalfield, within the northern portion of the Bowser Basin (refer to Figure 1.1). The Bowser Basin, positioned in the Intermontane Belt, is bounded to the north by the Stikine Arch and to the south by the Skeena Arch. The basin is situated in the Cordilleran Eugeosyncline and characterised by a regressive coarsening upwards sequence of clastic sediments deposited during the formation of the Coastal Mountains. Extending about 400 km and covering an area of approximately 50,000 km^2, the Bowser Basin is the largest contiguous basin in the Canadian Cordillera. The Groundhog Coalfield contains coal deposits that are Late Jurassic to Early Cretaceous in age.

Panorama North is comprised of sedimentary rocks of the Bowser Lake Group. The Bowser Lake Group is an approximately 3,500 m thick, regressive sedimentary sequence dating from Late Jurassic to Early Cretaceous. Using the nomenclature from Cookanoo and Bustin (1989) the strata are comprised of four formations, from oldest to youngest: the Ashman Formation, the Currier Formation, the McEvoy Formation, and the Devil's Claw Formation (Figure 2.1). Below, the Bowser Lake Group unconformably overlies the Triassic to Jurassic Takla-Hazelton assemblage. Above, lithologies of the Late Cretaceous Sustut Group unconformably overlay the Bowser Lake Group.

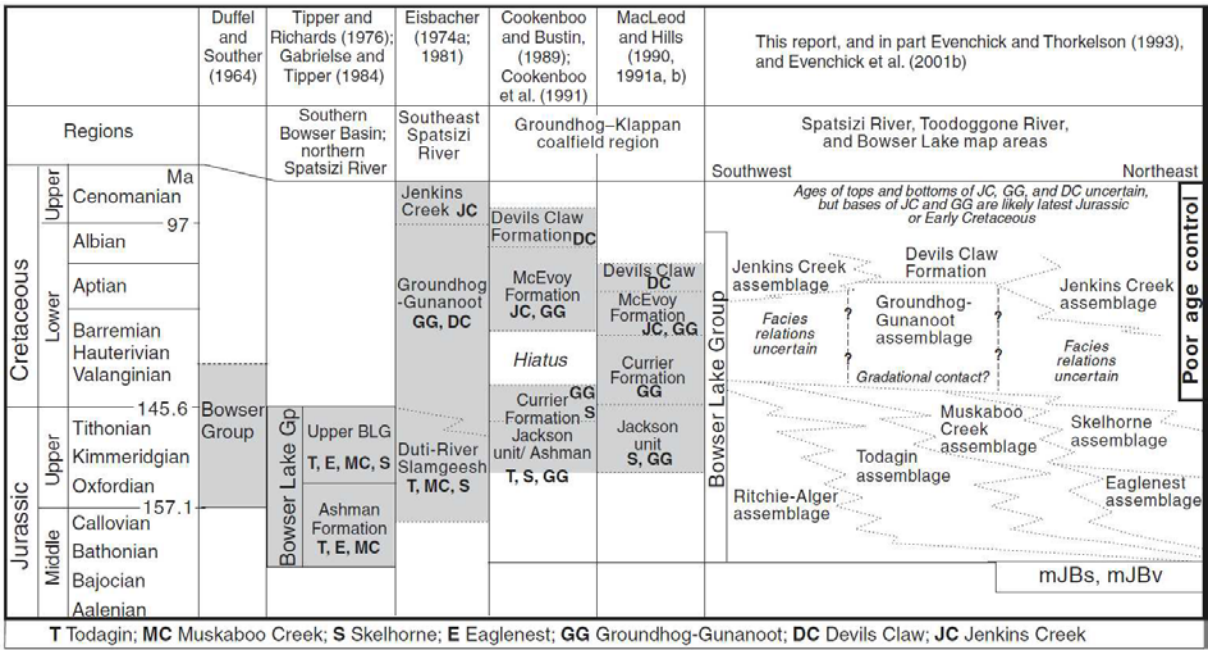

FIGURE 2.1 STRATIGRAPHIC COLUMN OF THE BOWSER LAKE GROUP AND GROUNDHOG-KLAPPAN COALFIELDS

2.1.1 Devil's Claw Formation

The Devil's Claw Formation overlies the McEvoy Formation and consists primarily of thick successions of conglomerates with minor interbeds of sandstone, siltstone and shale. This 300 to 500 m thick formation is interpreted as being deposited in a high-energy environment such as an alluvial fan. Both large-scale cross-bedding of pebble to cobble-conglomerates and homogenous conglomerates can be seen in the Devil's Claw Formation. The conglomerates are clast-supported and composed of well-sorted and well-rounded chert, volcanic quartz, and occasional granodiorite clasts.

2.1.2 McEvoy Formation

The McEvoy Formation overlies the Currier Formation. Strata from the 600 to 1,000 m thick McEvoy Formation are interpreted as being deposited in paralic and brackish waters from a fluvially dominated delta system. Coarsening-upward, silt mudstones are the dominant facies, yet sandstones and conglomerates are present, as well as thin sub-anthracite seams.

2.1.3 Currier Formation

The approximately 1,000 m thick Currier Formation overlies the Ashman Formation and is the primary coal-bearing formation of the Groundhog Coalfield. It is deltaic in origin and records a change from the underlying Ashman Formation to alternating marine and non-marine deposition. The formation consists of alternating beds of shale and sandstone with lesser amounts of siltstone, conglomerate and coal.

Prior to 1991, the Currier Formation was referred to either as the Groundhog Sequence or Groundhog Unit. See Figure 2.2 for the various naming schemes used for the Bowser Lake Group.

2.1.4 Ashman Formation

The approximately 1,800 m thick, fully marine Ashman Formation is the oldest formation in the Bowser Lake Group. The Jurassic age formation is composed of mostly dark bluish grey to black shale that coarsens upwards repetitively to shallow-marine sandy mudstone and sandstone.

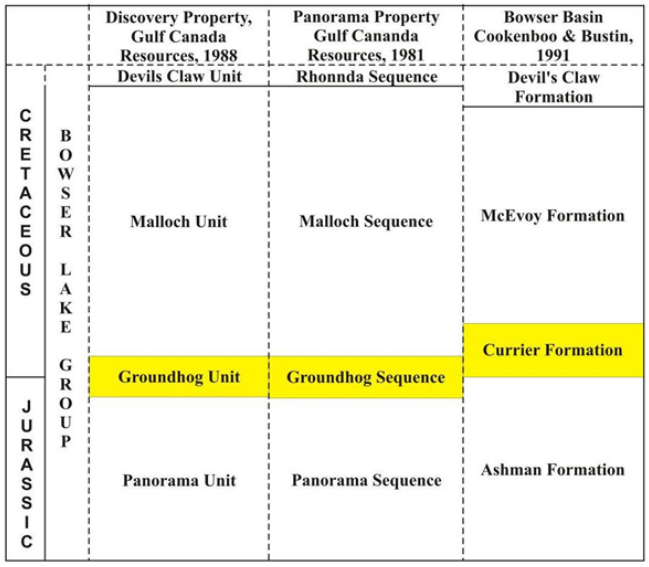

FIGURE 2.2 COMPARISON OF NOMENCLATURE OF THE BOWSER LAKE GROUP (MOOSE MOUNTAIN TECHNICAL SERVICES, 2010)

2.2 Structural Geology

The Bowser Basin sedimentary sequence experienced two major deformational events. The former (F1), being of higher intensity, resulted from northeast-southwest compression during the uplift of the Coast Crystalline Belt. The northwest-southeast trending Beirnes Synclinorium is the regional dominant structure that was a result of this compression, with associated folding and thrust-faulting. The latter, less intense phase of northwest-southeast, compressional deformation (F2), resulted in broad, open folds and flat-lying thrusts. Gulf (1981) noted that later normal faulting was also evident in the area.

Northwest-southeast compressional F2 deformation was coaxial to that of F1, forming shallow, open northeast-southwest trending folds that affect the plunge of F1 folds. F2 folds vary in wavelength from 100 m to 700 m and in amplitude from 100 m to 200 m. Flat laying thrust faults resulting from the F2 deformation event are thought to be related to the hanging walls of drag folds and have displacement visible along bedding surfaces. It is apparent that the structure of the Groundhog Coalfield can range up to very complicated in localised zones due to the two phases of deformation.

2.3 Local Geology

Panorama is characterised by the features of a compressional tectonic regime. Broad, open synclines span distances up to 4 km with steeply, southwest dipping limbs and tighter anticlines (Figure 2.3). Tight isoclinal folding, occurring over distances of 500 to 700 m, and minor associated faulting can be imprinted on these larger structures. Bustin and Moffatt (1983), suggest that the style of deformation in the Bowser Basin is related partially to lithology type. This has been observed at the Groundhog property with rigid sandstone units that appeared to be less deformed than thinly bedded mudstones and siltstone units.

The 2017 Panorama North field mapping further delineated structural trends throughout Panorama North (Figure 2.4). The coal-bearing Currier formation is believed to make up the entirety of Panorama North, consisting of alternating beds of shale and siltstone, with lesser amounts of massive sandstone, coal, and conglomerate. Flat-laying strata and tectonic features extend for 10's of kilometers parallel the dominant northwest-southeast trend. Flat bedding is interrupted by folds trending parallel to this northwest-southeast strike. Minor faulting was documented at surface, striking northeast-southwest, roughly perpendicular to the dominant trend. Multiple surface exposures of coal seams (Figure 2.4), with

thicknesses up to 2 m, were documented, with much of the Panorama North project area within the coal-bearing Currier Formation. Some of the coal seams at surface likely show apparent thicknesses, thus exaggerating the thickness of the surface coal exposure.

FIGURE 2.3 REGIONAL STRUCTURES OF THE GROUNDHOG COALFIELD AS SEEN JUST EAST OF THE PANORAMA NORTH PROPERTY. THE OPEN FOLD IS APPROXIMATELY 2 TO 3 KM ACROSS. THE RED LINE SHOWS RELATIVE BEDDING DIP.

FIGURE 2.4 2017 FIELD MAPPING TEAM IDENTIFYING A COAL SEAM ON SURFACE AT PANORAMA NORTH

With 9 drillholes drilled over two exploration programs, coal seam correlations and structural interpretation confidence has improved, but is still limited by the amount of data. The combination of surface mapping data, field photographs, core photographs, descriptive and geophysical logs, and coal quality results were used to better understand the stratigraphic sequence. Atrum geologists have a better understanding of the overall geology across the explored area of Panorama North. Figure 2.5 shows the most recent geological interpretation. It is estimated that 450 m of Currier Formation has been intersected to date at the Panorama North project. A generalised stratigraphic log is given in Figure 2.6. The interburden sediments that separate coal seams are comprised mainly of interbedded siltstone, sandstone, and carbonaceous mudstone beds. Strata are generally arranged in coarsening-upward units. The siltstones and sandstones display numerous thin carbonaceous laminations, with some bivalve shell fragments and plant fossils. Localised veining occurs within the sedimentary rocks, including coal seams, with veins primarily comprised of quartz, dolomite, and minor siderite. Within the coal seams, thin quartz veins and pyrite lenses, or disseminated pyrite, are locally abundant. The 2017 exploration program allowed geologists to further categorise the horizons and to enhance the understanding of the sequence and propagation of coal seams.

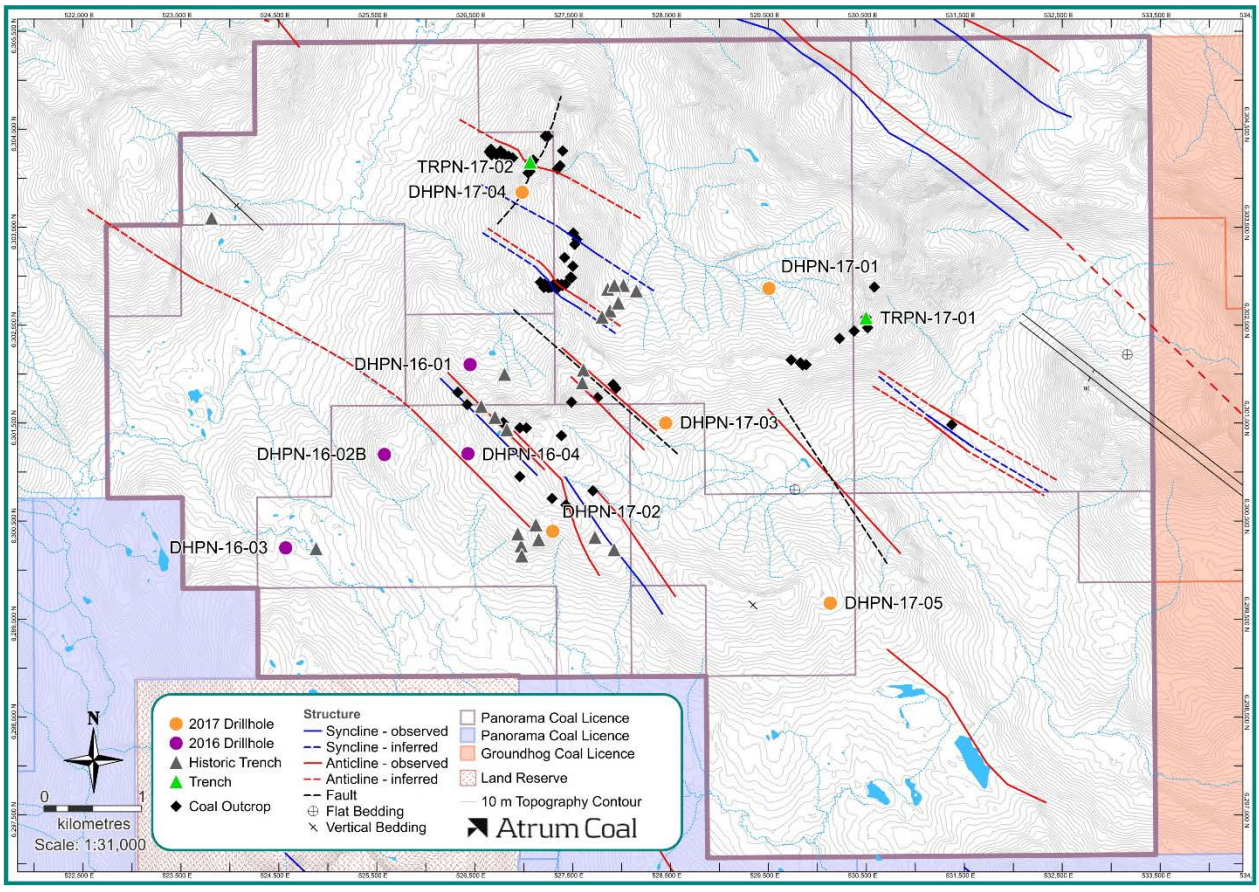

FIGURE 2.5. STRUCTURAL GEOLOGY AND COAL (CURRIER FORMATION) OUTCROP

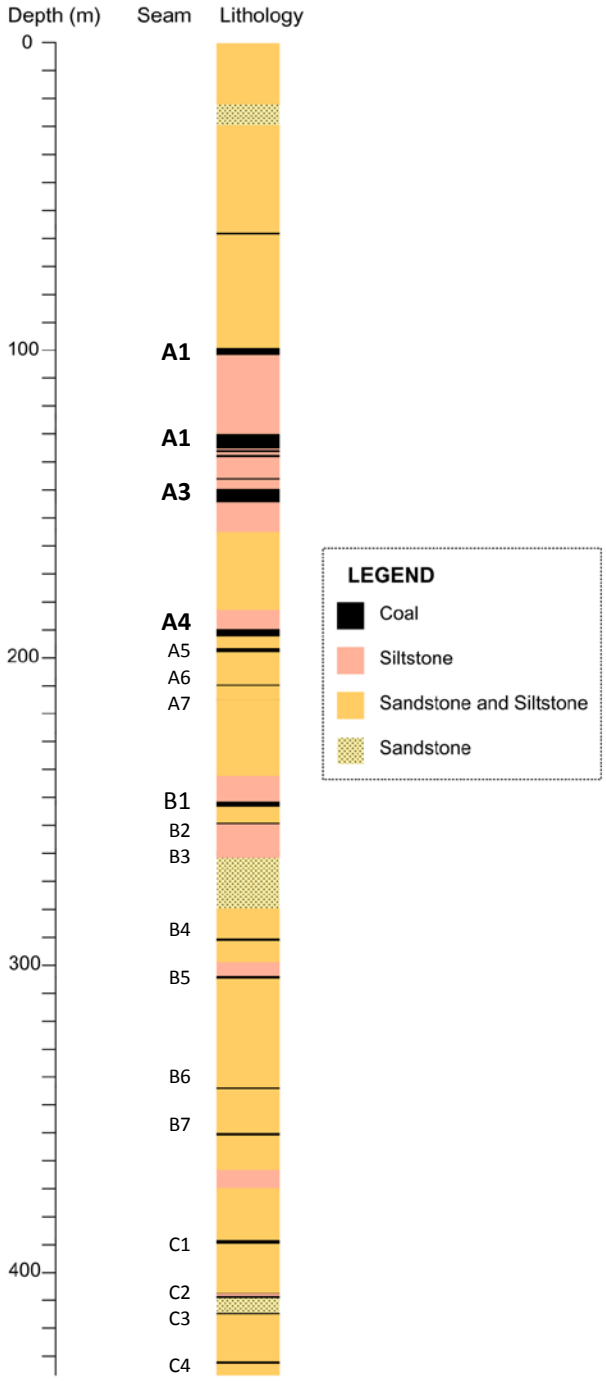

FIGURE 2.6 GENERALISED STRATIGRAPHIC LOG OF THE AREA EXPLORED AT PANORAMA NORTH

3 Exploration

The objective of the 2017 exploration program was to further delineate coal seams of potential economic significance further across the Panorama North property, characterise the coal rank, and summarise the

stratigraphy. The exploration program took place between August 1st and September 6th. A week-long surface mapping program, which included 2 hand trenches, was conducted at the beginning of the exploration program. Upon completion of the mapping program, the drilling program was carried out and concluded with five drillholes with an additional shallow re-drill of one drillhole from the same pad and collar location. The drillhole and trench locations are shown in Figure 3.1.

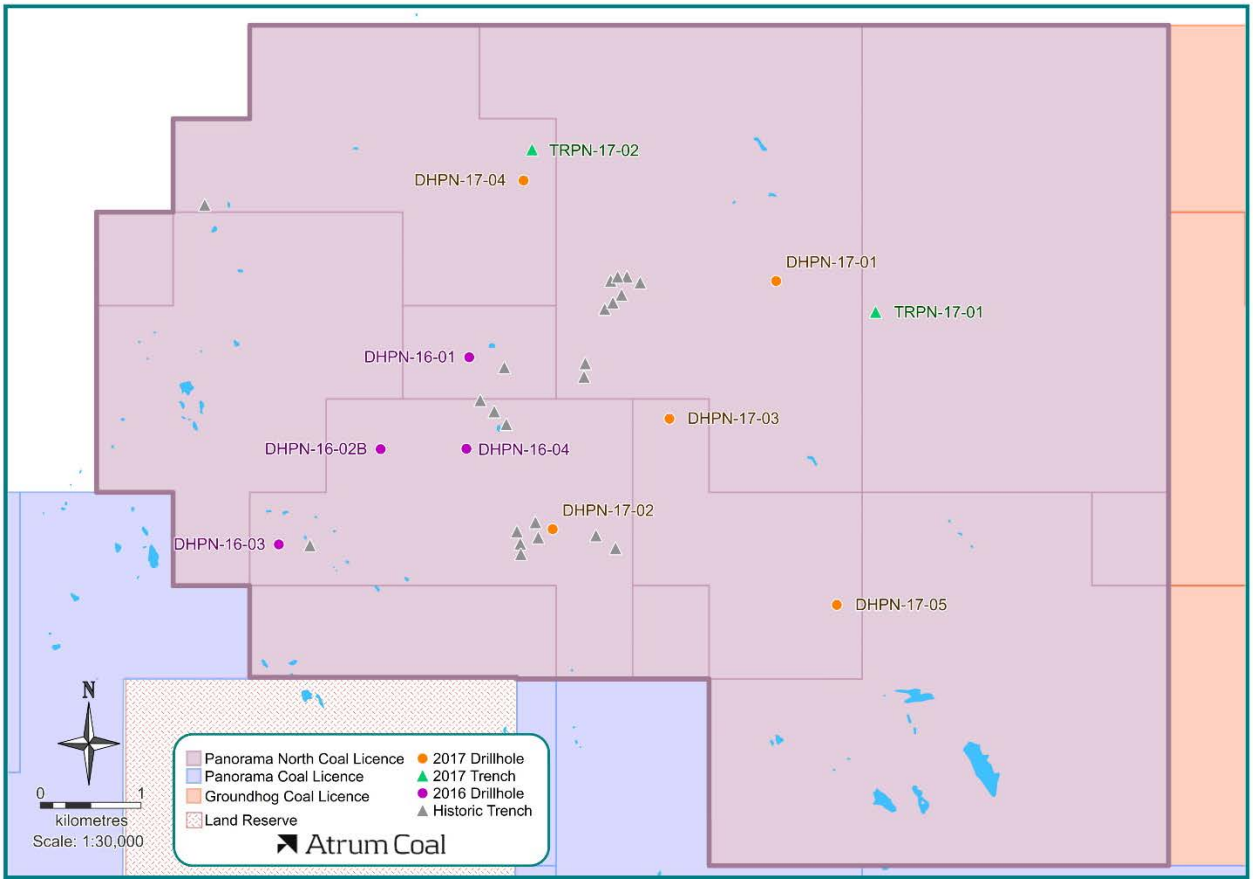

FIGURE 3.1 SUMMARY OF EXPLORATION ACTIVITIES TO DATE AT PANORAMA NORTH.

3.1 Mapping

Mapping took place over the course of one week and proved to be useful for classifying regional and local structures and their trends, finding coal seam exposures at surface, and identifying drillhole targets. Lithologies including coal were logged from two hand trenches (Table 3.1). Both trenches occurred on talus slopes with no vegetation; only the top layer of gravel was moved aside and was returned in order-of-removal to full reclamation. No coal samples were taken from the trenches, as the coal at surface was weathered and likely oxidised.

TABLE 3.1 2017 SURFACE TRENCHING SUMMARY

Trench	Easting	Northing	Elevation	Azimuth	Total Depth
TRPN-17-01	530496	6302583	1762	210	2.40
TRPN-17-02	527066	6304173	1513	205	1.60

3.2 Drilling

2017 drillhole collar summary information is provided in Table 3.2. 5 drillholes, plus one shallow re-drill, totalling 1244.00 m were fully-cored using HQ3 drilling equipment. Triple tubing has been used successfully on prior drilling programs within the Groundhog Coalfield.

The drillcore was lithologically logged, sampled, and photographed by geologists on-site at the Kluatantan Camp located at the confines of the Skeena River and Kluatantan River. In addition, the drillcore was logged to a level of detail to be able to calculate Rock Mass Rating (RMR) for use in mine designs and hydrogeological modelling.

All drillcore is stored on-site at the Kluatantan Camp with coal and geophysical samples stored at Birtley Coal and Mineral Testing in Calgary, AB.

Appendix 1 contains descriptive logs and a collar summary spreadsheet. The individual strip logs for each drillhole are found in Appendix 2.

TABLE 3.2 2017 DRILLING SUMMARY

Hole	Easting	Northing	Elevation	Dip	Azimuth	Start Date	End Date	Total Depth	Core Size
DHPN-17-01	529503.92	6302889.08	1536.91	-90	0	14/08/2017	23/08/2017	317.00	HQ3
DHPN-17-02	527295.76	6300409.17	1645.61	-90	0	16/08/2017	16/08/2017	219.50	HQ3
DHPN-17-02B	527295.76	6300409.17	1645.61	-80	020	25/08/2017	25/08/2017	16.50	HQ3
DHPN-17-03	528450.64	6301514.46	1614.37	-90	0	24/08/2017	31/08/2017	286.50	HQ3
DHPN-17-04	526983.26	6303870.08	1563.64	-70	040	27/08/2017	02/09/2017	156.00	HQ3
DHPN-17-05	530130.96	6299676.51	1580.78	-90	0	01/09/2017	04/09/2017	248.50	HQ3

3.3 Geophysical

Downhole geophysical data was captured using geophysical tools for drillholes DHPN-17-01, DHPN-17-02, DHPN-17-02B, DHPN-17-03, and DHPN-17-05. Geophysical tools were not run on DHPN-17-04. The geophysical data available for each drillhole are summarised in Table 3.3.

Geophysical logs are in Appendix 3.

TABLE 3.3 SUMMARY OF DOWNHOLE GEOPHYSICAL LOGS

Hole	Caliper	Density	Gamma	Dipmeter	Resistivity	Sonic
	Primary:			Add-on:		
DHPN-17-01	✓	✓	✓	✗	✗	✗
DHPN-17-02	✓	✓	✓	✓	✓	✓
DHPN-17-02B	✓	✓	✓	✗	✗	✗
DHPN-17-03	✓	✓	✓	✗	✗	✗
DHPN-17-04	✗	✗	✗	✗	✗	✗
DHPN-17-05	✓	✓	✓	✗	✗	✗

3.4 Coal Quality

The evaluation of coal quality for the 2017 Panorama North exploration program is based on the analytical results of drillcore coal samples.

Lab analyses on drillcore samples were performed by Birtley Coal and Mineral Testing of Calgary, Alberta to an ASTM standard. Most of the samples collected were representative of selected coal units and their associated partings. Coal seam recovery averaged 90% for all coal intersections. Roof and floor samples were collected for most seams, although a limited number of roof and floor samples have been analysed. Preliminary coal quality results indicate that the Panorama North coal is of anthracite rank.

224 core samples were collected from the 2017 drilling program for coal quality analysis 133 coal ply samples and 91 rock roof/floor samples. An additional 6 rock samples were collected for geotechnical testing. All coal and geotechnical samples are being stored at Birtley Coal and Mineral Testing. Preliminary tests have been carried out on the coals from the 2017 Panorama North exploration program, yet more results are expected after the submission of this report.

Coal quality results are given in Appendix 4.

3.4.1 Raw Coal Analysis

Raw coal quality results are presented on an air-dry basis for the 2017 samples and exclude roof and floor samples, partings, and outliers. The results are summarised in Table 3.4. Air dry moisture ranges from 0.90% to 11.76% and averages around 4.93% adb. Ash ranges from 8.24% to 49.85% and averages at 27.50% adb, with a calorific value of 3615 Cal/g to 7696 Cal/g, averaging at 5773 Cal/g. Volatiles ranges from 5.39% to 11.29% with an average of 7.09% adb. Fixed Carbon ranges from 41.90% to 84.71% with an average of 64.13% adb. Sulphur ranges from 0.34 to 5.29% with an average of 1.28% adb. The high sulphur values in some samples are typically due to the nugget effect of pyrite nodules.

TABLE 3.4 AVERAGE PRELIMINARY RAW COAL QUALITY RESULTS EXCLUDING ROOF AND FLOOR SAMPLES, PARTING, AND OUTLIERS. ALL RESULTS ARE GIVEN ON AN AIR-DRY BASIS.

	ADM %	MOIST%	ASH%	VOL%	F.C.%	%S	Cal/g
Minimum	1.18	0.52	8.24	5.39	41.90	0.34	3615
Maximum	9.63	2.32	49.85	11.29	84.71	5.29	7696
Average	4.50	1.28	27.50	7.09	64.13	1.28	5773

3.5 Physical Work

Two hand trenches were made, however this required no do digging as both trenches occurred on talus slopes with no vegetation. Only the top layer of gravel was moved aside and was returned in order-of-removal to full reclamation. No disturbance of ground to build trails, roads, line cuts, or open cuts was carried out during the 2016 Panorama North exploration program.

4 Statement of Costs

Table 4.1 provides a statement for the 2017 Panorama North exploration program costs. Note that not all costs were received at the time that this report was written, including coal quality.

TABLE 4.1 STATEMENT OF COSTS

Exploration Work type	Comment				Totals
Personnel		**Days**	**Rate**	**Subtotal**	
Atrum Administrative and Geologists				$ 129,990.66	
Students and Technicians				$ 32,025.00	
Project Management				$ -	
				$ 162,015.66	**$ 162,015.66**
Office Studies					
Literature search				$ -	
Database compilation				$ -	
Computer modelling				$ -	
Reprocessing of data				$ -	
General research				$ -	
Report preparation				$ -	
Other (specify)	Project Manager			$ 11,610.00	
				$ 11,610.00	**$ 11,610.00**
Airborne Exploration Surveys	**Line Kilometres / Enter total invoiced amount**				
Aeromagnetics				$ -	
Radiometrics				$ -	
Electromagnetics				$ -	
Gravity				$ -	
Digital terrain modelling				$ -	
Other (specify)				$ -	
				$ -	**$ -**
Remote Sensing	**Area in Hectares / Enter total invoiced amount or list personnel**				
Aerial photography				$ -	
LANDSAT				$ -	
LiDAR				$ 29,900.00	
				$ 29,900.00	**$ 29,900.00**
Ground Exploration Surveys	**Area in Hectares/List Personnel**				
Archaeology				$ 10,815.00	
Geological mapping				$ -	
Regional				$ -	
Reconnaissance				$ -	
Prospect				$ -	
Underground				$ -	
Trenches				$ -	
				$ 10,815.00	**$ 10,815.00**
Ground geophysics	**Line Kilometres / Enter total amount invoiced list personnel**				
Radiometrics				$ -	
Magnetics				$ -	

Exploration Work type	Comment				Totals
Gravity				$ -	
Digital terrain modelling				$ -	
Electromagnetics				$ -	
SP/AP/EP				$ -	
IP				$ -	
AMT/CSAMT				$ -	
Resistivity				$ -	
Complex resistivity				$ -	
Seismic reflection				$ -	
Seismic refraction				$ -	
Well logging				$ 89,250.00	
Geophysical interpretation				$ -	
Petrophysics				$ -	
Other (specify)				$ -	
				$ 89,250.00	**$ 89,250.00**
Geochemical Surveying	**Number of Samples**	**No.**	**Rate**	**Subtotal**	
Drill (cuttings, core, etc.)				$ -	
Stream sediment				$ -	
Soil				$ -	
Rock				$ -	
Water				$ -	
Biogeochemistry				$ -	
Whole rock				$ -	
Petrology				$ -	
Other (specify)				$ -	
				$ -	**$ -**
Drilling	**No. of Holes, Size of Core and Metres**	**No.**	**Rate**	**Subtotal**	
Drill pad building				$ 23,834.15	
Diamond	4, HQ, 1244.0 m			$ 177,856.50	
Reverse circulation (RC)				$ -	
Rotary air blast (RAB)				$ -	
				$ 201,690.65	**$ 201,690.65**
Other Operations	**Clarify**	**No.**	**Rate**	**Subtotal**	
Core Logging				$ 1,351.01	
Trenching				$ -	
Bulk sampling				$ -	
Underground development				$ -	
				$ 1,351.01	**$ 1,351.01**
Reclamation	**Clarify**	**No.**	**Rate**	**Subtotal**	
After drilling				$ -	

Exploration Work type	Comment				Totals
Monitoring				$ -	
				$ -	$ -
Transportation		**No.**	**Rate**	**Subtotal**	
Airfare				$ 203,288.70	
Taxi				$ -	
truck rental				$ 6,363.31	
kilometers				$ -	
ATV				$ -	
fuel				$ -	
Helicopter				$ 263,909.24	
Fuel				$ 33,956.75	
Other	Airport security			$ 33,060.00	
				$ 540,578.00	**$ 540,578.00**
Accommodation & Food	**Rates per day**				
Hotel				$ -	
Camp				$ 242,997.05	
Meals				$ 5,027.36	
				$ 248,024.41	**$ 248,024.41**
Miscellaneous					
Telephone				$ 5,506.22	
Expediting				$ 1,182.72	
Health & Safety Supplies				$ 22,249.56	
Insurance				$ 490.00	
Tenure Fees				$ 30,000.00	
Professional Fees, Taxation				$ 1,590.00	
Legal Fees	Community Relations			$ 9,741.76	
First Nations Access and Royalty				$ 35,000.00	
First Nations Consulting				$ 14,529.85	
				$ 120,290.11	**$ 120,290.11**
Equipment Rentals					
Field Gear (Specify)				$ -	
				$ -	$ -
Freight					
Freight				$ 1,620.69	
				$ 1,620.69	**$ 1,620.69**
TOTAL Expenditures					**$ 1,417,145.53**

5 Conclusions

The 2017 exploration season, comprised of drilling and mapping, contributed great value to Atrum's understanding of the geological environment and potential resource at Panorama North. Regional and localised structures are characteristic of a compressional tectonic regime, with dominant structures trending northwest-southeast.

High-grade anthracite coal has been identified based on drilling, coal quality analysis, and geophysical data within the Panorama North. The coal at Panorama North is comparable to Atrum's Groundhog project in terms of coal thickness and quality based on drilling, geophysical, and coal quality data. The coal seams at Panorama North are speculated to be laterally continuous and span large areas within the coal-bearing Currier Formation. Additional drilling, surface mapping, and trenching are required to increase the confidence level of the current resource potential and understanding of coal quality.

6 Works Cited

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Cookenboo, H. O., & Bustin, R. M. (1989). Jura-Cretaceous (Oxfordian to Cenomanian) stratigraphy of the north-central Bowser Basin, northern British Columbia. *Canadian Journal of Earth Sciences, 26*, 1001-1012.

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APPENDIX 1

Collar Summaries and Descriptive Core Logs

Drillhole ID	Easting	Northing	Elevation (m)	Drill Start Date	Drill End Date	Depth (m)	Type	Core Size
DHPN-17-01	529504	6302889	1537	14/08/2017	23/08/2017	317.00	Fully Cored	HQ3
DHPN-17-02	527296	6300409	1646	16/08/2017	16/08/2017	219.50	Fully Cored	HQ3
DHPN-17-02B	527296	6300409	1645	25/08/2017	25/08/2017	16.50	Fully Cored	HQ3
DHPN-17-03	528451	6301514	1614	24/08/2017	31/08/2017	286.50	Fully Cored	HQ3
DHPN-17-04	526983	6303870	1564	27/08/2017	02/09/2017	156.00	Fully Cored	HQ3
DHPN-17-05	530131	6299676	1581	01/09/2017	04/09/2017	248.50	Fully Cored	HQ3

Trench ID	Easting	Northing	Elevation (m)	Date	Azimuth	Length (m)
TRPN-17-01	530496	6302583	1762	07/08/2017	210	2.4
TRPN-17-02	527066	6304173	1513	09/08/2017	205	1.6

Hole: DHPN-17-01

Hole Summary

Hole Type: Fully cored

Location

Site:	ARCH7	Lease:	
Easting:	529504	Accuracy:	GPS (hand held)
Northing:	6302889	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1537	Height Datum:	North American Datum 1983
Survey Company:	CENTURY WIRELINE	Survey Date:	August-23-17

Comments

Broke rods at 40 m.

Geologists

Depth	Geologist
317.00	IM

Drilling

Date Commenced:	August-14-17	Geological Org.:	
Date Completed:	August-23-17	Total Depth:	317
Drilling Company			

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
1	0.32	5.00	DRIFTWOOD DIAMOND DRILLING		SB-500			
2	0.15	6.50						
3	0.34	11.00						
5	0.50	14.00						
6	0.23	17.00						
7	1.40	20.00						
8	2.76	23.00						
9	2.11	26.00						
10	2.69	29.00						
11	2.96	32.00						
12	2.64	35.00						
13	2.54	38.00						
14	2.72	41.00						
15	2.64	44.00						
16	2.58	47.00						
17	2.75	50.00						
18	2.82	53.00						
19	3.00	56.00						
20	2.91	59.00						
21	2.82	62.00						
22	3.00	65.00						
23	2.39	68.00						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
24	3.00	71.00						
25	2.96	74.00						
26	3.00	77.00						
27	2.62	80.00						
28	2.60	83.00						
29	2.46	86.00						
30	2.74	89.00						
31	3.00	92.00						
32	2.71	95.00						
33	2.19	98.00						
34	0.40	99.50						
35	1.12	101.00						
36	2.95	104.00						
37	3.00	107.00						
38	2.70	110.00						
39	2.05	113.00						
40	3.00	116.00						
41	3.00	119.00						
42	3.00	122.00						
43	2.87	125.00						
44	2.96	128.00						
45	0.92	129.10						
46	1.23	131.00						
47	2.93	134.00						
48	3.00	137.00						
49	3.00	140.00						
50	2.96	143.00						
51	2.96	146.00						
52	2.93	149.00						
53	2.82	152.00						
54	2.85	155.00						
55	2.72	158.00						
56	2.96	161.00						
57	2.95	164.00						
58	2.86	167.00						
59	3.00	170.00						
60	2.94	173.00						
61	3.00	176.00						
62	3.00	179.00						
63	2.94	182.00						
64	3.00	185.00						
65	2.81	188.00						
66	3.00	191.00						
67	3.00	194.00						
68	2.90	197.00						
69	2.87	200.00						
70	3.00	203.00						
71	2.81	206.00						
72	3.00	209.00						
73	3.00	212.00						
74	3.00	215.00						
75	2.93	218.00						
76	3.00	221.00						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
77	3.00	224.00						
78	2.94	227.00						
79	2.90	230.00						
80	2.19	233.00						
81	2.92	236.00						
82	3.00	239.00						
83	3.00	242.00						
84	2.89	245.00						
85	2.93	248.00						
86	3.00	251.00						
87	3.00	254.00						
88	2.90	257.00						
89	3.00	260.00						
90	2.90	263.00						
91	3.00	266.00						
92	3.00	269.00						
93	2.97	272.00						
94	3.00	275.00						
95	2.59	278.00						
96	2.94	281.00						
97	3.00	284.00						
98	3.00	287.00						
99	0.86	288.00						
100	2.00	290.00						
101	3.00	293.00						
102	2.93	296.00						
103	3.00	299.00						
104	3.00	302.00						
105	2.86	305.00						
106	3.00	308.00						
107	2.89	311.00						
108	3.00	314.00						
109	3.00	317.00						

Casing

Depth	Type	Size	Recovered
44.00	HQ		

Cementing

From Depth	To Depth	Date	Volume

Geophysics

Acoustic Scanner	☐
Caliper	☒
Density	☒
Deviation	☒
Dipmeter	☐
Natural Gamma	☐
Neutron	☐
Resistivity	☐
Sonic	☐
Temperature	☐
Acoustic Scanner	☐
Caliper	☐
Cement bond log	☐
Density	☐
Dipmeter	☐
Downhole Camera	☐
Full Waveform Sonic	☐
Gyroscopic Verticality	☐
Natural Gamma	☐
Neutron	☐
Resistivity	☐
Spontaneous Potential	☐
Sonic	☐
Temperature	☐
Verticality	☐
X-Ray	☐

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology

DHPN-17-01

From	To	Thick	Description	RL From	RL To
0.00	4.79	4.79	Core Loss	1,537.00	1,532.21
4.79	5.11	0.32	Cobbles, medium grey, Weathered	1,532.21	1,531.89
5.11	6.46	1.35	Core Loss	1,531.89	1,530.54
6.46	6.61	0.15	Gravel, medium grey, Weathered	1,530.54	1,530.39
6.61	10.77	4.16	Core Loss	1,530.39	1,526.23
10.77	11.11	0.34	Cobbles, medium grey, Weathered	1,526.23	1,525.89
11.11	13.61	2.50	Core Loss	1,525.89	1,523.39
13.61	14.11	0.50	Mud, dark grey, Weathered	1,523.39	1,522.89
14.11	16.88	2.77	Core Loss	1,522.89	1,520.12
16.88	17.11	0.23	Mud, dark grey, Weathered	1,520.12	1,519.89
17.11	18.71	1.60	Core Loss	1,519.89	1,518.29
18.71	22.76	4.05	Sandstone, Very fine to fine grained, medium grey, laminated Moderately weathered, gradational basal contact, 15 dip	1,518.29	1,514.24
22.76	23.00	0.24	Core Loss	1,514.24	1,514.00
23.00	24.17	1.17	Siltstone, medium grey, laminated Slightly weathered, sharp and parallel basal contact, 10 dip	1,514.00	1,512.83
24.17	25.06	0.89	Core Loss	1,512.83	1,511.94
25.06	27.10	2.04	Siltstone, medium grey, laminated Slightly weathered, sharp and parallel basal contact, 10 dip	1,511.94	1,509.90
27.10	27.41	0.31	Core Loss	1,509.90	1,509.59
27.41	27.94	0.53	Coaly Siltstone, medium grey, laminated Fresh, gradational basal contact, 15 dip, minor (1-15 %) pyrite disseminated	1,509.59	1,509.06
27.94	28.56	0.62	Mudstone, dark grey, laminated Fresh, sharp and parallel basal contact, 10 dip, minor (1-15 %) plant fragments on bedding planes	1,509.06	1,508.44
28.56	28.60	0.04	Core Loss	1,508.44	1,508.40
28.60	34.58	5.98	Mudstone	1,508.40	1,502.42
34.58	34.94	0.36	Core Loss	1,502.42	1,502.06
34.94	36.07	1.13	Mudstone, dark grey, laminated Fresh, sharp and parallel basal contact, 10 dip, minor (1-15 %) plant fragments on bedding planes	1,502.06	1,500.93
36.07	36.34	0.27	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) pyrite disseminated	1,500.93	1,500.66
36.34	36.44	0.10	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact	1,500.66	1,500.56
36.44	37.72	1.28	Carbonaceous Mudstone, dark grey, laminated 5 dip, minor (1-15 %) quartz on bedding planes	1,500.56	1,499.28
37.72	38.00	0.28	Core Loss	1,499.28	1,499.00
38.00	39.83	1.83	Siltstone, medium grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) plant fragments on bedding planes	1,499.00	1,497.17
39.83	41.12	1.29	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,497.17	1,495.88
41.12	41.48	0.36	Core Loss	1,495.88	1,495.52
41.48	44.26	2.78	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 15 dip, common (15-40 %) quartz in veins	1,495.52	1,492.74
44.26	44.58	0.32	Siltstone, medium grey, laminated Fresh, minor (1-15 %) plant fragments on bedding planes	1,492.74	1,492.42

From	To	Thick	Description	RL From	RL To
44.58	45.00	0.42	Core Loss	1,492.42	1,492.00
45.00	46.97	1.97	Siltstone, light grey, laminated Fresh, gradational basal contact	1,492.00	1,490.03
46.97	47.00	0.03	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 10 dip	1,490.03	1,490.00
47.00	47.25	0.25	Core Loss	1,490.00	1,489.75
47.25	52.00	4.75	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 10 dip	1,489.75	1,485.00
52.00	52.18	0.18	Core Loss	1,485.00	1,484.82
52.18	56.33	4.15	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 10 dip	1,484.82	1,480.67
56.33	58.91	2.58	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact, 15 dip, rare (<1 %) bivalves on bedding planes	1,480.67	1,478.09
58.91	59.00	0.09	Core Loss	1,478.09	1,478.00
59.00	60.31	1.31	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, 10 dip	1,478.00	1,476.69
60.31	60.49	0.18	Core Loss	1,476.69	1,476.51
60.49	64.36	3.87	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact	1,476.51	1,472.64
64.36	65.66	1.30	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,472.64	1,471.34
65.66	65.86	0.20	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,471.34	1,471.14
65.86	66.07	0.21	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,471.14	1,470.93
66.07	66.11	0.04	Coal, bright (>90%), black, Fresh	1,470.93	1,470.89
66.11	66.19	0.08	Coal, dull with minor bright bands (1-10%), black, laminated Fresh	1,470.89	1,470.81
66.19	66.30	0.11	Core Loss, Lost coal	1,470.81	1,470.70
66.30	66.58	0.28	Siltstone, black, laminated Fresh	1,470.70	1,470.42
66.58	66.64	0.06	Core Loss, laminated Fresh	1,470.42	1,470.36
66.64	67.00	0.36	Core Loss, Lost coal	1,470.36	1,470.00
67.00	67.10	0.10	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,470.00	1,469.90
67.10	67.31	0.21	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,469.90	1,469.69
67.31	68.35	1.04	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,469.69	1,468.65
68.35	71.24	2.89	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,468.65	1,465.76
71.24	72.67	1.43	Siltstone, medium grey, laminated Fresh, minor (1-15 %) pyrite disseminated	1,465.76	1,464.33
72.67	72.71	0.04	Core Loss	1,464.33	1,464.29
72.71	75.30	2.59	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,464.29	1,461.70
75.30	79.14	3.84	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,461.70	1,457.86
79.14	79.70	0.56	Carbonaceous Mudstone, dark grey, laminated Fresh, gradational basal contact	1,457.86	1,457.30
79.70	80.08	0.38	Core Loss	1,457.30	1,456.92
80.08	81.59	1.51	Carbonaceous Mudstone, dark grey, laminated Fresh, gradational basal contact	1,456.92	1,455.41

From	To	Thick	Description	RL From	RL To
81.59	81.82	0.23	Carbonaceous Mudstone, dark grey, laminated Fresh, gradational basal contact	1,455.41	1,455.18
81.82	82.04	0.22	Coal, bright with dull bands (60-90%), black, laminated Fresh	1,455.18	1,454.96
82.04	82.21	0.17	Core Loss, Lost coal	1,454.96	1,454.79
82.21	82.51	0.30	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,454.79	1,454.49
82.51	82.73	0.22	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,454.49	1,454.27
82.73	82.83	0.10	Core Loss, laminated	1,454.27	1,454.17
82.83	84.19	1.36	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,454.17	1,452.81
84.19	84.68	0.49	Core Loss	1,452.81	1,452.32
84.68	84.73	0.05	Core Loss, Lost coal	1,452.32	1,452.27
84.73	84.84	0.11	Coal, interbanded dull and bright bands(40-60%)	1,452.27	1,452.16
84.84	86.21	1.37	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,452.16	1,450.79
86.21	86.75	0.54	Sandstone and Siltstone, Very fine grained , dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,450.79	1,450.25
86.75	87.01	0.26	Core Loss	1,450.25	1,449.99
87.01	89.06	2.05	Sandstone and Siltstone, Very fine grained , dark grey, laminated Fresh, gradational basal contact	1,449.99	1,447.94
89.06	91.01	1.95	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,447.94	1,445.99
91.01	91.34	0.33	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,445.99	1,445.66
91.34	92.40	1.06	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,445.66	1,444.60
92.40	94.07	1.67	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,444.60	1,442.93
94.07	96.06	1.99	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 5 dip	1,442.93	1,440.94
96.06	96.35	0.29	Core Loss	1,440.94	1,440.65
96.35	97.19	0.84	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,440.65	1,439.81
97.19	98.00	0.81	Core Loss	1,439.81	1,439.00
98.00	98.40	0.40	Core Loss	1,439.00	1,438.60
98.40	100.62	2.22	Sandstone, Very fine to fine grained, light grey, laminated Fresh, 5 dip	1,438.60	1,436.38
100.62	101.00	0.38	Core Loss	1,436.38	1,436.00
101.00	101.05	0.05	Core Loss	1,436.00	1,435.95
101.05	102.17	1.12	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,435.95	1,434.83
102.17	103.63	1.46	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,434.83	1,433.37
103.63	104.91	1.28	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,433.37	1,432.09
104.91	105.95	1.04	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,432.09	1,431.05
105.95	106.15	0.20	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,431.05	1,430.85

From	To	Thick	Description	RL From	RL To
106.15	106.63	0.48	Siltstone, medium grey, laminated Fresh	1,430.85	1,430.37
106.63	106.93	0.30	Core Loss	1,430.37	1,430.07
106.93	109.55	2.62	Siltstone, medium grey, laminated Fresh	1,430.07	1,427.45
109.55	109.75	0.20	Siltstone, medium grey, Fresh	1,427.45	1,427.25
109.75	110.53	0.78	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,427.25	1,426.47
110.53	111.15	0.62	Core Loss	1,426.47	1,425.85
111.15	111.33	0.18	Core Loss, Lost coal	1,425.85	1,425.67
111.33	111.54	0.21	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,425.67	1,425.46
111.54	112.87	1.33	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,425.46	1,424.13
112.87	118.33	5.46	Siltstone, medium grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) plant fragments on bedding planes	1,424.13	1,418.67
118.33	119.81	1.48	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,418.67	1,417.19
119.81	121.56	1.75	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,417.19	1,415.44
121.56	123.04	1.48	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,415.44	1,413.96
123.04	124.56	1.52	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,413.96	1,412.44
124.56	124.69	0.13	Core Loss	1,412.44	1,412.31
124.69	124.73	0.04	Core Loss	1,412.31	1,412.27
124.73	126.34	1.61	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,412.27	1,410.66
126.34	127.64	1.30	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,410.66	1,409.36
127.64	127.69	0.05	Siltstone, medium grey, laminated Fresh	1,409.36	1,409.31
127.69	127.87	0.18	Core Loss	1,409.31	1,409.13
127.87	128.49	0.62	Siltstone, medium grey, laminated Fresh	1,409.13	1,408.51
128.49	128.69	0.20	Carbonaceous Siltstone, dark grey, laminated	1,408.51	1,408.31
128.69	129.18	0.49	Core Loss	1,408.31	1,407.82
129.18	129.36	0.18	Core Loss, Lost coal	1,407.82	1,407.64
129.36	129.73	0.37	Coal, mainly dull with frequent bright bands (10-40%), black, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,407.64	1,407.27
129.73	129.91	0.18	Carbonaceous Siltstone, medium grey, laminated Fresh	1,407.27	1,407.09
129.91	130.69	0.78	Siltstone, medium grey, laminated Fresh	1,407.09	1,406.31
130.69	130.76	0.07	Core Loss	1,406.31	1,406.24
130.76	130.95	0.19	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,406.24	1,406.05
130.95	132.68	1.73	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 5 dip	1,406.05	1,404.32
132.68	135.11	2.43	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,404.32	1,401.89
135.11	136.70	1.59	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,401.89	1,400.30

From	To	Thick	Description	RL From	RL To
136.70	139.92	3.22	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,400.30	1,397.08
139.92	141.92	2.00	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,397.08	1,395.08
141.92	142.96	1.04	Coaly Siltstone, dark grey, laminated Fresh, minor (1-15 %) pyrite on bedding planes	1,395.08	1,394.04
142.96	143.00	0.04	Core Loss	1,394.04	1,394.00
143.00	143.04	0.04	Core Loss	1,394.00	1,393.96
143.04	145.61	2.57	Siltstone, medium grey, massive Fresh, gradational basal contact	1,393.96	1,391.39
145.61	145.91	0.30	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,391.39	1,391.09
145.91	147.05	1.14	Sandstone and Siltstone, Very fine to fine grained, dark grey, laminated Fresh, gradational basal contact, 10 dip	1,391.09	1,389.95
147.05	147.25	0.20	Sandstone and Siltstone, Very fine to fine grained, dark grey, laminated Fresh, gradational basal contact, 10 dip	1,389.95	1,389.75
147.25	147.38	0.13	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, 10 dip	1,389.75	1,389.62
147.38	147.40	0.02	Core Loss, Lost coal	1,389.62	1,389.60
147.40	147.65	0.25	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,389.60	1,389.35
147.65	147.76	0.11	Core Loss	1,389.35	1,389.24
147.76	148.18	0.42	Coal, interbanded dull and bright bands(40-60%), black, Fresh, gradational basal contact	1,389.24	1,388.82
148.18	148.25	0.07	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite laminae	1,388.82	1,388.75
148.25	148.65	0.40	Coal, interbanded dull and bright bands(40-60%), black, Fresh	1,388.75	1,388.35
148.65	149.00	0.35	Coal, interbanded dull and bright bands(40-60%), black, Fresh	1,388.35	1,388.00
149.00	149.07	0.07	Core Loss, Lost coal	1,388.00	1,387.93
149.07	149.68	0.61	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,387.93	1,387.32
149.68	149.88	0.20	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,387.32	1,387.12
149.88	150.18	0.30	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,387.12	1,386.82
150.18	150.23	0.05	Core Loss	1,386.82	1,386.77
150.23	153.63	3.40	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,386.77	1,383.37
153.63	154.48	0.85	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,383.37	1,382.52
154.48	154.63	0.15	Core Loss	1,382.52	1,382.37
154.63	155.20	0.57	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,382.37	1,381.80
155.20	155.37	0.17	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,381.80	1,381.63
155.37	156.00	0.63	Coal, dull with minor bright bands (1-10%)	1,381.63	1,381.00
156.00	156.25	0.25	Core Loss	1,381.00	1,380.75
156.25	156.85	0.60	Coal, mainly dull with frequent bright bands (10-40%)	1,380.75	1,380.15

From	To	Thick	Description	RL From	RL To
156.85	157.15	0.30	Coal, interbanded dull and bright bands(40-60%)	1,380.15	1,379.85
157.15	157.58	0.43	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,379.85	1,379.42
157.58	158.28	0.70	Coal, interbanded dull and bright bands(40-60%), black, Fresh, gradational basal contact	1,379.42	1,378.72
158.28	158.33	0.05	Core Loss, Lost coal, black, Fresh, gradational basal contact	1,378.72	1,378.67
158.33	158.59	0.26	Siltstone, dark grey, laminated Fresh, faulted at basal contact	1,378.67	1,378.41
158.59	163.95	5.36	Siltstone, dark grey, laminated Fresh, faulted at basal contact	1,378.41	1,373.05
163.95	164.00	0.05	Core Loss	1,373.05	1,373.00
164.00	166.86	2.86	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,373.00	1,370.14
166.86	167.00	0.14	Core Loss	1,370.14	1,370.00
167.00	168.05	1.05	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,370.00	1,368.95
168.05	168.77	0.72	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,368.95	1,368.23
168.77	171.39	2.62	Siltstone, dark grey, laminated Fresh, gradational basal contact, 10 dip	1,368.23	1,365.61
171.39	172.00	0.61	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,365.61	1,365.00
172.00	172.94	0.94	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,365.00	1,364.06
172.94	173.00	0.06	Core Loss	1,364.06	1,364.00
173.00	180.50	7.50	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,364.00	1,356.50
180.50	180.56	0.06	Core Loss	1,356.50	1,356.44
180.56	181.45	0.89	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,356.44	1,355.55
181.45	187.81	6.36	Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, common (15-40 %) quartz in veins	1,355.55	1,349.19
187.81	188.00	0.19	Core Loss	1,349.19	1,349.00
188.00	196.90	8.90	Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, common (15-40 %) quartz in veins	1,349.00	1,340.10
196.90	197.00	0.10	Core Loss	1,340.10	1,340.00
197.00	199.87	2.87	Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, common (15-40 %) quartz in veins	1,340.00	1,337.13
199.87	200.00	0.13	Core Loss	1,337.13	1,337.00
200.00	204.20	4.20	Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, 5 dip, common (15-40 %) quartz in veins	1,337.00	1,332.80
204.20	204.32	0.12	Coal, mainly dull with frequent bright bands (10-40%), black, Fresh	1,332.80	1,332.68
204.32	204.51	0.19	Core Loss	1,332.68	1,332.49
204.51	204.68	0.17	Siltstone, medium grey, massive Fresh, gradational basal contact	1,332.49	1,332.32
204.68	205.04	0.36	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,332.32	1,331.96

From	To	Thick	Description	RL From	RL To
205.04	205.75	0.71	Siltstone, medium grey, massive Fresh, gradational basal contact	1,331.96	1,331.25
205.75	205.85	0.10	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,331.25	1,331.15
205.85	210.80	4.95	Siltstone, medium grey, massive Fresh, sheared at basal contact	1,331.15	1,326.20
210.80	211.41	0.61	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,326.20	1,325.59
211.41	212.30	0.89	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,325.59	1,324.70
212.30	213.82	1.52	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,324.70	1,323.18
213.82	215.73	1.91	Siltstone, medium grey, laminated Fresh, gradational basal contact, rare (<1 %) quartz in veins	1,323.18	1,321.27
215.73	217.46	1.73	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,321.27	1,319.54
217.46	217.93	0.47	Siltstone, medium grey, laminated Fresh, 10 dip	1,319.54	1,319.07
217.93	218.00	0.07	Core Loss	1,319.07	1,319.00
218.00	220.06	2.06	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,319.00	1,316.94
220.06	223.20	3.14	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,316.94	1,313.80
223.20	226.25	3.05	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,313.80	1,310.75
226.25	226.74	0.49	Carbonaceous Siltstone, dark grey, laminated Fresh, minor (1-15 %) quartz on bedding planes	1,310.75	1,310.26
226.74	226.80	0.06	Core Loss	1,310.26	1,310.20
226.80	226.84	0.04	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,310.20	1,310.16
226.84	226.92	0.08	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,310.16	1,310.08
226.92	228.46	1.54	Coaly Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,310.08	1,308.54
228.46	229.11	0.65	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,308.54	1,307.89
229.11	229.70	0.59	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh	1,307.89	1,307.30
229.70	229.80	0.10	Core Loss	1,307.30	1,307.20
229.80	230.91	1.11	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) quartz on bedding planes	1,307.20	1,306.09
230.91	231.72	0.81	Core Loss	1,306.09	1,305.28
231.72	235.92	4.20	Siltstone, medium grey, laminated Fresh, gradational basal contact, 20 dip	1,305.28	1,301.08
235.92	236.00	0.08	Core Loss	1,301.08	1,301.00
236.00	243.82	7.82	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,301.00	1,293.18
243.82	244.94	1.12	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,293.18	1,292.06
244.94	245.05	0.11	Core Loss	1,292.06	1,291.95

From	To	Thick	Description	RL From	RL To
245.05	247.68	2.63	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,291.95	1,289.32
247.68	247.98	0.30	Coaly Siltstone, medium grey, laminated Fresh	1,289.32	1,289.02
247.98	248.05	0.07	Core Loss	1,289.02	1,288.95
248.05	248.45	0.40	Coaly Siltstone, medium grey, laminated Fresh, gradational basal contact	1,288.95	1,288.55
248.45	250.19	1.74	Carbonaceous Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,288.55	1,286.81
250.19	252.06	1.87	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,286.81	1,284.94
252.06	256.90	4.84	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, 10 dip, minor (1-15 %) pyrite disseminated	1,284.94	1,280.10
256.90	257.00	0.10	Core Loss	1,280.10	1,280.00
257.00	258.00	1.00	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,280.00	1,279.00
258.00	262.90	4.90	Sandstone, Very fine to fine grained, light grey, massive Fresh	1,279.00	1,274.10
262.90	263.00	0.10	Core Loss	1,274.10	1,274.00
263.00	264.17	1.17	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,274.00	1,272.83
264.17	265.45	1.28	Sandstone and Siltstone, medium grey, laminated Fresh, gradational basal contact	1,272.83	1,271.55
265.45	266.12	0.67	Sandstone, Very fine to fine grained, light grey, massive	1,271.55	1,270.88
266.12	267.81	1.69	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 10 dip	1,270.88	1,269.19
267.81	272.00	4.19	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact	1,269.19	1,265.00
272.00	272.20	0.20	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,265.00	1,264.80
272.20	272.23	0.03	Core Loss	1,264.80	1,264.77
272.23	273.92	1.69	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,264.77	1,263.08
273.92	275.64	1.72	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,263.08	1,261.36
275.64	275.84	0.20	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,261.36	1,261.16
275.84	276.15	0.31	Coal, bright (>90%), black, laminated Fresh, fractured at basal contact, minor (1-15 %) quartz clasts	1,261.16	1,260.85
276.15	276.31	0.16	Coal, mainly dull with frequent bright bands (10-40%), black, minor (1-15%) Siltstone bands Fresh, fractured at basal contact	1,260.85	1,260.69
276.31	276.51	0.20	Coal, interbanded dull and bright bands(40-60%), black, Fresh	1,260.69	1,260.49
276.51	276.72	0.21	Core Loss, Lost coal	1,260.49	1,260.28
276.72	276.91	0.19	Core Loss	1,260.28	1,260.09
276.91	277.06	0.15	Siltstone, dark grey, massive Fresh, gradational basal contact	1,260.09	1,259.94
277.06	277.15	0.09	Coaly Siltstone, black, laminated Fresh, gradational basal contact	1,259.94	1,259.85

From	To	Thick	Description	RL From	RL To
277.15	279.22	2.07	Siltstone, dark grey, massive Fresh, gradational basal contact	1,259.85	1,257.78
279.22	281.17	1.95	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,257.78	1,255.83
281.17	281.23	0.06	Core Loss	1,255.83	1,255.77
281.23	287.86	6.63	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,255.77	1,249.14
287.86	288.00	0.14	Core Loss	1,249.14	1,249.00
288.00	288.03	0.03	Siltstone, dark grey	1,249.00	1,248.97
288.03	288.19	0.16	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) quartz in cleat	1,248.97	1,248.81
288.19	288.62	0.43	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite on bedding planes	1,248.81	1,248.38
288.62	288.85	0.23	Coal, mainly dull with frequent bright bands (10-40%), black, laminated Fresh, gradational basal contact, common (15-40 %) quartz in cleat	1,248.38	1,248.15
288.85	289.08	0.23	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,248.15	1,247.92
289.08	290.06	0.98	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,247.92	1,246.94
290.06	291.55	1.49	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,246.94	1,245.45
291.55	295.12	3.57	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,245.45	1,241.88
295.12	295.97	0.85	Siltstone, medium grey, massive Fresh	1,241.88	1,241.03
295.97	296.04	0.07	Core Loss	1,241.03	1,240.96
296.04	297.00	0.96	Siltstone, medium grey, massive Fresh, gradational basal contact	1,240.96	1,240.00
297.00	297.18	0.18	Coal, bright with dull bands (60-90%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite on bedding planes	1,240.00	1,239.82
297.18	299.38	2.20	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact	1,239.82	1,237.62
299.38	303.37	3.99	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,237.62	1,233.63
303.37	303.62	0.25	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,233.63	1,233.38
303.62	303.82	0.20	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,233.38	1,233.18
303.82	304.02	0.20	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,233.18	1,232.98
304.02	304.22	0.20	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,232.98	1,232.78
304.22	304.41	0.19	Siltstone, medium grey, laminated Fresh, minor (1-15 %) quartz on bedding planes	1,232.78	1,232.59

From	To	Thick	Description	RL From	RL To
304.41	305.03	0.62	Siltstone, medium grey, laminated Fresh, minor (1-15 %) quartz on bedding planes	1,232.59	1,231.97
305.03	305.17	0.14	Core Loss	1,231.97	1,231.83
305.17	305.44	0.27	Siltstone, medium grey, laminated Fresh	1,231.83	1,231.56
305.44	305.79	0.35	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,231.56	1,231.21
305.79	306.34	0.55	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,231.21	1,230.66
306.34	309.45	3.11	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,230.66	1,227.55
309.45	310.89	1.44	Sandstone, Very fine to fine grained, light grey, massive Fresh	1,227.55	1,226.11
310.89	311.00	0.11	Core Loss	1,226.11	1,226.00
311.00	312.47	1.47	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,226.00	1,224.53
312.47	314.52	2.05	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,224.53	1,222.48
314.52	314.61	0.09	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,222.48	1,222.39
314.61	315.52	0.91	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,222.39	1,221.48
315.52	315.64	0.12	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,221.48	1,221.36
315.64	317.00	1.36	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,221.36	1,220.00

Hole: DHPN-17-02

Hole Summary

Hole Type: Fully cored

Location

Site:	ARCH3	Lease:	
Easting:	527296	Accuracy:	GPS (hand held)
Northing:	6300409	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1646	Height Datum:	North American Datum 1983
Survey Company:		Survey Date:	

Comments

Geologists

Depth	Geologist
219.50	DC

Drilling

Date Commenced:	August-16-17	Geological Org.:	
Date Completed:	August-25-17	Total Depth:	219.5
Drilling Company			

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
1	0.60	3.50	DRIFTWOOD DIAMOND DRILLING					
2	1.43	5.00						
3	1.47	6.50						
4	1.50	8.00						
5	0.67	9.50						
6	1.35	11.00						
7	1.50	12.50						
8	0.94	14.00						
9	0.80	15.50						
10	1.36	17.00						
11	0.70	18.50						
12	0.78	20.00						
13	1.09	21.50						
14	1.38	23.00						
15	1.28	24.50						
16	1.29	26.00						
17	1.50	27.50						
18	1.38	29.00						
19	1.50	30.50						
20	1.32	32.00						
21	1.49	33.50						
22	1.47	35.00						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
23	1.50	36.50						
24	1.44	38.00						
25	1.50	39.50						
26	1.46	41.00						
27	1.50	42.50						
28	1.50	44.00						
29	1.50	45.50						
30	1.40	47.00						
31	1.50	48.50						
32	1.50	50.00						
33	1.57	51.50						
34	1.35	53.00						
35	1.50	54.50						
36	1.44	56.00						
37	1.38	57.50						
38	1.50	59.00						
39	1.38	60.50						
40	1.47	62.00						
41	1.45	63.50						
42	1.47	65.00						
43	1.43	66.50						
44	1.46	68.00						
45	1.50	69.50						
46	1.45	71.00						
47	1.48	72.50						
48	1.30	74.00						
49	1.50	75.50						
50	1.50	77.00						
51	1.27	78.50						
52	1.50	80.00						
53	1.50	81.50						
54	1.50	83.00						
55	1.46	84.50						
56	1.37	86.00						
57	1.50	87.50						
58	1.33	89.00						
59	1.50	90.50						
60	1.50	92.00						
61	1.50	93.50						
62	1.50	95.00						
63	1.45	96.50						
64	1.50	98.00						
65	1.45	99.50						
66	1.50	101.00						
67	1.50	102.50						
68	1.50	104.00						
69	1.50	105.50						
70	1.50	107.00						
71	1.40	108.50						
72	1.41	110.00						
73	1.50	111.50						
74	1.50	113.00						
75	1.50	114.50						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
76	1.45	116.00						
77	1.50	117.50						
78	1.46	119.00						
79	1.50	120.50						
80	1.50	122.00						
81	1.50	123.50						
82	1.48	125.00						
83	1.47	126.50						
84	1.47	128.00						
85	1.50	129.50						
86	1.43	131.00						
87	1.50	132.50						
88	1.50	134.00						
89	1.50	135.50						
90	1.50	137.00						
91	1.18	138.50						
92	1.50	140.00						
93	1.45	141.50						
94	1.50	143.00						
95	1.50	144.50						
96	1.46	146.00						
97	1.45	147.50						
98	1.50	149.00						
99	1.50	150.50						
100	1.48	152.00						
101	1.46	153.50						
102	1.50	155.00						
103	1.50	156.50						
104	1.47	158.00						
105	1.50	159.50						
106	1.37	161.00						
107	1.50	162.50						
108	1.46	164.00						
109	1.35	165.50						
110	1.50	167.00						
111	1.50	168.50						
112	1.50	170.00						
113	1.50	171.50						
114	1.45	173.00						
115	1.45	174.50						
116	1.50	176.00						
117	1.50	177.50						
118	1.47	179.00						
119	1.50	180.50						
120	1.42	182.00						
121	1.50	183.50						
122	1.50	185.00						
123	1.50	186.50						
124	1.43	188.00						
125	1.50	189.50						
126	1.46	191.00						
127	1.50	192.50						
128	1.50	194.00						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
129	1.50	195.50						
130	1.50	197.00						
131	1.50	198.50						
132	1.42	200.00						
133	1.50	201.50						
134	1.48	203.00						
135	1.48	204.50						
136	1.45	206.00						
137	1.50	207.50						
138	1.46	209.00						
139	1.37	210.50						
140	1.48	212.00						
141	1.47	213.50						
142	1.40	215.00						
143	1.50	216.50						
144	1.46	218.00						
145	1.50	219.50						

Casing

Depth	Type	Size	Recovered
25.50	HQ		

Cementing

From Depth	To Depth	Date	Volume

Geophysics

Acoustic Scanner	☐
Caliper	☒
Density	☒
Deviation	☒
Dipmeter	☒
Natural Gamma	☒
Neutron	☒
Resistivity	☒
Sonic	☒
Temperature	☐
Acoustic Scanner	☐
Caliper	☐
Cement bond log	☐
Density	☐
Dipmeter	☐
Downhole Camera	☐
Full Waveform Sonic	☐
Gyroscopic Verticality	☐
Natural Gamma	☐
Neutron	☐
Resistivity	☐
Spontaneous Potential	☐
Sonic	☐
Temperature	☐
Verticality	☐
X-Ray	☐

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology DHPN-17-02

From	To	Thick	Description	RL From	RL To
0.00	2.25	2.25	Core Loss	1,646.00	1,643.75
2.25	5.42	3.17	Gravel, light grey, Weathered, sharp and parallel basal contact, 5 dip	1,643.75	1,640.58
5.42	6.07	0.65	Core Loss, Lost coal	1,640.58	1,639.93
6.07	6.14	0.07	Core Loss	1,639.93	1,639.86
6.14	6.41	0.27	Gravel, light grey, Weathered, sharp and parallel basal contact, 5 dip	1,639.86	1,639.59
6.41	7.02	0.61	Sandstone, Very fine to fine grained, light grey, laminated Weathered, gradational basal contact, 10 dip	1,639.59	1,638.98
7.02	7.91	0.89	Siltstone, medium grey, laminated Weathered, minor (1-15 %) plant fragments on bedding planes	1,638.98	1,638.09
7.91	7.94	0.03	Core Loss	1,638.09	1,638.06
7.94	8.30	0.36	Siltstone, medium grey, laminated Weathered, sharp and parallel basal contact	1,638.06	1,637.70
8.30	9.26	0.96	Sandstone, Very fine to fine grained, light grey, laminated Weathered, gradational basal contact	1,637.70	1,636.74
9.26	9.51	0.25	Coaly Siltstone, medium grey, laminated Moderately weathered	1,636.74	1,636.49
9.51	9.71	0.20	Coaly Siltstone, black, laminated Moderately weathered, gradational basal contact	1,636.49	1,636.29
9.71	9.88	0.17	Coal, interbanded dull and bright bands(40-60%), laminated minor (1-15%) Siltstone laminae Weathered, fractured at basal contact	1,636.29	1,636.12
9.88	10.15	0.27	Core Loss, Lost coal	1,636.12	1,635.85
10.15	10.71	0.56	Core Loss	1,635.85	1,635.29
10.71	10.94	0.23	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,635.29	1,635.06
10.94	11.09	0.15	Core Loss	1,635.06	1,634.91
11.09	12.72	1.63	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,634.91	1,633.28
12.72	14.02	1.30	Sandstone and Siltstone, Very fine grained , light grey, laminated Fresh, gradational basal contact	1,633.28	1,631.98
14.02	14.85	0.83	Siltstone, medium grey, laminated Fresh, 10 dip	1,631.98	1,631.15
14.85	15.41	0.56	Core Loss	1,631.15	1,630.59
15.41	16.01	0.60	Siltstone, medium grey, laminated Fresh	1,630.59	1,629.99
16.01	16.71	0.70	Core Loss	1,629.99	1,629.29
16.71	17.99	1.28	Siltstone, medium grey, laminated Fresh	1,629.29	1,628.01
17.99	18.13	0.14	Core Loss	1,628.01	1,627.87
18.13	18.49	0.36	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,627.87	1,627.51
18.49	18.66	0.17	Coaly Siltstone, dark grey, laminated Fresh, fractured at basal contact	1,627.51	1,627.34
18.66	18.80	0.14	Coal, mainly dull with frequent bright bands (10-40%), black, laminated Fresh, fractured at basal contact	1,627.34	1,627.20
18.80	18.98	0.18	Core Loss, Lost coal	1,627.20	1,627.02
18.98	19.42	0.44	Carbonaceous Siltstone, dark grey, laminated Fresh	1,627.02	1,626.58
19.42	19.50	0.08	Core Loss	1,626.58	1,626.50
19.50	20.02	0.52	Core Loss, Lost coal	1,626.50	1,625.98
20.02	20.39	0.37	Siltstone, medium grey, laminated Fresh	1,625.98	1,625.61
20.39	21.13	0.74	Core Loss	1,625.61	1,624.87
21.13	21.50	0.37	Siltstone, medium grey, laminated Fresh	1,624.87	1,624.50

From	To	Thick	Description	RL From	RL To
21.50	21.91	0.41	Core Loss	1,624.50	1,624.09
21.91	23.94	2.03	Siltstone, medium grey, laminated Fresh	1,624.09	1,622.06
23.94	24.06	0.12	Core Loss	1,622.06	1,621.94
24.06	24.28	0.22	Core Loss	1,621.94	1,621.72
24.28	25.56	1.28	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite disseminated	1,621.72	1,620.44
25.56	25.76	0.20	Core Loss	1,620.44	1,620.24
25.76	25.77	0.01	Core Loss, Lost coal	1,620.24	1,620.23
25.77	25.84	0.07	Coal, mainly dull with frequent bright bands (10-40%), black, laminated Fresh, gradational basal contact	1,620.23	1,620.16
25.84	26.28	0.44	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,620.16	1,619.72
26.28	26.98	0.70	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,619.72	1,619.02
26.98	30.53	3.55	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,619.02	1,615.47
30.53	30.65	0.12	Core Loss, laminated	1,615.47	1,615.35
30.65	31.59	0.94	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,615.35	1,614.41
31.59	31.77	0.18	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,614.41	1,614.23
31.77	31.93	0.16	Coal, bright with dull bands (60-90%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,614.23	1,614.07
31.93	32.19	0.26	Coal, bright (>90%), black, laminated Fresh, gradational basal contact	1,614.07	1,613.81
32.19	32.34	0.15	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,613.81	1,613.66
32.34	32.55	0.21	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,613.66	1,613.45
32.55	32.91	0.36	Siltstone, dark grey, laminated Fresh, fractured at basal contact	1,613.45	1,613.09
32.91	33.09	0.18	Core Loss	1,613.09	1,612.91
33.09	34.58	1.49	Siltstone, dark grey, Fresh, fractured at basal contact	1,612.91	1,611.42
34.58	34.59	0.01	Core Loss	1,611.42	1,611.41
34.59	36.06	1.47	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 15 dip, minor (1-15 %) pyrite disseminated	1,611.41	1,609.94
36.06	36.09	0.03	Core Loss	1,609.94	1,609.91
36.09	39.35	3.26	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,609.91	1,606.65
39.35	39.41	0.06	Core Loss	1,606.65	1,606.59
39.41	40.87	1.46	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, 5 dip	1,606.59	1,605.13
40.87	40.91	0.04	Core Loss	1,605.13	1,605.09
40.91	46.91	6.00	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,605.09	1,599.09
46.91	47.01	0.10	Core Loss	1,599.09	1,598.99
47.01	48.44	1.43	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,598.99	1,597.56

From	To	Thick	Description	RL From	RL To
48.44	53.55	5.11	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, rare (<1 %) quartz on bedding planes	1,597.56	1,592.45
53.55	53.70	0.15	Core Loss	1,592.45	1,592.30
53.70	54.97	1.27	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, rare (<1 %) quartz on bedding planes	1,592.30	1,591.03
54.97	57.06	2.09	Siltstone, medium grey, laminated Fresh, gradational basal contact, 10 dip	1,591.03	1,588.94
57.06	57.12	0.06	Core Loss	1,588.94	1,588.88
57.12	57.23	0.11	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,588.88	1,588.77
57.23	57.35	0.12	Core Loss	1,588.77	1,588.65
57.35	57.95	0.60	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,588.65	1,588.05
57.95	59.40	1.45	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,588.05	1,586.60
59.40	60.03	0.63	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,586.60	1,585.97
60.03	60.21	0.18	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,585.97	1,585.79
60.21	60.38	0.17	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,585.79	1,585.62
60.38	60.55	0.17	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,585.62	1,585.45
60.55	60.82	0.27	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,585.45	1,585.18
60.82	60.99	0.17	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,585.18	1,585.01
60.99	61.18	0.19	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,585.01	1,584.82
61.18	61.59	0.41	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,584.82	1,584.41
61.59	61.73	0.14	Core Loss	1,584.41	1,584.27
61.73	61.76	0.03	Core Loss	1,584.27	1,584.24
61.76	62.76	1.00	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,584.24	1,583.24
62.76	64.91	2.15	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact	1,583.24	1,581.09
64.91	64.96	0.05	Core Loss	1,581.09	1,581.04
64.96	65.24	0.28	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact	1,581.04	1,580.76
65.24	66.25	1.01	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,580.76	1,579.75
66.25	66.28	0.03	Core Loss	1,579.75	1,579.72
66.28	66.55	0.27	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,579.72	1,579.45
66.55	67.63	1.08	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact	1,579.45	1,578.37
67.63	67.91	0.28	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,578.37	1,578.09
67.91	67.98	0.07	Core Loss	1,578.09	1,578.02

From	To	Thick	Description	RL From	RL To
67.98	69.41	1.43	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,578.02	1,576.59
69.41	69.45	0.04	Core Loss, 10 dip	1,576.59	1,576.55
69.45	72.36	2.91	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,576.55	1,573.64
72.36	72.41	0.05	Core Loss	1,573.64	1,573.59
72.41	72.69	0.28	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,573.59	1,573.31
72.69	73.89	1.20	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,573.31	1,572.11
73.89	73.91	0.02	Core Loss	1,572.11	1,572.09
73.91	74.11	0.20	Core Loss	1,572.09	1,571.89
74.11	79.02	4.91	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,571.89	1,566.98
79.02	79.17	0.15	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,566.98	1,566.83
79.17	79.40	0.23	Core Loss	1,566.83	1,566.60
79.40	81.30	1.90	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,566.60	1,564.70
81.30	85.87	4.57	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,564.70	1,560.13
85.87	85.91	0.04	Core Loss	1,560.13	1,560.09
85.91	87.28	1.37	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, abundant (40-60 %) quartz in veins	1,560.09	1,558.72
87.28	89.94	2.66	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,558.72	1,556.06
89.94	90.11	0.17	Core Loss	1,556.06	1,555.89
90.11	91.94	1.83	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,555.89	1,554.06
91.94	96.41	4.47	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,554.06	1,549.59
96.41	97.86	1.45	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,549.59	1,548.14
97.86	97.91	0.05	Core Loss	1,548.14	1,548.09
97.91	100.03	2.12	Siltstone, dark grey, laminated Fresh	1,548.09	1,545.97
100.03	100.41	0.38	Siltstone, dark grey, laminated Fresh	1,545.97	1,545.59
100.41	100.76	0.35	Siltstone, dark grey, laminated Fresh, sharp and parallel basal contact	1,545.59	1,545.24
100.76	100.81	0.05	Core Loss	1,545.24	1,545.19
100.81	101.01	0.20	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,545.19	1,544.99
101.01	101.43	0.42	Coal, bright with dull bands (60-90%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,544.99	1,544.57
101.43	101.82	0.39	Coal, bright (>90%), black, laminated Fresh, gradational basal contact	1,544.57	1,544.18
101.82	101.98	0.16	Coal, bright (>90%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,544.18	1,544.02
101.98	102.18	0.20	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,544.02	1,543.82

From	To	Thick	Description	RL From	RL To
102.18	104.09	1.91	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,543.82	1,541.91
104.09	104.30	0.21	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,541.91	1,541.70
104.30	104.48	0.18	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,541.70	1,541.52
104.48	104.76	0.28	Siltstone, dark grey, massive Fresh, gradational basal contact	1,541.52	1,541.24
104.76	105.10	0.34	Coal, bright (>90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,541.24	1,540.90
105.10	105.32	0.22	Siltstone, dark grey, laminated Fresh	1,540.90	1,540.68
105.32	105.60	0.28	Siltstone, dark grey, laminated Fresh	1,540.68	1,540.40
105.60	105.97	0.37	Siltstone, dark grey, laminated Fresh	1,540.40	1,540.03
105.97	106.66	0.69	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,540.03	1,539.34
106.66	109.81	3.15	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,539.34	1,536.19
109.81	109.91	0.10	Core Loss	1,536.19	1,536.09
109.91	111.26	1.35	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,536.09	1,534.74
111.26	111.35	0.09	Core Loss	1,534.74	1,534.65
111.35	111.81	0.46	Sandstone, Fine to medium grained, light grey, laminated Fresh, gradational basal contact	1,534.65	1,534.19
111.81	113.26	1.45	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,534.19	1,532.74
113.26	113.46	0.20	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,532.74	1,532.54
113.46	113.65	0.19	Coal, interbanded dull and bright bands(40-60%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,532.54	1,532.35
113.65	114.00	0.35	Coal, bright with dull bands (60-90%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,532.35	1,532.00
114.00	114.29	0.29	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,532.00	1,531.71
114.29	114.48	0.19	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,531.71	1,531.52
114.48	116.17	1.69	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,531.52	1,529.83
116.17	116.22	0.05	Core Loss	1,529.83	1,529.78
116.22	117.19	0.97	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,529.78	1,528.81
117.19	118.77	1.58	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 10 dip	1,528.81	1,527.23
118.77	118.81	0.04	Core Loss	1,527.23	1,527.19
118.81	121.94	3.13	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,527.19	1,524.06
121.94	123.09	1.15	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,524.06	1,522.91
123.09	126.39	3.30	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,522.91	1,519.61

From	To	Thick	Description	RL From	RL To
126.39	126.41	0.02	Core Loss	1,519.61	1,519.59
126.41	126.44	0.03	Core Loss	1,519.59	1,519.56
126.44	127.11	0.67	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,519.56	1,518.89
127.11	127.91	0.80	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,518.89	1,518.09
127.91	127.94	0.03	Core Loss	1,518.09	1,518.06
127.94	129.41	1.47	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,518.06	1,516.59
129.41	132.25	2.84	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,516.59	1,513.75
132.25	132.34	0.09	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,513.75	1,513.66
132.34	132.41	0.07	Core Loss	1,513.66	1,513.59
132.41	134.12	1.71	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,513.59	1,511.88
134.12	138.41	4.29	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 15 dip	1,511.88	1,507.59
138.41	138.73	0.32	Core Loss	1,507.59	1,507.27
138.73	140.84	2.11	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact	1,507.27	1,505.16
140.84	142.86	2.02	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,505.16	1,503.14
142.86	142.91	0.05	Core Loss	1,503.14	1,503.09
142.91	144.65	1.74	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in blebs	1,503.09	1,501.35
144.65	146.03	1.38	Siltstone, dark grey, laminated Fresh, minor (1-15 %) pyrite disseminated	1,501.35	1,499.97
146.03	146.26	0.23	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,499.97	1,499.74
146.26	146.54	0.28	Coal, interbanded dull and bright bands(40-60%), black, laminated minor (1-15%) Mudstone bands Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,499.74	1,499.46
146.54	146.74	0.20	Siltstone, dark grey, laminated Fresh	1,499.46	1,499.26
146.74	147.36	0.62	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,499.26	1,498.64
147.36	147.39	0.03	Core Loss	1,498.64	1,498.61
147.39	148.39	1.00	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,498.61	1,497.61
148.39	148.44	0.05	Core Loss	1,497.61	1,497.56
148.44	151.81	3.37	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,497.56	1,494.19
151.81	152.50	0.69	Sandstone and Siltstone, Very fine to fine grained, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,494.19	1,493.50
152.50	152.54	0.04	Core Loss	1,493.50	1,493.46
152.54	154.79	2.25	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,493.46	1,491.21
154.79	154.83	0.04	Core Loss	1,491.21	1,491.17
154.83	156.07	1.24	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in blebs	1,491.17	1,489.93

From	To	Thick	Description	RL From	RL To
156.07	159.38	3.31	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 15 dip	1,489.93	1,486.62
159.38	159.41	0.03	Core Loss	1,486.62	1,486.59
159.41	159.58	0.17	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sheared at basal contact	1,486.59	1,486.42
159.58	160.78	1.20	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in blebs	1,486.42	1,485.22
160.78	160.91	0.13	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in blebs	1,485.22	1,485.09
160.91	160.98	0.07	Core Loss	1,485.09	1,485.02
160.98	161.04	0.06	Core Loss, Lost coal	1,485.02	1,484.96
161.04	161.23	0.19	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,484.96	1,484.77
161.23	161.38	0.15	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,484.77	1,484.62
161.38	161.57	0.19	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,484.62	1,484.43
161.57	164.43	2.86	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,484.43	1,481.57
164.43	164.47	0.04	Core Loss	1,481.57	1,481.53
164.47	164.88	0.41	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,481.53	1,481.12
164.88	166.19	1.31	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,481.12	1,479.81
166.19	166.34	0.15	Core Loss	1,479.81	1,479.66
166.34	170.68	4.34	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,479.66	1,475.32
170.68	172.99	2.31	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact	1,475.32	1,473.01
172.99	174.36	1.37	Sandstone, Very fine to fine grained, light grey, massive Fresh, minor (1-15 %) quartz in veins	1,473.01	1,471.64
174.36	174.41	0.05	Core Loss	1,471.64	1,471.59
174.41	175.86	1.45	Sandstone, Very fine to fine grained, light grey, massive Fresh, minor (1-15 %) quartz in veins	1,471.59	1,470.14
175.86	175.91	0.05	Core Loss	1,470.14	1,470.09
175.91	180.17	4.26	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,470.09	1,465.83
180.17	180.38	0.21	Siltstone, dark grey, laminated Fresh	1,465.83	1,465.62
180.38	180.41	0.03	Core Loss	1,465.62	1,465.59
180.41	181.89	1.48	Siltstone, dark grey, massive Fresh	1,465.59	1,464.11
181.89	181.97	0.08	Core Loss	1,464.11	1,464.03
181.97	182.02	0.05	Siltstone, dark grey, massive Fresh, sharp and parallel basal contact	1,464.03	1,463.98
182.02	182.20	0.18	Siltstone, dark grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite on bedding planes	1,463.98	1,463.80
182.20	182.33	0.13	Coal, interbanded dull and bright bands(40-60%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, common (15-40 %) quartz clasts	1,463.80	1,463.67

From	To	Thick	Description	RL From	RL To
182.33	182.56	0.23	Coal, interbanded dull and bright bands(40-60%), black, laminated minor (1-15%) Mudstone bands Fresh, gradational basal contact, minor (1-15 %) pyrite in blebs	1,463.67	1,463.44
182.56	182.86	0.30	Coal, interbanded dull and bright bands(40-60%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, common (15-40 %) quartz clasts	1,463.44	1,463.14
182.86	183.04	0.18	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,463.14	1,462.96
183.04	184.91	1.87	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,462.96	1,461.09
184.91	187.96	3.05	Sandstone, Very fine to fine grained, medium grey, massive Fresh, sharp and parallel basal contact	1,461.09	1,458.04
187.96	189.21	1.25	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,458.04	1,456.79
189.21	189.38	0.17	Coaly Siltstone, dark grey, laminated Fresh	1,456.79	1,456.62
189.38	189.45	0.07	Core Loss	1,456.62	1,456.55
189.45	190.02	0.57	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,456.55	1,455.98
190.02	190.20	0.18	Coal, dull with minor bright bands (1-10%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts	1,455.98	1,455.80
190.20	191.91	1.71	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,455.80	1,454.09
191.91	192.37	0.46	Sandstone, Very fine to fine grained, medium grey, laminated Fresh	1,454.09	1,453.63
192.37	192.41	0.04	Core Loss	1,453.63	1,453.59
192.41	200.61	8.20	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and oblique, minor (1-15 %) quartz in veins	1,453.59	1,445.39
200.61	200.74	0.13	Coaly Siltstone, black, laminated Fresh, minor (1-15 %) quartz on bedding planes	1,445.39	1,445.26
200.74	200.82	0.08	Core Loss	1,445.26	1,445.18
200.82	202.80	1.98	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,445.18	1,443.20
202.80	204.39	1.59	Siltstone, dark grey, laminated Fresh, minor (1-15 %) quartz in veins	1,443.20	1,441.61
204.39	204.41	0.02	Core Loss	1,441.61	1,441.59
204.41	204.98	0.57	Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,441.59	1,441.02
204.98	205.89	0.91	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,441.02	1,440.11
205.89	205.91	0.02	Core Loss	1,440.11	1,440.09
205.91	205.96	0.05	Core Loss	1,440.09	1,440.04
205.96	210.37	4.41	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,440.04	1,435.63
210.37	210.41	0.04	Core Loss	1,435.63	1,435.59
210.41	211.78	1.37	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,435.59	1,434.22
211.78	211.91	0.13	Core Loss	1,434.22	1,434.09
211.91	213.39	1.48	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, 15 dip, minor (1-15 %) quartz in veins	1,434.09	1,432.61

From	To	Thick	Description	RL From	RL To
213.39	213.41	0.02	Core Loss	1,432.61	1,432.59
213.41	214.88	1.47	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,432.59	1,431.12
214.88	214.91	0.03	Core Loss	1,431.12	1,431.09
214.91	216.31	1.40	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,431.09	1,429.69
216.31	216.41	0.10	Core Loss	1,429.69	1,429.59
216.41	219.37	2.96	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,429.59	1,426.63
219.37	219.41	0.04	Core Loss	1,426.63	1,426.59
219.41	219.50	0.09	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,426.59	1,426.50

Hole: DHPN-17-02B

Hole Summary

Hole Type: Fully cored

Location

Site:	ARCH3	Lease:	
Easting:	527296	Accuracy:	GPS (hand held)
Northing:	6300409	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1645	Height Datum:	North American Datum 1983
Survey Company:		Survey Date:	

Comments

Geologists

Depth	Geologist

Drilling

Date Commenced: August-25-17 Geological Org.:
Date Completed: August-25-17 Total Depth: 16.5
Drilling Company

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
1	0.87	1.50	DRIFTWOOD DIAMOND DRILLING					
2	2.10	4.50						
3	1.07	6.00						
4	0.92	7.50						
5	1.20	9.00						
6	0.98	10.50						
7	1.39	12.00						
8	1.48	13.50						
9	1.10	15.00						
10	1.29	16.50						

Casing

Depth	Type	Size	Recovered

Cementing

From Depth	To Depth	Date	Volume

Geophysics

Acoustic Scanner	☐
Caliper	☒
Density	☒
Deviation	☐
Dipmeter	☐
Natural Gamma	☒
Neutron	☐
Resistivity	☐
Sonic	☐
Temperature	☐
Acoustic Scanner	☐
Caliper	☐
Cement bond log	☐
Density	☐
Dipmeter	☐
Downhole Camera	☐
Full Waveform Sonic	☐
Gyroscopic Verticality	☐
Natural Gamma	☐
Neutron	☐
Resistivity	☐
Spontaneous Potential	☐
Sonic	☐
Temperature	☐
Verticality	☐
X-Ray	☐

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology

DHPN-17-02B

From	To	Thick	Description	RL From	RL To
0.00	0.87	0.87	Gravel, brown, Distinctly weathered	1,645.00	1,644.13
0.87	1.50	0.63	Core Loss	1,644.13	1,643.50
1.50	2.49	0.99	Gravel, brown, Distinctly weathered	1,643.50	1,642.51
2.49	3.39	0.90	Core Loss	1,642.51	1,641.61
3.39	4.74	1.35	Siltstone, light grey, massive Distinctly weathered, minor (1-15 %) plant fragments on bedding planes	1,641.61	1,640.26
4.74	4.89	0.15	Core Loss	1,640.26	1,640.11
4.89	5.43	0.54	Siltstone, medium grey, massive Moderately weathered, gradational basal contact, minor (1-15 %) plant fragments on bedding planes	1,640.11	1,639.57
5.43	5.62	0.19	Siltstone, medium grey, massive Moderately weathered, sharp and parallel basal contact, minor (1-15 %) plant fragments on bedding planes	1,639.57	1,639.38
5.62	5.97	0.35	Coal, interbanded dull and bright bands(40-60%), black, laminated Slightly weathered, gradational basal contact	1,639.38	1,639.03
5.97	6.25	0.28	Core Loss, Lost coal	1,639.03	1,638.75
6.25	6.47	0.22	Carbonaceous Siltstone, black, laminated Slightly weathered, gradational basal contact, plant fragments on bedding planes	1,638.75	1,638.53
6.47	6.67	0.20	Siltstone, dark grey, laminated Slightly weathered, sharp and parallel basal contact	1,638.53	1,638.33
6.67	6.80	0.13	Siltstone, medium grey, massive Slightly weathered	1,638.33	1,638.20
6.80	7.38	0.58	Core Loss	1,638.20	1,637.62
7.38	7.51	0.13	Siltstone, medium grey, massive Moderately weathered, gradational basal contact	1,637.62	1,637.49
7.51	8.50	0.99	Sandstone, Very fine to fine grained, light grey, laminated Moderately weathered, 5 dip	1,637.49	1,636.50
8.50	8.80	0.30	Core Loss	1,636.50	1,636.20
8.80	9.71	0.91	Siltstone, medium grey, laminated Slightly weathered	1,636.20	1,635.29
9.71	10.23	0.52	Core Loss	1,635.29	1,634.77
10.23	10.45	0.22	Siltstone, medium grey, laminated Slightly weathered, gradational basal contact, minor (1-15 %) quartz in veins	1,634.77	1,634.55
10.45	11.89	1.44	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Slightly weathered	1,634.55	1,633.11
11.89	12.00	0.11	Core Loss	1,633.11	1,633.00
12.00	13.92	1.92	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) plant fragments on bedding planes	1,633.00	1,631.08
13.92	13.94	0.02	Core Loss	1,631.08	1,631.06
13.94	14.34	0.40	Core Loss	1,631.06	1,630.66
14.34	14.53	0.19	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,630.66	1,630.47
14.53	14.81	0.28	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact, 10 dip	1,630.47	1,630.19
14.81	16.29	1.48	Carbonaceous Siltstone, medium grey, laminated Fresh	1,630.19	1,628.71
16.29	16.50	0.21	Core Loss	1,628.71	1,628.50

Hole: DHPN-17-03

Hole Summary

Hole Type: Fully cored

Location

Site:	ARCH7	Lease:	
Easting:	528451	Accuracy:	GPS (hand held)
Northing:	6301514	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1614	Height Datum:	North American Datum 1983
Survey Company:		Survey Date:	

Comments

Geologists

Depth	Geologist
286.50	DC

Drilling

Date Commenced:	August-24-17	Geological Org.:	
Date Completed:	August-31-17	Total Depth:	286.5
Drilling Company			

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
1	0.43	2.00	DRIFTWOOD DIAMOND DRILLING		SB 5200			
2	0.22	5.00						
3	0.25	8.00						
4	0.90	9.00						
5	0.50	9.50						
6	1.12	12.50						
7	0.43	13.50						
8	1.21	16.50						
9	0.93	19.50						
10	1.70	22.50						
11	0.93	25.50						
12	0.63	28.50						
13	1.74	31.50						
14	3.00	34.50						
15	3.00	37.50						
16	2.95	40.50						
17	2.60	43.50						
18	2.84	46.50						
19	1.54	48.50						
20	1.00	49.50						
21	2.94	52.50						
22	2.95	55.50						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
23	3.00	58.50						
24	3.00	61.50						
25	3.00	64.50						
26	2.96	67.50						
27	3.00	70.50						
28	2.93	73.50						
29	2.84	76.50						
30	3.00	79.50						
31	2.98	82.50						
32	3.00	85.50						
33	3.00	88.50						
34	2.98	91.50						
35	2.80	94.50						
36	3.00	97.50						
37	2.91	100.50						
38	2.92	103.50						
39	3.00	106.50						
40	3.00	109.50						
41	3.00	112.50						
42	3.00	115.50						
43	2.87	118.50						
44	3.00	121.50						
45	3.00	124.50						
46	1.80	126.30						
47	2.67	129.30						
48	1.20	130.50						
49	2.88	133.50						
50	3.00	136.50						
51	3.00	139.50						
52	3.00	142.50						
53	2.92	145.50						
54	2.97	148.50						
55	3.00	151.50						
56	3.00	154.50						
57	2.95	157.50						
58	3.00	160.50						
59	3.00	163.50						
60	3.00	166.50						
61	2.98	169.50						
62	3.00	172.50						
63	2.93	175.50						
64	2.91	178.50						
65	2.62	181.50						
66	3.00	184.50						
67	3.00	187.50						
68	2.89	190.50						
69	3.00	193.50						
70	3.00	196.50						
71	3.00	199.50						
72	2.86	202.50						
73	3.00	205.50						
74	2.94	208.50						
75	2.92	211.50						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
76	3.00	214.50						
77	3.00	217.50						
78	3.00	220.50						
79	2.98	223.50						
80	3.00	226.50						
81	2.93	229.50						
82	2.90	232.50						
83	2.93	235.50						
84	3.00	238.50						
85	3.00	241.50						
86	3.00	244.50						
87	3.00	247.50						
88	2.94	250.50						
89	2.88	253.50						
90	2.85	256.50						
91	1.50	258.00						
92	0.80	259.50						
93	3.00	262.50						
94	1.50	264.00						
95	1.50	265.50						
96	3.00	268.50						
97	2.89	271.50						
98	3.00	274.50						
99	3.00	277.50						
100	2.91	280.50						
101	2.93	283.50						
102	3.00	286.50						

Casing

Depth	Type	Size	Recovered
25.50	HQ		

Cementing

From Depth	To Depth	Date	Volume

Geophysics

Acoustic Scanner	☐
Caliper	☒
Density	☒
Deviation	☐
Dipmeter	☐
Natural Gamma	☒
Neutron	☐
Resistivity	☐
Sonic	☐
Temperature	☐
Acoustic Scanner	☐
Caliper	☐
Cement bond log	☐
Density	☐
Dipmeter	☐
Downhole Camera	☐
Full Waveform Sonic	☐
Gyroscopic Verticality	☐
Natural Gamma	☐
Neutron	☐
Resistivity	☐
Spontaneous Potential	☐
Sonic	☐
Temperature	☐
Verticality	☐
X-Ray	☐

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology DHPN-17-03

From	To	Thick	Description	RL From	RL To
0.00	0.30	0.30	Sandstone, Very fine to fine grained, brown, massive Extremely weathered	1,614.00	1,613.70
0.30	1.38	1.08	Core Loss	1,613.70	1,612.62
1.38	1.53	0.15	Sandstone, Very fine to fine grained, light grey, massive Highly weathered	1,612.62	1,612.47
1.53	3.44	1.91	Core Loss	1,612.47	1,610.56
3.44	5.33	1.89	Core Loss	1,610.56	1,608.67
5.33	5.57	0.24	Sandstone and Siltstone, Very fine to fine grained, light grey, massive Extremely weathered	1,608.67	1,608.43
5.57	5.67	0.10	Core Loss	1,608.43	1,608.33
5.67	6.72	1.05	Siltstone, medium grey, laminated Distinctly weathered, sharp and parallel basal contact, 45 dip	1,608.33	1,607.28
6.72	7.45	0.73	Sandstone, Very fine to fine grained, light grey, massive Slightly weathered	1,607.28	1,606.55
7.45	9.33	1.88	Core Loss	1,606.55	1,604.67
9.33	10.50	1.17	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Highly weathered, 10 dip	1,604.67	1,603.50
10.50	11.07	0.57	Core Loss	1,603.50	1,602.93
11.07	12.86	1.79	Core Loss	1,602.93	1,601.14
12.86	14.07	1.21	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Highly weathered, sharp and parallel basal contact	1,601.14	1,599.93
14.07	15.00	0.93	Sandstone, Very fine to fine grained, brown, massive Extremely weathered	1,599.93	1,599.00
15.00	17.07	2.07	Core Loss	1,599.00	1,596.93
17.07	17.97	0.90	Sandstone, Very fine to fine grained, light grey, massive Highly weathered	1,596.93	1,596.03
17.97	19.27	1.30	Core Loss	1,596.03	1,594.73
19.27	19.81	0.54	Sandstone, Very fine to fine grained, light grey, massive Highly weathered, sharp and parallel basal contact	1,594.73	1,594.19
19.81	20.07	0.26	Siltstone, medium grey, laminated Distinctly weathered	1,594.19	1,593.93
20.07	22.14	2.07	Core Loss	1,593.93	1,591.86
22.14	23.07	0.93	Siltstone, medium grey, laminated Distinctly weathered, 30 dip	1,591.86	1,590.93
23.07	25.44	2.37	Core Loss	1,590.93	1,588.56
25.44	25.83	0.39	Siltstone, medium grey, laminated Highly weathered, sharp and parallel basal contact	1,588.56	1,588.17
25.83	26.94	1.11	Sandstone, Very fine to fine grained, light grey, massive Highly weathered, sharp and oblique	1,588.17	1,587.06
26.94	27.81	0.87	Siltstone, medium grey, massive Highly weathered	1,587.06	1,586.19
27.81	29.07	1.26	Core Loss	1,586.19	1,584.93
29.07	30.00	0.93	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Moderately weathered, gradational basal contact, 10 dip, minor (1-15 %) quartz on bedding planes	1,584.93	1,584.00
30.00	32.17	2.17	Siltstone, medium grey, massive Slightly weathered, gradational basal contact	1,584.00	1,581.83
32.17	32.75	0.58	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,581.83	1,581.25
32.75	34.08	1.33	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,581.25	1,579.92

From	To	Thick	Description	RL From	RL To
34.08	35.26	1.18	Siltstone, medium grey, laminated Moderately weathered, sharp and oblique	1,579.92	1,578.74
35.26	37.58	2.32	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact, 20 dip, rare (<1 %) quartz on bedding planes	1,578.74	1,576.42
37.58	37.99	0.41	Siltstone, medium grey, massive Fresh	1,576.42	1,576.01
37.99	38.04	0.05	Core Loss	1,576.01	1,575.96
38.04	38.47	0.43	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact	1,575.96	1,575.53
38.47	38.64	0.17	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, 10 dip, rare (<1 %) clay on bedding planes	1,575.53	1,575.36
38.64	38.84	0.20	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, 10 dip, rare (<1 %) clay on bedding planes	1,575.36	1,575.16
38.84	39.20	0.36	Core Loss, Lost coal	1,575.16	1,574.80
39.20	39.50	0.30	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh	1,574.80	1,574.50
39.50	39.52	0.02	Core Loss	1,574.50	1,574.48
39.52	39.81	0.29	Siltstone, dark grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz on bedding planes	1,574.48	1,574.19
39.81	40.02	0.21	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact	1,574.19	1,573.98
40.02	40.12	0.10	Carbonaceous Siltstone, dark grey, laminated Fresh, sharp and parallel basal contact	1,573.98	1,573.88
40.12	40.52	0.40	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, rare (<1 %) quartz in cleat	1,573.88	1,573.48
40.52	40.72	0.20	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, rare (<1 %) quartz in cleat	1,573.48	1,573.28
40.72	40.92	0.20	Siltstone, dark grey, massive Fresh, gradational basal contact	1,573.28	1,573.08
40.92	42.06	1.14	Siltstone, dark grey, massive Fresh, gradational basal contact	1,573.08	1,571.94
42.06	43.88	1.82	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,571.94	1,570.12
43.88	44.04	0.16	Core Loss	1,570.12	1,569.96
44.04	45.58	1.54	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,569.96	1,568.42
45.58	46.04	0.46	Core Loss	1,568.42	1,567.96
46.04	46.74	0.70	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) clay on joints	1,567.96	1,567.26
46.74	48.80	2.06	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,567.26	1,565.20
48.80	49.98	1.18	Siltstone, medium grey, massive Fresh	1,565.20	1,564.02
49.98	50.04	0.06	Core Loss	1,564.02	1,563.96
50.04	50.93	0.89	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact	1,563.96	1,563.07
50.93	51.24	0.31	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and undulose basal contact	1,563.07	1,562.76
51.24	52.99	1.75	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, 5 dip	1,562.76	1,561.01

From	To	Thick	Description	RL From	RL To
52.99	53.04	0.05	Core Loss	1,561.01	1,560.96
53.04	54.33	1.29	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,560.96	1,559.67
54.33	59.21	4.88	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and oblique, minor (1-15 %) clay on joints	1,559.67	1,554.79
59.21	64.27	5.06	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, rare (<1 %) clay on joints	1,554.79	1,549.73
64.27	65.00	0.73	Siltstone, medium grey, laminated Fresh	1,549.73	1,549.00
65.00	65.04	0.04	Core Loss	1,549.00	1,548.96
65.04	68.20	3.16	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,548.96	1,545.80
68.20	70.09	1.89	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,545.80	1,543.91
70.09	70.99	0.90	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,543.91	1,543.01
70.99	71.01	0.02	Siltstone, medium grey, massive Fresh	1,543.01	1,542.99
71.01	71.08	0.07	Core Loss	1,542.99	1,542.92
71.08	72.13	1.05	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite nodules	1,542.92	1,541.87
72.13	72.33	0.20	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite nodules	1,541.87	1,541.67
72.33	72.45	0.12	Coal, bright with dull bands (60-90%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,541.67	1,541.55
72.45	72.59	0.14	Coal, mainly dull with frequent bright bands (10-40%), black, laminated Fresh, sharp and parallel basal contact	1,541.55	1,541.41
72.59	72.66	0.07	Core Loss, Lost coal	1,541.41	1,541.34
72.66	72.84	0.18	Coal, bright with dull bands (60-90%), black, laminated Fresh, sharp and parallel basal contact	1,541.34	1,541.16
72.84	72.88	0.04	Core Loss, Lost coal	1,541.16	1,541.12
72.88	73.03	0.15	Coal, mainly dull with frequent bright bands (10-40%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,541.12	1,540.97
73.03	73.22	0.19	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, rare (<1 %) quartz on bedding planes	1,540.97	1,540.78
73.22	73.37	0.15	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, rare (<1 %) quartz on bedding planes	1,540.78	1,540.63
73.37	74.01	0.64	Siltstone, medium grey, massive Fresh	1,540.63	1,539.99
74.01	74.06	0.05	Core Loss	1,539.99	1,539.94
74.06	74.35	0.29	Siltstone, medium grey, massive Fresh, gradational basal contact	1,539.94	1,539.65
74.35	75.20	0.85	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact, 5 dip	1,539.65	1,538.80
75.20	75.77	0.57	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact	1,538.80	1,538.23
75.77	77.97	2.20	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,538.23	1,536.03

From	To	Thick	Description	RL From	RL To
77.97	78.31	0.34	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact	1,536.03	1,535.69
78.31	79.07	0.76	Carbonaceous Siltstone, medium grey, laminated Fresh, gradational basal contact	1,535.69	1,534.93
79.07	80.02	0.95	Siltstone, medium grey, massive Fresh	1,534.93	1,533.98
80.02	80.04	0.02	Core Loss	1,533.98	1,533.96
80.04	81.34	1.30	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite disseminated	1,533.96	1,532.66
81.34	81.50	0.16	Coal, interbanded dull and bright bands(40-60%), black, laminated common (15-40%) Siltstone Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,532.66	1,532.50
81.50	81.68	0.18	Carbonaceous Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite disseminated	1,532.50	1,532.32
81.68	88.30	6.62	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,532.32	1,525.70
88.30	89.07	0.77	Siltstone, medium grey, laminated Fresh	1,525.70	1,524.93
89.07	89.09	0.02	Core Loss	1,524.93	1,524.91
89.09	89.32	0.23	Carbonaceous Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, common (15-40 %) pyrite disseminated	1,524.91	1,524.68
89.32	89.64	0.32	Coal, dull with minor bright bands (1-10%), black, laminated abundant (40-60%) Siltstone Fresh	1,524.68	1,524.36
89.64	89.84	0.20	Coal, interbanded dull and bright bands(40-60%), black, laminated minor (1-15%) Siltstone laminae Fresh	1,524.36	1,524.16
89.84	90.04	0.20	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,524.16	1,523.96
90.04	91.77	1.73	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,523.96	1,522.23
91.77	92.04	0.27	Core Loss	1,522.23	1,521.96
92.04	93.16	1.12	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,521.96	1,520.84
93.16	94.05	0.89	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,520.84	1,519.95
94.05	96.16	2.11	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 5 dip	1,519.95	1,517.84
96.16	96.50	0.34	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite on bedding planes	1,517.84	1,517.50
96.50	96.70	0.20	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite on bedding planes	1,517.50	1,517.30
96.70	96.94	0.24	Coal, bright with dull bands (60-90%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) pyrite on bedding planes	1,517.30	1,517.06
96.94	97.14	0.20	Carbonaceous Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact	1,517.06	1,516.86
97.14	97.53	0.39	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact	1,516.86	1,516.47
97.53	98.03	0.50	Siltstone, medium grey, massive Fresh	1,516.47	1,515.97
98.03	98.12	0.09	Core Loss	1,515.97	1,515.88
98.12	98.36	0.24	Siltstone, medium grey, massive	1,515.88	1,515.64

From	To	Thick	Description	RL From	RL To
98.36	98.56	0.20	Coal, interbanded dull and bright bands(40-60%), black, laminated common (15-40%) Siltstone bands Fresh, gradational basal contact	1,515.64	1,515.44
98.56	98.76	0.20	Carbonaceous Siltstone, dark grey, massive Fresh, gradational basal contact	1,515.44	1,515.24
98.76	100.21	1.45	Siltstone, dark grey, massive Fresh, gradational basal contact	1,515.24	1,513.79
100.21	101.05	0.84	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,513.79	1,512.95
101.05	101.13	0.08	Core Loss	1,512.95	1,512.87
101.13	102.26	1.13	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,512.87	1,511.74
102.26	102.50	0.24	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,511.74	1,511.50
102.50	103.74	1.24	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,511.50	1,510.26
103.74	106.09	2.35	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact, 5 dip, minor (1-15 %) quartz in veins	1,510.26	1,507.91
106.09	106.58	0.49	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact	1,507.91	1,507.42
106.58	108.75	2.17	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,507.42	1,505.25
108.75	110.42	1.67	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,505.25	1,503.58
110.42	111.73	1.31	Siltstone, medium grey, massive Fresh, gradational basal contact	1,503.58	1,502.27
111.73	115.17	3.44	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,502.27	1,498.83
115.17	115.91	0.74	Sandstone, Very fine to fine grained, light grey, massive Fresh	1,498.83	1,498.09
115.91	116.04	0.13	Core Loss	1,498.09	1,497.96
116.04	120.76	4.72	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,497.96	1,493.24
120.76	121.32	0.56	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,493.24	1,492.68
121.32	121.91	0.59	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,492.68	1,492.09
121.91	122.42	0.51	Siltstone, medium grey, massive Fresh, minor (1-15 %) pyrite nodules	1,492.09	1,491.58
122.42	122.67	0.25	Siltstone, medium grey, massive Fresh	1,491.58	1,491.33
122.67	123.71	1.04	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite nodules	1,491.33	1,490.29
123.71	123.91	0.20	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite nodules	1,490.29	1,490.09
123.91	124.15	0.24	Core Loss	1,490.09	1,489.85
124.15	124.35	0.20	Coal, interbanded dull and bright bands(40-60%), black, Fresh, fractured at basal contact	1,489.85	1,489.65
124.35	124.89	0.54	Coal, interbanded dull and bright bands(40-60%), black, Fresh, fractured at basal contact	1,489.65	1,489.11

From	To	Thick	Description	RL From	RL To
124.89	124.98	0.09	Core Loss, Lost coal	1,489.11	1,489.02
124.98	125.12	0.14	Siltstone, dark grey, massive Fresh, fractured at basal contact, minor (1-15 %) quartz in veins	1,489.02	1,488.88
125.12	125.39	0.27	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact	1,488.88	1,488.61
125.39	125.87	0.48	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact	1,488.61	1,488.13
125.87	126.07	0.20	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact	1,488.13	1,487.93
126.07	126.18	0.11	Siltstone, medium grey, massive Fresh, minor (1-15 %) pyrite nodules	1,487.93	1,487.82
126.18	126.39	0.21	Siltstone, medium grey, massive Fresh	1,487.82	1,487.61
126.39	126.95	0.56	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite nodules	1,487.61	1,487.05
126.95	128.00	1.05	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,487.05	1,486.00
128.00	128.57	0.57	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact	1,486.00	1,485.43
128.57	128.66	0.09	Coaly Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz on bedding planes	1,485.43	1,485.34
128.66	130.54	1.88	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,485.34	1,483.46
130.54	130.92	0.38	Siltstone, medium grey, massive Fresh	1,483.46	1,483.08
130.92	131.04	0.12	Core Loss	1,483.08	1,482.96
131.04	131.38	0.34	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact	1,482.96	1,482.62
131.38	132.70	1.32	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and oblique, minor (1-15 %) quartz in veins	1,482.62	1,481.30
132.70	134.45	1.75	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,481.30	1,479.55
134.45	135.80	1.35	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 5 dip	1,479.55	1,478.20
135.80	138.61	2.81	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,478.20	1,475.39
138.61	138.85	0.24	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,475.39	1,475.15
138.85	139.00	0.15	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,475.15	1,475.00
139.00	140.75	1.75	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact	1,475.00	1,473.25
140.75	141.49	0.74	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,473.25	1,472.51
141.49	141.77	0.28	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,472.51	1,472.23
141.77	142.30	0.53	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,472.23	1,471.70
142.30	142.93	0.63	Siltstone, dark grey, laminated Fresh, gradational basal contact, plant fragments on bedding planes	1,471.70	1,471.07

From	To	Thick	Description	RL From	RL To
142.93	143.00	0.07	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, minor (1-15 %) quartz in cleat	1,471.07	1,471.00
143.00	143.08	0.08	Core Loss, Lost coal	1,471.00	1,470.92
143.08	143.11	0.03	Core Loss, Lost coal	1,470.92	1,470.89
143.11	143.21	0.10	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,470.89	1,470.79
143.21	144.94	1.73	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,470.79	1,469.06
144.94	154.99	10.05	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, 10 dip	1,469.06	1,459.01
154.99	155.04	0.05	Core Loss	1,459.01	1,458.96
155.04	155.22	0.18	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,458.96	1,458.78
155.22	159.29	4.07	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,458.78	1,454.71
159.29	163.28	3.99	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,454.71	1,450.72
163.28	163.68	0.40	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,450.72	1,450.32
163.68	167.02	3.34	Siltstone, dark grey, laminated Fresh, minor (1-15 %) pyrite disseminated	1,450.32	1,446.98
167.02	167.04	0.02	Core Loss	1,446.98	1,446.96
167.04	168.48	1.44	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,446.96	1,445.52
168.48	168.91	0.43	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,445.52	1,445.09
168.91	171.99	3.08	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,445.09	1,442.01
171.99	172.22	0.23	Siltstone, dark grey, laminated Fresh, sharp and oblique	1,442.01	1,441.78
172.22	172.54	0.32	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, minor (1-15 %) quartz in cleat	1,441.78	1,441.46
172.54	172.83	0.29	Siltstone, Fresh	1,441.46	1,441.17
172.83	173.03	0.20	Coal, bright (>90%), black, laminated Fresh	1,441.17	1,440.97
173.03	173.10	0.07	Core Loss, Lost coal	1,440.97	1,440.90
173.10	173.19	0.09	Core Loss, Lost coal	1,440.90	1,440.81
173.19	173.73	0.54	Coal, bright (>90%), black, laminated Fresh, gradational basal contact	1,440.81	1,440.27
173.73	174.31	0.58	Coal, bright with dull bands (60-90%), black, massive Fresh, gradational basal contact	1,440.27	1,439.69
174.31	174.85	0.54	Coal, bright with dull bands (60-90%), black, massive Fresh, gradational basal contact	1,439.69	1,439.15
174.85	175.39	0.54	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, fractured at basal contact	1,439.15	1,438.61
175.39	175.48	0.09	Siltstone, dark grey, massive carbonaceous Fresh, fractured at basal contact	1,438.61	1,438.52
175.48	175.83	0.35	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact	1,438.52	1,438.17
175.83	176.02	0.19	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact	1,438.17	1,437.98
176.02	176.20	0.18	Siltstone, dark grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) quartz on bedding planes	1,437.98	1,437.80

From	To	Thick	Description	RL From	RL To
176.20	176.31	0.11	Siltstone, dark grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) quartz on bedding planes	1,437.80	1,437.69
176.31	176.58	0.27	Sandstone, Very fine to fine grained, medium grey, massive Fresh, minor (1-15 %) pyrite nodules	1,437.69	1,437.42
176.58	178.25	1.67	Sandstone, Very fine to fine grained, medium grey, massive Fresh, sharp and oblique, minor (1-15 %) quartz in veins	1,437.42	1,435.75
178.25	178.72	0.47	Siltstone, dark grey, laminated Fresh	1,435.75	1,435.28
178.72	179.10	0.38	Core Loss	1,435.28	1,434.90
179.10	182.50	3.40	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,434.90	1,431.50
182.50	184.73	2.23	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,431.50	1,429.27
184.73	187.56	2.83	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,429.27	1,426.44
187.56	187.93	0.37	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) quartz in cleat	1,426.44	1,426.07
187.93	188.04	0.11	Core Loss	1,426.07	1,425.96
188.04	188.34	0.30	Mudstone, light grey, massive Moderately weathered, sharp and parallel basal contact	1,425.96	1,425.66
188.34	190.04	1.70	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,425.66	1,423.96
190.04	190.85	0.81	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact	1,423.96	1,423.15
190.85	191.14	0.29	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,423.15	1,422.86
191.14	192.11	0.97	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact	1,422.86	1,421.89
192.11	192.30	0.19	Carbonaceous Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz on bedding planes	1,421.89	1,421.70
192.30	192.53	0.23	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,421.70	1,421.47
192.53	192.69	0.16	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,421.47	1,421.31
192.69	192.87	0.18	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,421.31	1,421.13
192.87	193.63	0.76	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,421.13	1,420.37
193.63	194.74	1.11	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,420.37	1,419.26
194.74	194.94	0.20	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact	1,419.26	1,419.06
194.94	195.13	0.19	Coal, mainly dull with frequent bright bands (10-40%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,419.06	1,418.87
195.13	195.30	0.17	Coal, mainly dull with frequent bright bands (10-40%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,418.87	1,418.70

From	To	Thick	Description	RL From	RL To
195.30	195.49	0.19	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) plant fragments on bedding planes	1,418.70	1,418.51
195.49	199.30	3.81	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) plant fragments on bedding planes	1,418.51	1,414.70
199.30	199.90	0.60	Siltstone, medium grey, laminated Fresh	1,414.70	1,414.10
199.90	200.04	0.14	Core Loss	1,414.10	1,413.96
200.04	202.20	2.16	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, 15 dip	1,413.96	1,411.80
202.20	206.02	3.82	Siltstone, medium grey, massive Fresh, minor (1-15 %) quartz in veins	1,411.80	1,407.98
206.02	206.08	0.06	Core Loss	1,407.98	1,407.92
206.08	206.49	0.41	Siltstone, medium grey, massive carbonaceous Fresh, gradational basal contact	1,407.92	1,407.51
206.49	206.69	0.20	Siltstone, medium grey, massive Fresh, gradational basal contact	1,407.51	1,407.31
206.69	206.88	0.19	Coal, interbanded dull and bright bands(40-60%), black, laminated common (15-40%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,407.31	1,407.12
206.88	207.14	0.26	Coaly Siltstone, medium grey, laminated common (15-40%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,407.12	1,406.86
207.14	207.46	0.32	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,406.86	1,406.54
207.46	207.65	0.19	Siltstone, medium grey, massive Fresh, rare (<1 %) quartz in veins	1,406.54	1,406.35
207.65	209.00	1.35	Siltstone, medium grey, massive Fresh, rare (<1 %) quartz in veins	1,406.35	1,405.00
209.00	209.08	0.08	Core Loss	1,405.00	1,404.92
209.08	209.95	0.87	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,404.92	1,404.05
209.95	212.24	2.29	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,404.05	1,401.76
212.24	212.76	0.52	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,401.76	1,401.24
212.76	215.07	2.31	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,401.24	1,398.93
215.07	219.26	4.19	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact	1,398.93	1,394.74
219.26	220.25	0.99	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,394.74	1,393.75
220.25	221.02	0.77	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,393.75	1,392.98
221.02	221.04	0.02	Core Loss	1,392.98	1,392.96
221.04	223.67	2.63	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,392.96	1,390.33
223.67	226.94	3.27	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,390.33	1,387.06
226.94	226.97	0.03	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,387.06	1,387.03

From	To	Thick	Description	RL From	RL To
226.97	227.04	0.07	Core Loss	1,387.03	1,386.96
227.04	228.42	1.38	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 15 dip	1,386.96	1,385.58
228.42	229.94	1.52	Siltstone, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,385.58	1,384.06
229.94	230.04	0.10	Core Loss	1,384.06	1,383.96
230.04	231.34	1.30	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,383.96	1,382.66
231.34	231.53	0.19	Coal, stony, black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,382.66	1,382.47
231.53	232.97	1.44	Carbonaceous Siltstone, medium grey, laminated Fresh, minor (1-15 %) quartz on bedding planes	1,382.47	1,381.03
232.97	233.04	0.07	Core Loss	1,381.03	1,380.96
233.04	233.33	0.29	Carbonaceous Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz on bedding planes	1,380.96	1,380.67
233.33	238.22	4.89	Siltstone, medium grey, massive Fresh, gradational basal contact	1,380.67	1,375.78
238.22	239.53	1.31	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,375.78	1,374.47
239.53	240.29	0.76	Siltstone, medium grey, laminated Fresh, sharp and oblique	1,374.47	1,373.71
240.29	240.85	0.56	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,373.71	1,373.15
240.85	241.30	0.45	Siltstone, medium grey, massive Fresh, sharp and oblique, minor (1-15 %) quartz in veins	1,373.15	1,372.70
241.30	242.93	1.63	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,372.70	1,371.07
242.93	244.42	1.49	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,371.07	1,369.58
244.42	246.02	1.60	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact	1,369.58	1,367.98
246.02	246.64	0.62	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,367.98	1,367.36
246.64	247.98	1.34	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, 15 dip	1,367.36	1,366.02
247.98	248.04	0.06	Core Loss	1,366.02	1,365.96
248.04	248.19	0.15	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,365.96	1,365.81
248.19	250.66	2.47	Siltstone, medium grey, laminated Fresh, sharp and oblique	1,365.81	1,363.34
250.66	250.74	0.08	Coal, interbanded dull and bright bands(40-60%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, common (15-40 %) quartz in cleat	1,363.34	1,363.26
250.74	251.12	0.38	Siltstone, dark grey, laminated Fresh	1,363.26	1,362.88
251.12	251.24	0.12	Core Loss	1,362.88	1,362.76
251.24	253.98	2.74	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,362.76	1,360.02
253.98	254.16	0.18	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,360.02	1,359.84

From	To	Thick	Description	RL From	RL To
254.16	254.31	0.15	Core Loss	1,359.84	1,359.69
254.31	254.68	0.37	Coal, dull (<1%), black, massive Fresh, fractured at basal contact	1,359.69	1,359.32
254.68	254.83	0.15	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, common (15-40 %) quartz in cleat	1,359.32	1,359.17
254.83	255.03	0.20	Siltstone, dark grey, laminated Fresh	1,359.17	1,358.97
255.03	255.54	0.51	Siltstone, dark grey, laminated Fresh	1,358.97	1,358.46
255.54	256.24	0.70	Core Loss	1,358.46	1,357.76
256.24	264.95	8.71	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact	1,357.76	1,349.05
264.95	265.13	0.18	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact	1,349.05	1,348.87
265.13	265.41	0.28	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact, common (15-40 %) quartz in cleat	1,348.87	1,348.59
265.41	265.63	0.22	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,348.59	1,348.37
265.63	266.20	0.57	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,348.37	1,347.80
266.20	266.31	0.11	Core Loss	1,347.80	1,347.69
266.31	276.84	10.53	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 10 dip	1,347.69	1,337.16
276.84	277.95	1.11	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,337.16	1,336.05
277.95	278.04	0.09	Core Loss	1,336.05	1,335.96
278.04	280.97	2.93	Sandstone, Very fine to fine grained, light grey, massive minor (1-15%) Siltstone Fresh	1,335.96	1,333.03
280.97	281.04	0.07	Core Loss	1,333.03	1,332.96
281.04	286.50	5.46	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,332.96	1,327.50

Hole: DHPN-17-04

Hole Summary

Hole Type: Fully cored

Location

Site:	ARCH8	Lease:	
Easting:	526983	Accuracy:	GPS (hand held)
Northing:	6303870	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1564	Height Datum:	North American Datum 1983
Survey Company:		Survey Date:	

Comments

Geologists

Depth	Geologist
156.00	IM

Drilling

Date Commenced:	August-27-17	Geological Org.:	
Date Completed:	September-02-17	Total Depth:	156
Drilling Company			

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
1	1.16	3.00	DRIFTWOOD DIAMOND DRILLING					
2	0.94	4.50						
3	1.08	6.00						
4	0.75	7.50						
5	1.15	9.00						
6	1.20	10.50						
7	1.13	12.00						
8	1.36	13.50						
9	0.99	15.00						
10	0.87	16.50						
11	1.03	18.00						
12	1.27	19.50						
13	1.03	21.00						
14	1.40	22.50						
15	1.44	24.00						
16	1.08	25.50						
17	0.44	27.00						
18	0.54	28.50						
19	0.43	30.00						
20	0.27	31.50						
21	0.16	33.00						
22	0.05	34.50						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
23	0.05	36.00						
24	0.17	37.50						
25	0.10	39.00						
26	1.14	40.50						
27	1.43	42.00						
28	0.27	43.50						
29	1.04	45.00						
30	0.93	46.50						
31	0.80	48.00						
32	1.02	49.50						
33	1.13	51.00						
34	1.41	52.50						
35	1.50	54.00						
36	1.30	55.50						
37	1.50	57.00						
38	1.45	58.50						
39	1.35	60.00						
40	0.69	61.50						
41	0.54	63.00						
42	0.41	64.50						
43	0.93	66.00						
44	1.47	67.50						
45	1.42	69.00						
46	1.48	70.50						
47	1.42	72.00						
48	1.50	73.50						
49	1.39	75.00						
50	1.50	76.50						
51	1.50	78.00						
52	1.35	79.50						
53	1.44	81.00						
54	1.41	82.50						
55	1.44	84.00						
56	0.89	85.50						
57	0.87	87.00						
58	0.84	88.50						
59	0.50	90.00						
60	1.11	91.50						
61	2.73	94.50						
62	1.24	96.00						
63	1.06	97.50						
64	1.03	99.00						
65	1.12	100.50						
66	1.22	102.00						
67	1.38	103.50						
68	1.33	105.00						
69	1.50	106.50						
70	1.50	108.00						
71	1.50	109.50						
72	1.46	111.00						
73	1.50	112.50						
74	1.47	114.00						
75	1.50	115.50						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
76	1.46	117.00						
77	1.50	118.50						
78	1.48	120.00						
79	1.50	121.50						
80	1.50	123.00						
81	1.48	124.50						
82	1.50	126.00						
83	1.50	127.50						
84	1.37	129.00						
85	1.50	130.50						
86	1.50	132.00						
87	1.50	133.50						
88	1.46	135.00						
89	1.50	136.50						
90	1.45	138.00						
91	1.50	139.50						
92	1.45	141.00						
93	1.02	142.50						
94	1.37	144.00						
95	1.44	145.50						
96	1.50	147.00						
97	1.34	148.50						
98	1.46	150.00						
99	1.32	151.50						
100	0.42	151.92						
101	0.98	153.00						
102	1.15	154.50						
103	1.24	156.00						

Casing

Depth	Type	Size	Recovered

Cementing

From Depth	To Depth	Date	Volume

Geophysics

- ☐ Acoustic Scanner
- ☐ Caliper
- ☐ Density
- ☐ Deviation
- ☐ Dipmeter
- ☐ Natural Gamma
- ☐ Neutron
- ☐ Resistivity
- ☐ Sonic
- ☐ Temperature
- ☐ Acoustic Scanner
- ☐ Caliper
- ☐ Cement bond log
- ☐ Density
- ☐ Dipmeter
- ☐ Downhole Camera
- ☐ Full Waveform Sonic
- ☐ Gyroscopic Verticality
- ☐ Natural Gamma
- ☐ Neutron
- ☐ Resistivity
- ☐ Spontaneous Potential
- ☐ Sonic
- ☐ Temperature
- ☐ Verticality
- ☐ X-Ray

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology DHPN-17-04

From	To	Thick	Description	RL From	RL To
0.00	1.16	1.16	Siltstone, medium grey, laminated Highly weathered	1,564.00	1,562.84
1.16	3.00	1.84	Core Loss	1,562.84	1,561.00
3.00	3.94	0.94	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Highly weathered	1,561.00	1,560.06
3.94	4.50	0.56	Core Loss	1,560.06	1,559.50
4.50	5.58	1.08	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Highly weathered	1,559.50	1,558.42
5.58	6.00	0.42	Core Loss	1,558.42	1,558.00
6.00	6.75	0.75	Sandstone and Siltstone, Very fine to fine grained, brown, laminated Extremely weathered	1,558.00	1,557.25
6.75	7.50	0.75	Core Loss	1,557.25	1,556.50
7.50	8.65	1.15	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Highly weathered	1,556.50	1,555.35
8.65	9.00	0.35	Core Loss	1,555.35	1,555.00
9.00	10.20	1.20	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Highly weathered, 70 dip	1,555.00	1,553.80
10.20	10.50	0.30	Core Loss	1,553.80	1,553.50
10.50	11.63	1.13	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Distinctly weathered	1,553.50	1,552.37
11.63	12.00	0.37	Core Loss	1,552.37	1,552.00
12.00	12.64	0.64	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Distinctly weathered, sharp and parallel basal contact	1,552.00	1,551.36
12.64	13.36	0.72	Siltstone, medium grey, massive Distinctly weathered	1,551.36	1,550.64
13.36	13.50	0.14	Core Loss	1,550.64	1,550.50
13.50	14.49	0.99	Siltstone, medium grey, massive Distinctly weathered	1,550.50	1,549.51
14.49	15.00	0.51	Core Loss	1,549.51	1,549.00
15.00	15.87	0.87	Siltstone, medium grey, massive Distinctly weathered	1,549.00	1,548.13
15.87	16.50	0.63	Core Loss	1,548.13	1,547.50
16.50	17.53	1.03	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Distinctly weathered, 10 dip	1,547.50	1,546.47
17.53	18.00	0.47	Core Loss	1,546.47	1,546.00
18.00	19.27	1.27	Sandstone, Very fine to fine grained, light grey, laminated Slightly weathered	1,546.00	1,544.73
19.27	19.50	0.23	Core Loss	1,544.73	1,544.50
19.50	20.53	1.03	Siltstone, medium grey, massive Moderately weathered	1,544.50	1,543.47
20.53	21.00	0.47	Core Loss	1,543.47	1,543.00
21.00	21.18	0.18	Siltstone, medium grey, massive Moderately weathered, sharp and parallel basal contact	1,543.00	1,542.82
21.18	21.63	0.45	Conglomerate, light grey, massive Slightly weathered, gradational basal contact	1,542.82	1,542.37
21.63	22.40	0.77	Sandstone, Coarse grained, light grey, massive Moderately weathered	1,542.37	1,541.60
22.40	22.50	0.10	Core Loss	1,541.60	1,541.50
22.50	23.94	1.44	Sandstone, Coarse grained, light grey, massive Moderately weathered, common (15-40 %) quartz in veins	1,541.50	1,540.06
23.94	24.00	0.06	Core Loss	1,540.06	1,540.00
24.00	25.08	1.08	Sandstone, Coarse grained, light grey, massive Slightly weathered, minor (1-15 %) quartz in veins	1,540.00	1,538.92
25.08	25.50	0.42	Core Loss	1,538.92	1,538.50
25.50	25.94	0.44	Sandstone, Medium to coarse grained, light grey, massive Moderately weathered	1,538.50	1,538.06

From	To	Thick	Description	RL From	RL To
25.94	27.00	1.06	Core Loss	1,538.06	1,537.00
27.00	27.54	0.54	Sandstone, Medium to coarse grained, light grey, massive Slightly weathered	1,537.00	1,536.46
27.54	28.50	0.96	Core Loss	1,536.46	1,535.50
28.50	28.93	0.43	Sandstone, Medium to coarse grained, light grey, massive Slightly weathered	1,535.50	1,535.07
28.93	30.00	1.07	Core Loss	1,535.07	1,534.00
30.00	30.27	0.27	Sandstone, Medium to coarse grained, light grey, massive Slightly weathered, minor (1-15 %) quartz in veins	1,534.00	1,533.73
30.27	31.50	1.23	Core Loss	1,533.73	1,532.50
31.50	31.66	0.16	Sandstone, Medium to coarse grained, light grey, massive Slightly weathered, minor (1-15 %) quartz in veins	1,532.50	1,532.34
31.66	33.00	1.34	Core Loss	1,532.34	1,531.00
33.00	33.05	0.05	Sandstone, Medium to coarse grained, light grey, massive Slightly weathered	1,531.00	1,530.95
33.05	34.50	1.45	Core Loss	1,530.95	1,529.50
34.50	34.55	0.05	Sandstone, Medium to coarse grained, light grey, massive Slightly weathered	1,529.50	1,529.45
34.55	36.00	1.45	Core Loss	1,529.45	1,528.00
36.00	36.17	0.17	Sandstone, Fine to medium grained, light grey, massive Slightly weathered	1,528.00	1,527.83
36.17	37.50	1.33	Core Loss	1,527.83	1,526.50
37.50	37.60	0.10	Sandstone, Fine to medium grained, light grey, massive Slightly weathered	1,526.50	1,526.40
37.60	39.00	1.40	Core Loss	1,526.40	1,525.00
39.00	40.14	1.14	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered, 10 dip	1,525.00	1,523.86
40.14	40.50	0.36	Core Loss	1,523.86	1,523.50
40.50	41.93	1.43	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered	1,523.50	1,522.07
41.93	42.00	0.07	Core Loss	1,522.07	1,522.00
42.00	42.27	0.27	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered	1,522.00	1,521.73
42.27	43.50	1.23	Core Loss	1,521.73	1,520.50
43.50	44.54	1.04	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered	1,520.50	1,519.46
44.54	45.00	0.46	Core Loss	1,519.46	1,519.00
45.00	45.93	0.93	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered	1,519.00	1,518.07
45.93	46.50	0.57	Core Loss	1,518.07	1,517.50
46.50	47.30	0.80	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered, 5 dip	1,517.50	1,516.70
47.30	48.00	0.70	Core Loss	1,516.70	1,516.00
48.00	49.02	1.02	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered	1,516.00	1,514.98
49.02	49.50	0.48	Core Loss	1,514.98	1,514.50
49.50	49.99	0.49	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Slightly weathered, gradational basal contact	1,514.50	1,514.01
49.99	50.63	0.64	Siltstone, medium grey, laminated Fresh	1,514.01	1,513.37
50.63	51.00	0.37	Core Loss	1,513.37	1,513.00
51.00	51.33	0.33	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,513.00	1,512.67

From	To	Thick	Description	RL From	RL To
51.33	51.53	0.20	Carbonaceous Siltstone, medium grey, laminated Fresh, fractured at basal contact	1,512.67	1,512.47
51.53	51.69	0.16	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,512.47	1,512.31
51.69	51.74	0.05	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,512.31	1,512.26
51.74	51.90	0.16	Coal, dull with minor bright bands (1-10%), black, laminated Fresh, fractured at basal contact	1,512.26	1,512.10
51.90	52.12	0.22	Carbonaceous Siltstone, medium grey, laminated Fresh, fractured at basal contact, minor (1-15 %) pyrite disseminated	1,512.10	1,511.88
52.12	52.41	0.29	Siltstone, medium grey, laminated Fresh, minor (1-15 %) pyrite disseminated	1,511.88	1,511.59
52.41	52.50	0.09	Core Loss	1,511.59	1,511.50
52.50	53.53	1.03	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,511.50	1,510.47
53.53	53.87	0.34	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact	1,510.47	1,510.13
53.87	54.00	0.13	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact	1,510.13	1,510.00
54.00	54.53	0.53	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact	1,510.00	1,509.47
54.53	55.30	0.77	Siltstone, medium grey, laminated Fresh, 5 dip	1,509.47	1,508.70
55.30	55.50	0.20	Core Loss	1,508.70	1,508.50
55.50	57.09	1.59	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,508.50	1,506.91
57.09	58.32	1.23	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,506.91	1,505.68
58.32	58.45	0.13	Siltstone, medium grey, massive Fresh	1,505.68	1,505.55
58.45	58.50	0.05	Core Loss	1,505.55	1,505.50
58.50	59.07	0.57	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact	1,505.50	1,504.93
59.07	59.78	0.71	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,504.93	1,504.22
59.78	59.85	0.07	Siltstone, medium grey, laminated Fresh	1,504.22	1,504.15
59.85	60.00	0.15	Core Loss	1,504.15	1,504.00
60.00	60.69	0.69	Siltstone, dark grey, laminated Fresh	1,504.00	1,503.31
60.69	61.50	0.81	Core Loss	1,503.31	1,502.50
61.50	61.79	0.29	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,502.50	1,502.21
61.79	62.04	0.25	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,502.21	1,501.96
62.04	63.00	0.96	Core Loss	1,501.96	1,501.00
63.00	63.41	0.41	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,501.00	1,500.59
63.41	64.50	1.09	Core Loss	1,500.59	1,499.50
64.50	65.43	0.93	Sandstone, Very fine to fine grained, light grey, laminated Fresh, 5 dip	1,499.50	1,498.57
65.43	66.00	0.57	Core Loss	1,498.57	1,498.00
66.00	66.14	0.14	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,498.00	1,497.86
66.14	67.47	1.33	Siltstone, medium grey, massive Fresh	1,497.86	1,496.53
67.47	67.50	0.03	Core Loss	1,496.53	1,496.50
67.50	68.00	0.50	Siltstone, medium grey, massive Fresh, sharp and parallel basal contact	1,496.50	1,496.00

From	To	Thick	Description	RL From	RL To
68.00	68.92	0.92	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,496.00	1,495.08
68.92	69.00	0.08	Core Loss	1,495.08	1,495.00
69.00	70.48	1.48	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,495.00	1,493.52
70.48	70.50	0.02	Core Loss	1,493.52	1,493.50
70.50	71.92	1.42	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,493.50	1,492.08
71.92	72.00	0.08	Core Loss	1,492.08	1,492.00
72.00	74.89	2.89	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,492.00	1,489.11
74.89	75.00	0.11	Core Loss	1,489.11	1,489.00
75.00	75.28	0.28	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,489.00	1,488.72
75.28	77.10	1.82	Siltstone, medium grey, laminated Fresh	1,488.72	1,486.90
77.10	78.07	0.97	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,486.90	1,485.93
78.07	79.35	1.28	Siltstone, medium grey, laminated Fresh	1,485.93	1,484.65
79.35	79.50	0.15	Core Loss	1,484.65	1,484.50
79.50	80.94	1.44	Siltstone, medium grey, laminated Fresh, 5 dip, minor (1-15 %) quartz in veins	1,484.50	1,483.06
80.94	81.00	0.06	Core Loss	1,483.06	1,483.00
81.00	82.41	1.41	Siltstone, medium grey, laminated Fresh	1,483.00	1,481.59
82.41	82.50	0.09	Core Loss	1,481.59	1,481.50
82.50	83.94	1.44	Siltstone, medium grey, laminated Fresh	1,481.50	1,480.06
83.94	84.00	0.06	Core Loss	1,480.06	1,480.00
84.00	84.89	0.89	Siltstone, medium grey, laminated Fresh	1,480.00	1,479.11
84.89	85.50	0.61	Core Loss	1,479.11	1,478.50
85.50	86.37	0.87	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh	1,478.50	1,477.63
86.37	87.00	0.63	Core Loss	1,477.63	1,477.00
87.00	87.20	0.20	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,477.00	1,476.80
87.20	87.84	0.64	Sandstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) quartz in veins	1,476.80	1,476.16
87.84	88.50	0.66	Core Loss	1,476.16	1,475.50
88.50	89.00	0.50	Sandstone, Very fine to fine grained, light grey, laminated Fresh, 5 dip, minor (1-15 %) quartz in veins	1,475.50	1,475.00
89.00	90.00	1.00	Core Loss	1,475.00	1,474.00
90.00	91.11	1.11	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,474.00	1,472.89
91.11	91.50	0.39	Core Loss	1,472.89	1,472.50
91.50	94.23	2.73	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins	1,472.50	1,469.77
94.23	94.50	0.27	Core Loss	1,469.77	1,469.50
94.50	95.74	1.24	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,469.50	1,468.26
95.74	96.00	0.26	Core Loss	1,468.26	1,468.00
96.00	97.06	1.06	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,468.00	1,466.94
97.06	97.50	0.44	Core Loss	1,466.94	1,466.50

From	To	Thick	Description	RL From	RL To
97.50	98.53	1.03	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,466.50	1,465.47
98.53	99.00	0.47	Core Loss	1,465.47	1,465.00
99.00	100.12	1.12	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,465.00	1,463.88
100.12	100.50	0.38	Core Loss	1,463.88	1,463.50
100.50	101.05	0.55	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,463.50	1,462.95
101.05	101.72	0.67	Sandstone, Very fine to fine grained, light grey, massive Fresh, minor (1-15 %) quartz in veins	1,462.95	1,462.28
101.72	102.00	0.28	Core Loss	1,462.28	1,462.00
102.00	103.21	1.21	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,462.00	1,460.79
103.21	103.38	0.17	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,460.79	1,460.62
103.38	103.50	0.12	Core Loss	1,460.62	1,460.50
103.50	104.83	1.33	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,460.50	1,459.17
104.83	105.00	0.17	Core Loss	1,459.17	1,459.00
105.00	107.94	2.94	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 10 dip	1,459.00	1,456.06
107.94	108.33	0.39	Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact	1,456.06	1,455.67
108.33	108.52	0.19	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,455.67	1,455.48
108.52	110.42	1.90	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,455.48	1,453.58
110.42	110.96	0.54	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,453.58	1,453.04
110.96	111.00	0.04	Core Loss	1,453.04	1,453.00
111.00	111.10	0.10	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,453.00	1,452.90
111.10	112.99	1.89	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact	1,452.90	1,451.01
112.99	113.97	0.98	Siltstone, medium grey, laminated Fresh	1,451.01	1,450.03
113.97	114.00	0.03	Core Loss	1,450.03	1,450.00
114.00	114.97	0.97	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,450.00	1,449.03
114.97	116.70	1.73	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,449.03	1,447.30
116.70	116.96	0.26	Siltstone, medium grey, laminated Fresh	1,447.30	1,447.04
116.96	117.00	0.04	Core Loss	1,447.04	1,447.00
117.00	118.02	1.02	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,447.00	1,445.98
118.02	119.98	1.96	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, 10 dip	1,445.98	1,444.02
119.98	120.00	0.02	Core Loss	1,444.02	1,444.00
120.00	120.79	0.79	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,444.00	1,443.21
120.79	121.50	0.71	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,443.21	1,442.50

From	To	Thick	Description	RL From	RL To
121.50	123.02	1.52	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,442.50	1,440.98
123.02	124.48	1.46	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,440.98	1,439.52
124.48	124.50	0.02	Core Loss	1,439.52	1,439.50
124.50	126.00	1.50	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,439.50	1,438.00
126.00	126.21	0.21	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,438.00	1,437.79
126.21	126.41	0.20	Coal, interbanded dull and bright bands(40-60%), black, laminated common (15-40%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,437.79	1,437.59
126.41	126.67	0.26	Coal, interbanded dull and bright bands(40-60%), black, laminated common (15-40%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,437.59	1,437.33
126.67	126.98	0.31	Coal, bright with dull bands (60-90%), dark grey, laminated Fresh, gradational basal contact	1,437.33	1,437.02
126.98	127.23	0.25	Coal, interbanded dull and bright bands(40-60%), black, laminated abundant (40-60%) Siltstone bands Fresh, gradational basal contact	1,437.02	1,436.77
127.23	127.71	0.48	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,436.77	1,436.29
127.71	128.19	0.48	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, faulted at basal contact, minor (1-15 %) pyrite disseminated	1,436.29	1,435.81
128.19	128.41	0.22	Siltstone, medium grey, laminated Fresh	1,435.81	1,435.59
128.41	128.87	0.46	Siltstone, medium grey, laminated Fresh	1,435.59	1,435.13
128.87	129.00	0.13	Core Loss	1,435.13	1,435.00
129.00	129.20	0.20	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,435.00	1,434.80
129.20	134.96	5.76	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) pyrite nodules	1,434.80	1,429.04
134.96	135.00	0.04	Core Loss	1,429.04	1,429.00
135.00	137.95	2.95	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,429.00	1,426.05
137.95	138.00	0.05	Core Loss	1,426.05	1,426.00
138.00	139.48	1.48	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, sharp and oblique, 20 dip, minor (1-15 %) quartz in veins	1,426.00	1,424.52
139.48	139.68	0.20	Siltstone, medium grey, laminated Fresh, sharp and oblique, 20 dip, minor (1-15 %) quartz in veins	1,424.52	1,424.32
139.68	139.89	0.21	Coal, dull with minor bright bands (1-10%), black, laminated Fresh, faulted at basal contact, common (15-40 %) quartz in cleat	1,424.32	1,424.11
139.89	140.14	0.25	Coal, dull with minor bright bands (1-10%), black, laminated Fresh, faulted at basal contact, common (15-40 %) quartz in cleat	1,424.11	1,423.86
140.14	140.34	0.20	Coal, dull with minor bright bands (1-10%), black, laminated Fresh, faulted at basal contact, common (15-40 %) quartz in cleat	1,423.86	1,423.66
140.34	140.54	0.20	Siltstone, medium grey, laminated Fresh, rare (<1 %) quartz in veins	1,423.66	1,423.46

From	To	Thick	Description	RL From	RL To
140.54	140.95	0.41	Siltstone, medium grey, laminated Fresh, rare (<1 %) quartz in veins	1,423.46	1,423.05
140.95	141.00	0.05	Core Loss	1,423.05	1,423.00
141.00	142.02	1.02	Siltstone, medium grey, laminated Fresh, fractured at basal contact	1,423.00	1,421.98
142.02	142.50	0.48	Core Loss	1,421.98	1,421.50
142.50	143.51	1.01	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on joints	1,421.50	1,420.49
143.51	143.87	0.36	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,420.49	1,420.13
143.87	144.00	0.13	Core Loss	1,420.13	1,420.00
144.00	145.44	1.44	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz on joints	1,420.00	1,418.56
145.44	145.50	0.06	Core Loss	1,418.56	1,418.50
145.50	146.57	1.07	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact	1,418.50	1,417.43
146.57	148.34	1.77	Siltstone, medium grey, laminated Fresh, faulted at basal contact, minor (1-15 %) pyrite on bedding planes	1,417.43	1,415.66
148.34	148.50	0.16	Core Loss	1,415.66	1,415.50
148.50	149.96	1.46	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, faulted at basal contact, 30 dip, minor (1-15 %) quartz in veins	1,415.50	1,414.04
149.96	150.00	0.04	Core Loss	1,414.04	1,414.00
150.00	150.30	0.30	Siltstone, medium grey, laminated Fresh	1,414.00	1,413.70
150.30	150.51	0.21	Siltstone, medium grey, laminated Fresh, faulted at basal contact	1,413.70	1,413.49
150.51	150.71	0.20	Coal, interbanded dull and bright bands(40-60%), black, Fresh, fractured at basal contact	1,413.49	1,413.29
150.71	150.91	0.20	Coal, mainly dull with frequent bright bands (10-40%), black, Fresh, fractured at basal contact	1,413.29	1,413.09
150.91	151.32	0.41	Coaly Siltstone, black, Fresh, faulted at basal contact	1,413.09	1,412.68
151.32	151.50	0.18	Core Loss	1,412.68	1,412.50
151.50	151.92	0.42	Coal, stony, black, Fresh, faulted at basal contact	1,412.50	1,412.08
151.92	152.08	0.16	Siltstone, dark grey, Fresh, faulted at basal contact	1,412.08	1,411.92
152.08	152.44	0.36	Coal, stony, black, Fresh, fractured at basal contact	1,411.92	1,411.56
152.44	152.60	0.16	Carbonaceous Siltstone, black, Fresh, fractured at basal contact	1,411.56	1,411.40
152.60	152.77	0.17	Carbonaceous Siltstone, black, Fresh, fractured at basal contact	1,411.40	1,411.23
152.77	152.90	0.13	Siltstone, dark grey, Fresh, fractured at basal contact	1,411.23	1,411.10
152.90	153.00	0.10	Core Loss	1,411.10	1,411.00
153.00	153.12	0.12	Coal, interbanded dull and bright bands(40-60%), black, Fresh, fractured at basal contact	1,411.00	1,410.88
153.12	153.20	0.08	Siltstone, dark grey, Fresh, fractured at basal contact	1,410.88	1,410.80
153.20	153.43	0.23	Coal, dull with minor bright bands (1-10%), black, Fresh, fractured at basal contact	1,410.80	1,410.57
153.43	153.63	0.20	Coaly Siltstone, black, Fresh, fractured at basal contact	1,410.57	1,410.37
153.63	154.15	0.52	Siltstone, dark grey, Fresh, fractured at basal contact	1,410.37	1,409.85
154.15	154.50	0.35	Core Loss	1,409.85	1,409.50
154.50	154.58	0.08	Siltstone	1,409.50	1,409.42
154.58	154.94	0.36	Coal, dull with minor bright bands (1-10%), black, Fresh, fractured at basal contact	1,409.42	1,409.06

From	To	Thick	Description	RL From	RL To
154.94	155.24	0.30	Coal, bright with dull bands (60-90%), black, Fresh, fractured at basal contact	1,409.06	1,408.76
155.24	155.74	0.50	Siltstone, dark grey, Fresh, fractured at basal contact	1,408.76	1,408.26
155.74	156.00	0.26	Core Loss	1,408.26	1,408.00

Hole: DHPN-17-05

Hole Summary

Hole Type: Fully cored

Location

Site:	ARCH2	Lease:	
Easting:	530131	Accuracy:	GPS (hand held)
Northing:	6299676	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1581	Height Datum:	North American Datum 1983
Survey Company:		Survey Date:	

Comments

Geologists

Depth	Geologist
143.00	DC
156.00	HH

Drilling

Date Commenced:	September-01-17	Geological Org.:	
Date Completed:	September-04-17	Total Depth:	248.5
Drilling Company			

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
1	0.45	2.50	DRIFTWOOD DIAMOND DRILLING		SIG SD10			
2	1.91	5.50						
3	2.82	8.50						
4	3.00	11.50						
5	3.00	14.50						
6	3.00	17.50						
7	2.94	20.50						
8	2.87	23.50						
9	2.94	26.50						
10	3.00	29.50						
11	3.00	32.50						
12	2.90	35.50						
13	2.94	38.50						
14	3.00	41.50						
15	3.00	44.50						
16	3.00	47.50						
17	3.00	50.50						
18	3.00	53.50						
19	3.00	56.50						
20	2.96	59.50						
21	2.90	62.50						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
22	3.00	65.50						
23	3.00	68.50						
24	2.92	71.50						
25	3.00	74.50						
26	3.00	77.50						
27	3.00	80.50						
28	2.93	83.50						
29	3.00	86.50						
30	3.00	89.50						
31	2.90	92.50						
32	3.00	95.50						
33	2.79	98.50						
34	2.96	101.50						
35	3.00	104.50						
36	3.00	107.50						
37	3.00	110.50						
38	2.96	113.50						
39	3.00	116.50						
40	3.00	119.50						
41	3.00	122.50						
42	3.00	125.50						
43	2.94	128.50						
44	3.00	131.50						
45	3.00	134.50						
46	3.00	137.50						
47	3.00	140.50						
48	3.00	143.50						
49	2.96	146.50						
50	3.00	149.50						
51	3.00	152.50						
52	2.83	155.50						
53	3.00	158.50						
54	3.00	161.50						
55	3.00	164.50						
56	2.86	167.50						
57	3.00	170.50						
58	3.00	173.50						
59	3.00	176.50						
60	3.00	179.50						
61	3.00	182.50						
62	2.89	185.50						
63	3.00	188.50						
64	3.00	191.50						
65	3.00	194.50						
66	3.00	197.50						
67	3.00	200.50						
68	3.00	203.50						
69	3.00	206.50						
70	3.00	209.50						
71	3.00	212.50						
72	2.95	215.50						
73	3.00	218.50						
74	3.00	221.50						

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid
75	3.00	224.50						
76	3.00	227.50						
77	2.94	230.50						
78	3.00	233.50						
79	3.00	236.50						
80	3.00	239.50						
81	3.00	242.50						
82	2.94	245.50						
83	1.42	248.50						

Casing

Depth	Type	Size	Recovered
6.00	HQ		

Cementing

From Depth	To Depth	Date	Volume

Geophysics

Acoustic Scanner	☐
Caliper	☒
Density	☒
Deviation	☐
Dipmeter	☐
Natural Gamma	☒
Neutron	☐
Resistivity	☐
Sonic	☐
Temperature	☐
Acoustic Scanner	☐
Caliper	☐
Cement bond log	☐
Density	☐
Dipmeter	☐
Downhole Camera	☐
Full Waveform Sonic	☐
Gyroscopic Verticality	☐
Natural Gamma	☐
Neutron	☐
Resistivity	☐
Spontaneous Potential	☐
Sonic	☐
Temperature	☐
Verticality	☐
X-Ray	☐

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology

DHPN-17-05

From	To	Thick	Description	RL From	RL To
0.00	0.45	0.45	Siltstone, dark grey, laminated Moderately weathered	1,581.00	1,580.55
0.45	2.05	1.60	Core Loss	1,580.55	1,578.95
2.05	3.96	1.91	Siltstone, dark grey, laminated Distinctly weathered, rare (<1 %) quartz in veins	1,578.95	1,577.04
3.96	5.05	1.09	Core Loss	1,577.04	1,575.95
5.05	5.90	0.85	Siltstone, dark grey, laminated Slightly weathered, gradational basal contact	1,575.95	1,575.10
5.90	6.59	0.69	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact, 5 dip	1,575.10	1,574.41
6.59	7.84	1.25	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,574.41	1,573.16
7.84	7.87	0.03	Sandstone, Very fine to fine grained, light grey, massive Fresh	1,573.16	1,573.13
7.87	8.05	0.18	Core Loss	1,573.13	1,572.95
8.05	16.99	8.94	Sandstone, Very fine to fine grained, light grey, massive Siltstone bands Fresh, sharp and parallel basal contact	1,572.95	1,564.01
16.99	17.18	0.19	Coal, bright with dull bands (60-90%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,564.01	1,563.82
17.18	17.58	0.40	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,563.82	1,563.42
17.58	19.99	2.41	Sandstone, Very fine to fine grained, light grey, massive Fresh	1,563.42	1,561.01
19.99	20.05	0.06	Core Loss	1,561.01	1,560.95
20.05	22.69	2.64	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins	1,560.95	1,558.31
22.69	22.76	0.07	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, minor (1-15 %) quartz in cleat	1,558.31	1,558.24
22.76	22.89	0.13	Core Loss	1,558.24	1,558.11
22.89	25.99	3.10	Sandstone, Very fine to fine grained, light grey, massive Fresh, 15 dip	1,558.11	1,555.01
25.99	26.05	0.06	Core Loss	1,555.01	1,554.95
26.05	26.39	0.34	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes	1,554.95	1,554.61
26.39	27.57	1.18	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,554.61	1,553.43
27.57	28.77	1.20	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,553.43	1,552.23
28.77	34.95	6.18	Sandstone, Very fine to fine grained, light grey, massive Fresh, common (15-40 %) quartz on joints	1,552.23	1,546.05
34.95	35.05	0.10	Core Loss	1,546.05	1,545.95
35.05	35.84	0.79	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact	1,545.95	1,545.16
35.84	37.99	2.15	Sandstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) quartz on bedding planes	1,545.16	1,543.01
37.99	38.05	0.06	Core Loss	1,543.01	1,542.95
38.05	38.17	0.12	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,542.95	1,542.83

From	To	Thick	Description	RL From	RL To
38.17	40.40	2.23	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) quartz on bedding planes	1,542.83	1,540.60
40.40	42.31	1.91	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,540.60	1,538.69
42.31	47.83	5.52	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,538.69	1,533.17
47.83	53.10	5.27	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 5 dip	1,533.17	1,527.90
53.10	56.02	2.92	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,527.90	1,524.98
56.02	59.01	2.99	Siltstone, medium grey, massive Fresh	1,524.98	1,521.99
59.01	59.05	0.04	Core Loss	1,521.99	1,521.95
59.05	59.23	0.18	Siltstone, medium grey, massive Fresh	1,521.95	1,521.77
59.23	59.44	0.21	Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,521.77	1,521.56
59.44	59.62	0.18	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,521.56	1,521.38
59.62	59.86	0.24	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,521.38	1,521.14
59.86	60.05	0.19	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,521.14	1,520.95
60.05	60.26	0.21	Siltstone, medium grey, laminated Fresh	1,520.95	1,520.74
60.26	61.58	1.32	Siltstone, medium grey, laminated Fresh	1,520.74	1,519.42
61.58	61.95	0.37	Sandstone, Very fine to fine grained, light grey, laminated Fresh	1,519.42	1,519.05
61.95	62.05	0.10	Core Loss	1,519.05	1,518.95
62.05	63.77	1.72	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,518.95	1,517.23
63.77	65.55	1.78	Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated	1,517.23	1,515.45
65.55	69.79	4.24	Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) clay on joints	1,515.45	1,511.21
69.79	70.97	1.18	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh	1,511.21	1,510.03
70.97	71.05	0.08	Core Loss	1,510.03	1,509.95
71.05	81.40	10.35	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in blebs	1,509.95	1,499.60
81.40	81.55	0.15	Coaly Siltstone, black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite disseminated	1,499.60	1,499.45
81.55	82.98	1.43	Siltstone, dark grey, laminated Fresh	1,499.45	1,498.02
82.98	83.05	0.07	Core Loss	1,498.02	1,497.95
83.05	83.63	0.58	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,497.95	1,497.37
83.63	84.21	0.58	Coaly Siltstone, dark grey, laminated Fresh, gradational basal contact	1,497.37	1,496.79

From	To	Thick	Description	RL From	RL To
84.21	84.95	0.74	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,496.79	1,496.05
84.95	88.67	3.72	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,496.05	1,492.33
88.67	91.95	3.28	Sandstone, Very fine to fine grained, light grey, laminated Fresh, 10 dip, minor (1-15 %) quartz in blebs	1,492.33	1,489.05
91.95	92.05	0.10	Core Loss	1,489.05	1,488.95
92.05	92.75	0.70	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in blebs	1,488.95	1,488.25
92.75	94.35	1.60	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,488.25	1,486.65
94.35	97.84	3.49	Sandstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) quartz in veins	1,486.65	1,483.16
97.84	98.05	0.21	Core Loss	1,483.16	1,482.95
98.05	100.37	2.32	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,482.95	1,480.63
100.37	101.01	0.64	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, 5 dip	1,480.63	1,479.99
101.01	101.05	0.04	Core Loss	1,479.99	1,479.95
101.05	104.89	3.84	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,479.95	1,476.11
104.89	106.44	1.55	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,476.11	1,474.56
106.44	107.63	1.19	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact	1,474.56	1,473.37
107.63	107.78	0.15	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,473.37	1,473.22
107.78	110.08	2.30	Siltstone, medium grey, laminated Fresh, gradational basal contact	1,473.22	1,470.92
110.08	112.15	2.07	Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,470.92	1,468.85
112.15	113.01	0.86	Siltstone, medium grey, laminated Fresh	1,468.85	1,467.99
113.01	113.05	0.04	Core Loss	1,467.99	1,467.95
113.05	115.02	1.97	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,467.95	1,465.98
115.02	123.23	8.21	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,465.98	1,457.77
123.23	125.99	2.76	Siltstone, dark grey, laminated Fresh, sharp and parallel basal contact	1,457.77	1,455.01
125.99	126.95	0.96	Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) clay on joints	1,455.01	1,454.05
126.95	127.01	0.06	Core Loss	1,454.05	1,453.99
127.01	127.49	0.48	Siltstone, dark grey, laminated Fresh, sharp and parallel basal contact	1,453.99	1,453.51
127.49	127.69	0.20	Coaly Siltstone, black, laminated Fresh, sharp and parallel basal contact	1,453.51	1,453.31
127.69	128.08	0.39	Coal, bright with dull bands (60-90%), black, laminated Fresh, common (15-40 %) quartz in cleat	1,453.31	1,452.92
128.08	128.28	0.20	Mudstone, black, laminated Fresh, gradational basal contact	1,452.92	1,452.72

From	To	Thick	Description	RL From	RL To
128.28	128.60	0.32	Carbonaceous Mudstone, black, laminated Fresh, gradational basal contact	1,452.72	1,452.40
128.60	128.74	0.14	Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,452.40	1,452.26
128.74	132.05	3.31	Siltstone, dark grey, laminated minor (1-15%) coaly Fresh, gradational basal contact, 10 dip	1,452.26	1,448.95
132.05	140.48	8.43	Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and oblique, minor (1-15 %) quartz in veins	1,448.95	1,440.52
140.48	143.63	3.15	Siltstone, dark grey, laminated Fresh, minor (1-15 %) quartz in veins	1,440.52	1,437.37
143.63	145.29	1.66	Siltstone, dark grey, massive Fresh, gradational basal contact	1,437.37	1,435.71
145.29	146.96	1.67	Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact	1,435.71	1,434.04
146.96	149.11	2.15	Sandstone, Very fine to fine grained, massive Fresh, 25 dip	1,434.04	1,431.89
149.11	152.04	2.93	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,431.89	1,428.96
152.04	153.09	1.05	Siltstone, medium grey, laminated Fresh, faulted at basal contact	1,428.96	1,427.91
153.09	154.09	1.00	Mudstone, dark grey, massive Fresh, sharp and oblique	1,427.91	1,426.91
154.09	154.26	0.17	Core Loss	1,426.91	1,426.74
154.26	154.47	0.21	Coaly Siltstone, black, Fresh, gradational basal contact, common (15-40 %) quartz in veins	1,426.74	1,426.53
154.47	154.69	0.22	Coal, bright with dull bands (60-90%), black, Fresh, gradational basal contact, minor (1-15 %) quartz in cleat	1,426.53	1,426.31
154.69	154.90	0.21	Carbonaceous Siltstone, black, Fresh, gradational basal contact	1,426.31	1,426.10
154.90	155.00	0.10	Carbonaceous Siltstone, black, laminated Fresh, gradational basal contact	1,426.10	1,426.00
155.00	159.45	4.45	Sandstone, Fine grained, light grey, massive Fresh, sharp and parallel basal contact	1,426.00	1,421.55
159.45	162.30	2.85	Siltstone, dark grey, laminated sharp and irregular basal contact, 20 dip	1,421.55	1,418.70
162.30	162.49	0.19	Siltstone, dark grey, laminated sharp and irregular basal contact, 20 dip	1,418.70	1,418.51
162.49	162.72	0.23	Coal, mainly dull with frequent bright bands (10-40%), black, laminated Fresh, gradational basal contact, common (15-40 %) quartz in cleat	1,418.51	1,418.28
162.72	162.93	0.21	Carbonaceous Siltstone, black, laminated Fresh, faulted at basal contact	1,418.28	1,418.07
162.93	164.23	1.30	Siltstone, medium grey, laminated Fresh, faulted at basal contact	1,418.07	1,416.77
164.23	166.13	1.90	Sandstone, Fine grained, light grey, massive Fresh, faulted at basal contact, minor (1-15 %) quartz in veins	1,416.77	1,414.87
166.13	166.27	0.14	Core Loss	1,414.87	1,414.73
166.27	167.10	0.83	Sandstone, Fine grained, light grey, massive Fresh, gradational basal contact, 60 dip	1,414.73	1,413.90
167.10	170.33	3.23	Sandstone, Very fine grained , dark grey, laminated Fresh, sharp and oblique, 90 dip	1,413.90	1,410.67

From	To	Thick	Description	RL From	RL To
170.33	171.68	1.35	Sandstone, Fine grained, medium grey, massive Fresh, gradational basal contact, 50 dip, minor (1-15 %) quartz in veins	1,410.67	1,409.32
171.68	174.24	2.56	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 60 dip	1,409.32	1,406.76
174.24	176.57	2.33	Siltstone, dark grey, laminated Fresh, fractured at basal contact	1,406.76	1,404.43
176.57	176.77	0.20	Siltstone, dark grey, laminated Fresh, fractured at basal contact	1,404.43	1,404.23
176.77	177.00	0.23	Coal, interbanded dull and bright bands(40-60%), laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat	1,404.23	1,404.00
177.00	177.20	0.20	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, faulted at basal contact, 45 dip	1,404.00	1,403.80
177.20	178.85	1.65	Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, faulted at basal contact, 45 dip	1,403.80	1,402.15
178.85	181.33	2.48	Sandstone, Fine grained, medium grey, massive Fresh, fractured at basal contact, 60 dip, common (15-40 %) quartz in veins	1,402.15	1,399.67
181.33	181.45	0.12	Coaly Siltstone, dark grey, Fresh, gradational basal contact, common (15-40 %) quartz in veins	1,399.67	1,399.55
181.45	181.65	0.20	Coal, dull with minor bright bands (1-10%), black, laminated Fresh, gradational basal contact	1,399.55	1,399.35
181.65	184.94	3.29	Sandstone, Fine grained, light grey, massive Fresh, minor (1-15 %) quartz in veins	1,399.35	1,396.06
184.94	187.14	2.20	Sandstone, Fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,396.06	1,393.86
187.14	193.07	5.93	Siltstone, medium grey, laminated Fresh, gradational basal contact, 65 dip	1,393.86	1,387.93
193.07	193.28	0.21	Siltstone, medium grey, laminated Fresh, gradational basal contact, 65 dip	1,387.93	1,387.72
193.28	193.84	0.56	Coal, bright with dull bands (60-90%), black, laminated Fresh, fractured at basal contact	1,387.72	1,387.16
193.84	193.98	0.14	Coal, bright with dull bands (60-90%), black, laminated Siltstone bands minor (1-15%) Fresh	1,387.16	1,387.02
193.98	194.18	0.20	Coaly Siltstone, black, laminated Fresh, sharp and irregular basal contact, minor (1-15 %) pyrite bands	1,387.02	1,386.82
194.18	194.64	0.46	Siltstone, dark grey, massive Fresh, sharp and irregular basal contact	1,386.82	1,386.36
194.64	194.89	0.25	Sandstone, Fine grained, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins	1,386.36	1,386.11
194.89	197.54	2.65	Sandstone, Fine grained, medium grey, massive Fresh, sharp and oblique, minor (1-15 %) bivalves on bedding planes	1,386.11	1,383.46
197.54	197.83	0.29	Sandstone, Fine grained, medium grey, massive Fresh, sharp and oblique, minor (1-15 %) bivalves on bedding planes	1,383.46	1,383.17
197.83	201.00	3.17	Siltstone, medium grey, massive Fresh, faulted at basal contact, 50 dip, minor (1-15 %) quartz in veins	1,383.17	1,380.00

From	To	Thick	Description	RL From	RL To
201.00	205.44	4.44	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact	1,380.00	1,375.56
205.44	210.16	4.72	Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact	1,375.56	1,370.84
210.16	213.42	3.26	Sandstone and Siltstone, Very fine to fine grained, dark grey, laminated Fresh, sharp and parallel basal contact, 60 dip	1,370.84	1,367.58
213.42	213.94	0.52	Sandstone, Fine grained, light grey, laminated Fresh	1,367.58	1,367.06
213.94	213.99	0.05	Core Loss	1,367.06	1,367.01
213.99	216.25	2.26	Sandstone, Fine grained, light grey, laminated Fresh, gradational basal contact	1,367.01	1,364.75
216.25	221.66	5.41	Sandstone and Siltstone, Fine grained, medium grey, laminated Fresh, minor (1-15 %) bivalves on bedding planes	1,364.75	1,359.34
221.66	223.13	1.47	Siltstone, dark grey, laminated Fresh, sharp and parallel basal contact, 65 dip	1,359.34	1,357.87
223.13	226.48	3.35	Sandstone, Fine grained, light grey, massive Fresh, gradational basal contact	1,357.87	1,354.52
226.48	229.59	3.11	Siltstone, dark grey, laminated Fresh	1,354.52	1,351.41
229.59	229.81	0.22	Siltstone, dark grey, laminated Fresh	1,351.41	1,351.19
229.81	229.87	0.06	Core Loss	1,351.19	1,351.13
229.87	230.13	0.26	Coal, bright with dull bands (60-90%), black, laminated Fresh, sharp and irregular basal contact, common (15-40 %) quartz in cleat	1,351.13	1,350.87
230.13	230.34	0.21	Sandstone, Fine to medium grained, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) bivalves on bedding planes	1,350.87	1,350.66
230.34	232.71	2.37	Sandstone, Fine to medium grained, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) bivalves on bedding planes	1,350.66	1,348.29
232.71	234.75	2.04	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,348.29	1,346.25
234.75	235.64	0.89	Siltstone, dark grey, laminated Fresh, gradational basal contact	1,346.25	1,345.36
235.64	243.03	7.39	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact, 70 dip	1,345.36	1,337.97
243.03	243.09	0.06	Core Loss	1,337.97	1,337.91
243.09	243.49	0.40	Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) bivalves on bedding planes	1,337.91	1,337.51
243.49	246.47	2.98	Sandstone, Fine grained, light grey, massive Fresh, gradational basal contact, 76 dip	1,337.51	1,334.53
246.47	248.50	2.03	Core Loss	1,334.53	1,332.50

Hole: TRPN-17-01

Hole Summary

Hole Type: Trench

Location

Site:	HH17-023	Lease:	
Easting:	530496	Accuracy:	GPS (hand held)
Northing:	6302583	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1762	Height Datum:	North American Datum 1983
Survey Company:		Survey Date:	

Comments

Geologists

Depth	Geologist

Drilling

Date Commenced:	August-07-17	Geological Org.:	
Date Completed:	August-07-17	Total Depth:	2.40
Drilling Company			

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid

Casing

Depth	Type	Size	Recovered

Cementing

From Depth	To Depth	Date	Volume

Geophysics

- ☐ Acoustic Scanner
- ☐ Caliper
- ☐ Density
- ☐ Deviation
- ☐ Dipmeter
- ☐ Natural Gamma
- ☐ Neutron
- ☐ Resistivity
- ☐ Sonic
- ☐ Temperature
- ☐ Acoustic Scanner
- ☐ Caliper
- ☐ Cement bond log
- ☐ Density
- ☐ Dipmeter
- ☐ Downhole Camera
- ☐ Full Waveform Sonic
- ☐ Gyroscopic Verticality
- ☐ Natural Gamma
- ☐ Neutron
- ☐ Resistivity
- ☐ Spontaneous Potential
- ☐ Sonic
- ☐ Temperature
- ☐ Verticality
- ☐ X-Ray

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology

TRPN-17-01

From	To	Thick	Description	RL From	RL To
0.00	2.40	2.40	Coal, weathered, black, Weathered	1,762.00	1,759.60

Hole: TRPN-17-02

Hole Summary

Hole Type: Trench

Location

Site:	DC17-54	Lease:	
Easting:	527066	Accuracy:	GPS (hand held)
Northing:	6304173	Geodetic Datum:	Universal Transverse Mercator
		UTM Zone:	9
Elevation:	1513	Height Datum:	North American Datum 1983
Survey Company:		Survey Date:	

Comments

Geologists

Depth	Geologist

Drilling

Date Commenced:	August-09-17	Geological Org.:	
Date Completed:	August-09-17	Total Depth:	1.60
Drilling Company			

Run No.	Recovered	Depth	Drill Co	Rig No	Rig Type	Bit Type	Hole Size	Drill Fluid

Casing

Depth	Type	Size	Recovered

Cementing

From Depth	To Depth	Date	Volume

Geophysics

- ☐ Acoustic Scanner
- ☐ Caliper
- ☐ Density
- ☐ Deviation
- ☐ Dipmeter
- ☐ Natural Gamma
- ☐ Neutron
- ☐ Resistivity
- ☐ Sonic
- ☐ Temperature
- ☐ Acoustic Scanner
- ☐ Caliper
- ☐ Cement bond log
- ☐ Density
- ☐ Dipmeter
- ☐ Downhole Camera
- ☐ Full Waveform Sonic
- ☐ Gyroscopic Verticality
- ☐ Natural Gamma
- ☐ Neutron
- ☐ Resistivity
- ☐ Spontaneous Potential
- ☐ Sonic
- ☐ Temperature
- ☐ Verticality
- ☐ X-Ray

Formation/Horizon Summary

Formation/Horizon	From	To	Thickness	RL From	RL To

Seam Summary

Seam	From	To	Thickness	RL From	RL To

Lithology

TRPN-17-02

From	To	Thick	Description	RL From	RL To
0.00	1.60	1.60	Coal, weathered, black, Weathered	1,513.00	1,511.40

APPENDIX 2

Strip Logs

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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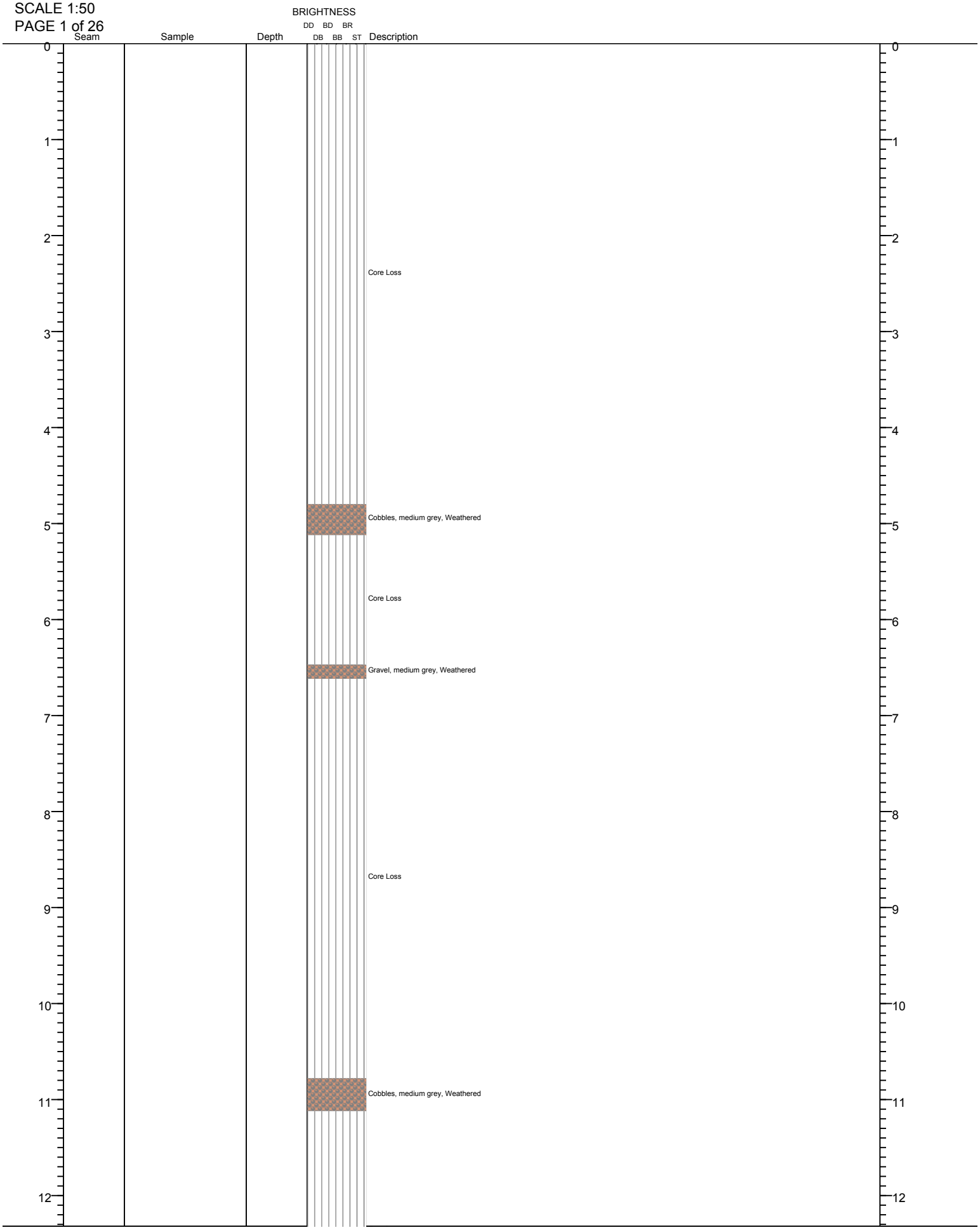
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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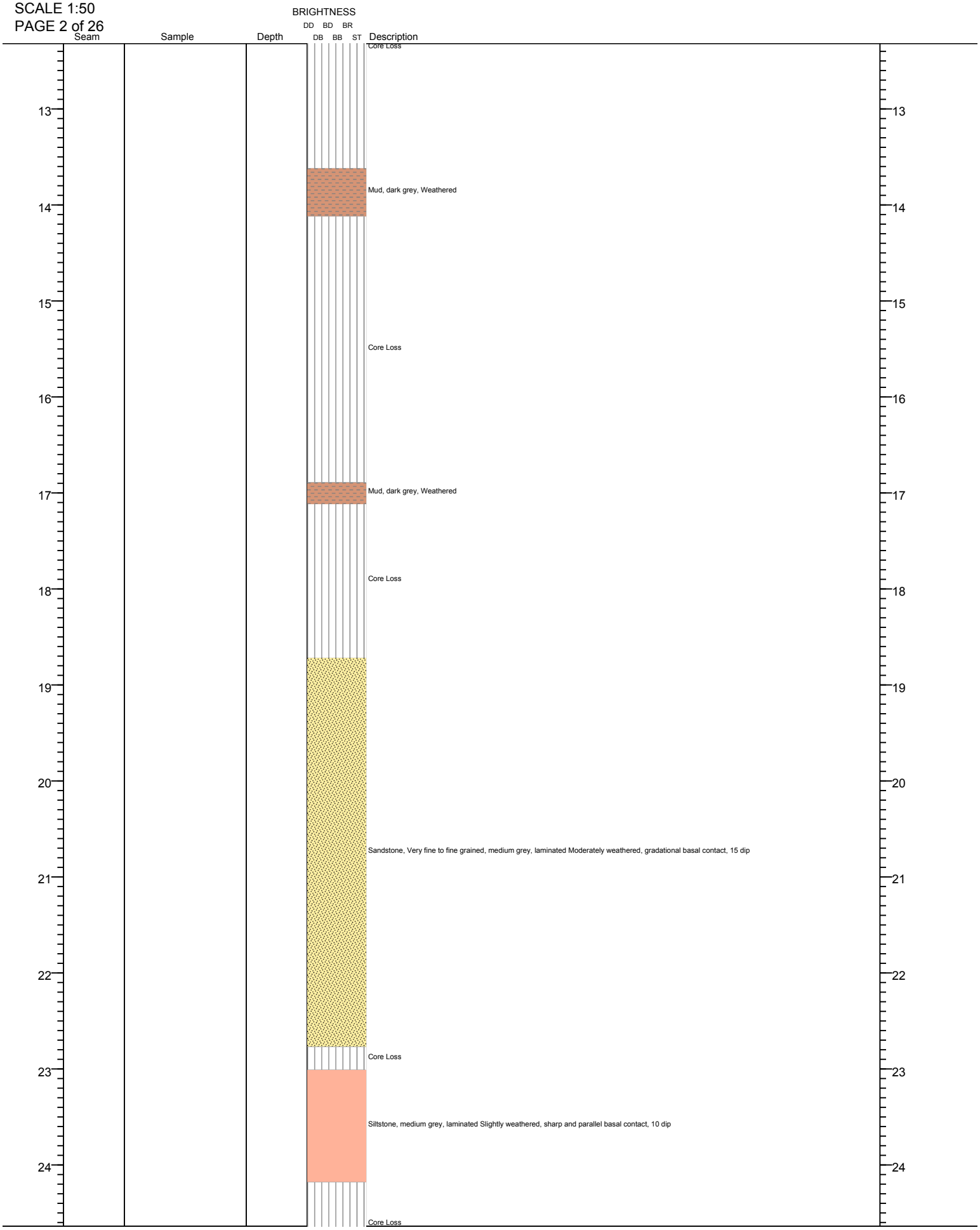
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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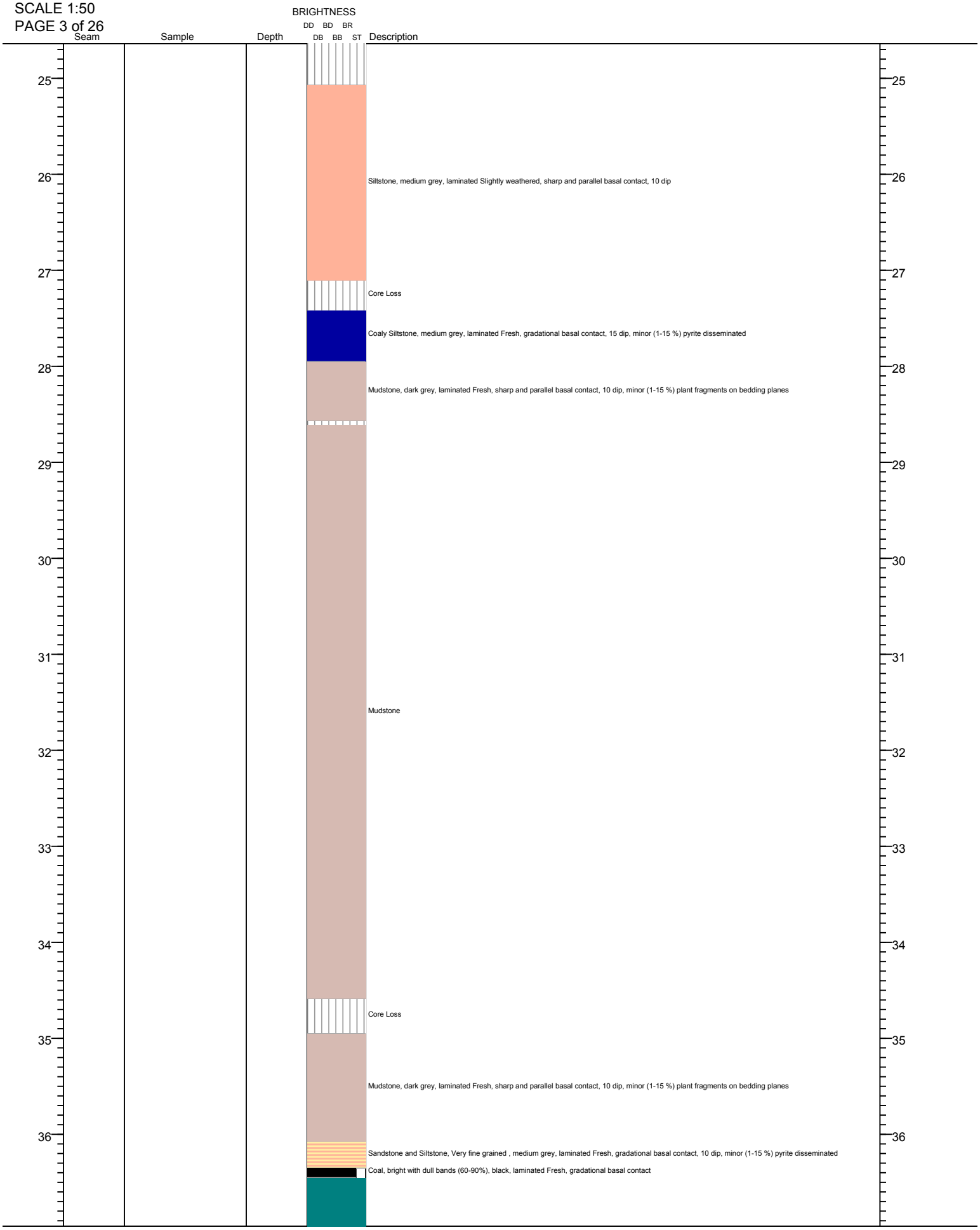
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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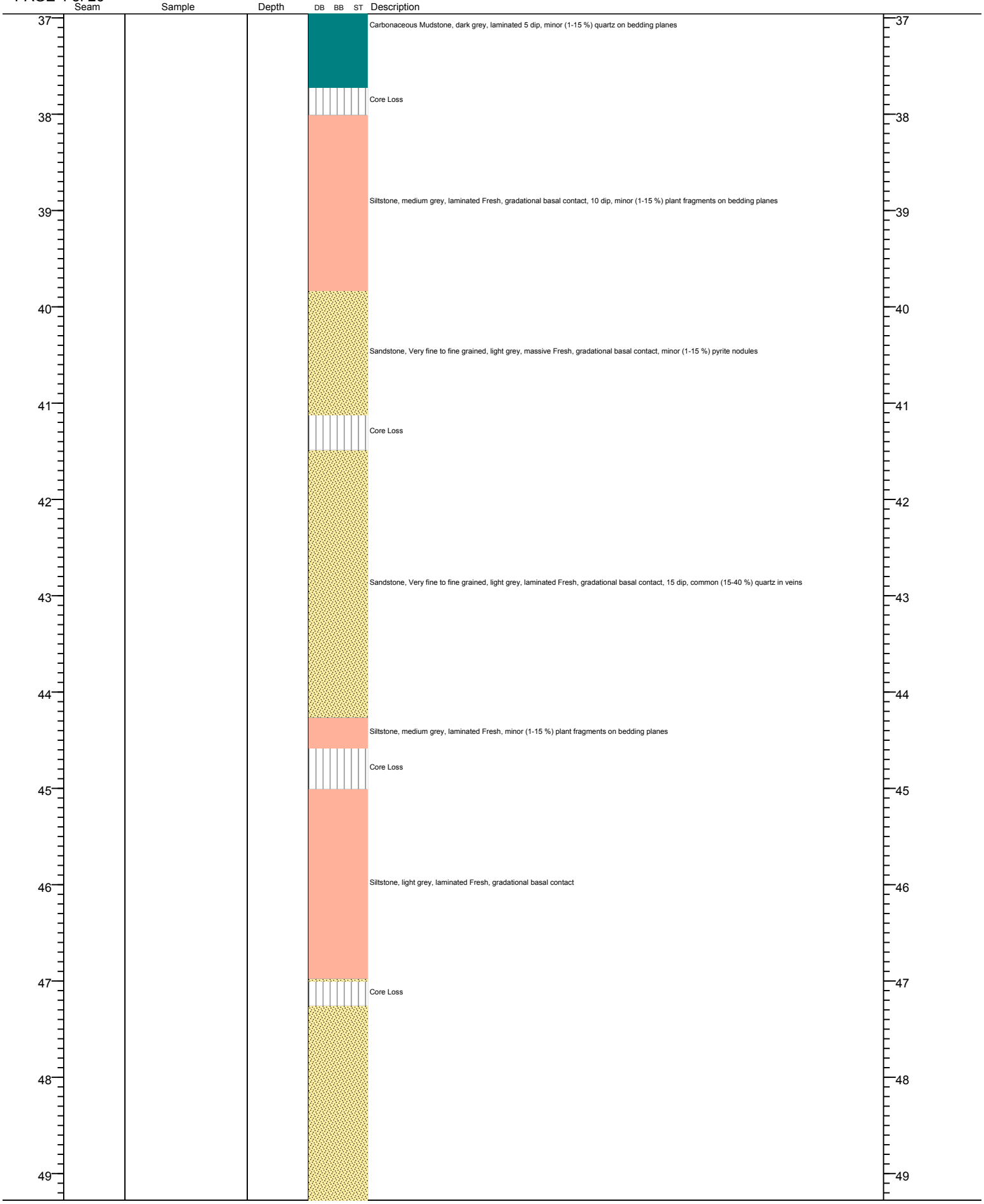
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		50		Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 10 dip
		51		
		52		Core Loss
		53		
		54		Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 10 dip
		55		
		56		
		57		Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact, 15 dip, rare (<1 %) bivalves on bedding planes
		58		
		59		Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, 10 dip
		60		Core Loss
		61		

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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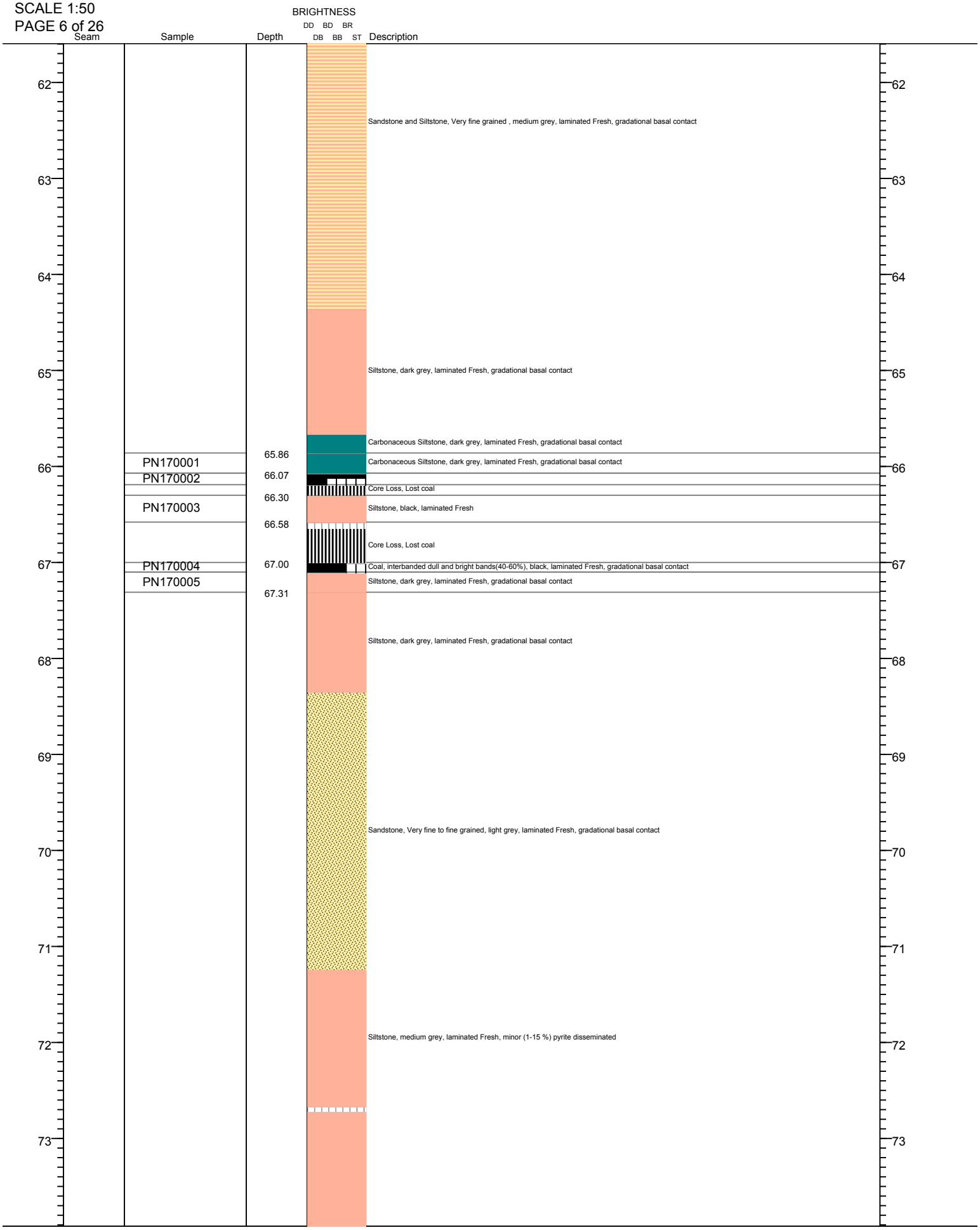
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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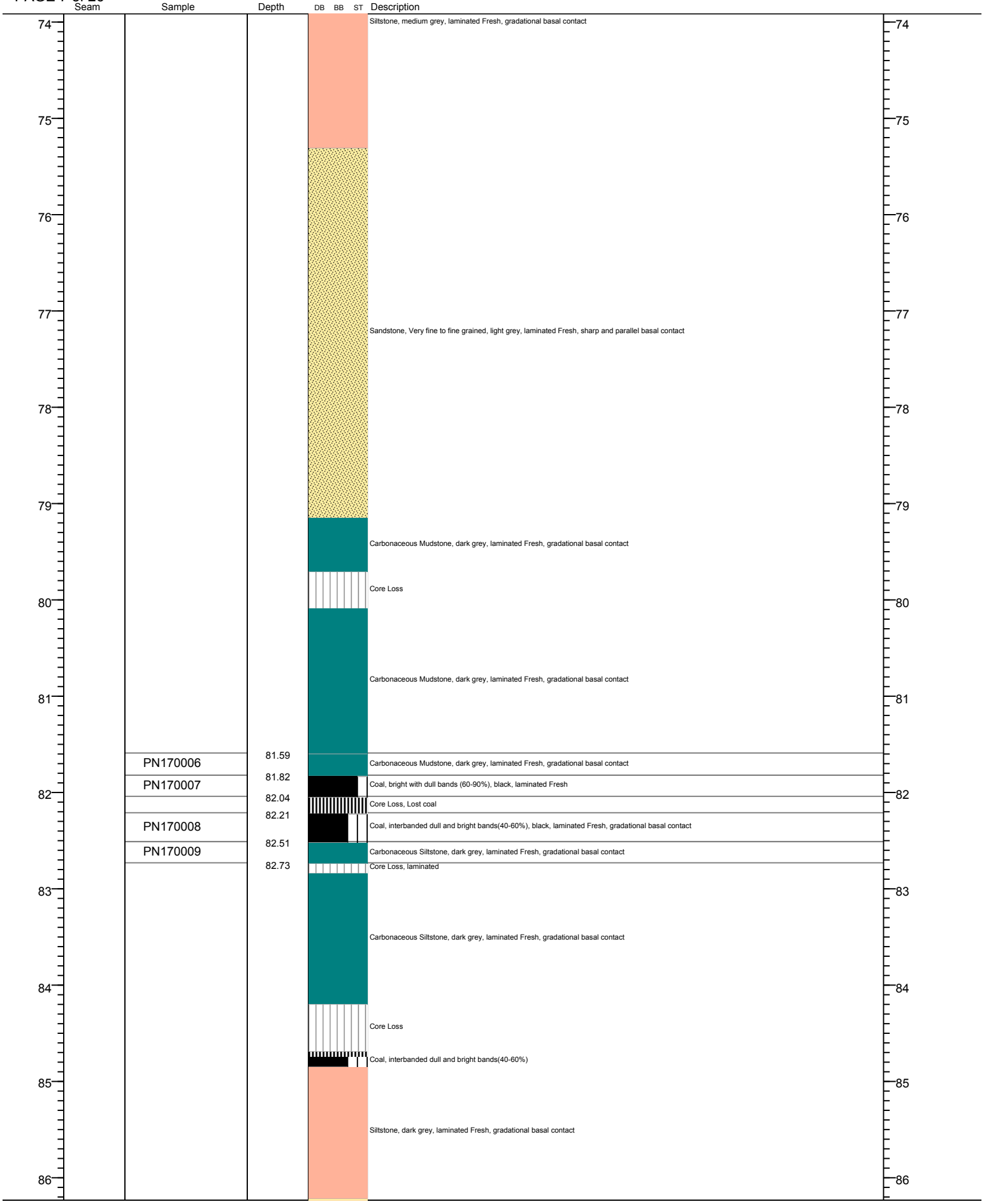
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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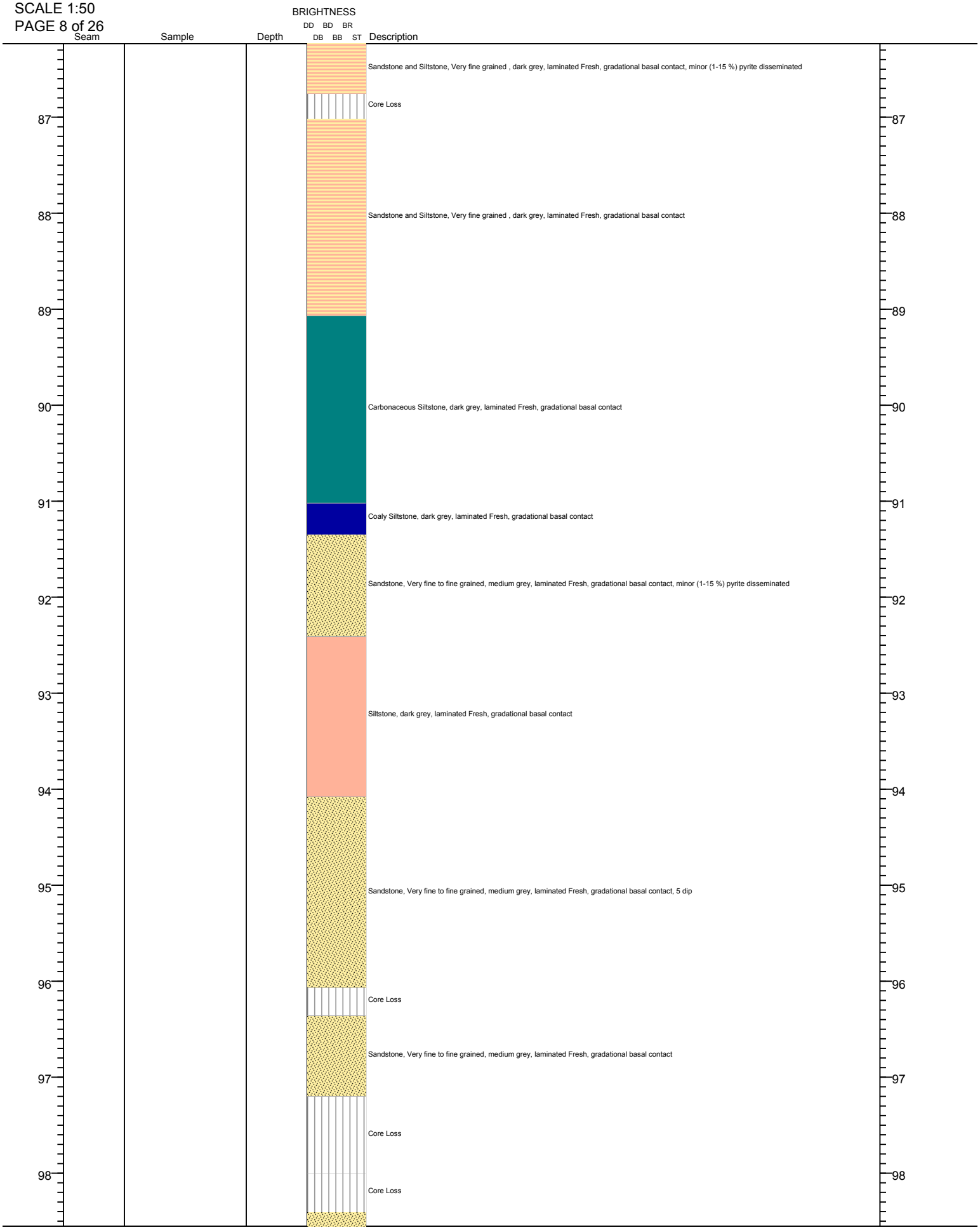
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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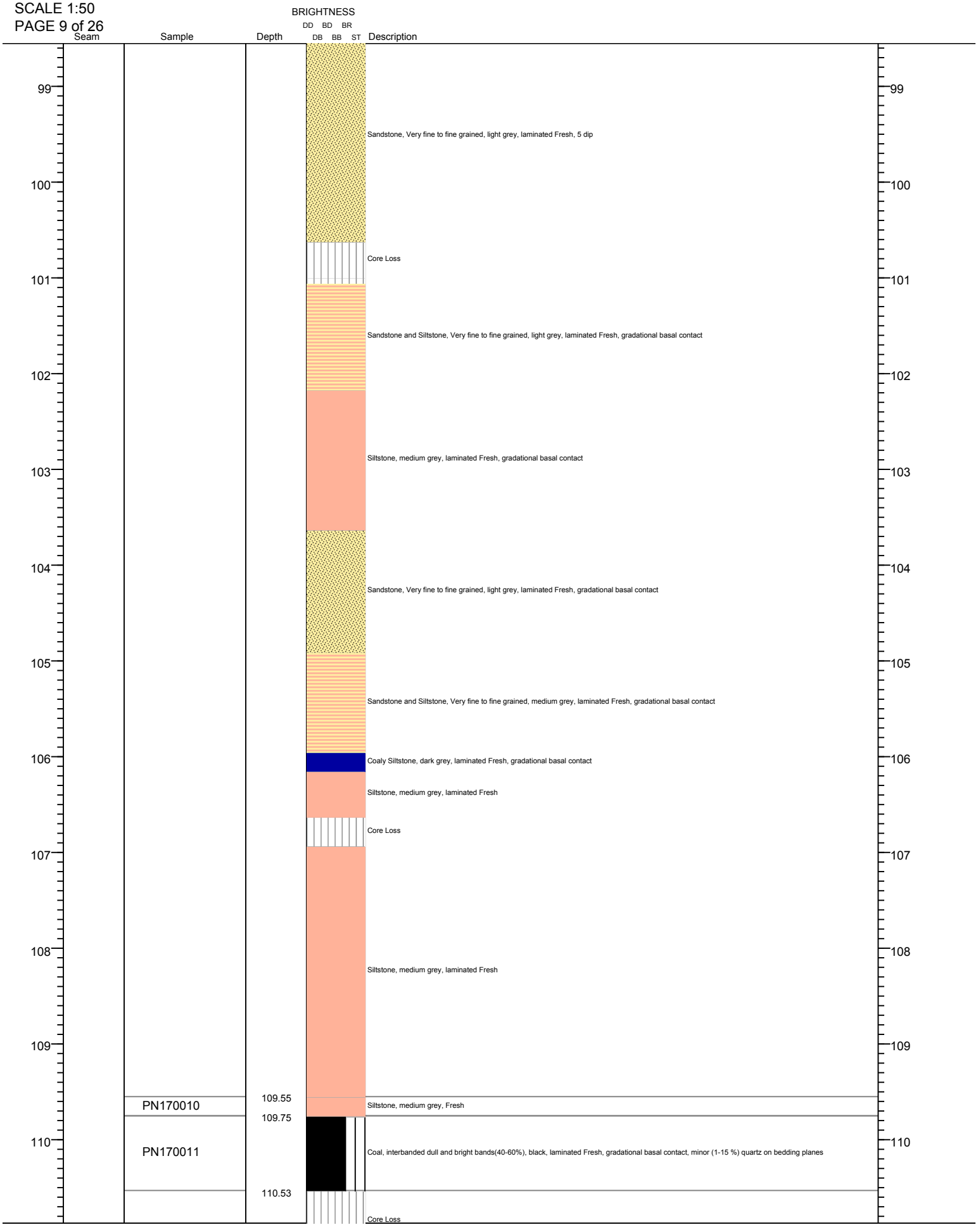
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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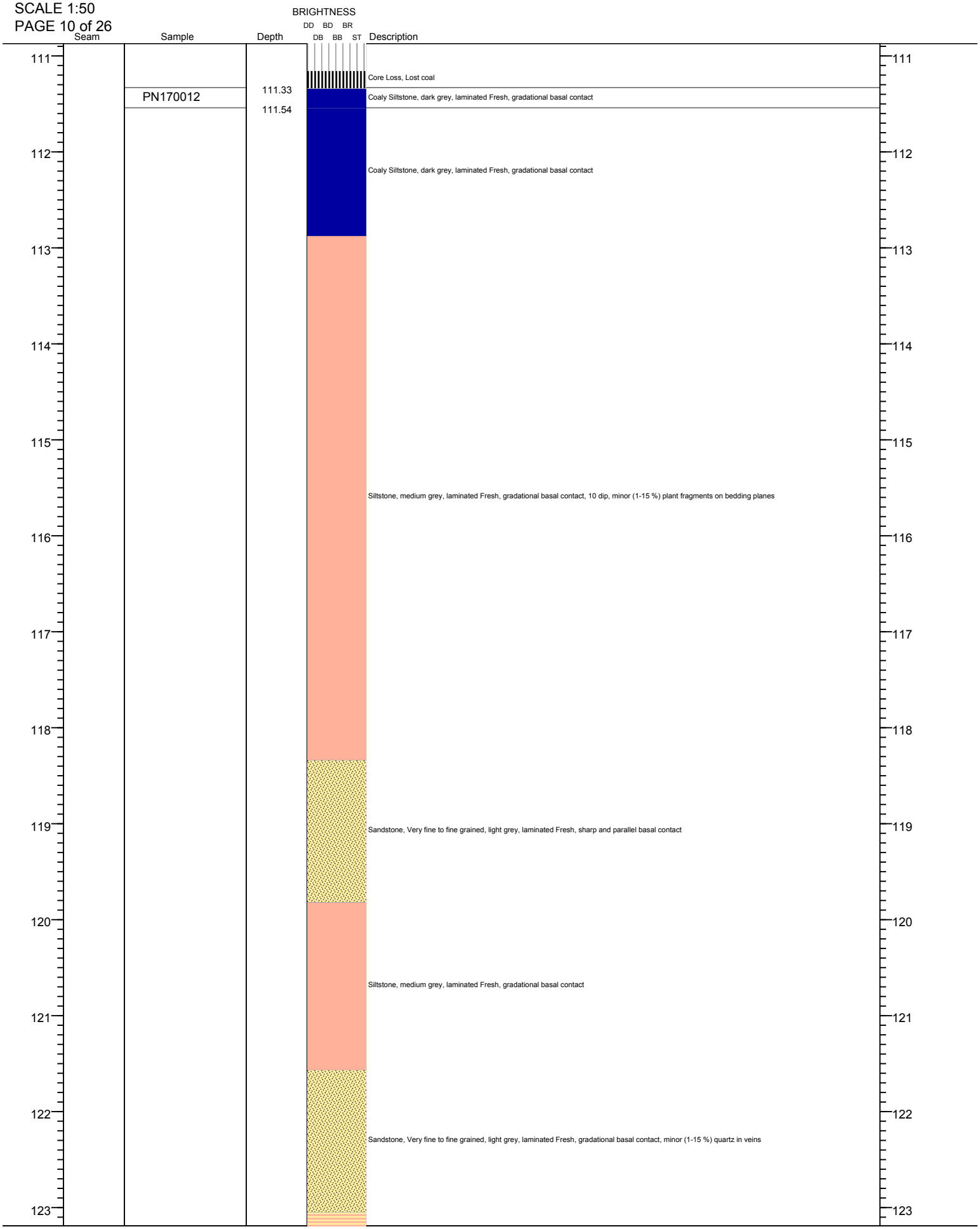
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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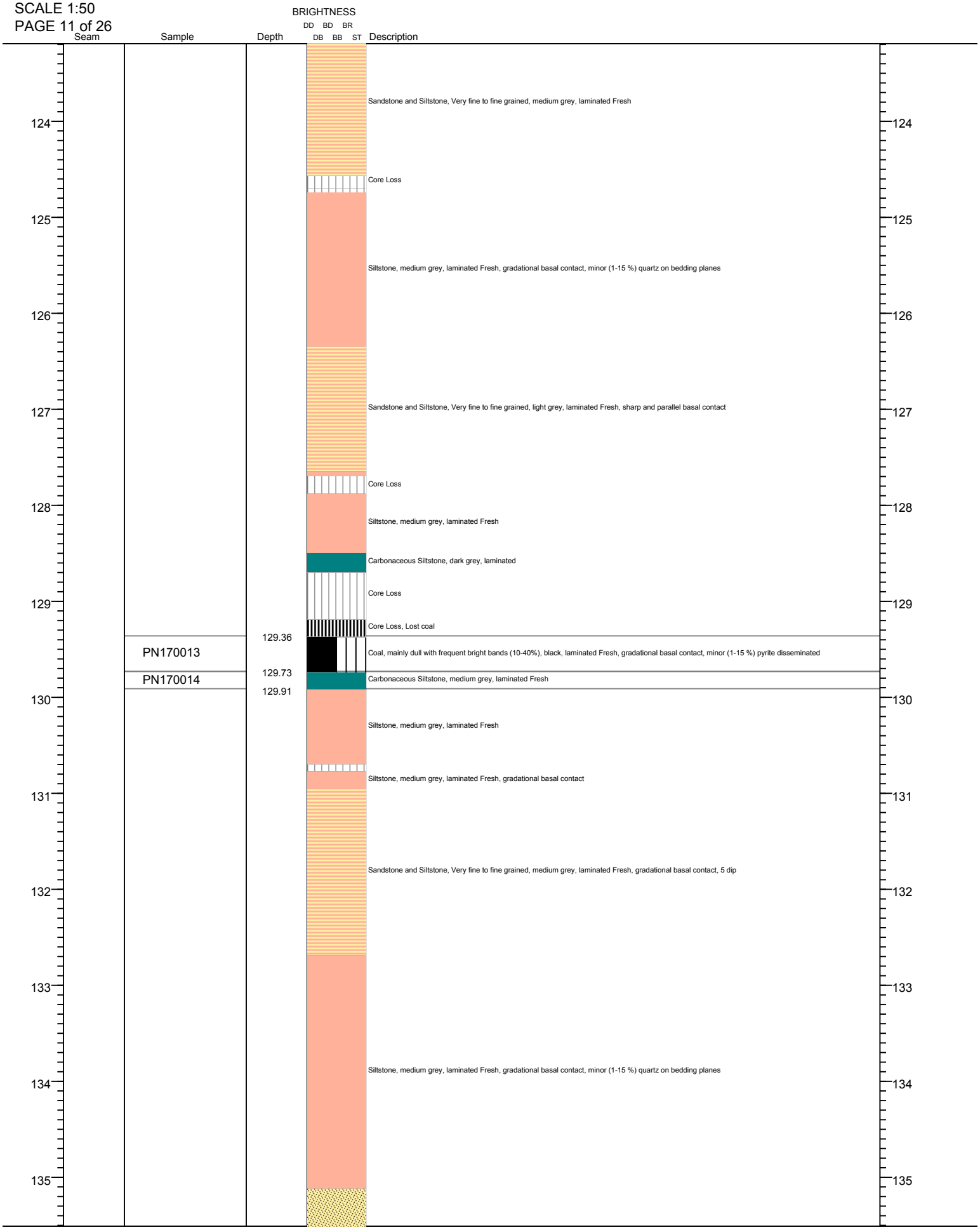
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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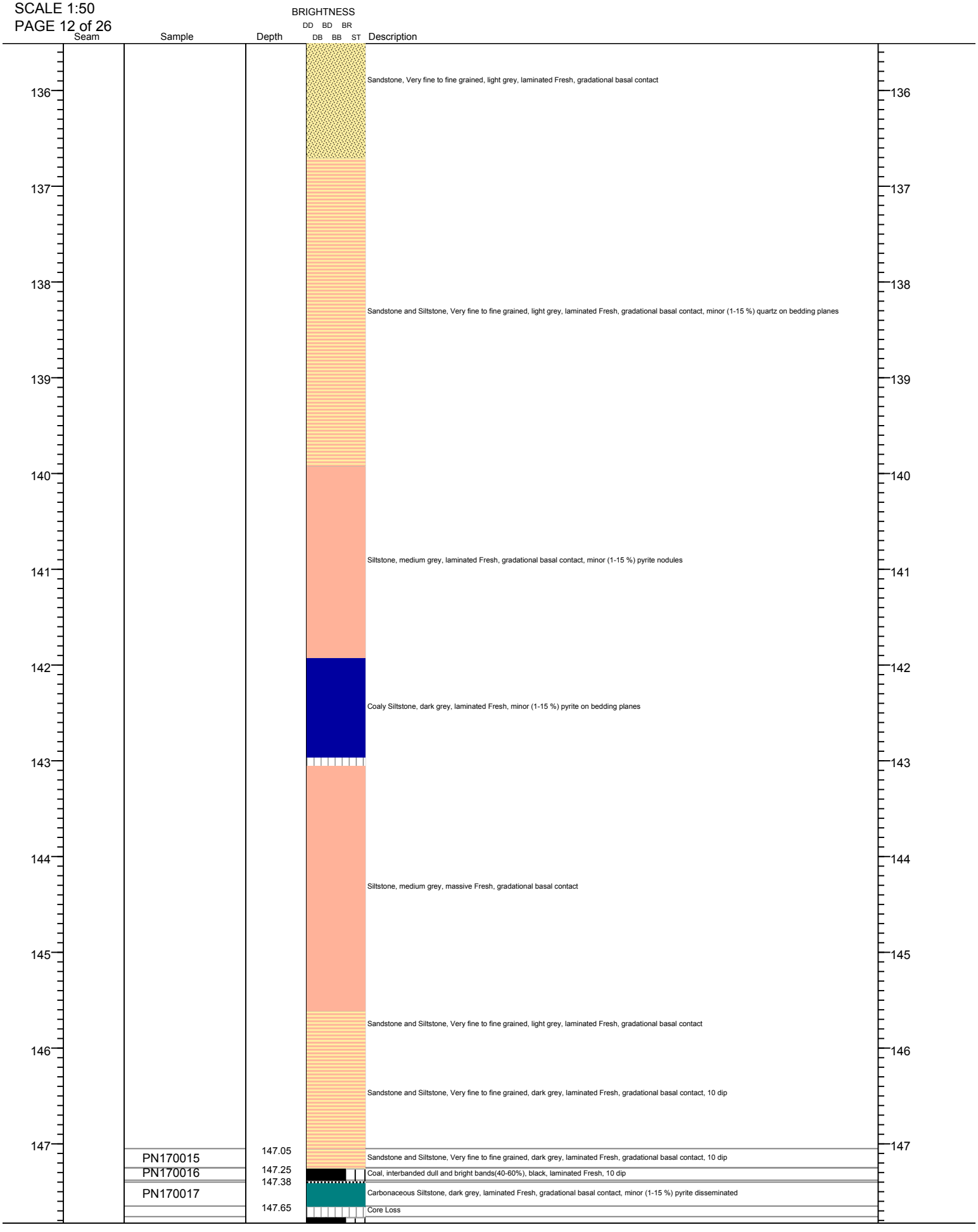
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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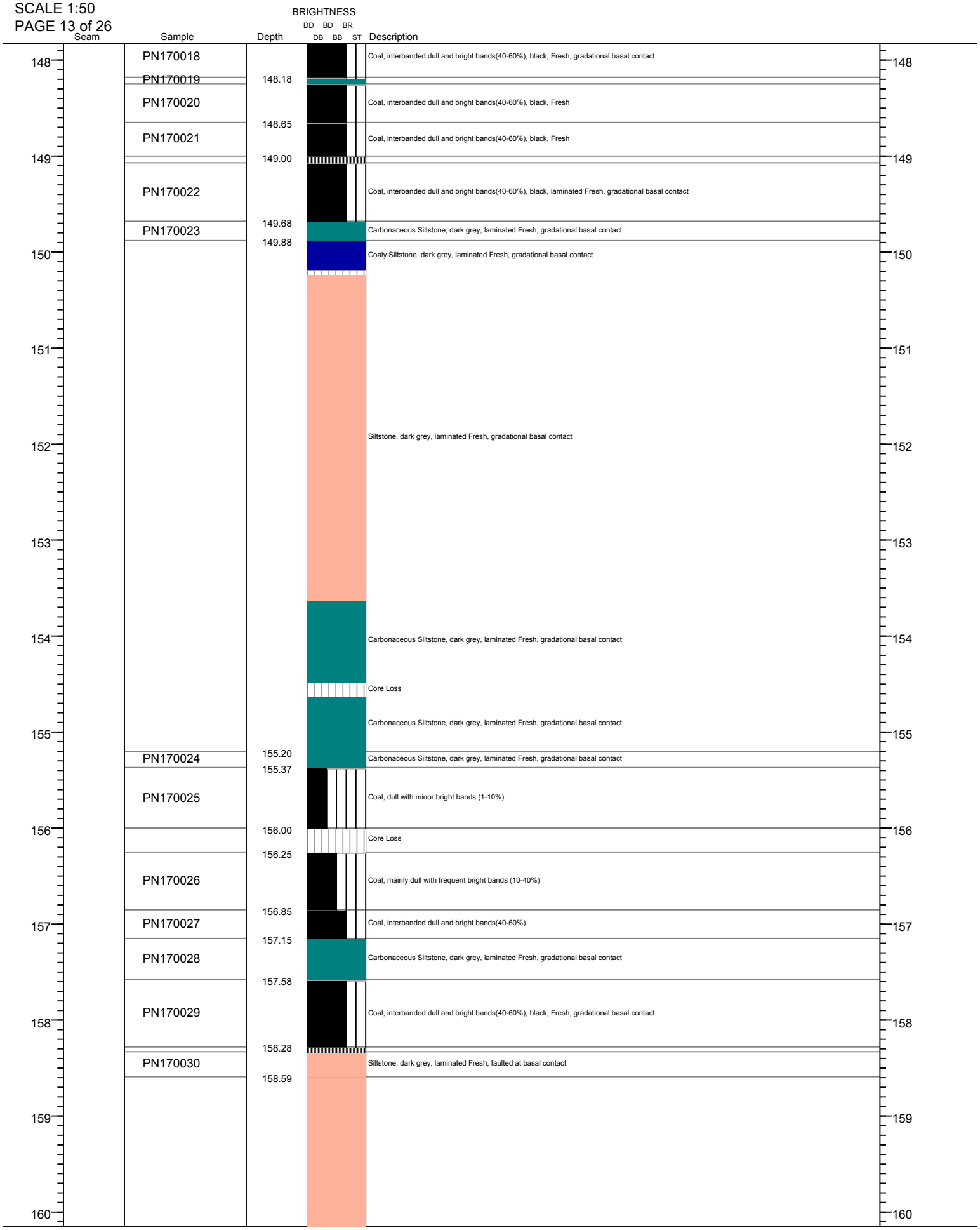
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD DB	BD BB	BR ST	Description
		161				Siltstone, dark grey, laminated Fresh, faulted at basal contact
		162				
		163				
		164				
		165				Siltstone, dark grey, laminated Fresh, gradational basal contact
		166				
		167				Core Loss
						Siltstone, dark grey, laminated Fresh, gradational basal contact
		168				Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact
		169				
		170				Siltstone, dark grey, laminated Fresh, gradational basal contact, 10 dip
		171				
		172				Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact
						Siltstone, dark grey, laminated Fresh, gradational basal contact

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		173		
		174		
		175		
		176		
		177		Siltstone, medium grey, laminated Fresh, gradational basal contact
		178		
		179		
		180		
		181		Siltstone, medium grey, laminated Fresh, gradational basal contact
		182		
		183		
		184		Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, common (15-40 %) quartz in veins

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50

GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		185		
		186		
		187		
		188		Core Loss
		189		
		190		
		191		
		192		Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, common (15-40 %) quartz in veins
		193		
		194		
		195		
		196		
		197		Core Loss

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
				Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, common (15-40 %) quartz in veins
				Core Loss
				Sandstone, Very fine to fine grained, medium grey, massive Fresh, gradational basal contact, 5 dip, common (15-40 %) quartz in veins
	PN170031	204.20		Coal, mainly dull with frequent bright bands (10-40%), black, Fresh
				Core Loss
				Siltstone, medium grey, massive Fresh, gradational basal contact
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact
				Siltstone, medium grey, massive Fresh, gradational basal contact
				Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, gradational basal contact
				Siltstone, medium grey, massive Fresh, sheared at basal contact

198 199 200 201 202 203 204 205 206 207 208 209

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD DB	BD BB	BR ST	Description
		210				
		211				Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins
		212				Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes
		213				Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins
		214				Siltstone, medium grey, laminated Fresh, gradational basal contact, rare (<1 %) quartz in veins
		215				
		216				Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact
		217				Siltstone, medium grey, laminated Fresh, 10 dip
		218				
		219				Siltstone, medium grey, laminated Fresh, gradational basal contact
		220				
		221				Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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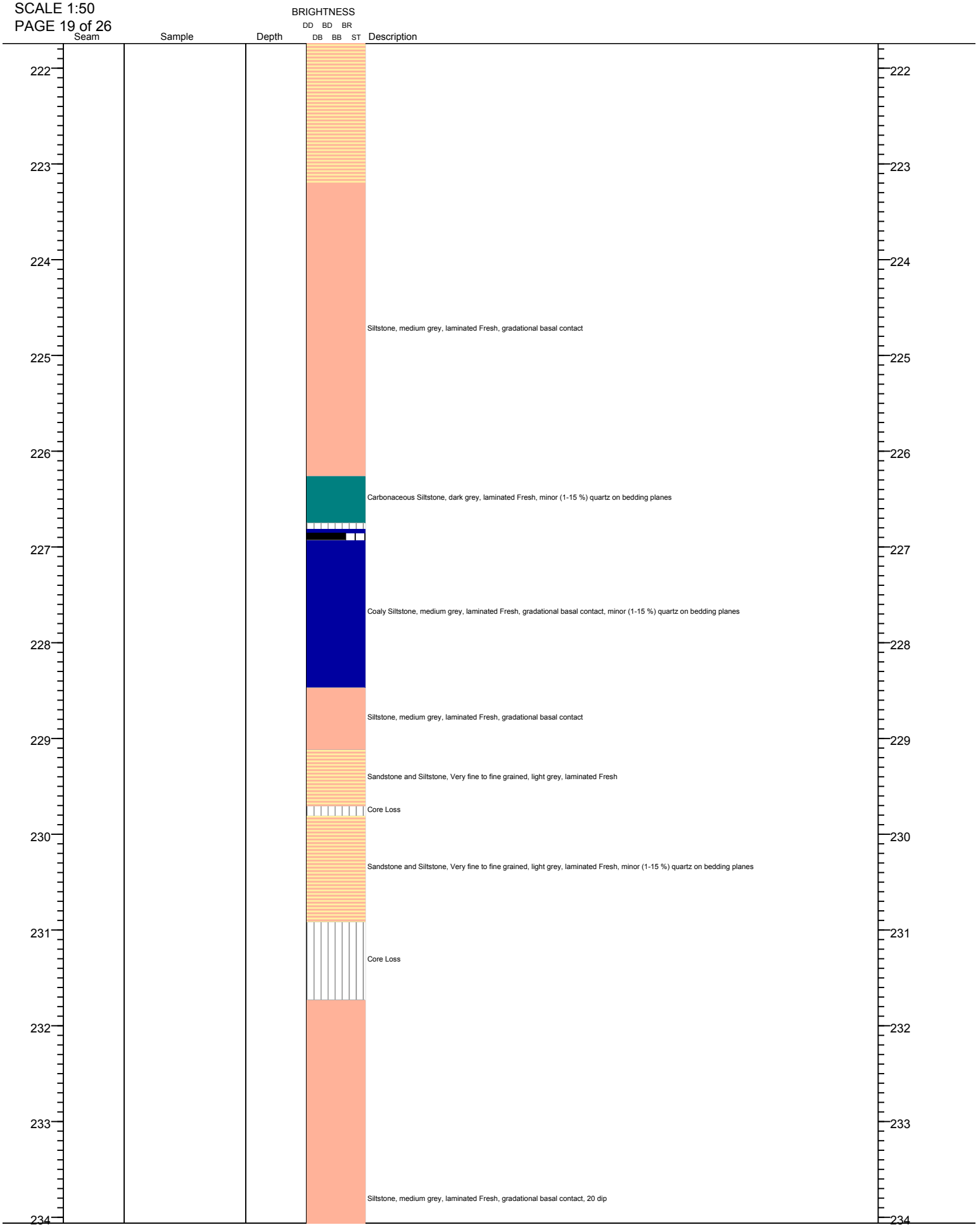
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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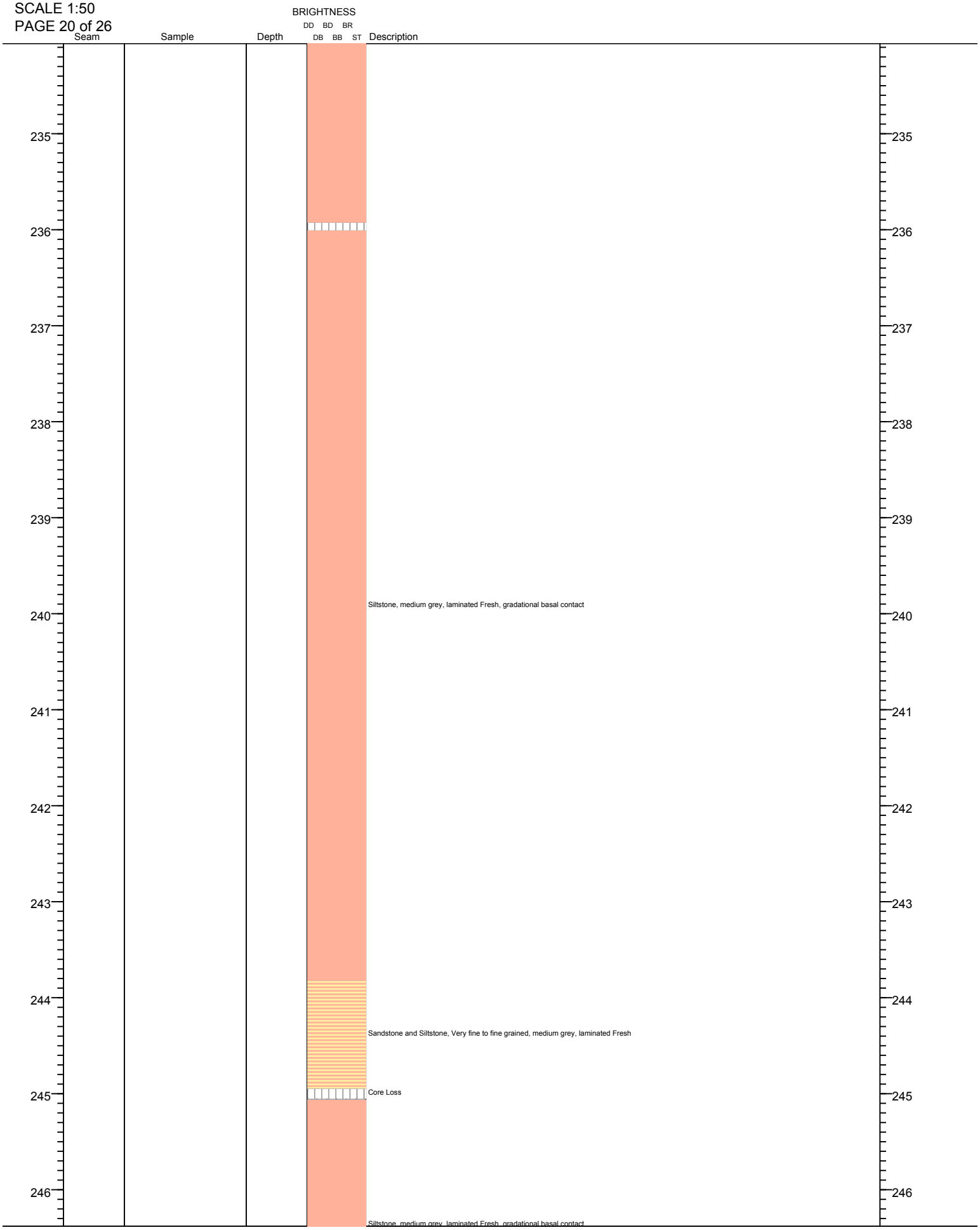
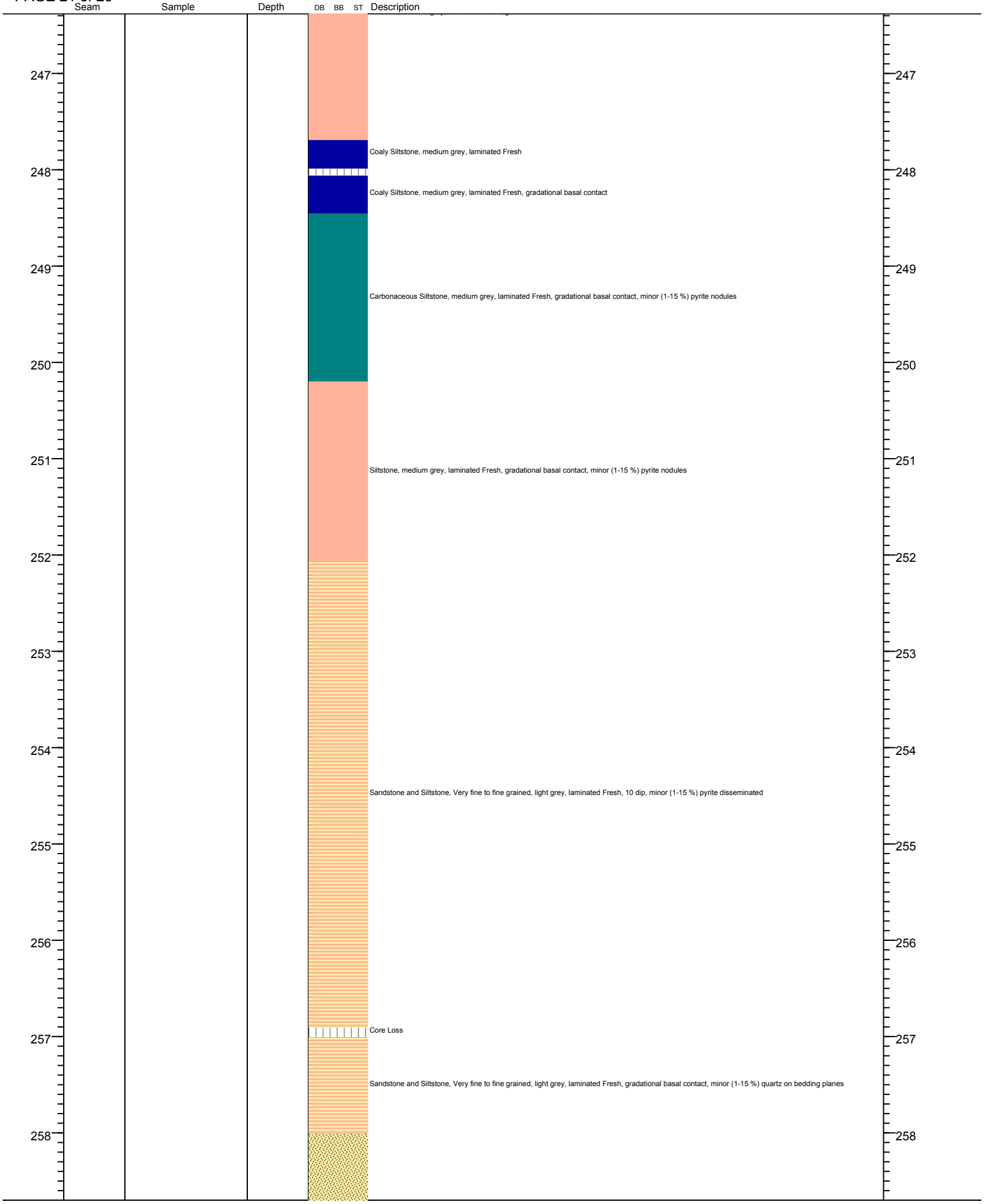
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50

GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		259		
		260		Sandstone, Very fine to fine grained, light grey, massive Fresh
		261		
		262		
		263		Core Loss
				Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes
		264		
				Sandstone and Siltstone, medium grey, laminated Fresh, gradational basal contact
		265		
				Sandstone, Very fine to fine grained, light grey, massive
		266		
				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 10 dip
		267		
		268		
		269		
				Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact
		270		
		271		

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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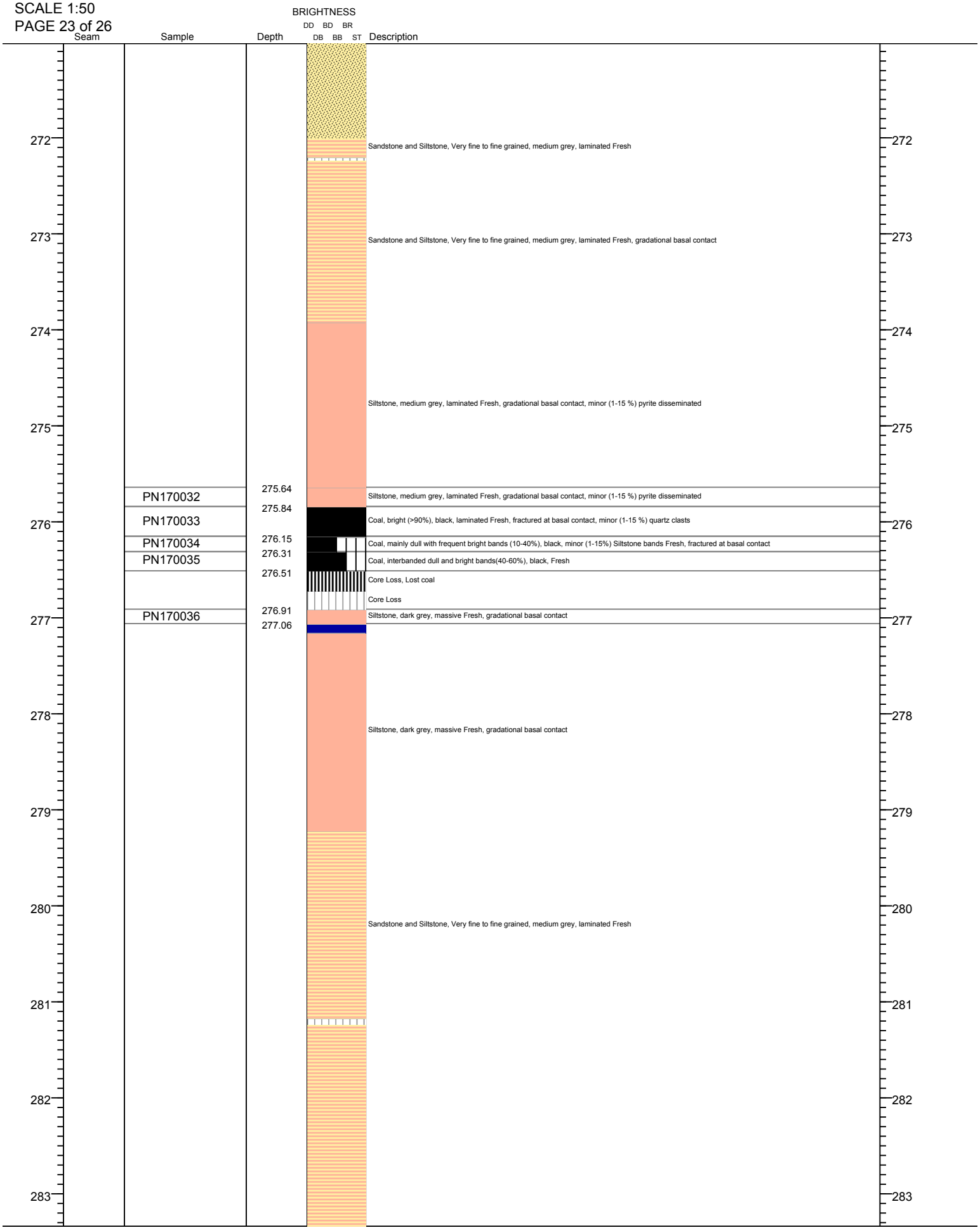
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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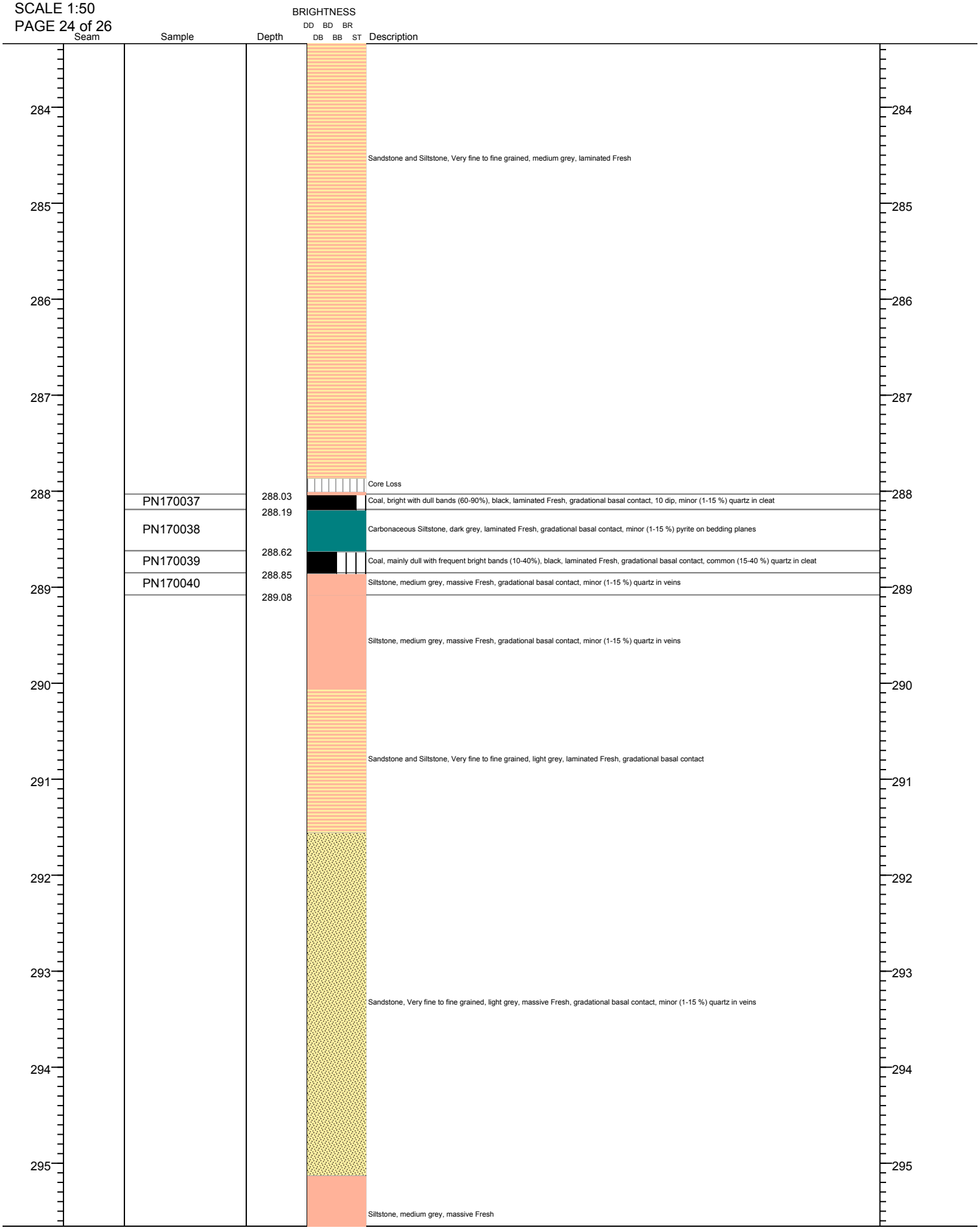
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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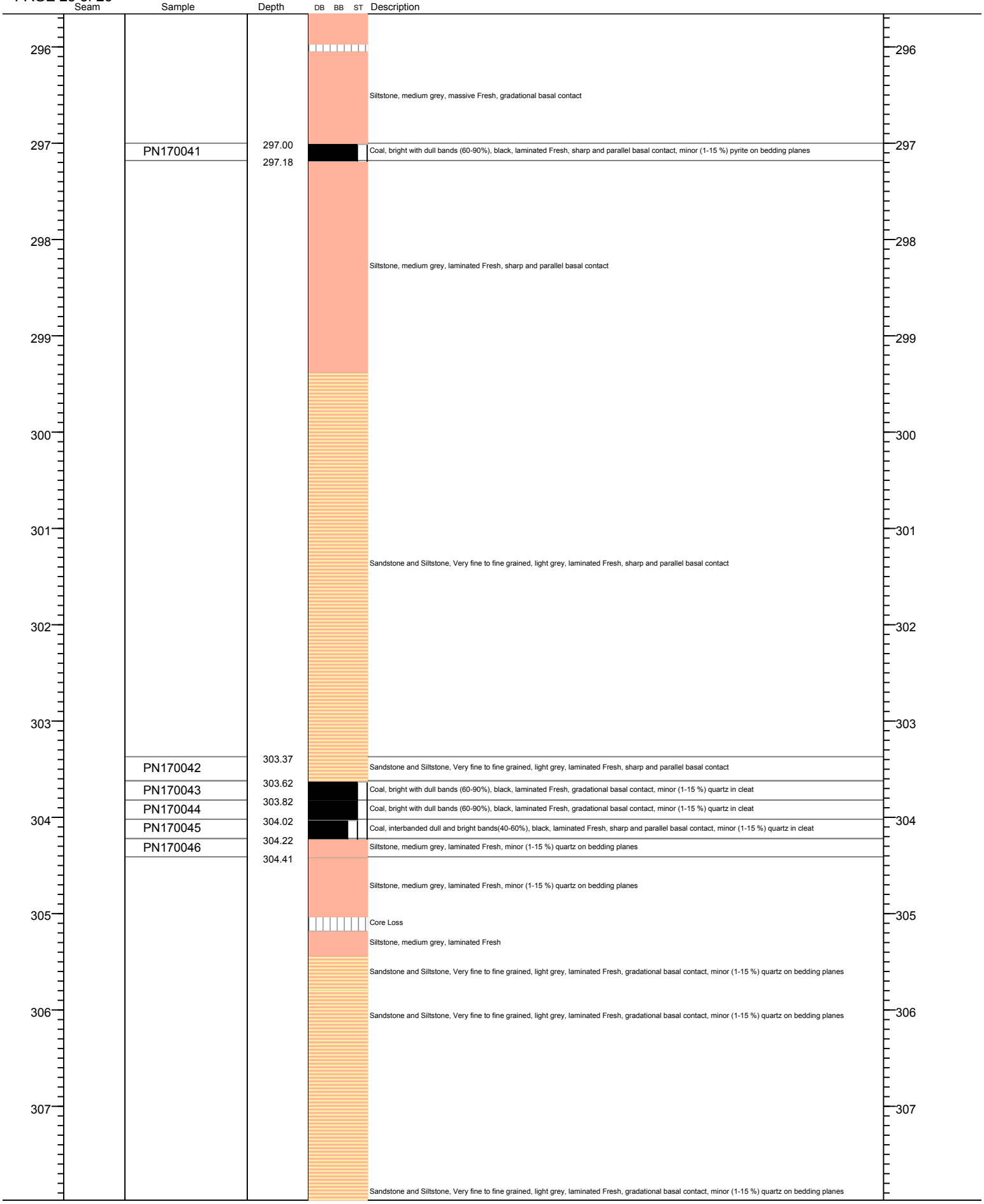
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-01
SCALE 1:50
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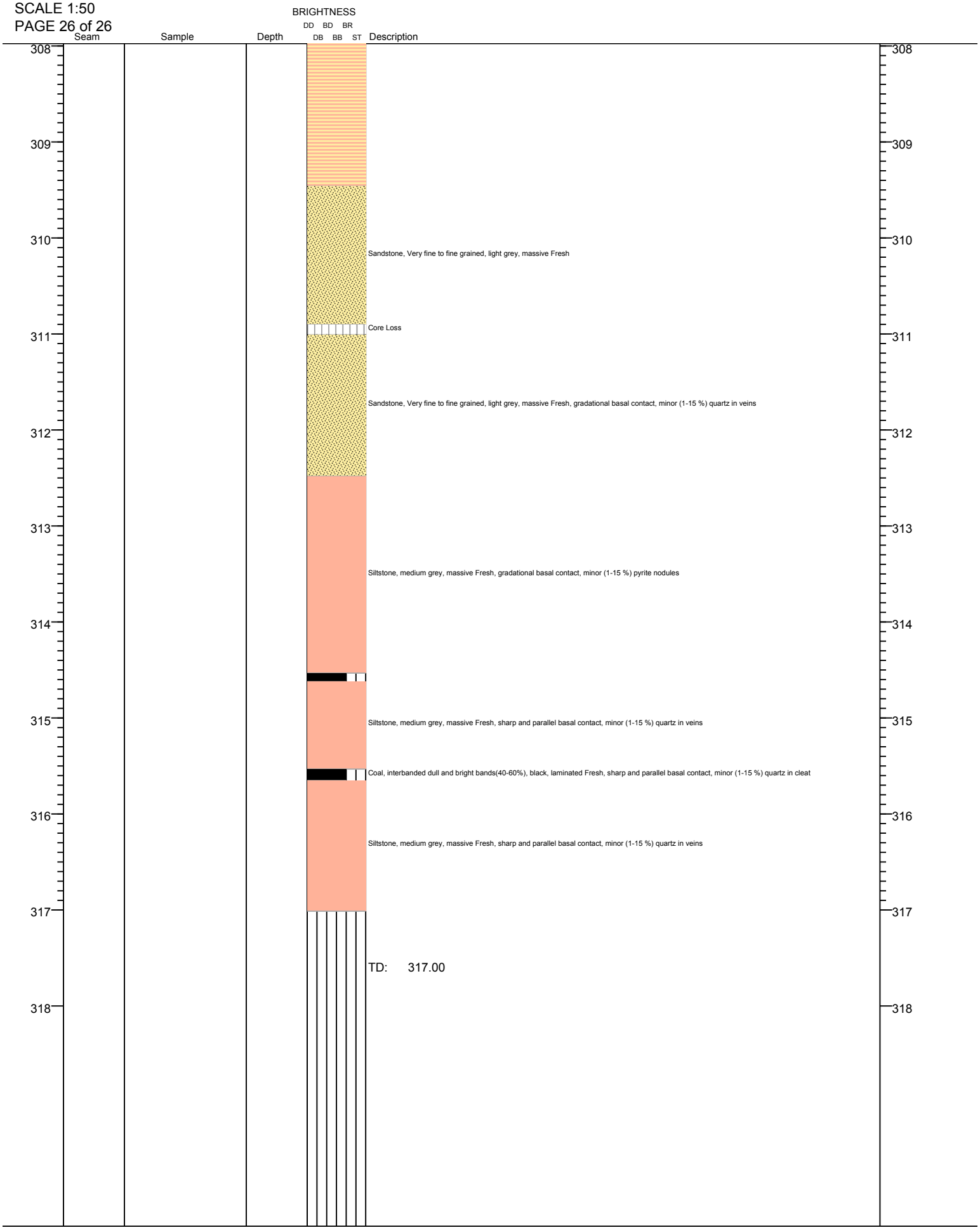
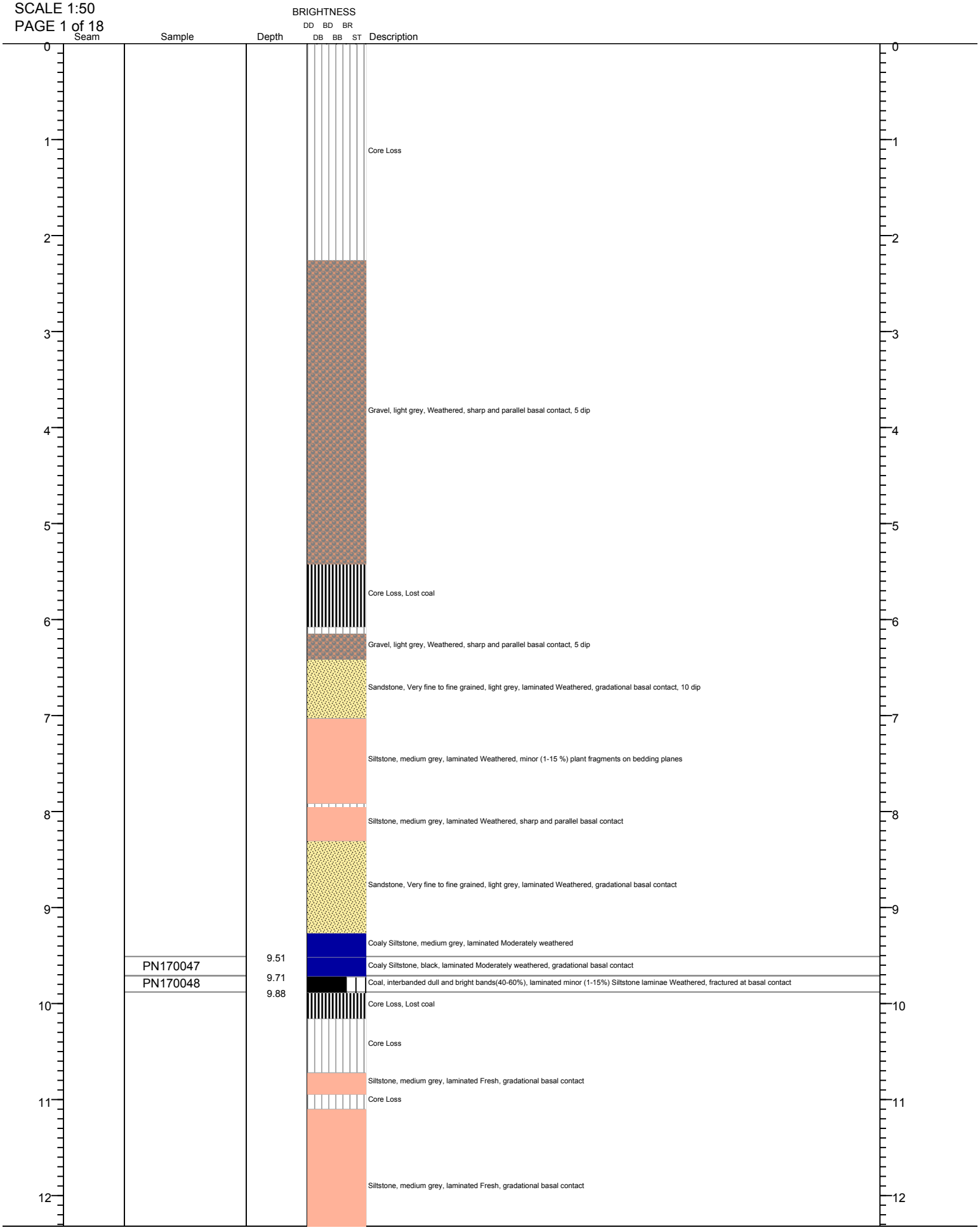
GEOPHYSICAL PROFILE



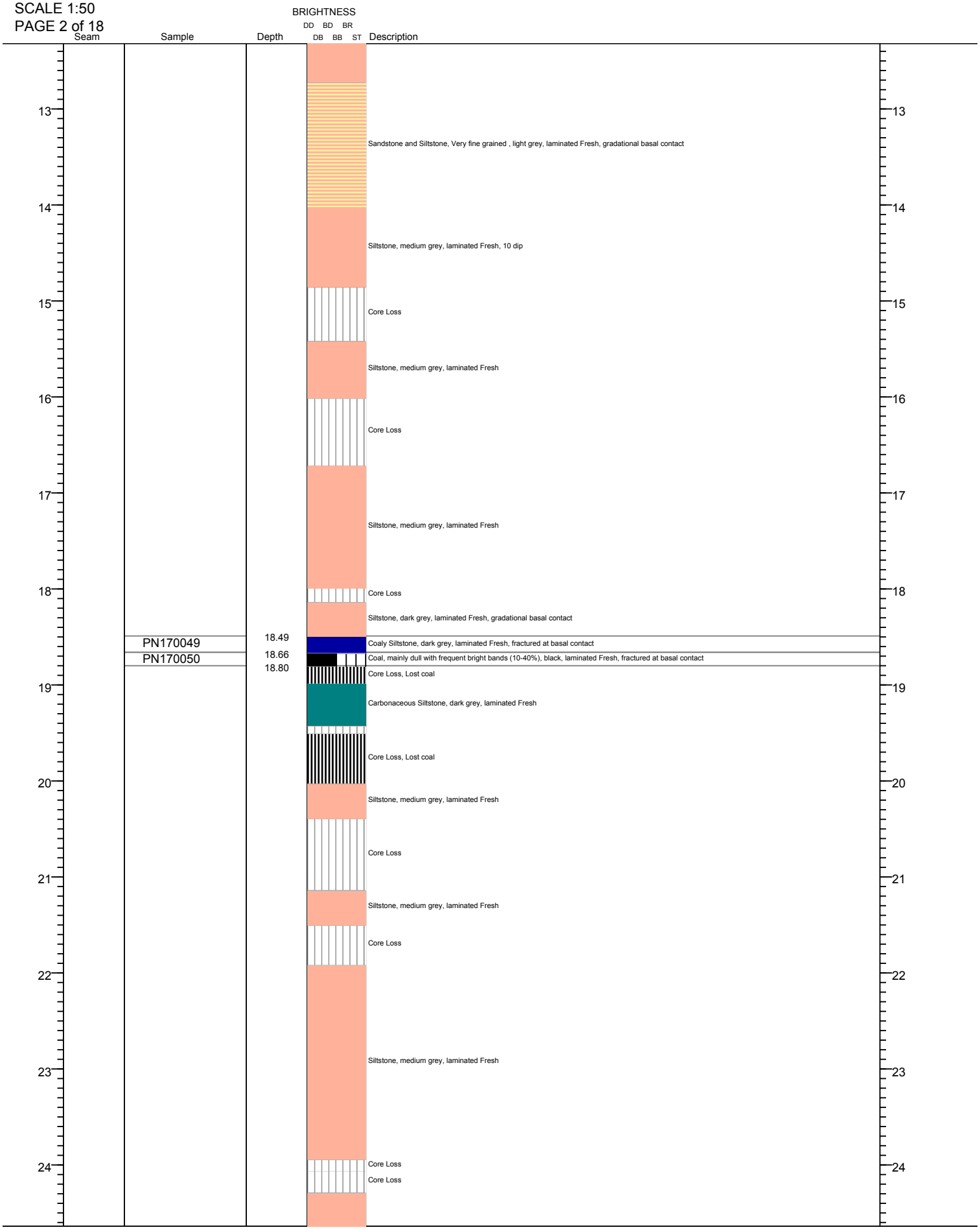
ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
PAGE 1 of 18

GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
PAGE 2 of 18

GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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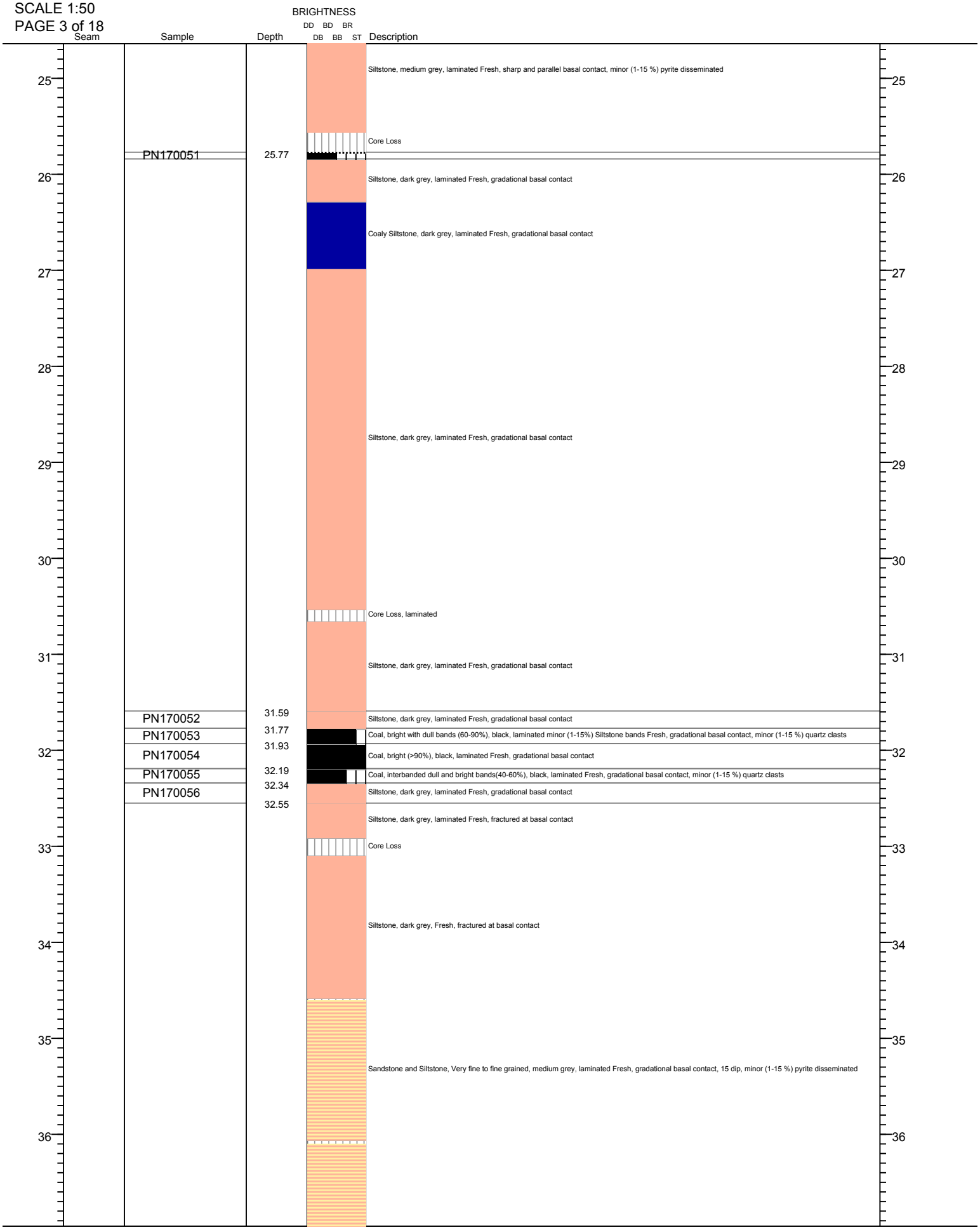

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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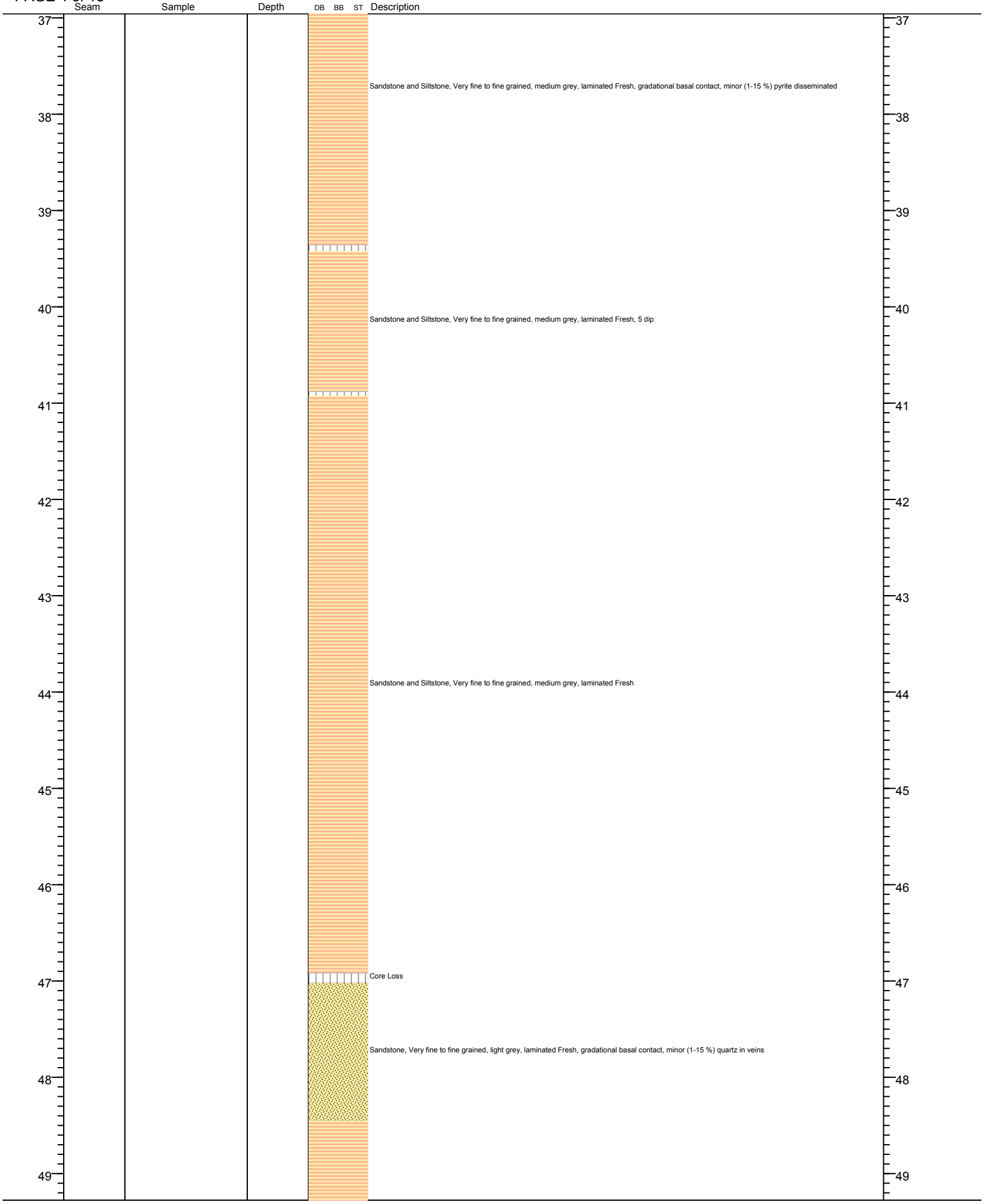
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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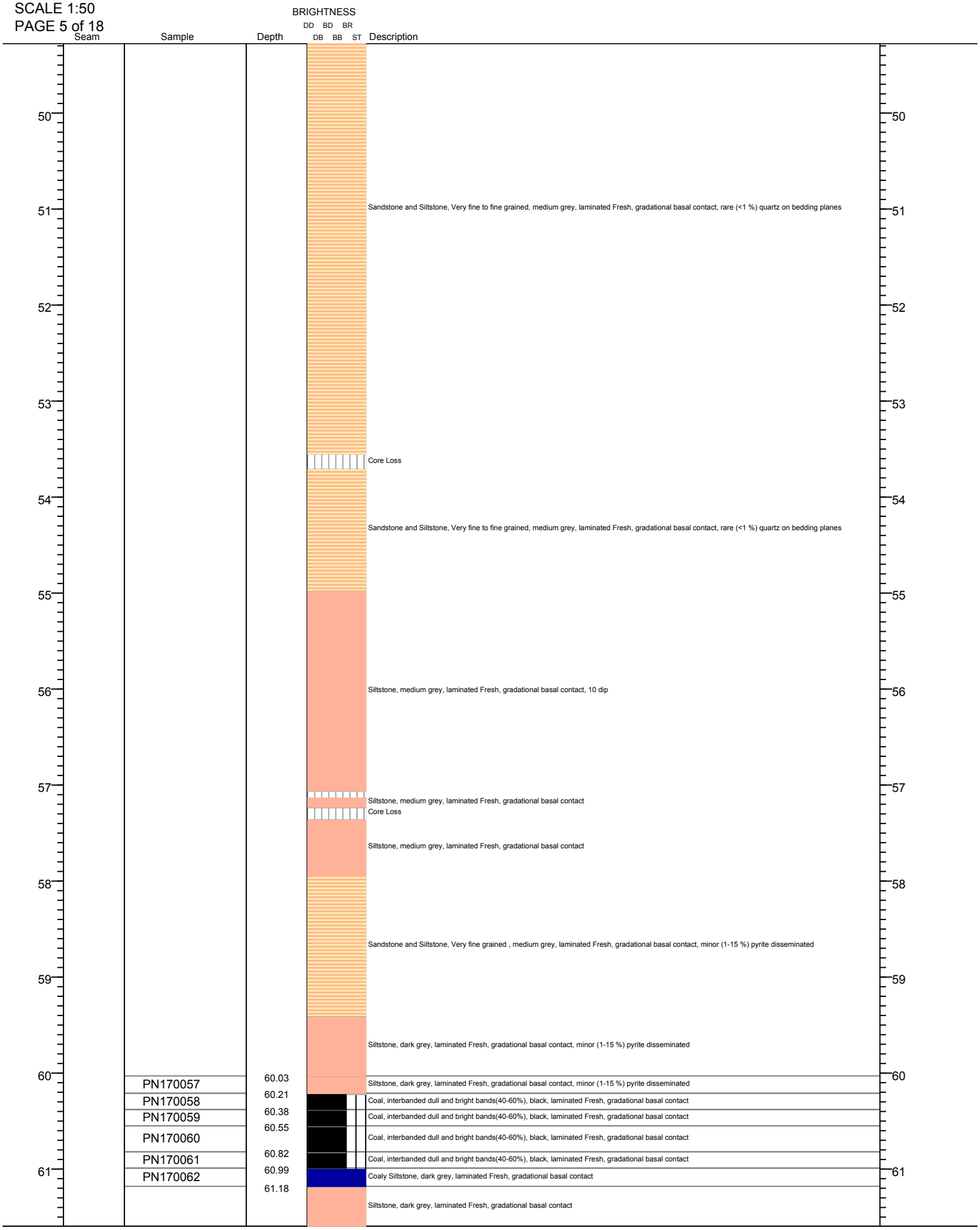
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		62		Core Loss
				Siltstone, dark grey, laminated Fresh, gradational basal contact
		63		
				Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact
		64		
		65		Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
		66		
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
		67		Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact
				Siltstone, dark grey, laminated Fresh, gradational basal contact
		68		
				Siltstone, dark grey, laminated Fresh, gradational basal contact
		69		
		70		
				Siltstone, dark grey, laminated Fresh, gradational basal contact
		71		
		72		
				Siltstone, dark grey, laminated Fresh, gradational basal contact
		73		Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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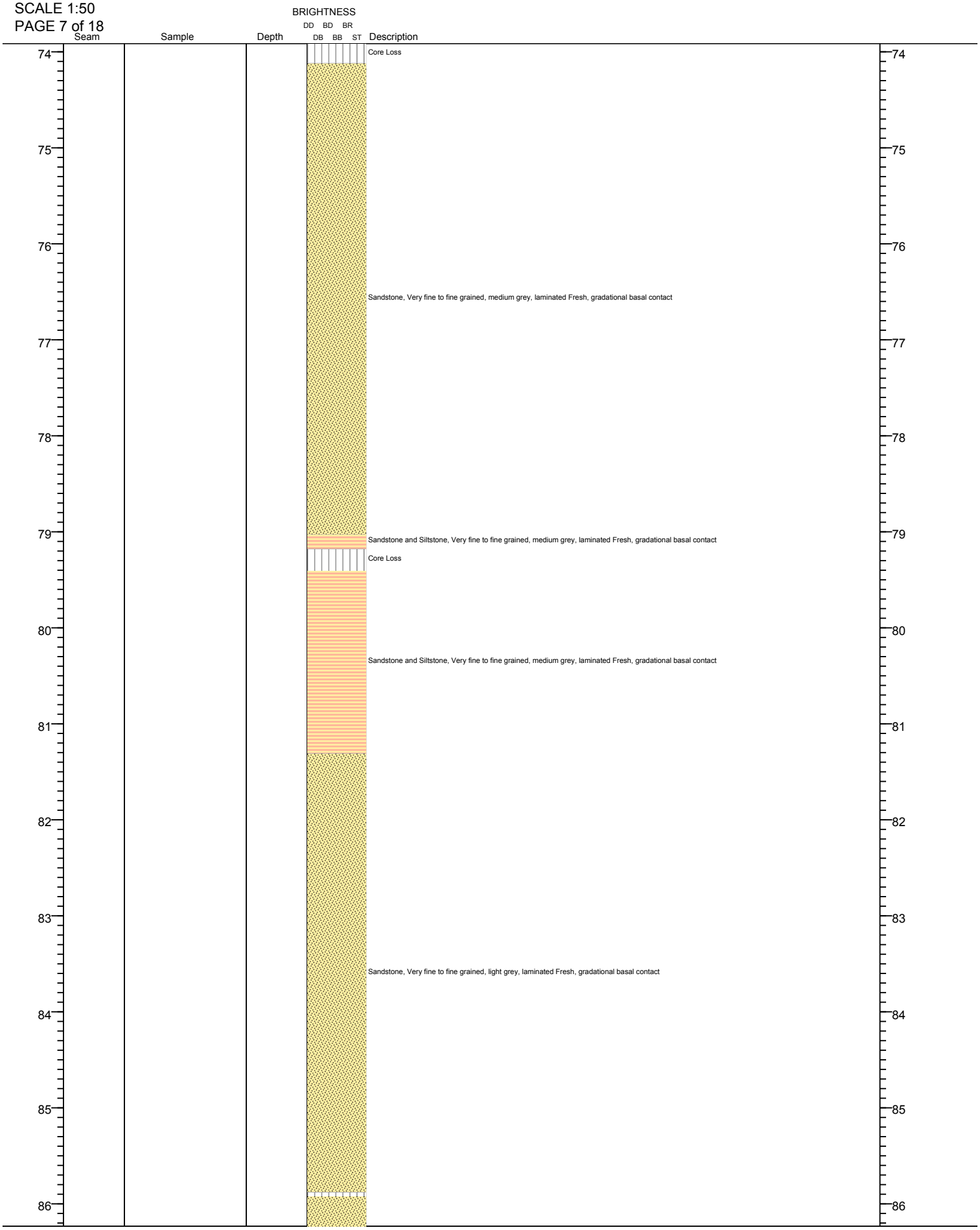
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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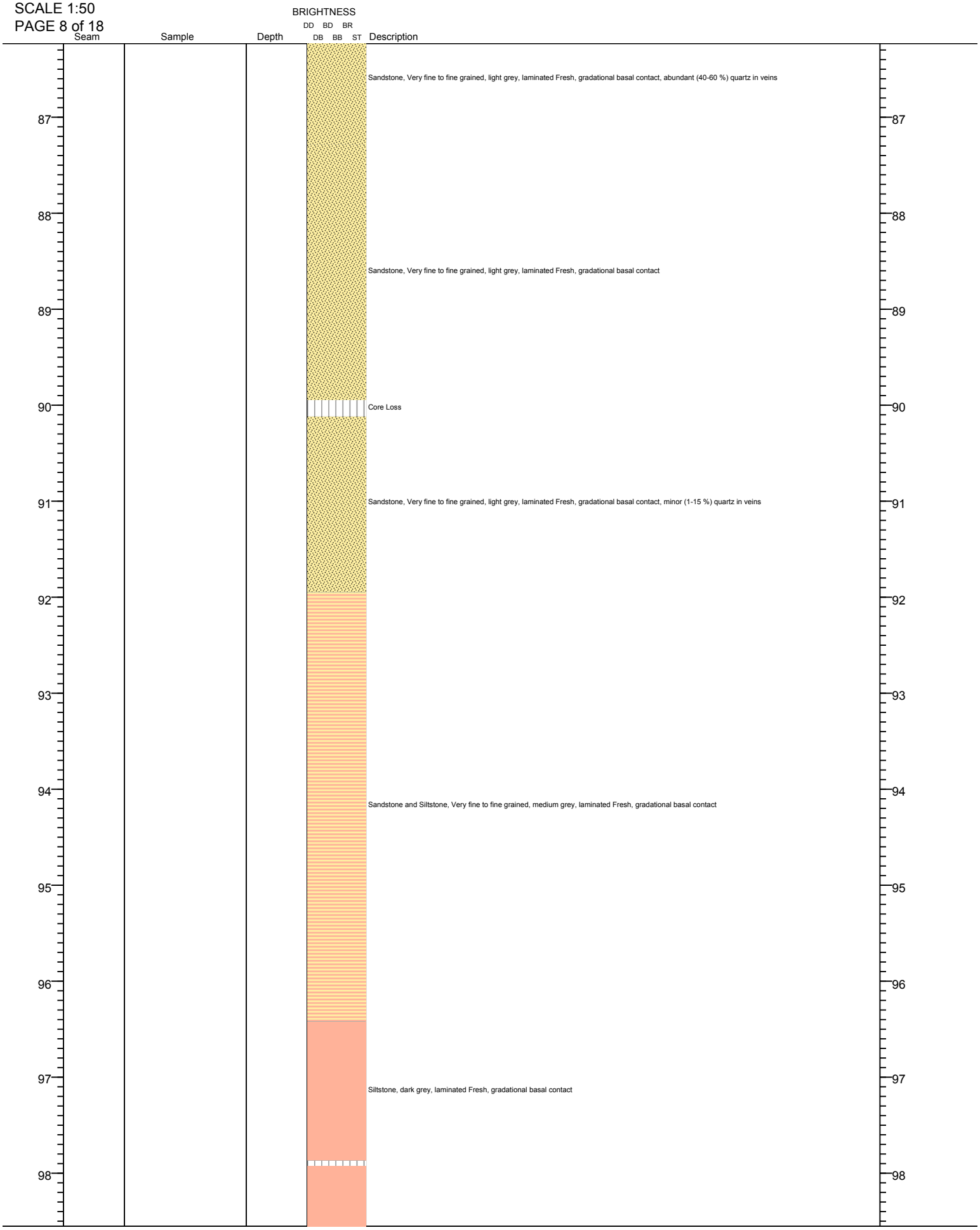

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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GEOPHYSICAL PROFILE

BRIGHTNESS
DD BD BR
DB BB ST

Seam	Sample	Depth	Description
			Siltstone, dark grey, laminated Fresh
	GT1701	100.03	Siltstone, dark grey, laminated Fresh
		100.41	Siltstone, dark grey, laminated Fresh, sharp and parallel basal contact
	PN170063	100.81	Siltstone, dark grey, laminated Fresh, gradational basal contact
	PN170064	101.01	Coal, bright with dull bands (60-90%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz clasts
	PN170065	101.43	Coal, bright (>90%), black, laminated Fresh, gradational basal contact
	PN170066	101.82	Coal, bright (>90%), black, laminated minor (1-15%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) quartz clasts
	PN170067	101.98	Siltstone, dark grey, laminated Fresh, gradational basal contact
		102.18	Siltstone, dark grey, laminated Fresh, gradational basal contact
	PN170068	104.09	Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated
	PN170069	104.30	Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts
	PN170070	104.48	Siltstone, dark grey, massive Fresh, gradational basal contact
	PN170071	104.76	Coal, bright (>90%), black, laminated Fresh, gradational basal contact, minor (1-15 %) quartz clasts
	PN170072	105.10	Siltstone, dark grey, laminated Fresh
		105.32	Siltstone, dark grey, laminated Fresh
	GT1702	105.60	Siltstone, dark grey, laminated Fresh
		105.97	Siltstone, dark grey, laminated Fresh, gradational basal contact
			Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
			Core Loss
			Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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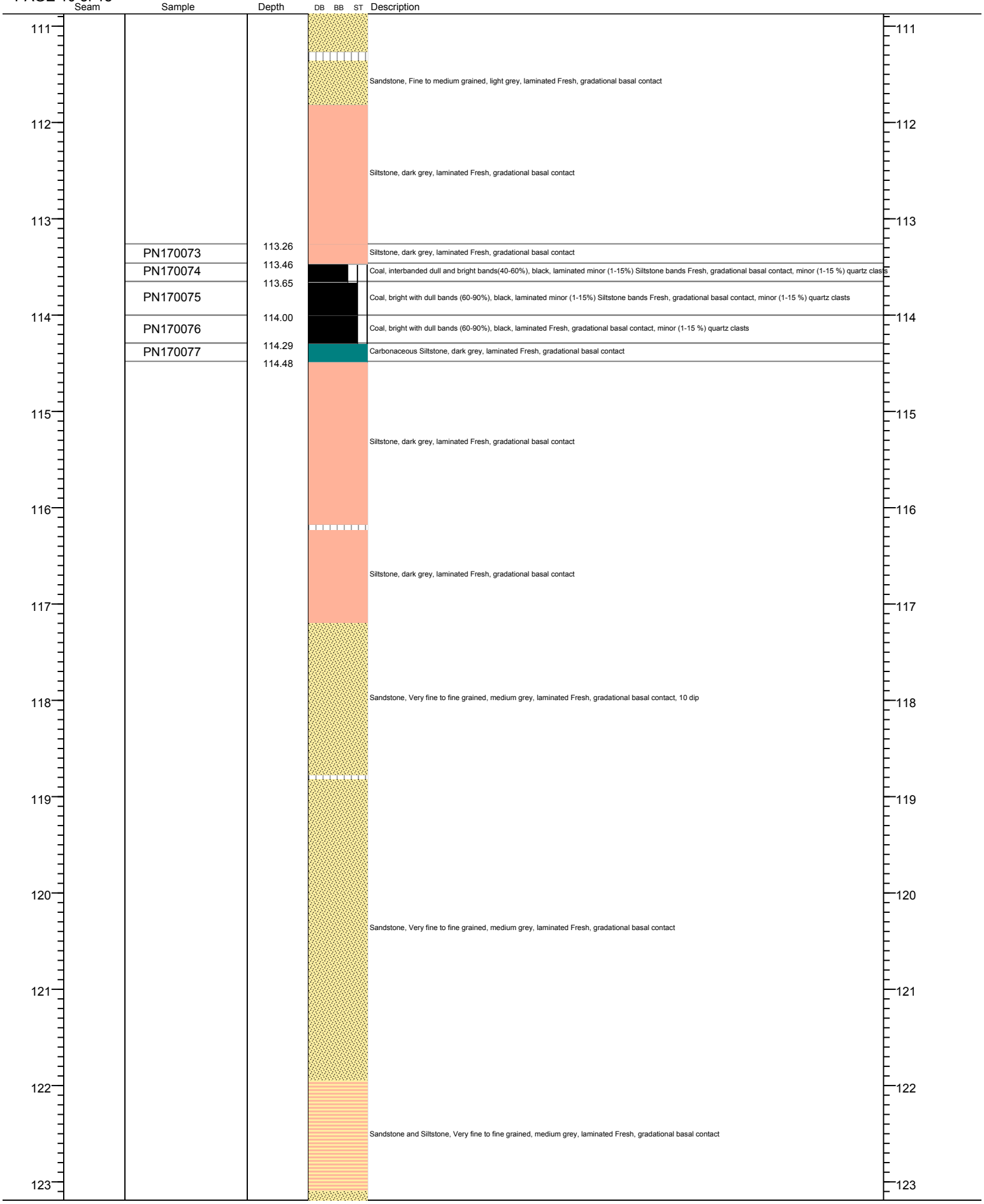

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PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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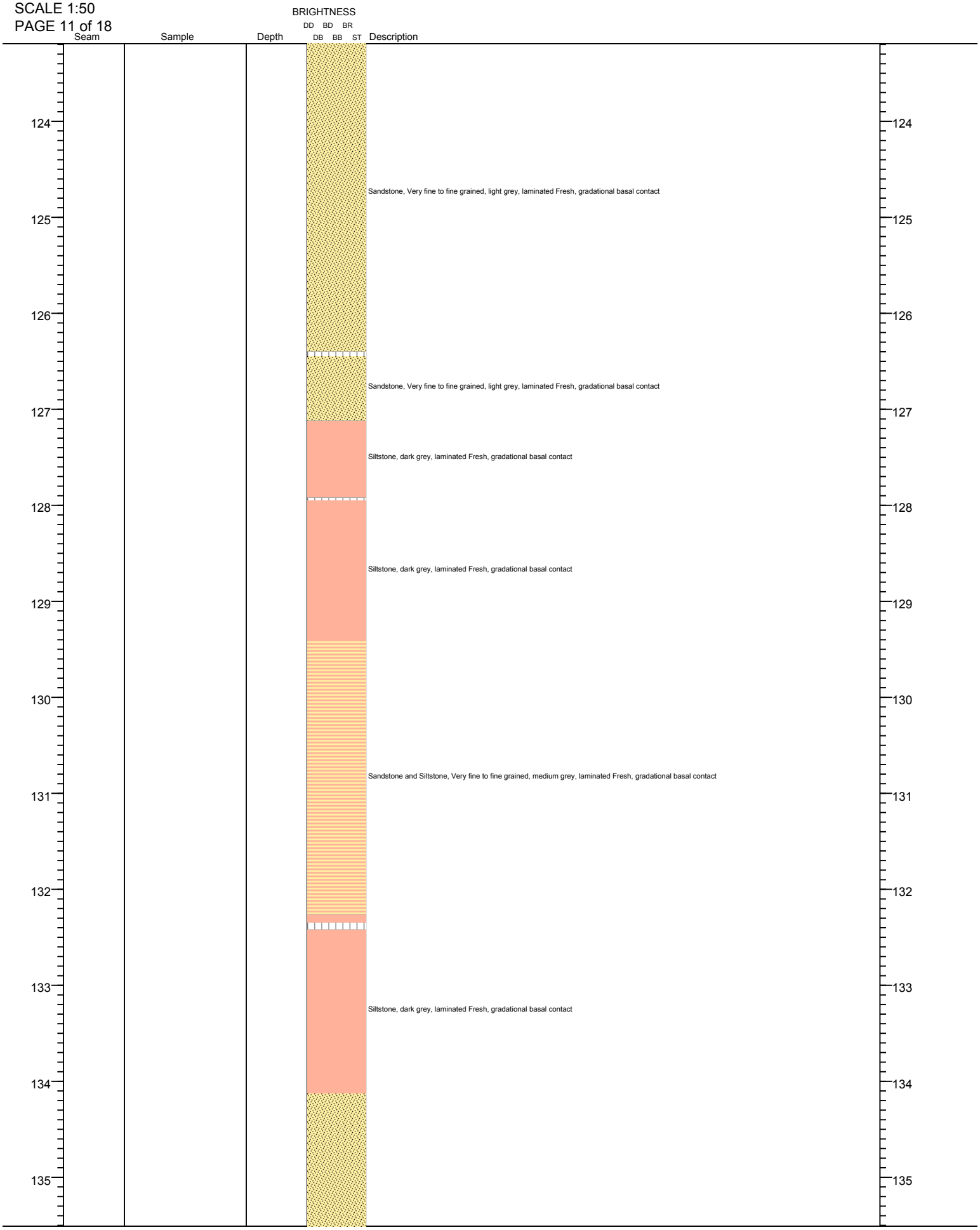

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PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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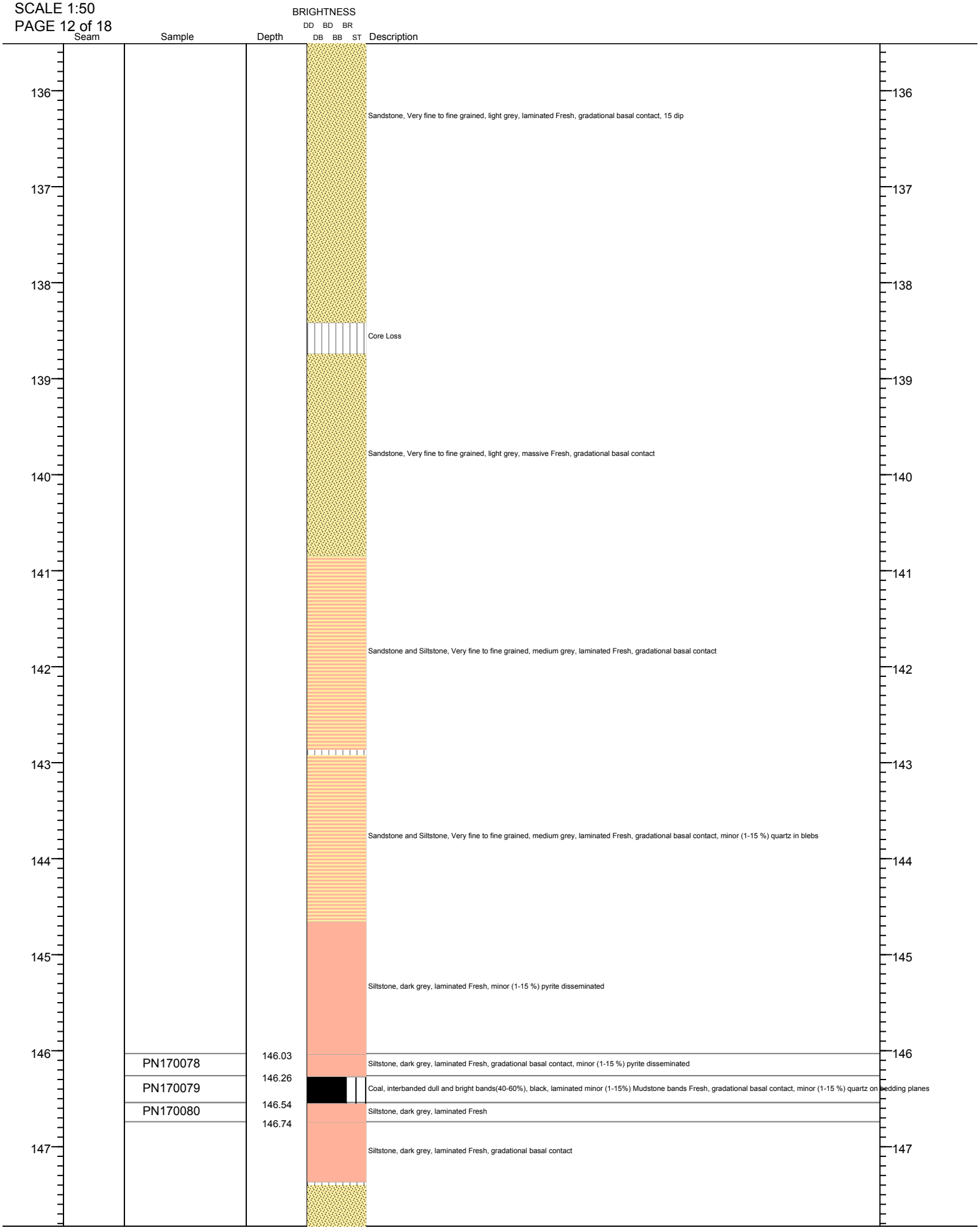

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PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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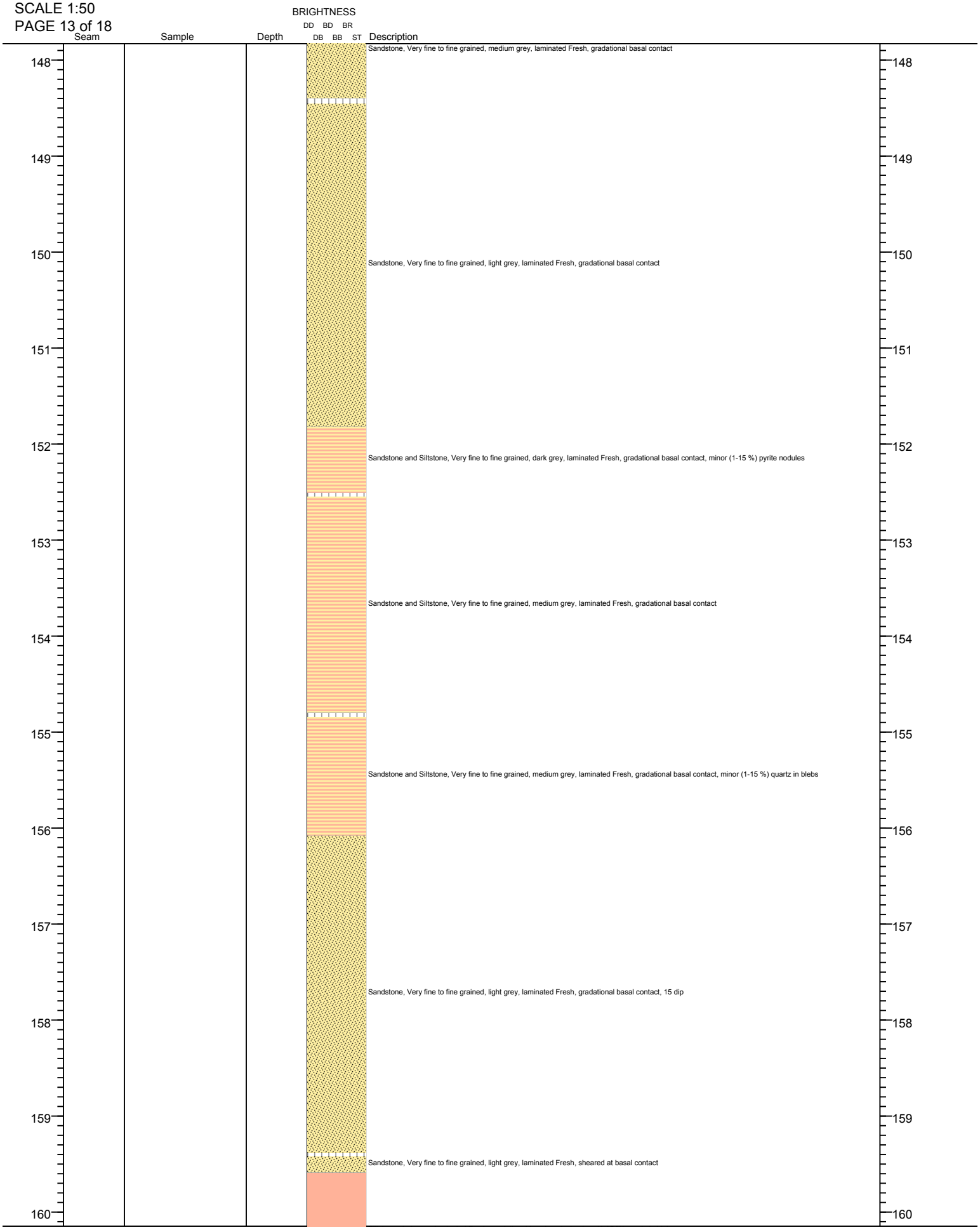

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PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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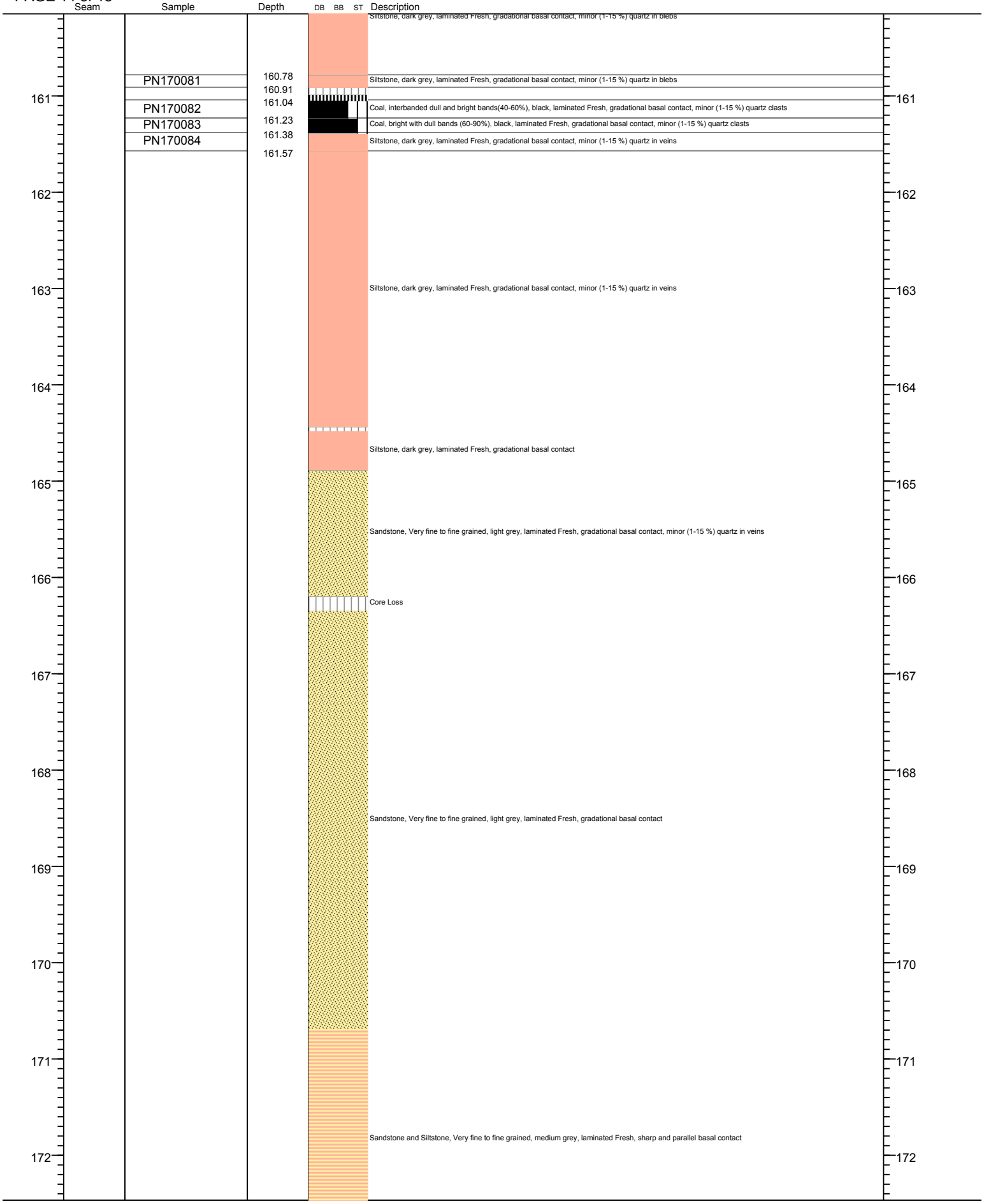

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PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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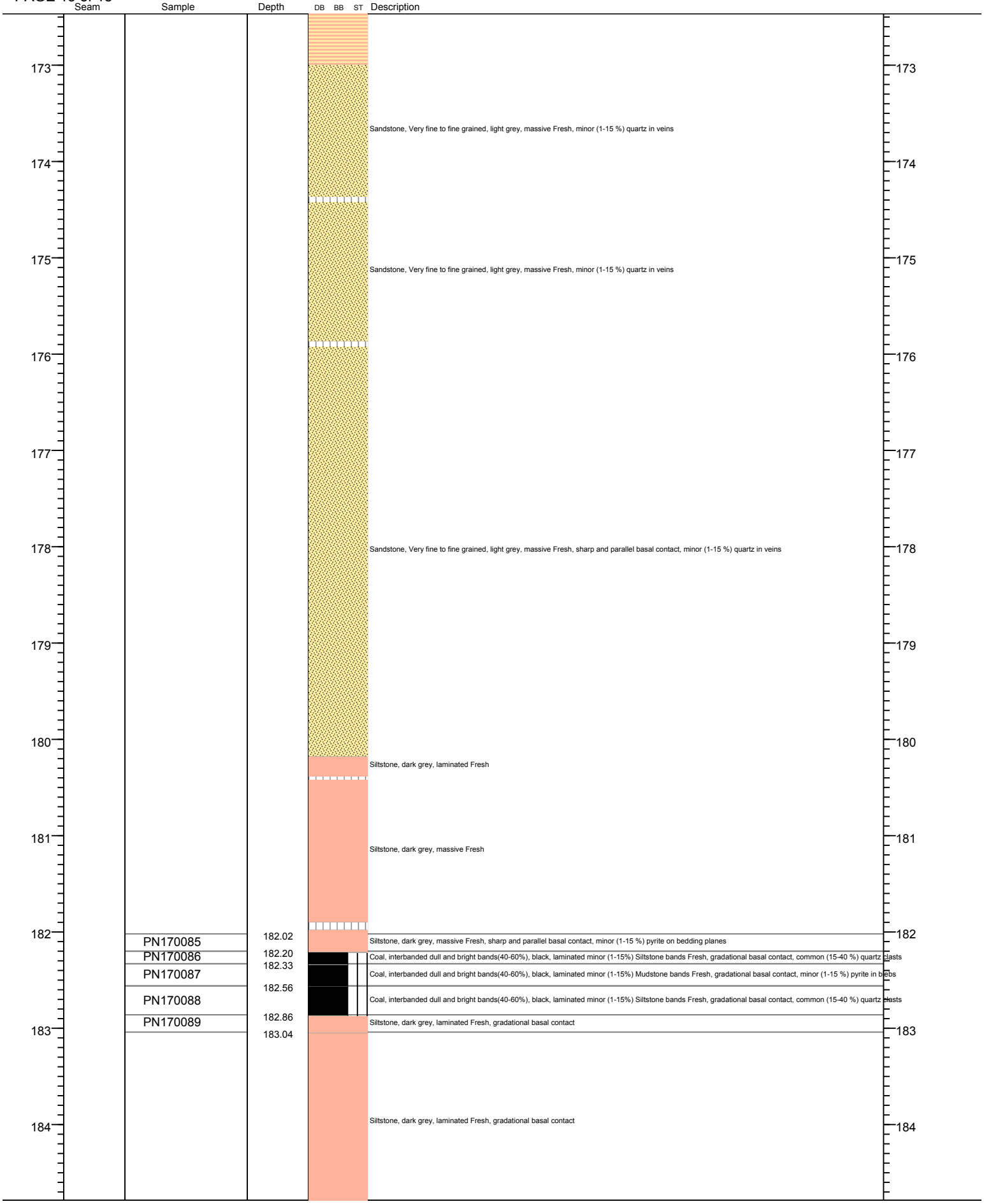

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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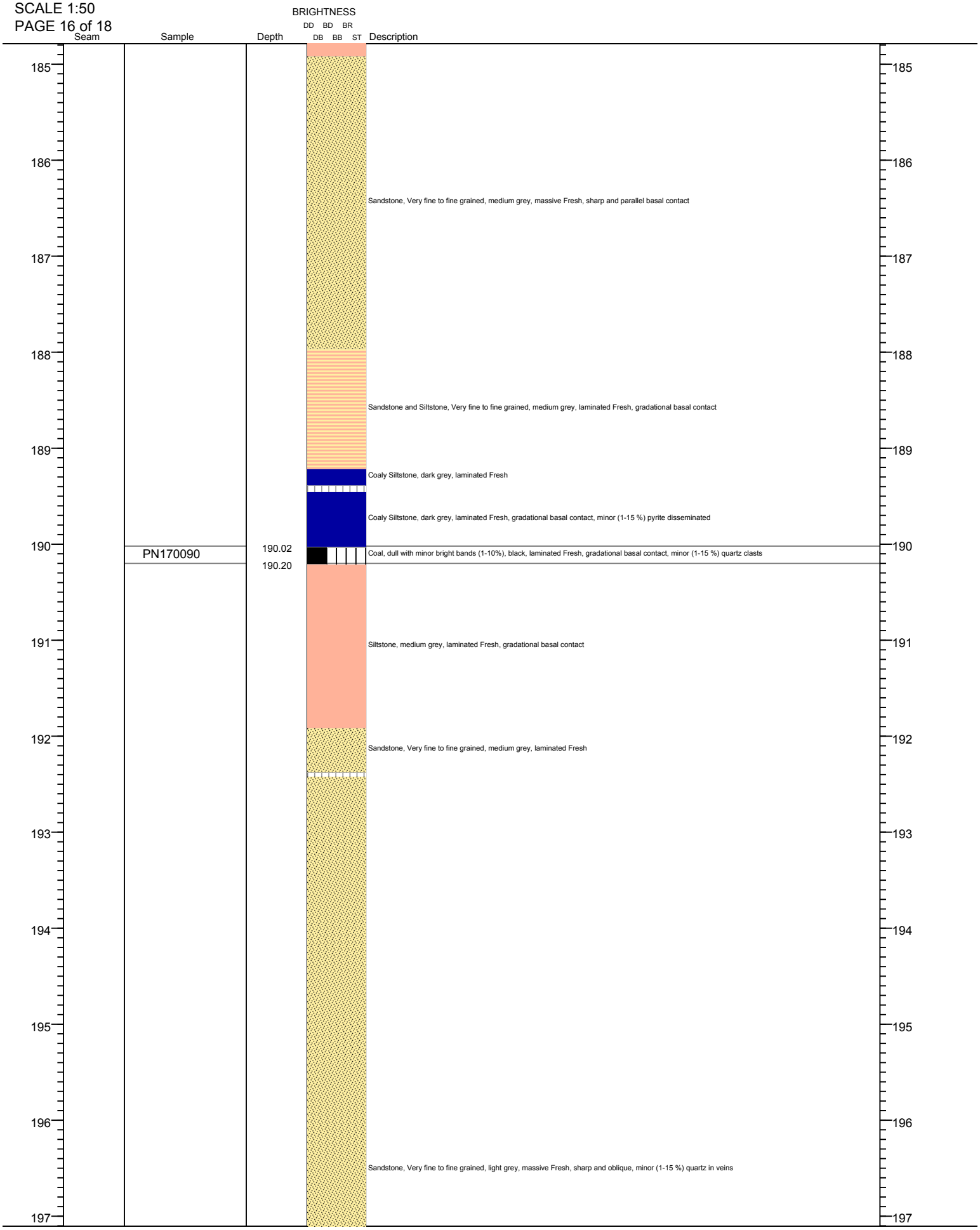

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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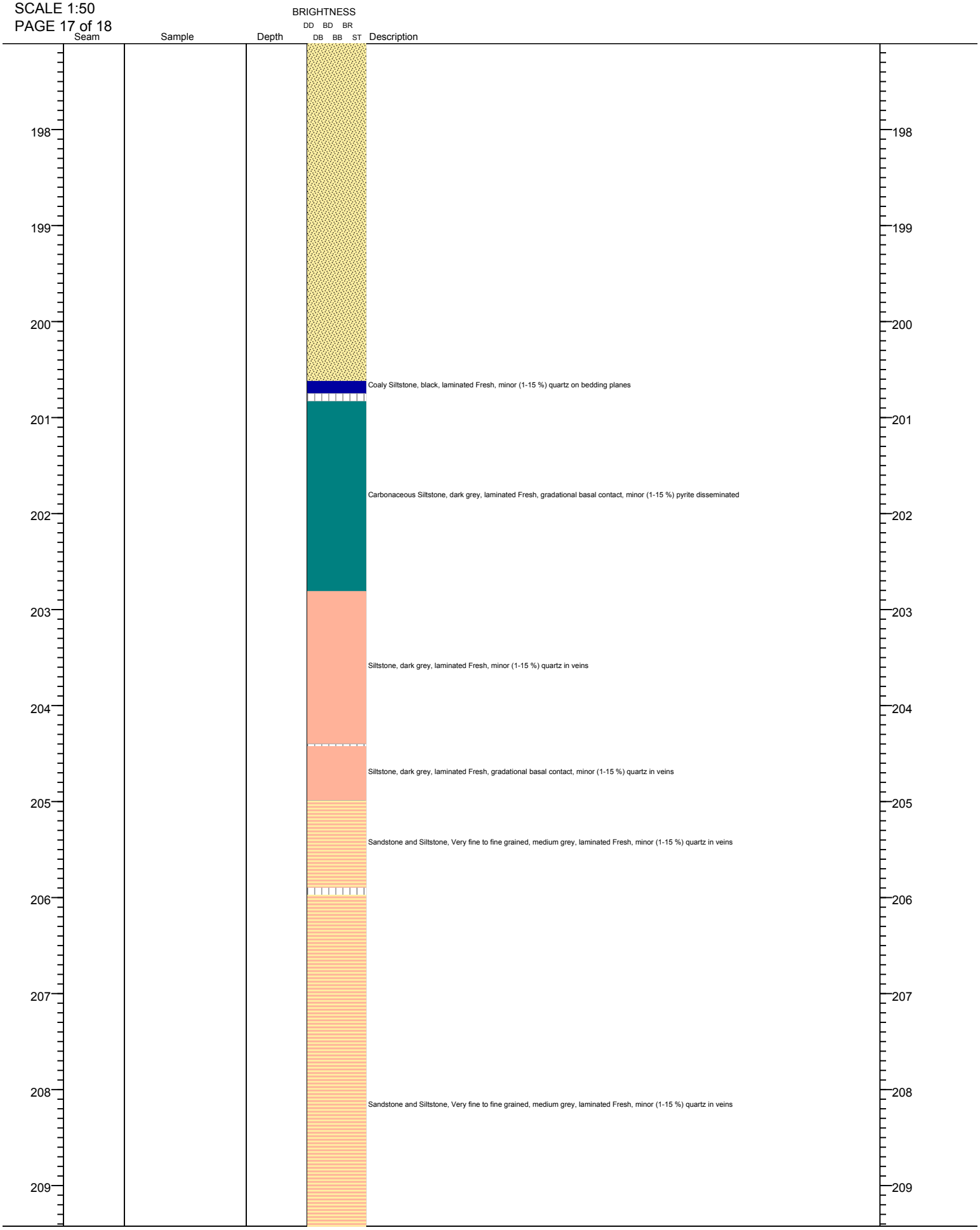

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-02
SCALE 1:50
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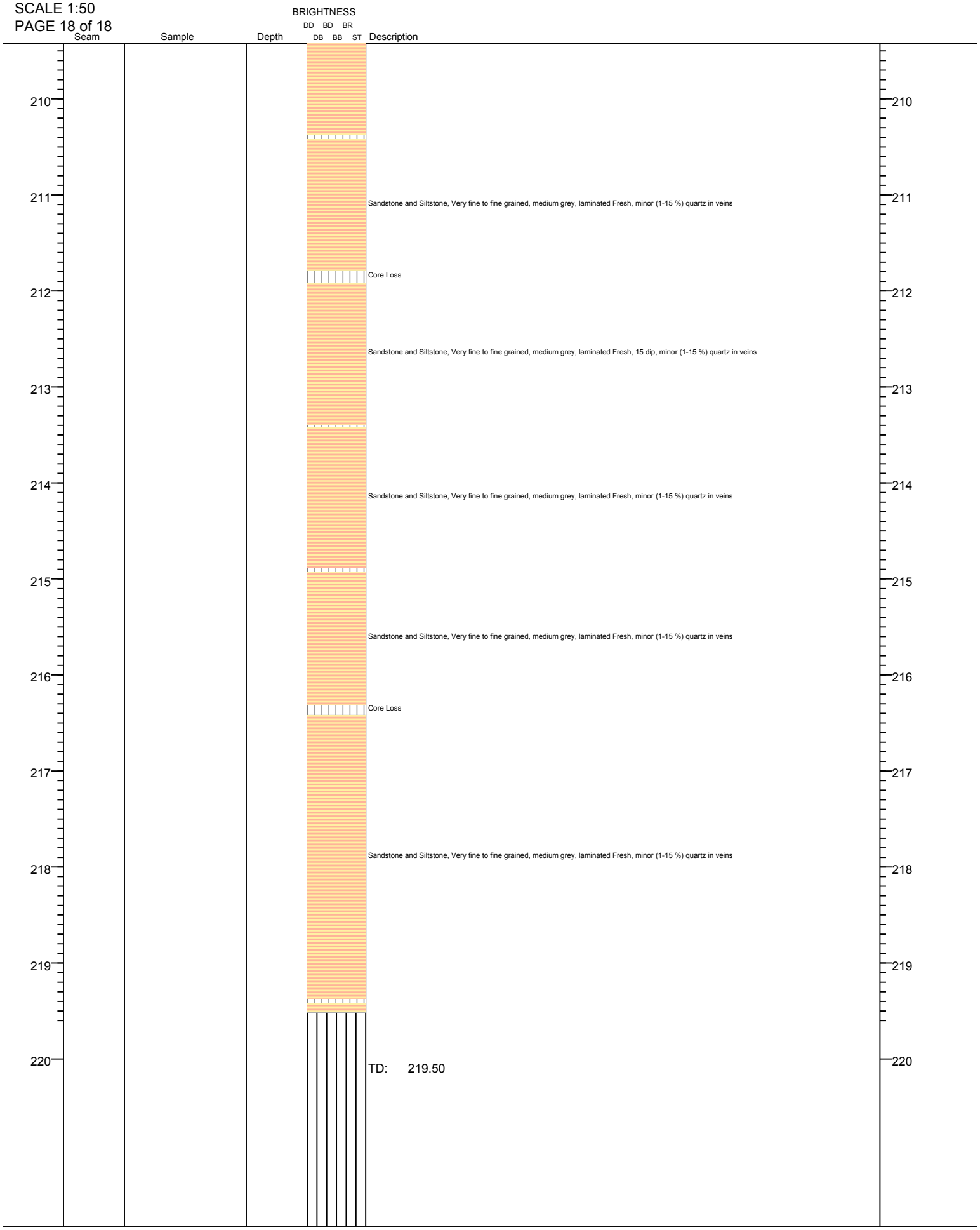

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HOLE DHPN-17-02B
SCALE 1:50
PAGE 1 of 2

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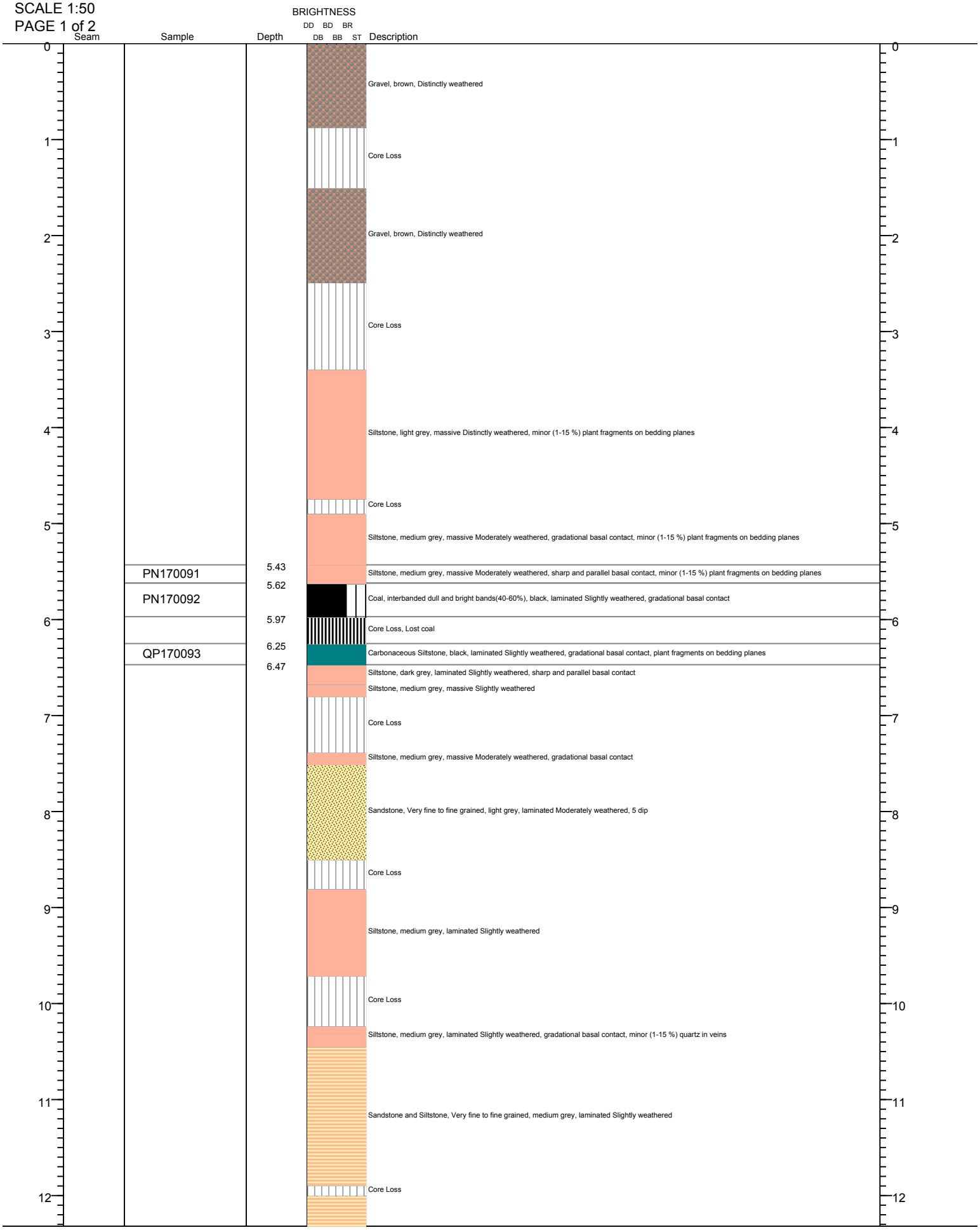

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PANORAMA NORTH
HOLE DHPN-17-02B
SCALE 1:50
PAGE 2 of 2

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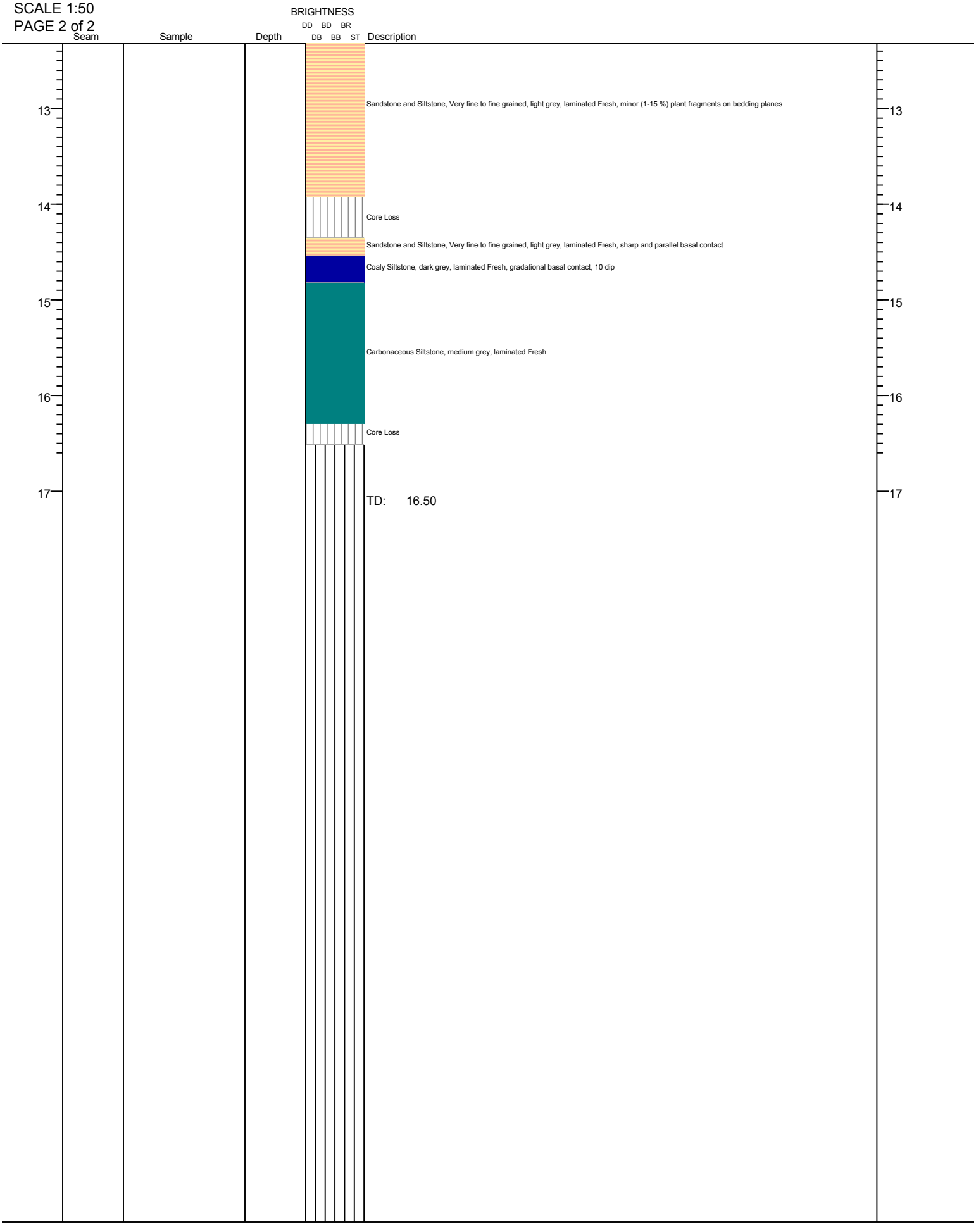

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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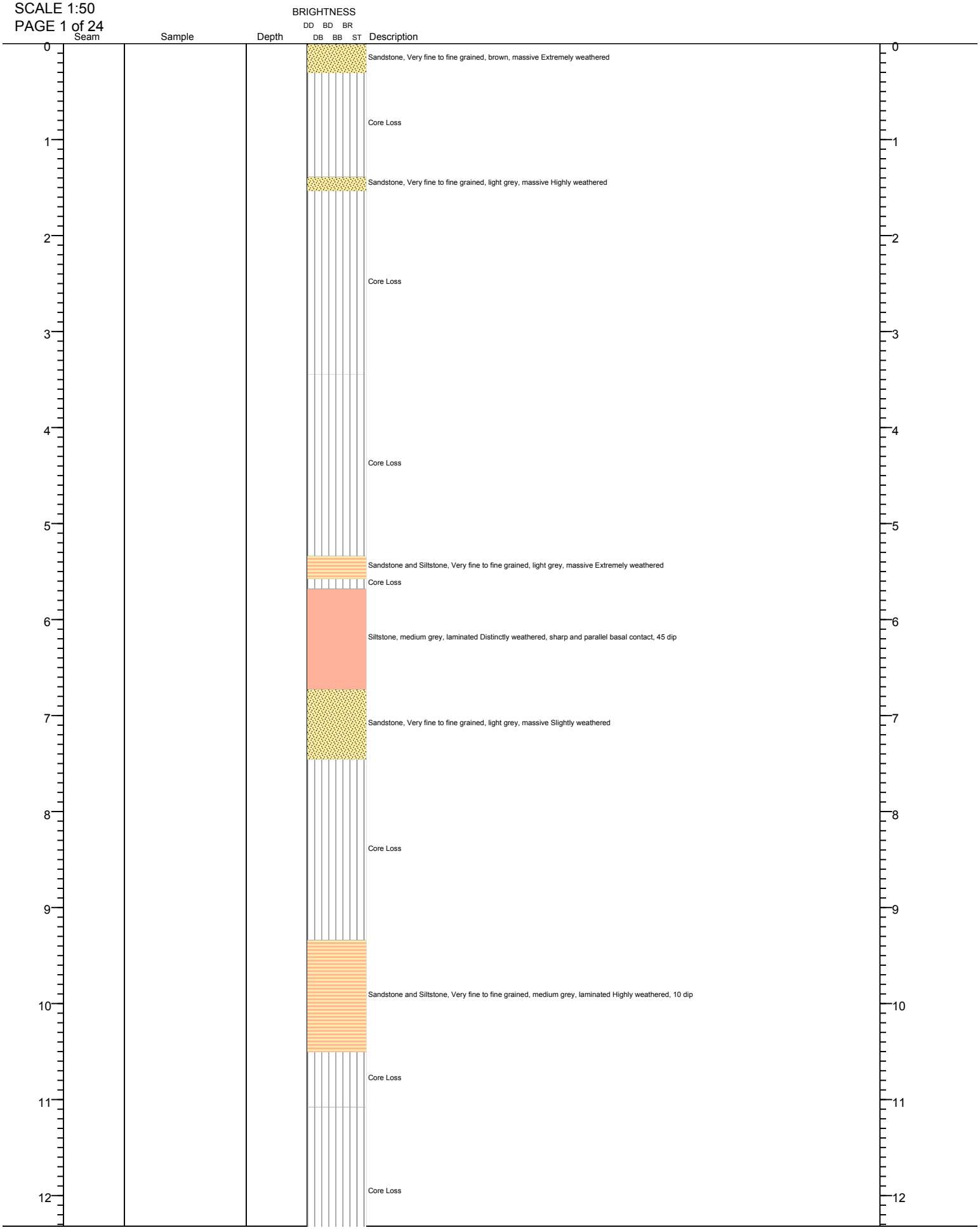

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PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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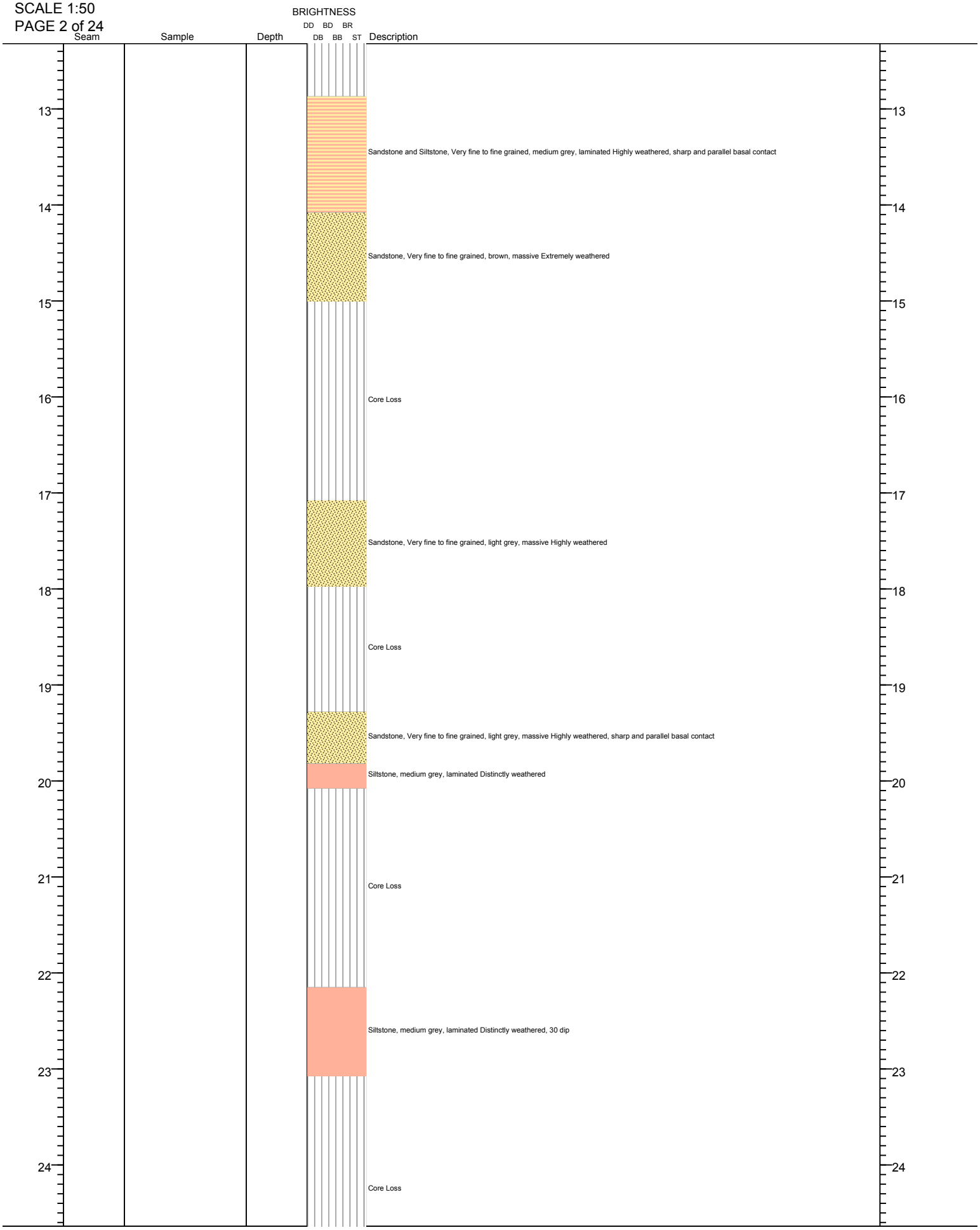

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PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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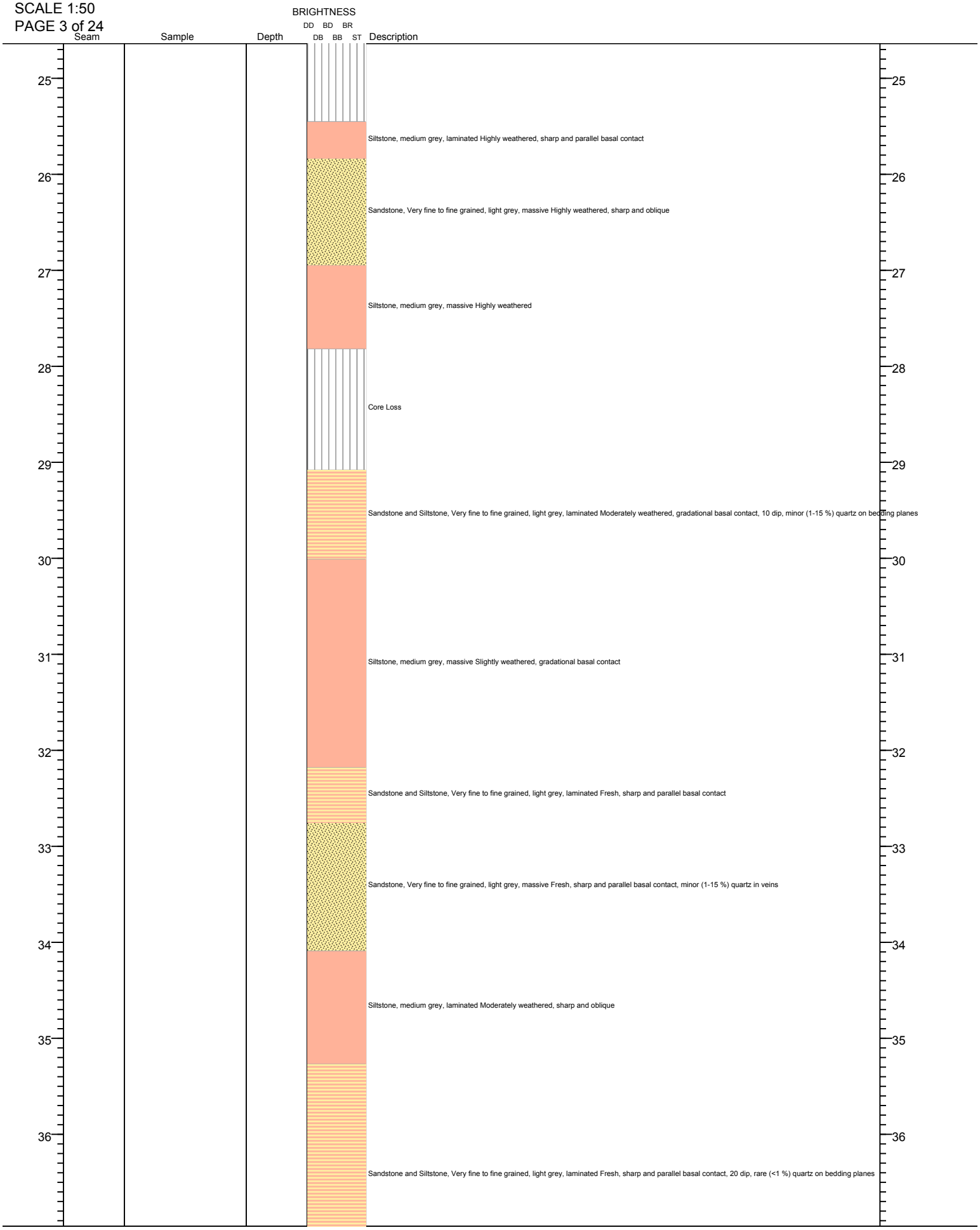

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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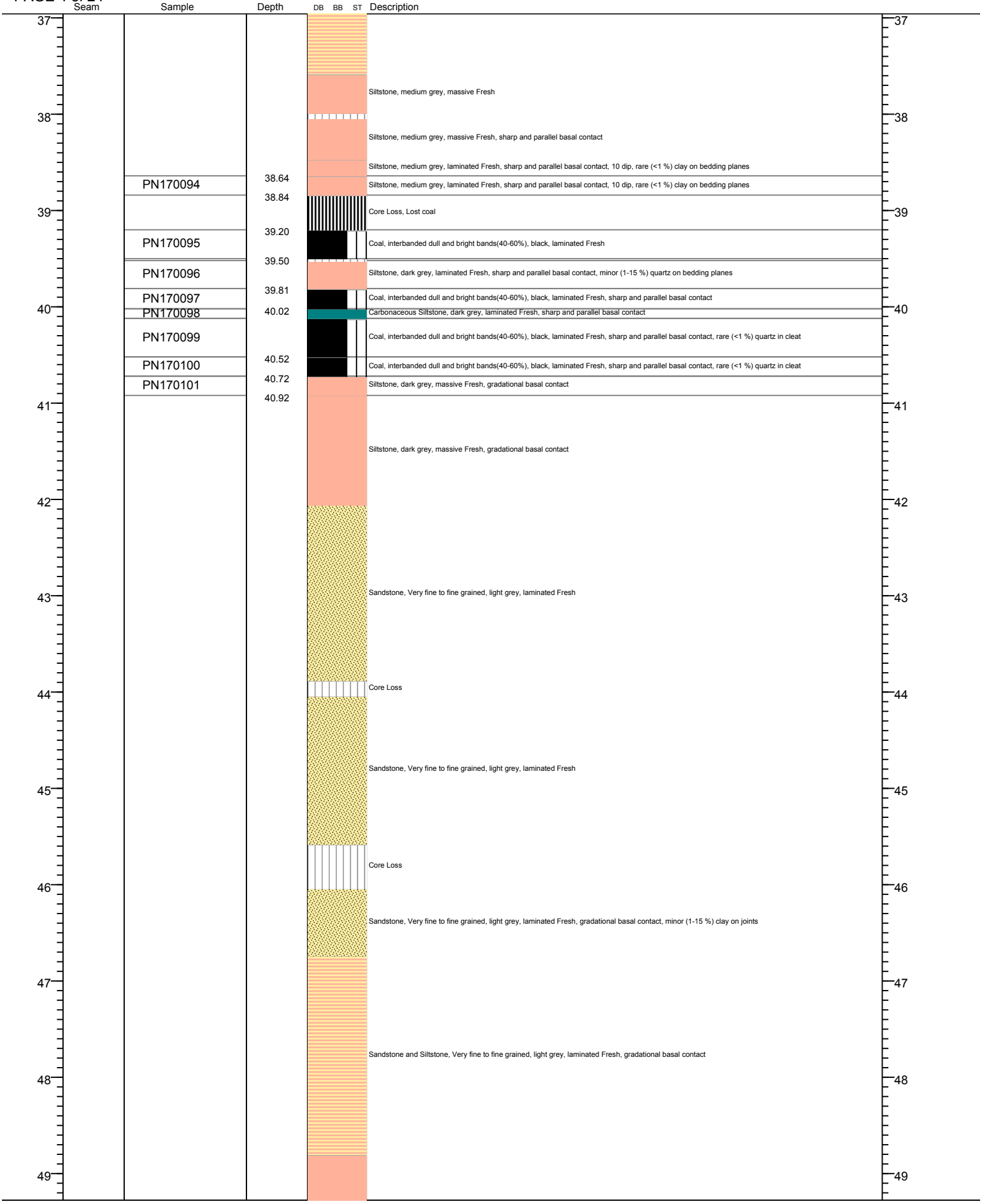

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		50		Siltstone, medium grey, massive Fresh
				Siltstone, medium grey, massive Fresh, sharp and parallel basal contact
		51		Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and undulose basal contact
		52		Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, 5 dip
		53		Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact
		54		
		55		
		56		
				Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and oblique, minor (1-15 %) clay on joints
		57		
		58		
		59		
		60		
		61		

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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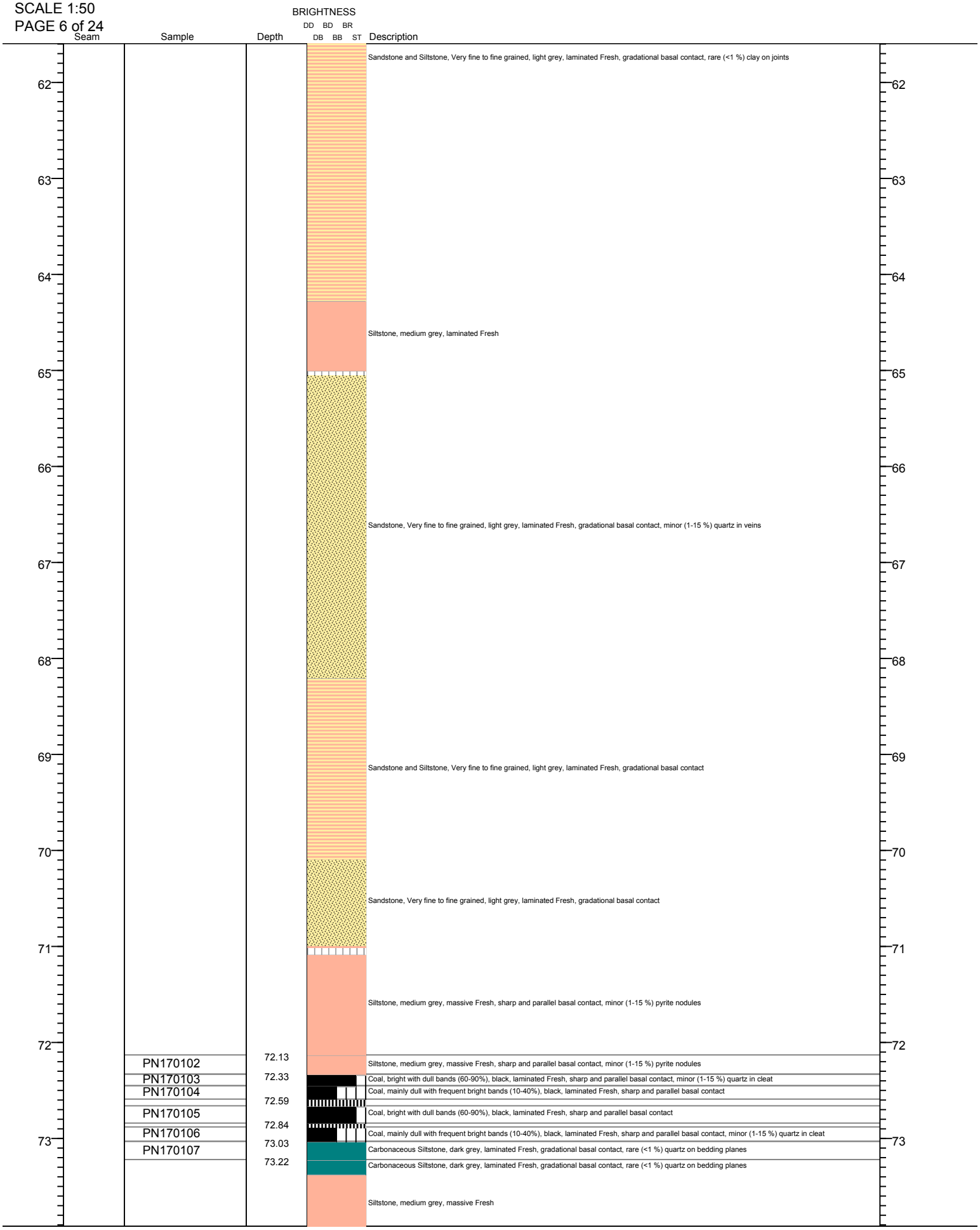
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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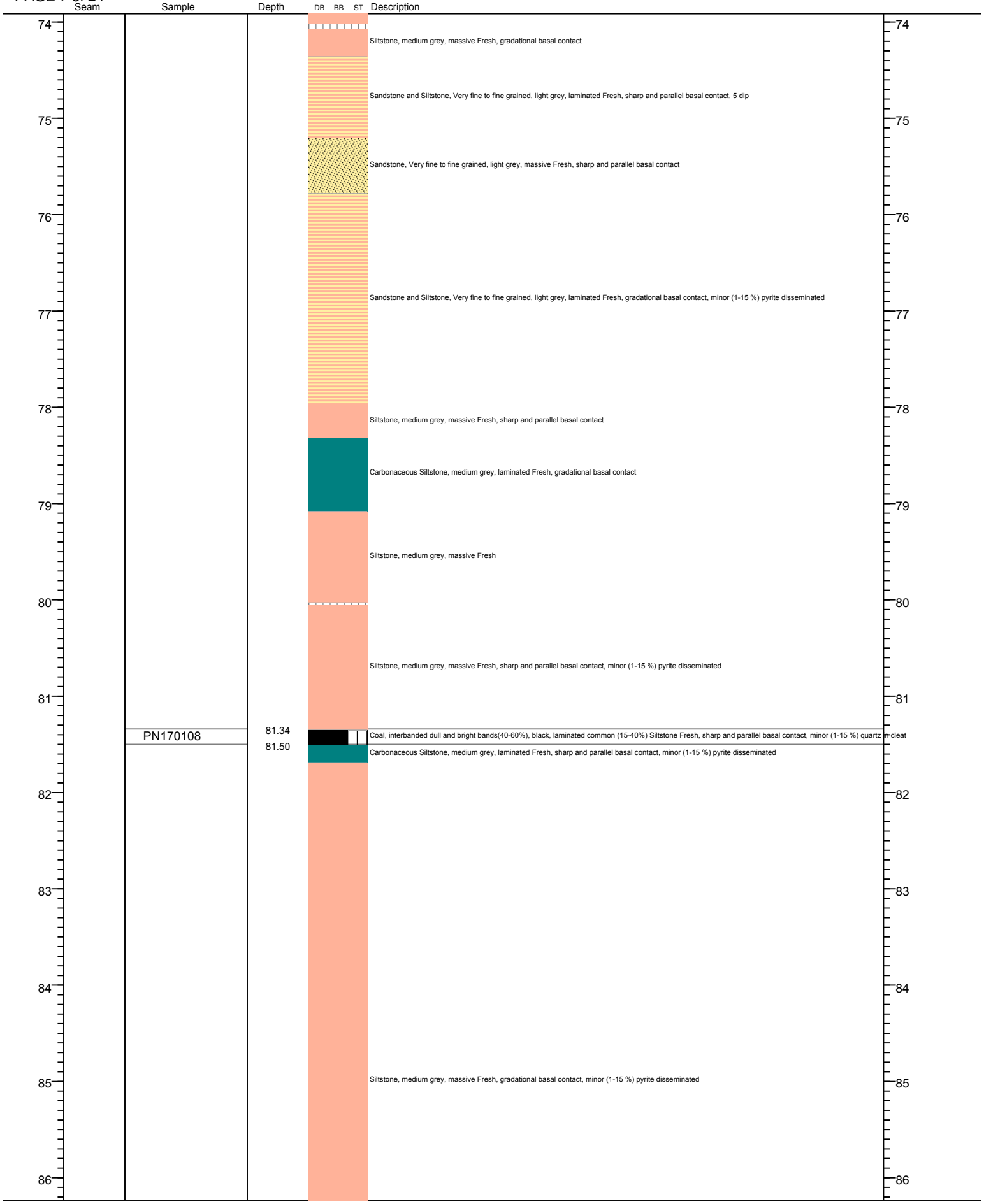
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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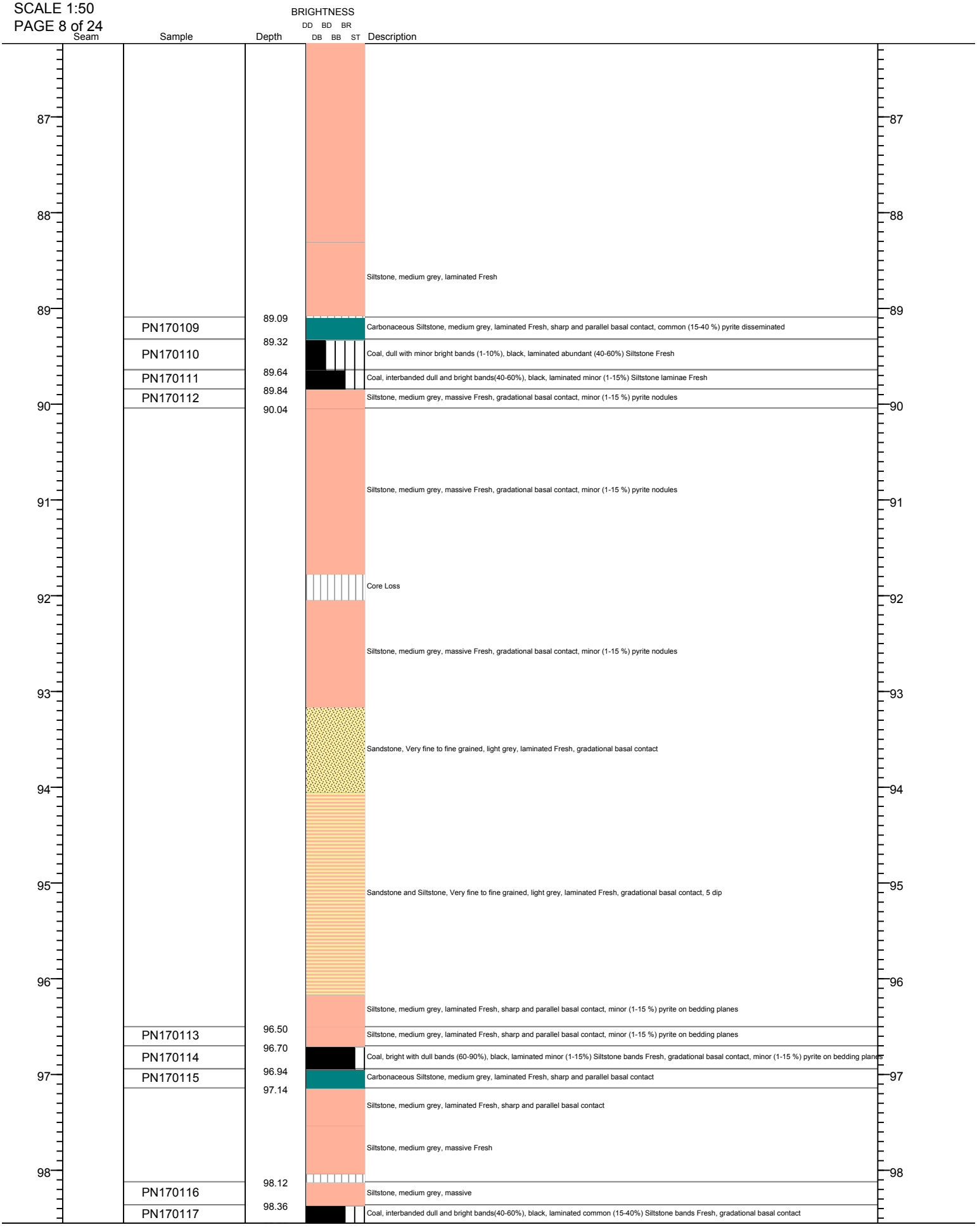
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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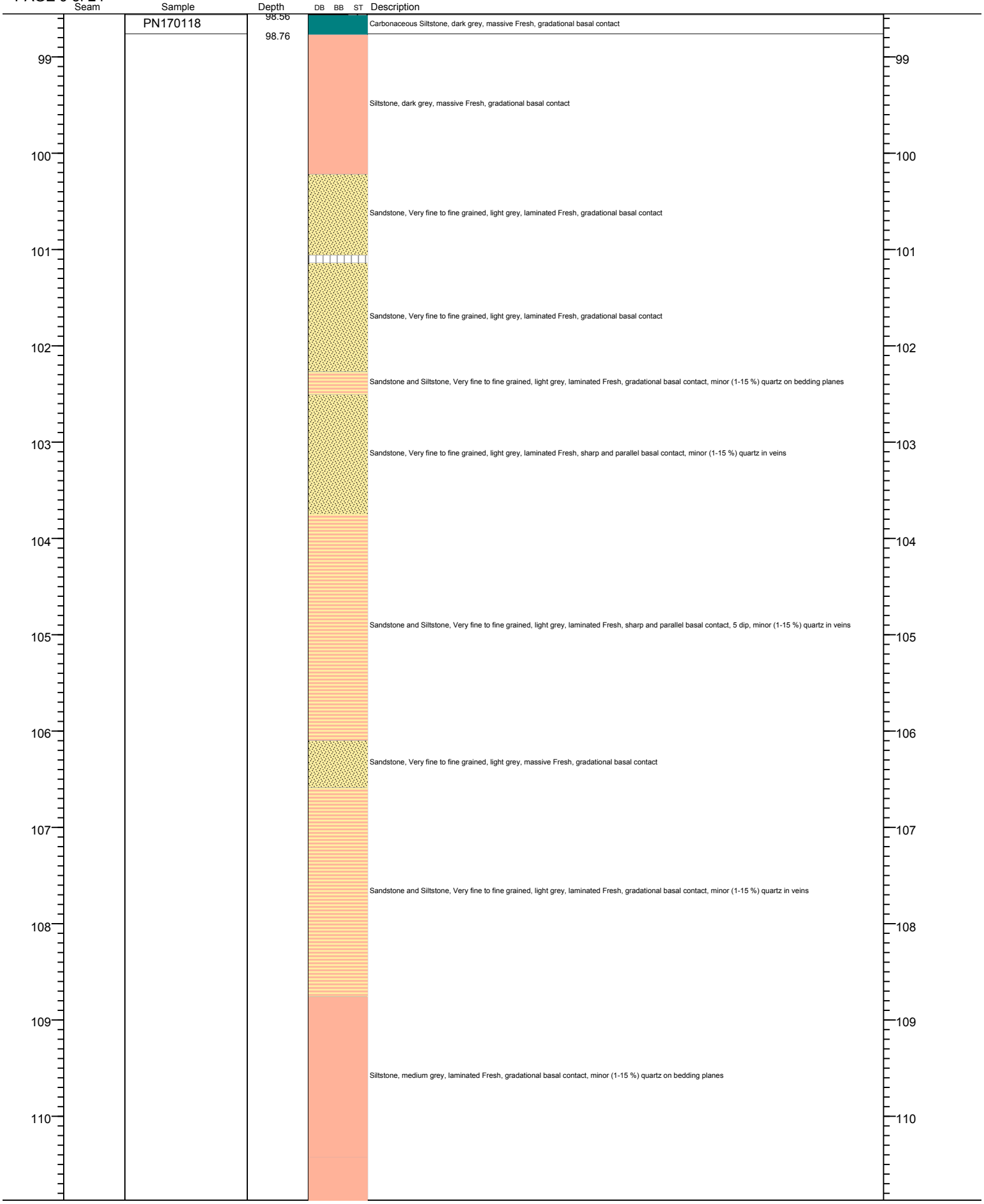
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR / DB BB ST	Description
				Siltstone, medium grey, massive Fresh, gradational basal contact
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
				Sandstone, Very fine to fine grained, light grey, massive Fresh
				Core Loss
				Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes
				Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
				Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
				Siltstone, medium grey, massive Fresh, minor (1-15 %) pyrite nodules
	GT1705	122.42		Siltstone, medium grey, massive Fresh
		122.67		
				Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite nodules

111 112 113 114 115 116 117 118 119 120 121 122 123

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DB	BRIGHTNESS BB	BRIGHTNESS ST	Description
	PN170119	123.71				Siltstone, medium grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) pyrite nodules
		123.91				Core Loss
	PN170120	124.15				Coal, interbanded dull and bright bands(40-60%), black, Fresh, fractured at basal contact
	PN170121	124.35				Coal, interbanded dull and bright bands(40-60%), black, Fresh, fractured at basal contact
		124.89				
	PN170122					Siltstone, dark grey, massive Fresh, fractured at basal contact, minor (1-15 %) quartz in veins
	PN170123	125.12				Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact
	PN170124	125.39				Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact
	PN170125	125.87				Coal, bright with dull bands (60-90%), black, laminated Fresh, gradational basal contact
	PN170126	126.07				Siltstone, medium grey, massive Fresh, minor (1-15 %) pyrite nodules
	GT1706					Siltstone, medium grey, massive Fresh
		126.39				Siltstone, medium grey, massive Fresh, gradational basal contact, minor (1-15 %) pyrite nodules
						Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
						Siltstone, medium grey, massive Fresh, sharp and parallel basal contact
						Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes
						Siltstone, medium grey, massive Fresh
						Core Loss
						Siltstone, medium grey, massive Fresh, sharp and parallel basal contact
						Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and oblique, minor (1-15 %) quartz in veins
						Siltstone, dark grey, laminated Fresh, gradational basal contact
						Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 5 dip

124 125 126 127 128 129 130 131 132 133 134 135

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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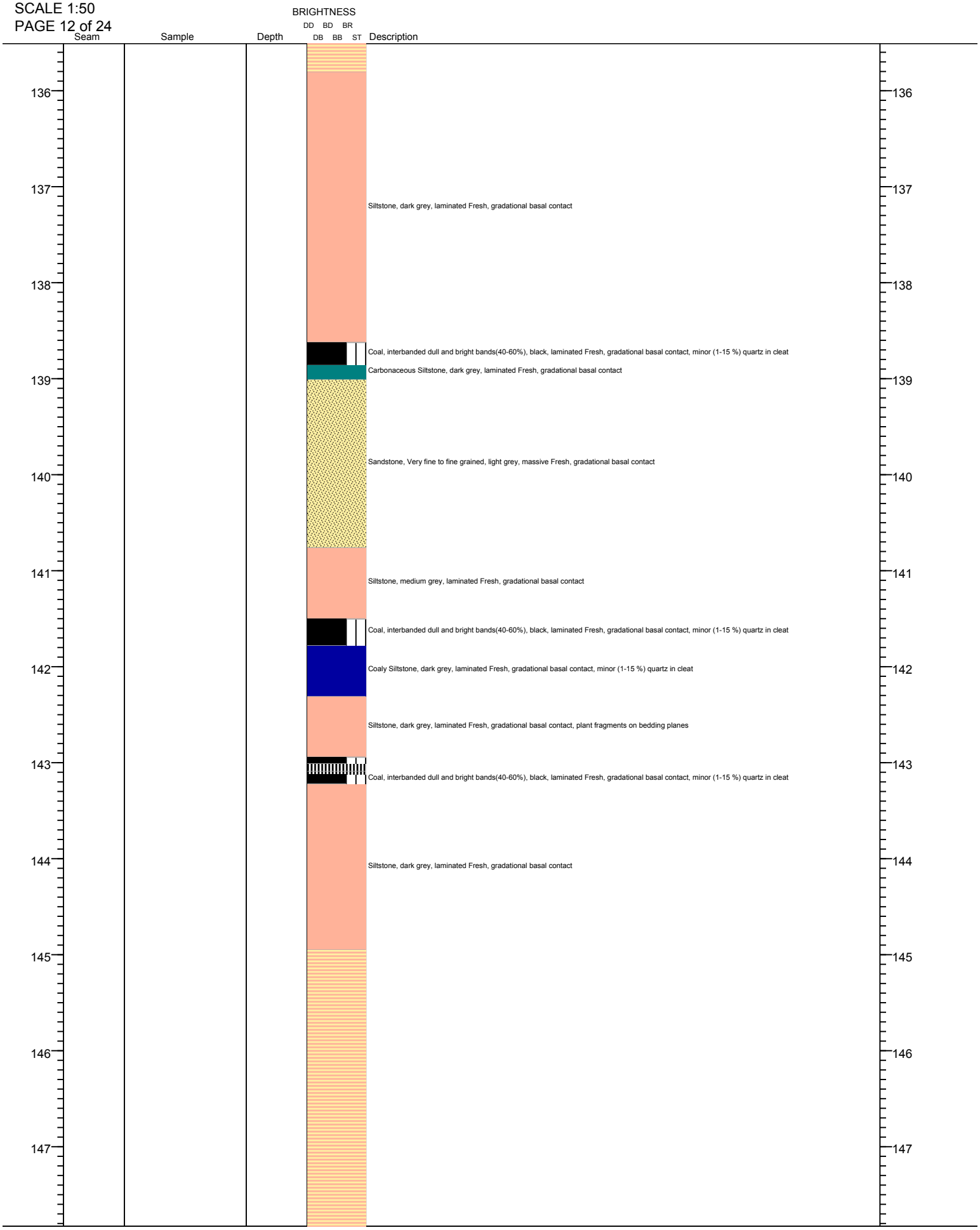
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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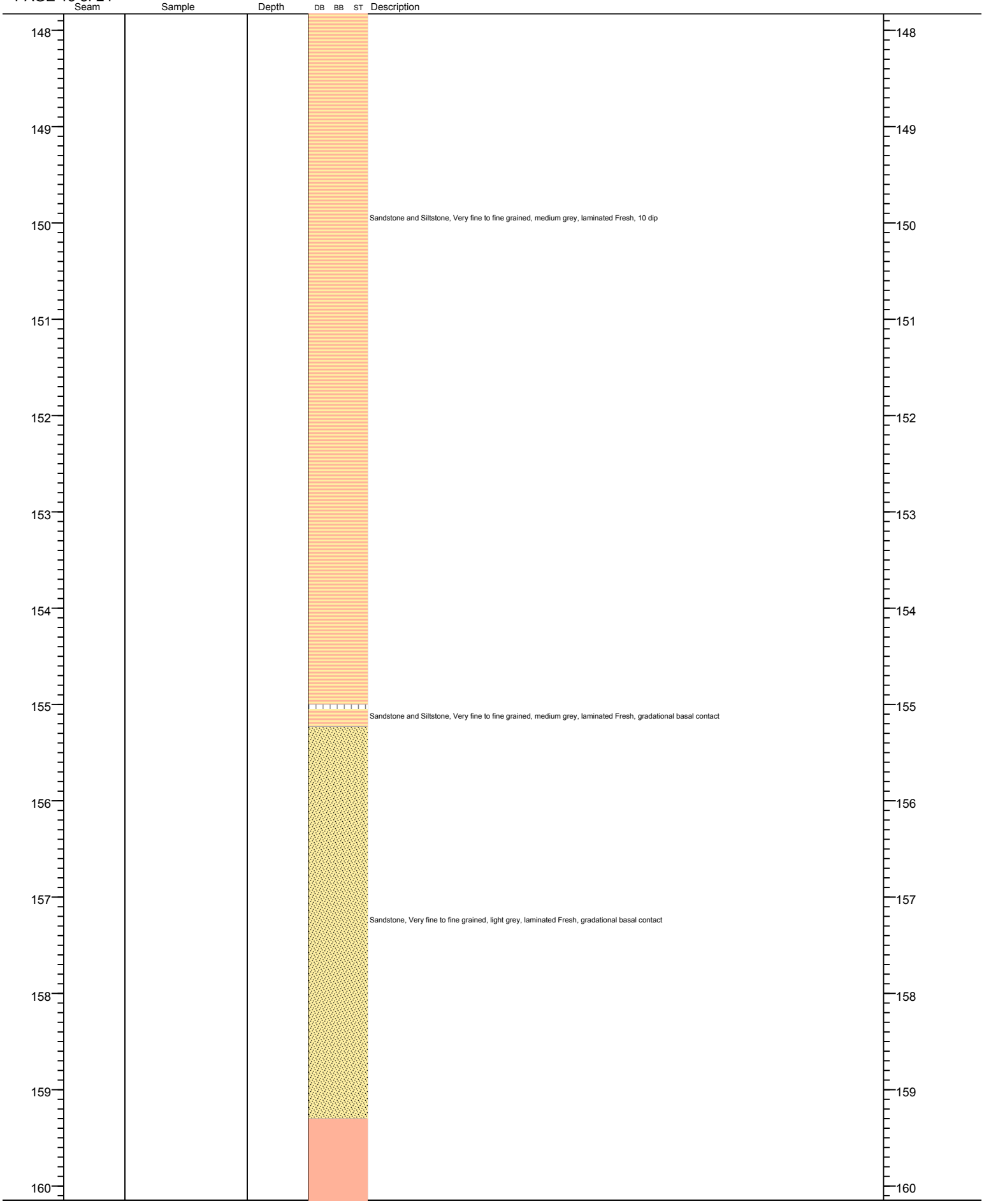

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PANORAMA NORTH
HOLE DHPN-17-03
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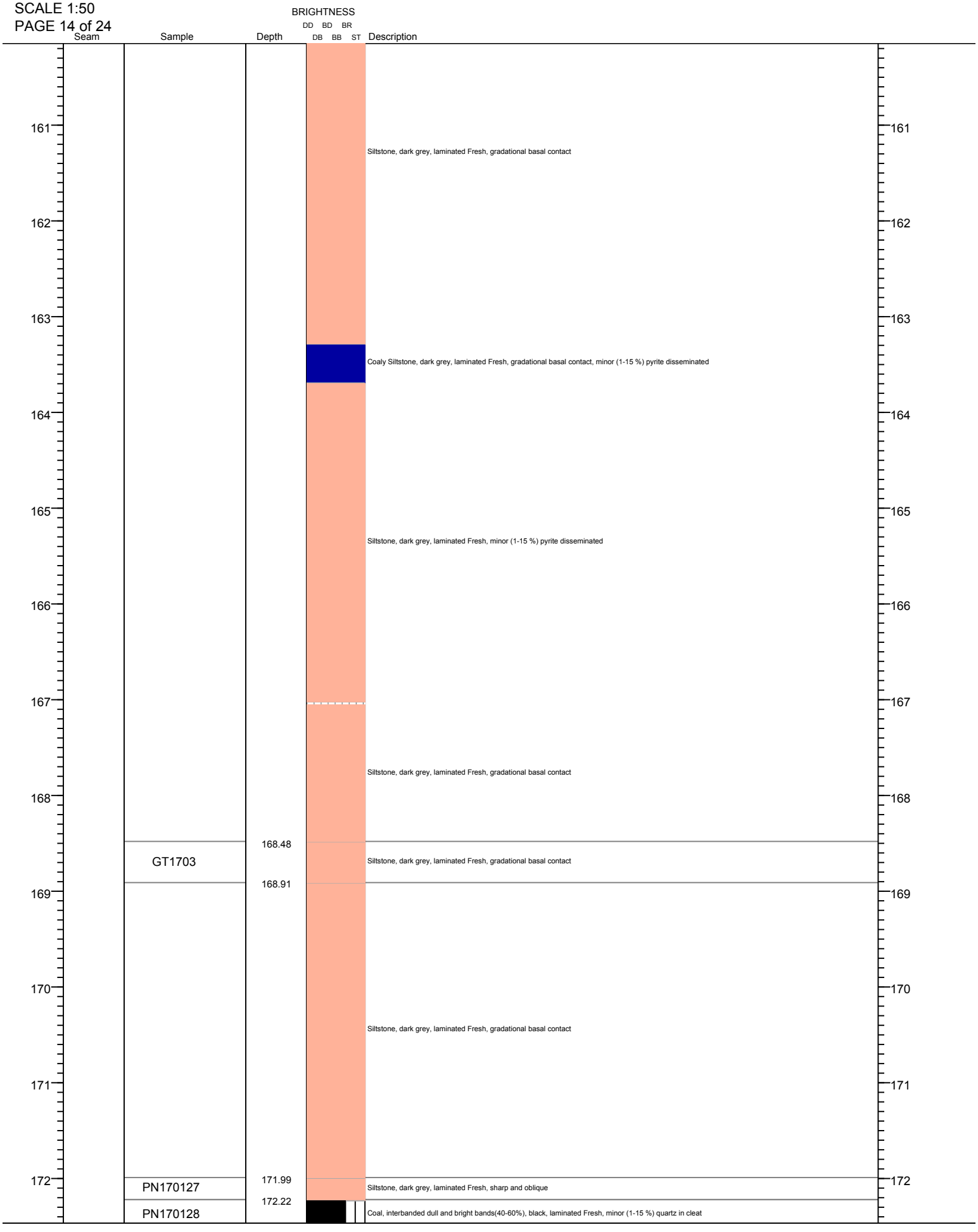

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PANORAMA NORTH
HOLE DHPN-17-03
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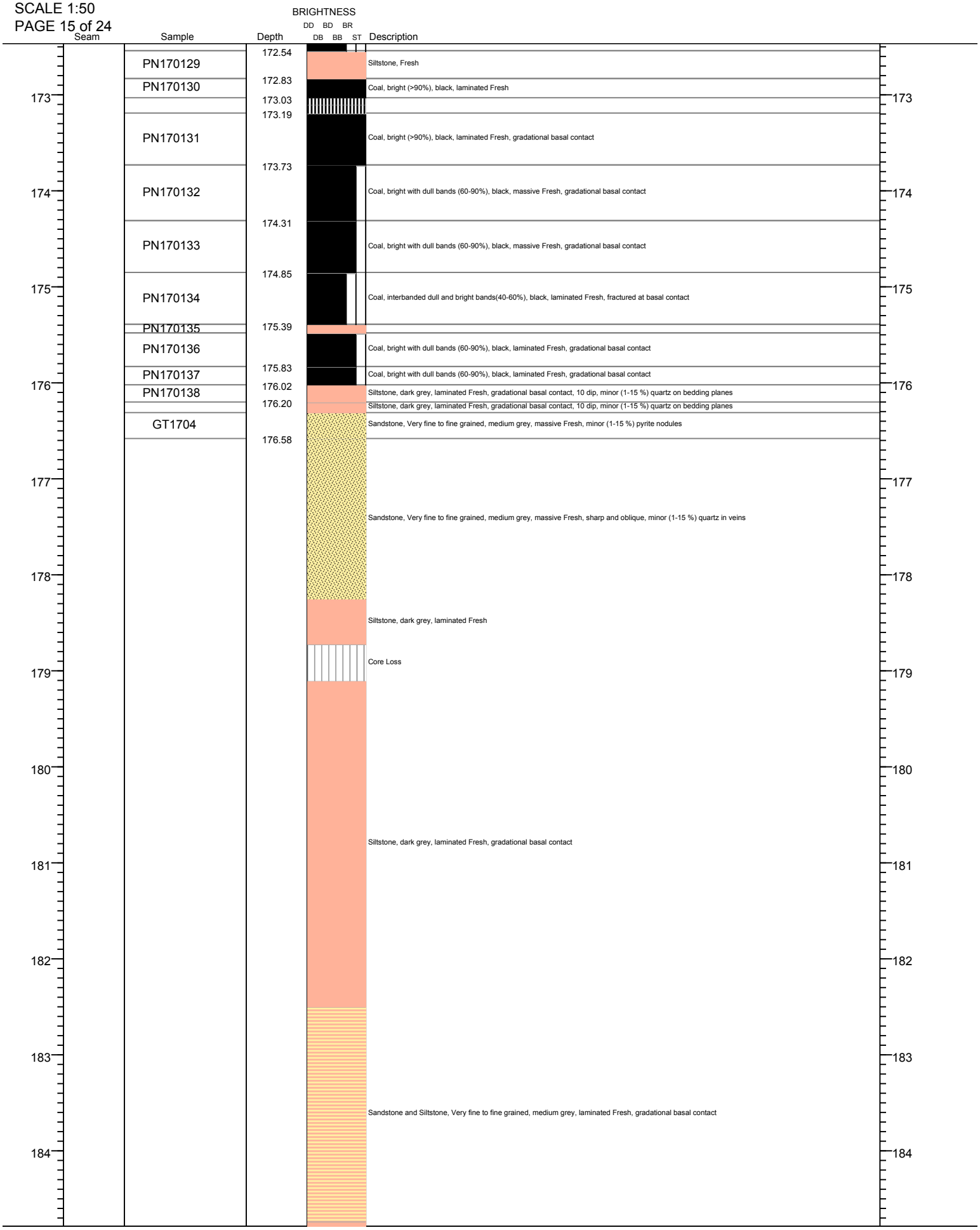

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PANORAMA NORTH
HOLE DHPN-17-03
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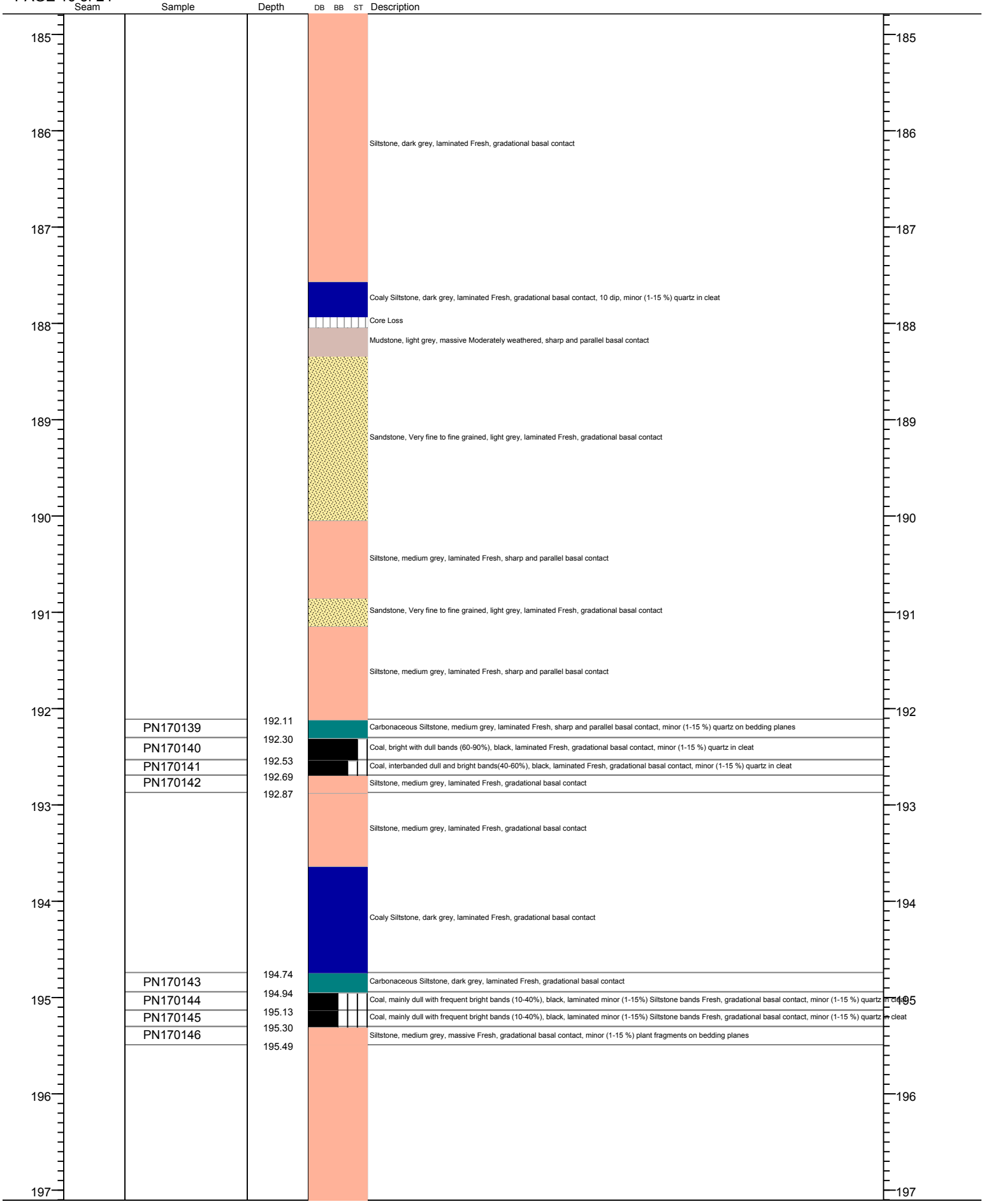

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PANORAMA NORTH
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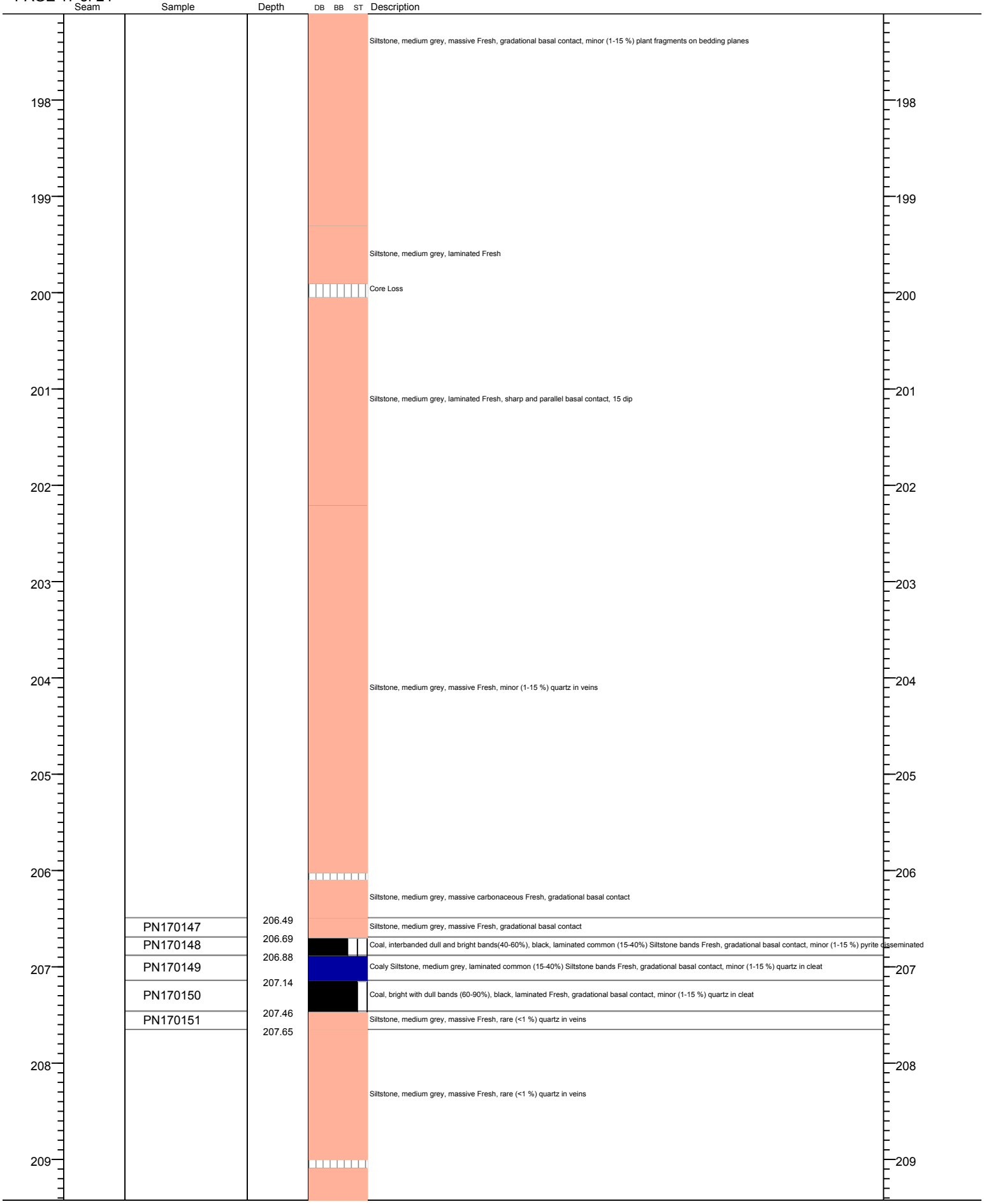

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PANORAMA NORTH
HOLE DHPN-17-03
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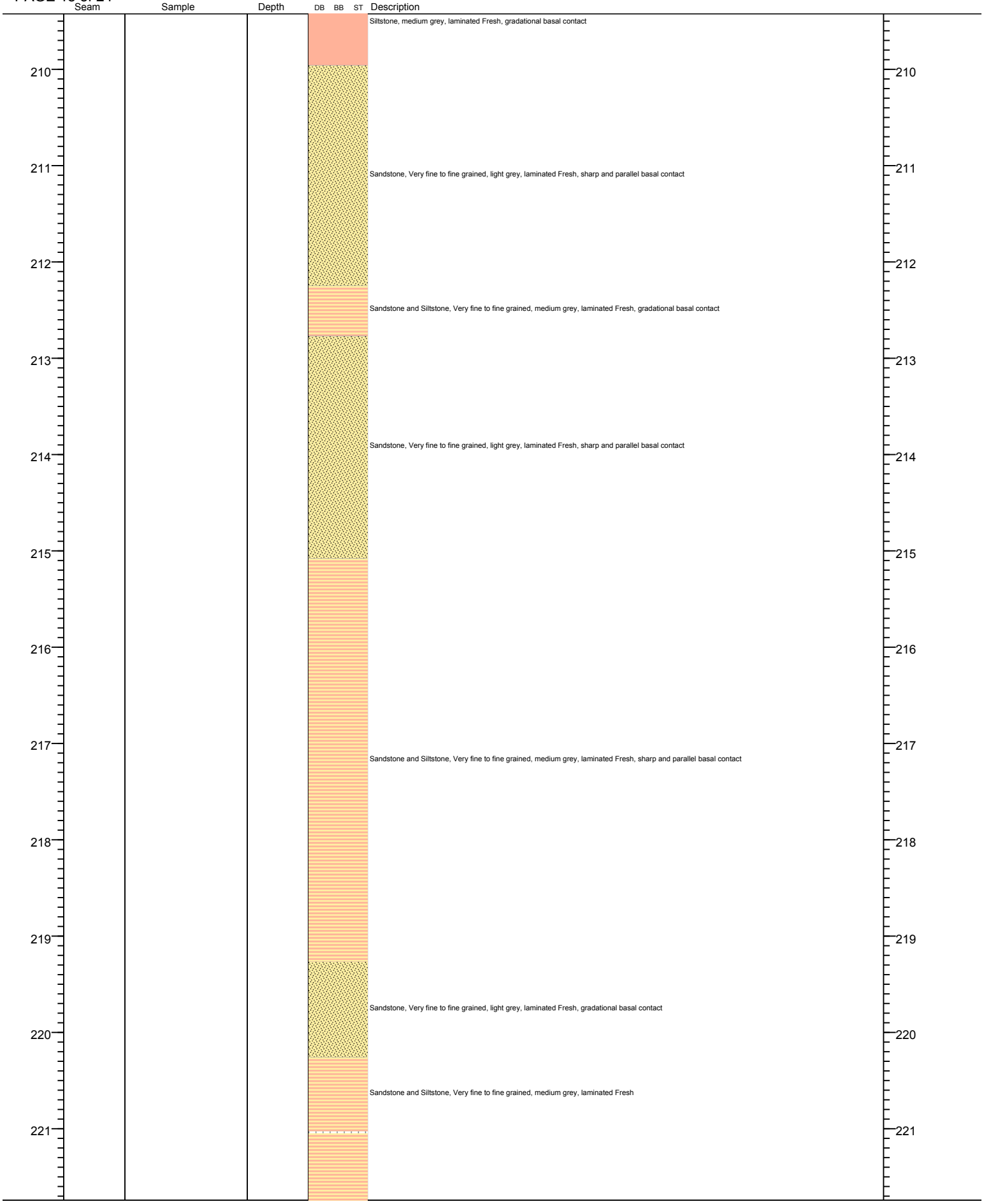

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PANORAMA NORTH
HOLE DHPN-17-03
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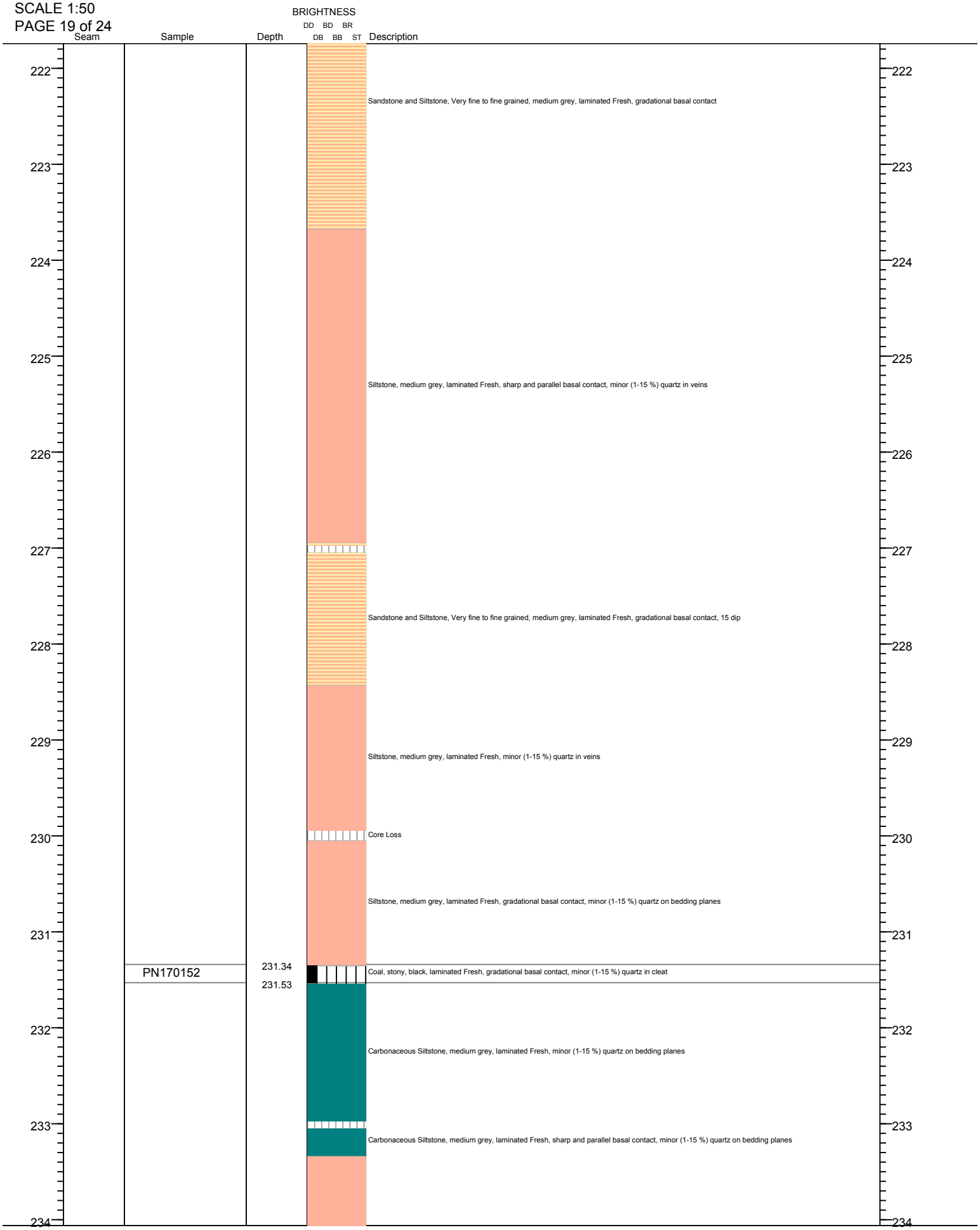

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		235		
		236		Siltstone, medium grey, massive Fresh, gradational basal contact
		237		
		238		
		239		Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes
		240		Siltstone, medium grey, laminated Fresh, sharp and oblique
		241		Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins
		242		Siltstone, medium grey, massive Fresh, sharp and oblique, minor (1-15 %) quartz in veins
		243		Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact
		244		Siltstone, medium grey, laminated Fresh, gradational basal contact
		245		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact
		246		Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50
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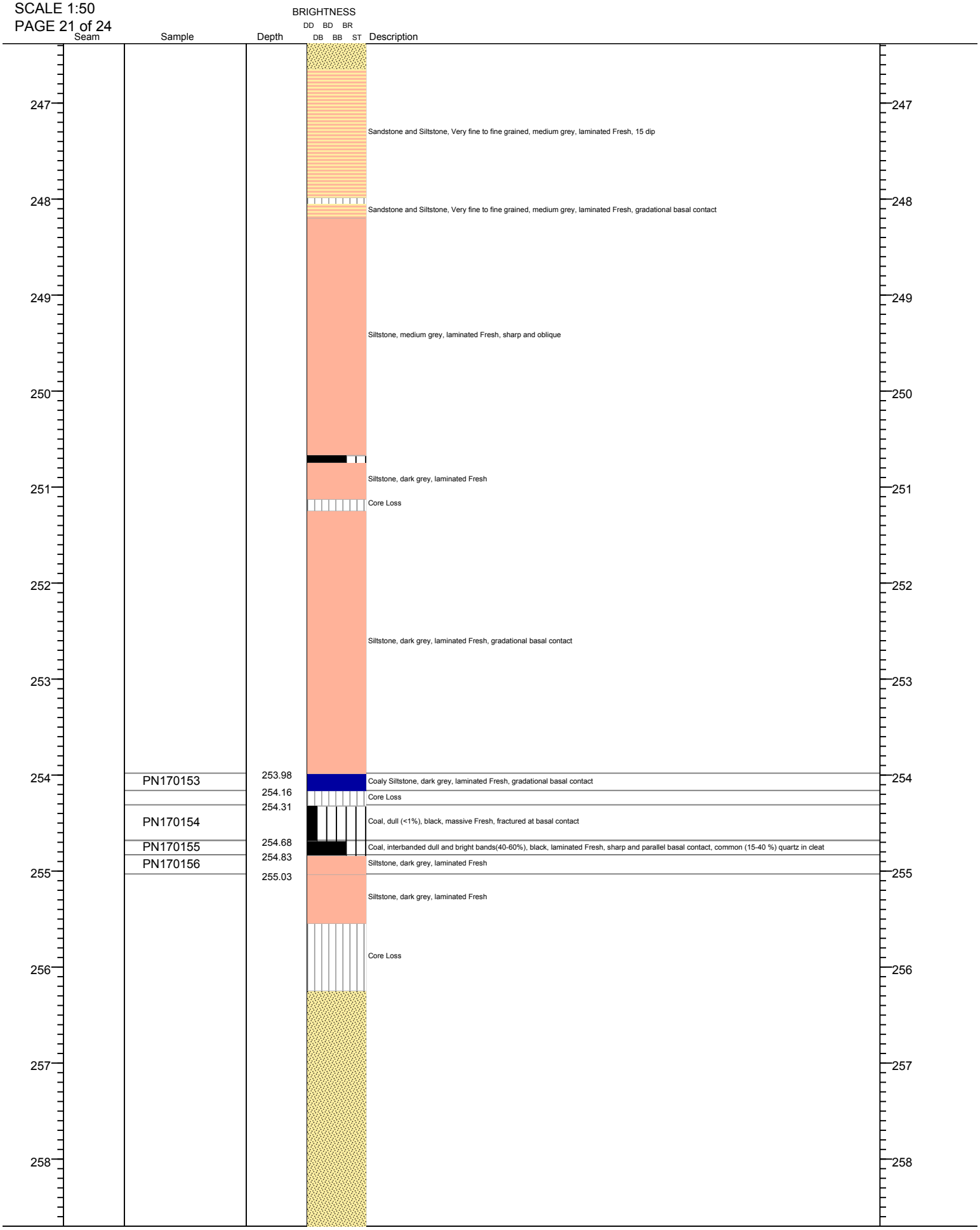
GEOPHYSICAL PROFILE



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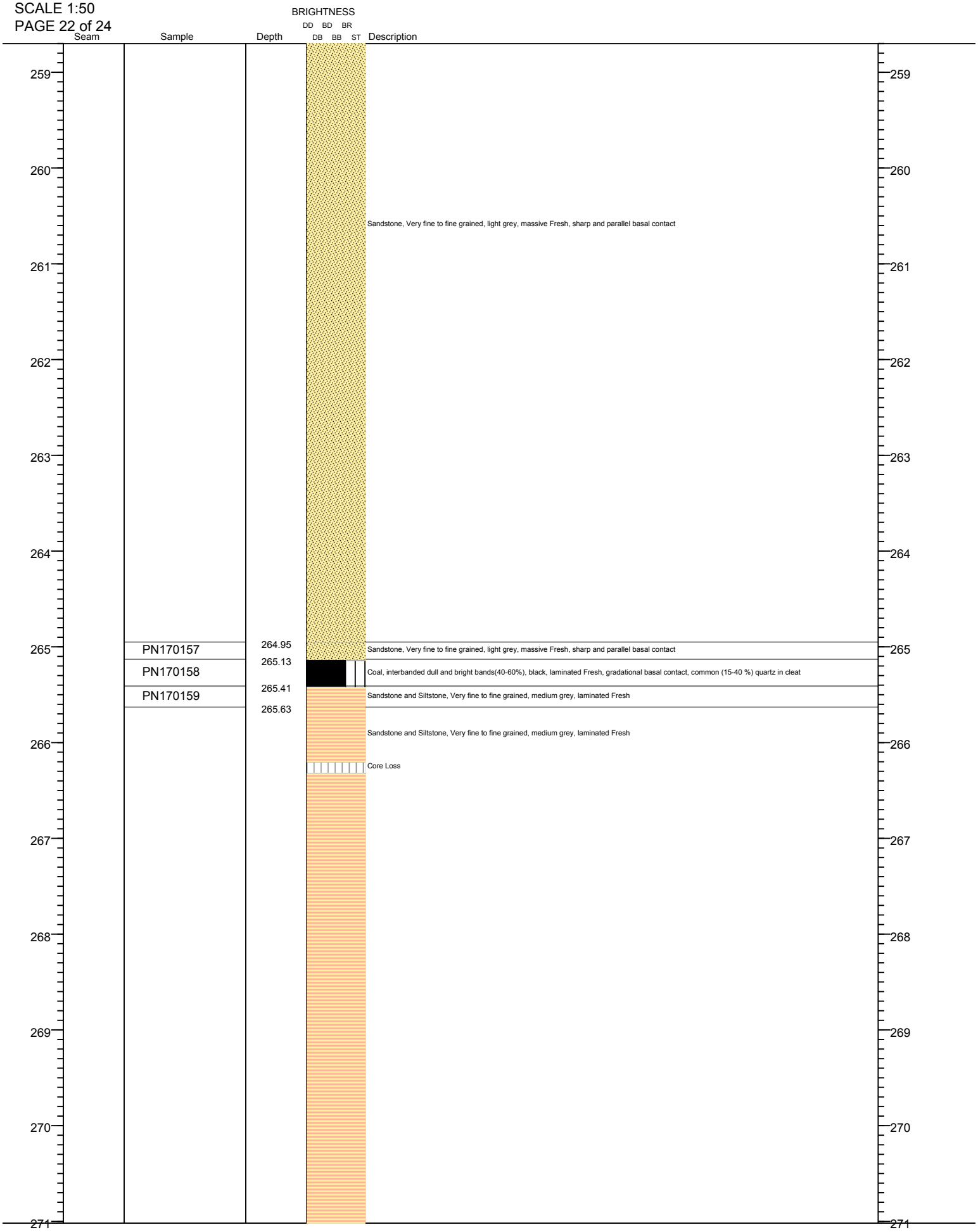
PANORAMA NORTH
HOLE DHPN-17-03
SCALE 1:50

GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-03
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD DB	BD BB	BR ST	Description
		272				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 10 dip
		273				
		274				
		275				
		276				
		277				Sandstone, Very fine to fine grained, light grey, laminated Fresh
		278				
		279				Sandstone, Very fine to fine grained, light grey, massive minor (1-15%) Siltstone Fresh
		280				
		281				
		282				
		283				

ATRUM COAL
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HOLE DHPN-17-03
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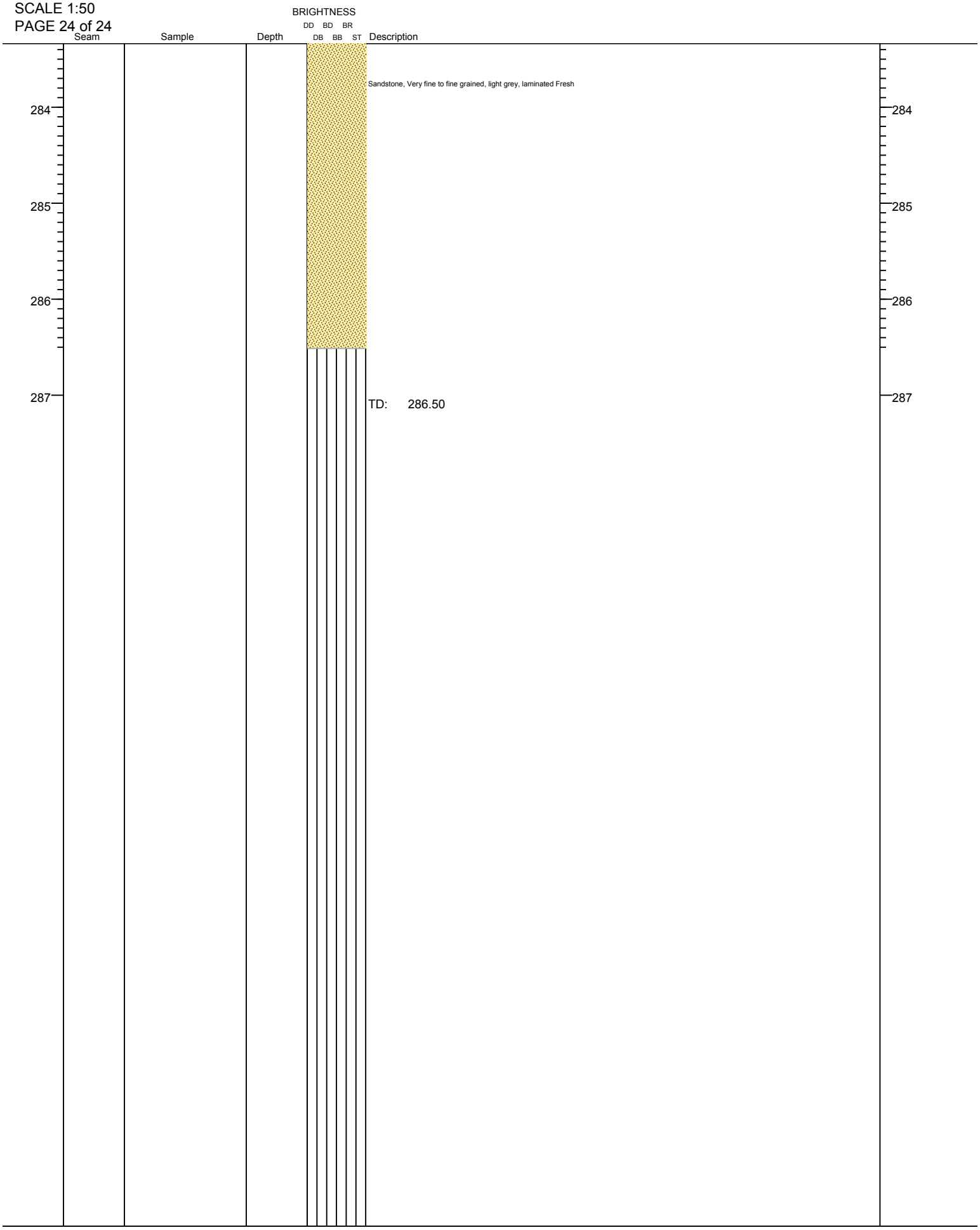
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-04
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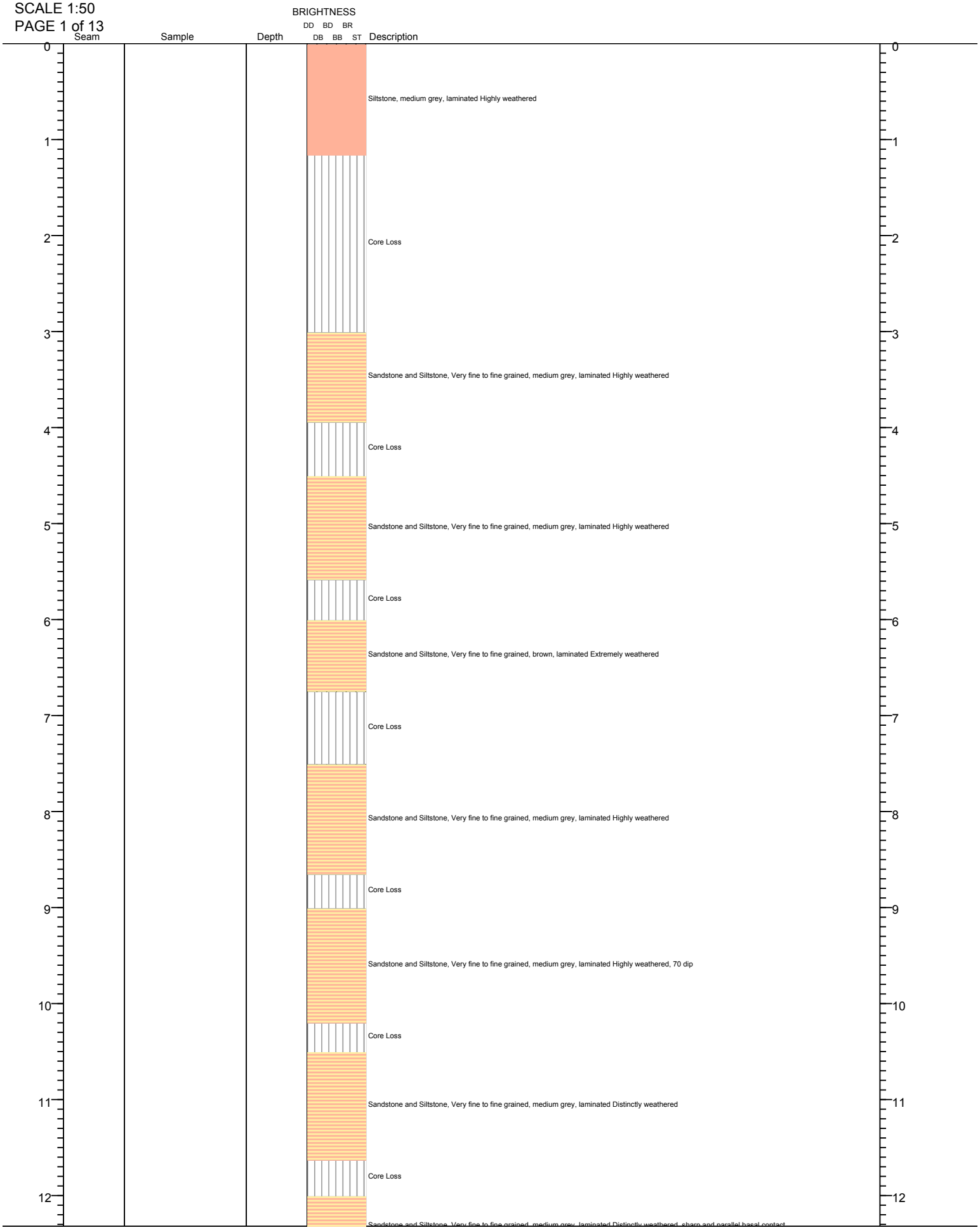
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-04
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD DB	BD BB	BR ST	Description
		13				Siltstone, medium grey, massive Distinctly weathered
						Core Loss
		14				Siltstone, medium grey, massive Distinctly weathered
						Core Loss
		15				Siltstone, medium grey, massive Distinctly weathered
		16				Core Loss
		17				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Distinctly weathered, 10 dip
						Core Loss
		18				Sandstone, Very fine to fine grained, light grey, laminated Slightly weathered
		19				Core Loss
		20				Siltstone, medium grey, massive Moderately weathered
						Core Loss
		21				Siltstone, medium grey, massive Moderately weathered, sharp and parallel basal contact
						Conglomerate, light grey, massive Slightly weathered, gradational basal contact
		22				Sandstone, Coarse grained, light grey, massive Moderately weathered
						Core Loss
		23				Sandstone, Coarse grained, light grey, massive Moderately weathered, common (15-40 %) quartz in veins
		24				Sandstone, Coarse grained, light grey, massive Slightly weathered, minor (1-15 %) quartz in veins

ATRUM COAL
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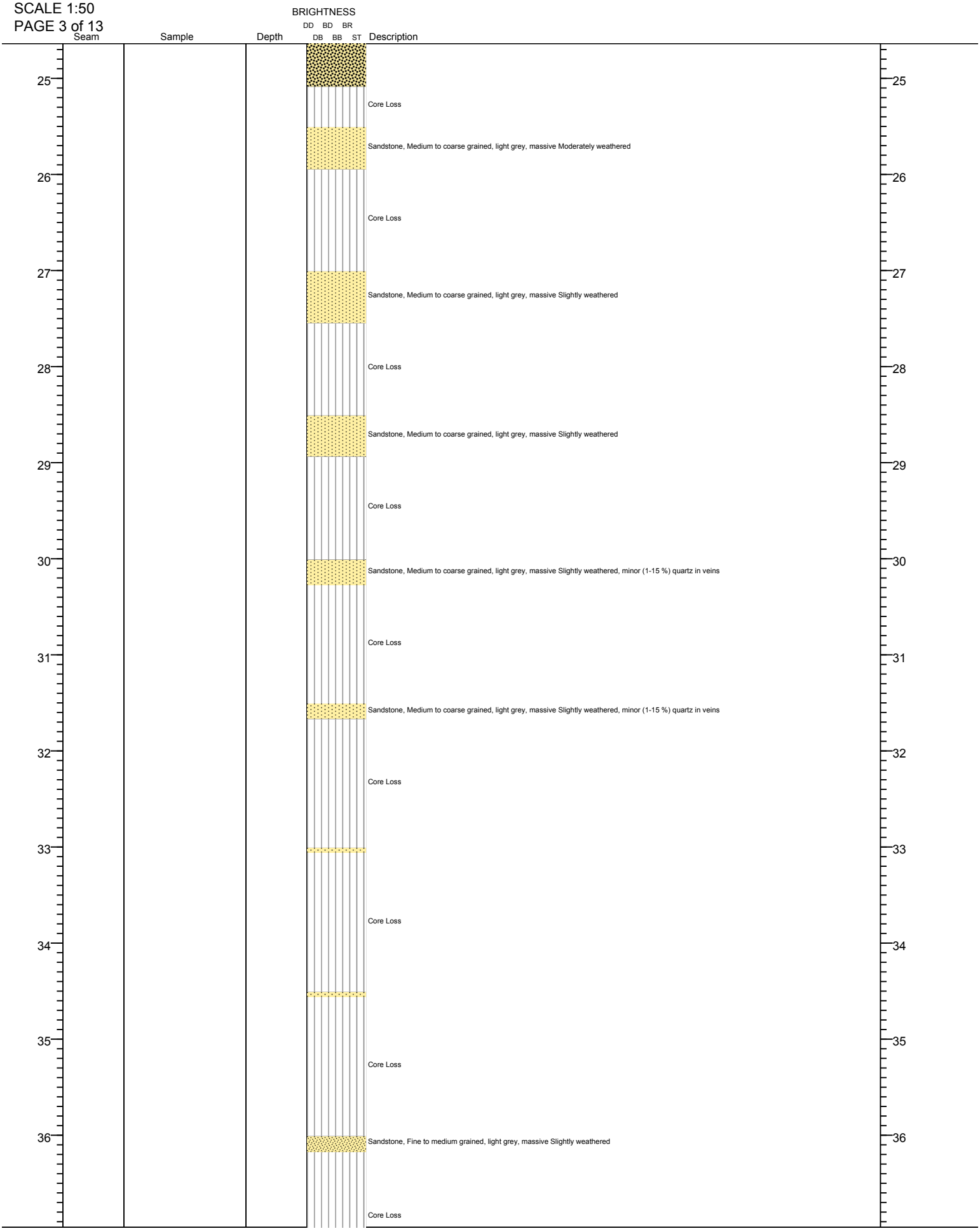
GEOPHYSICAL PROFILE



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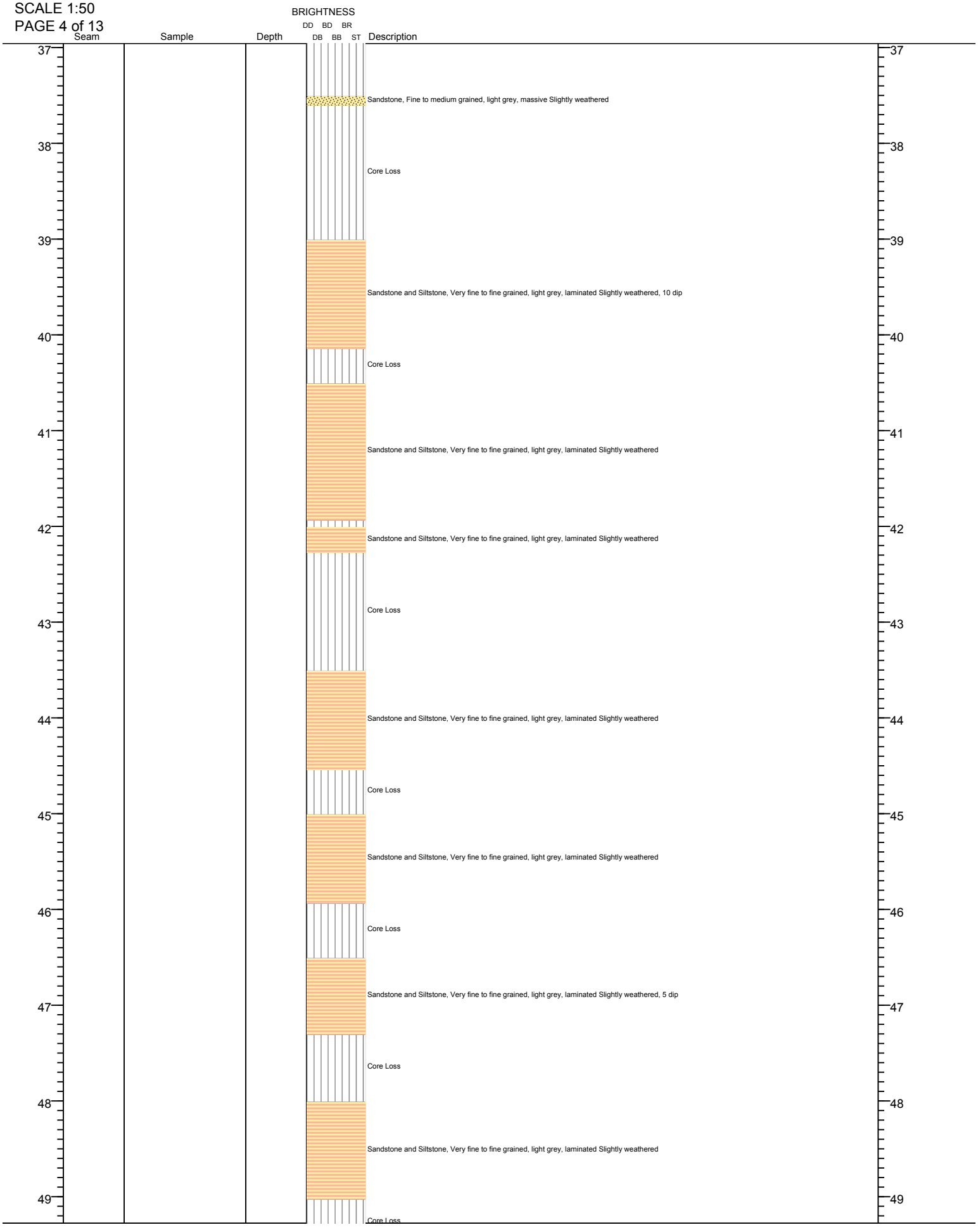
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-04
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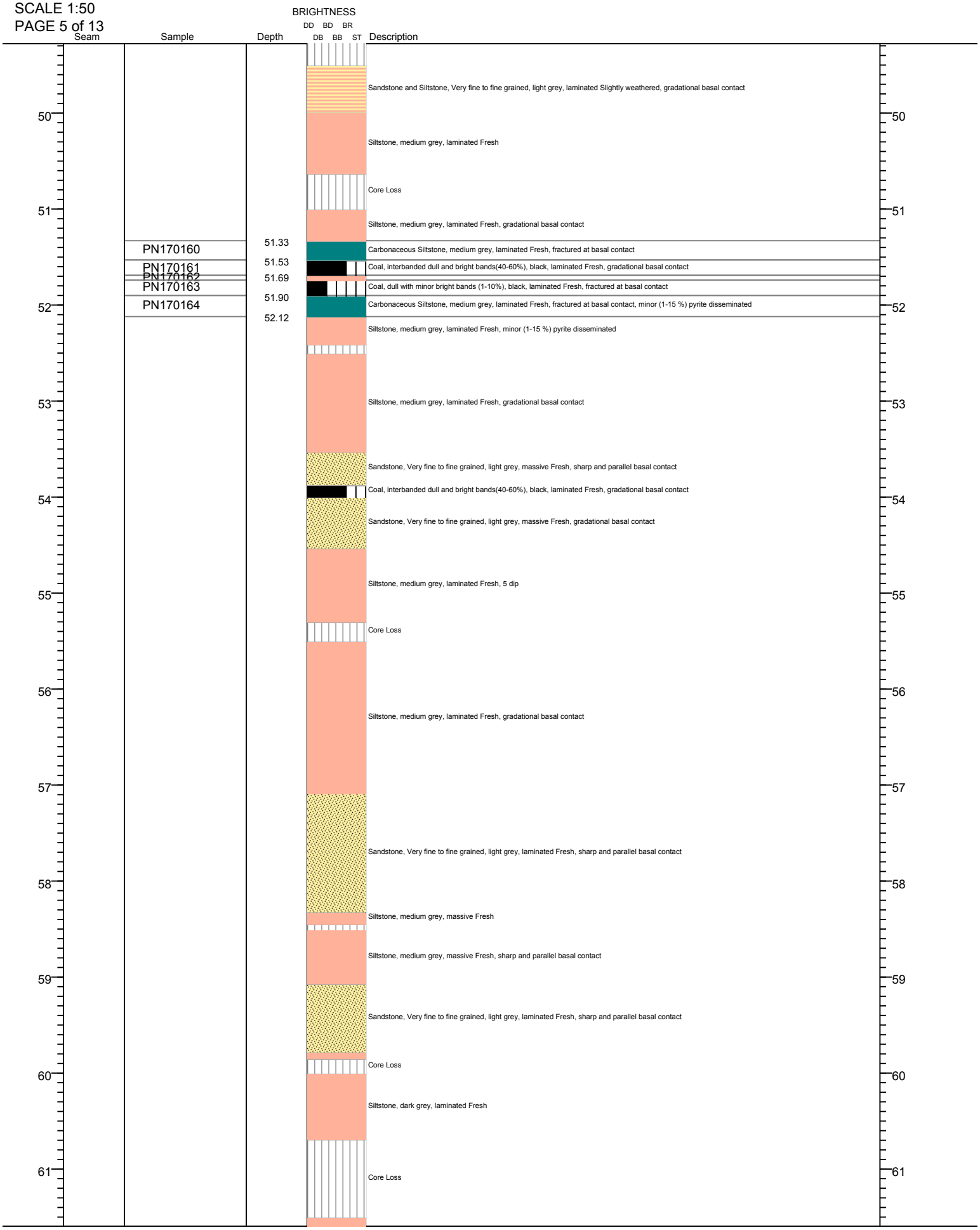
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-04
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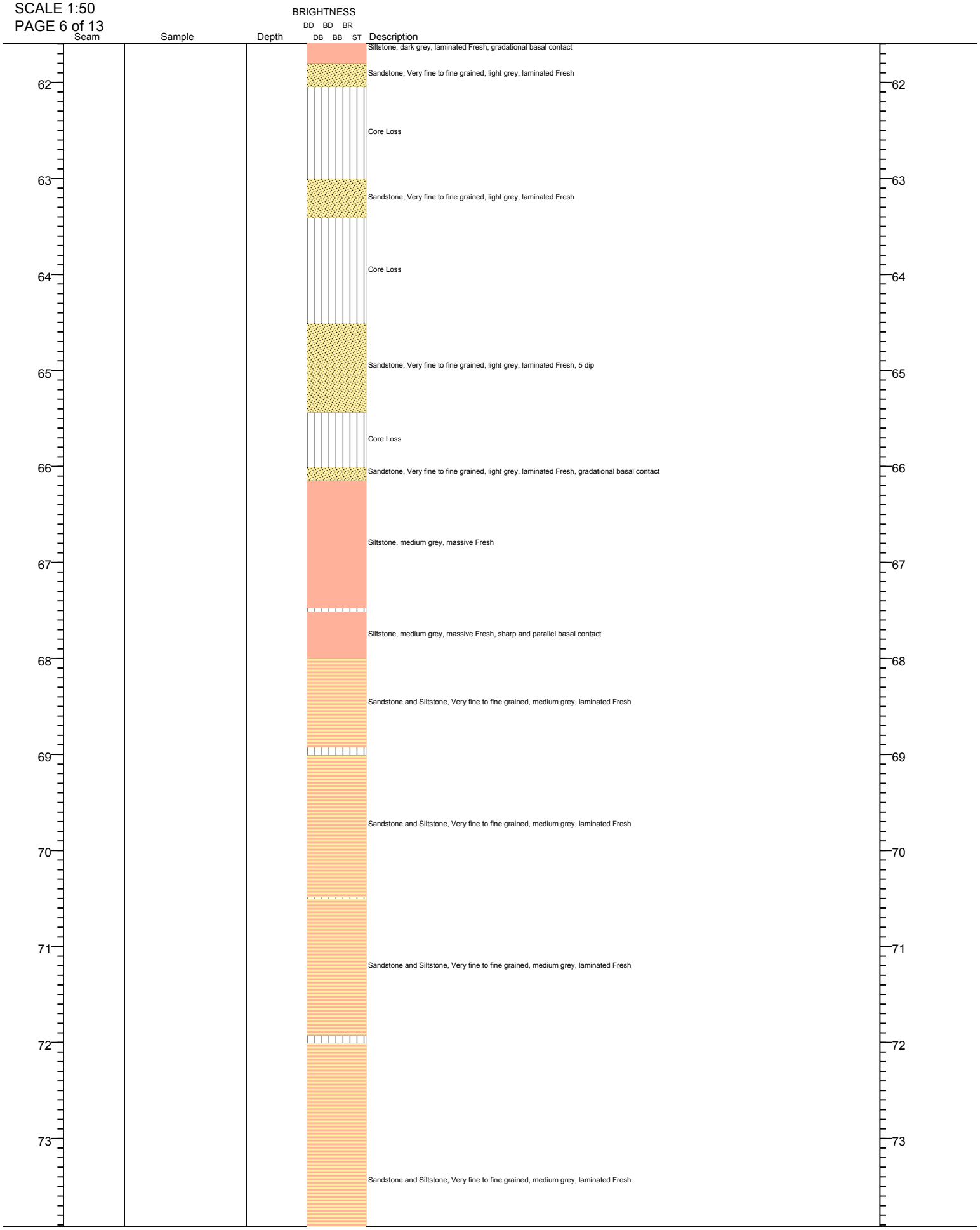
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-04
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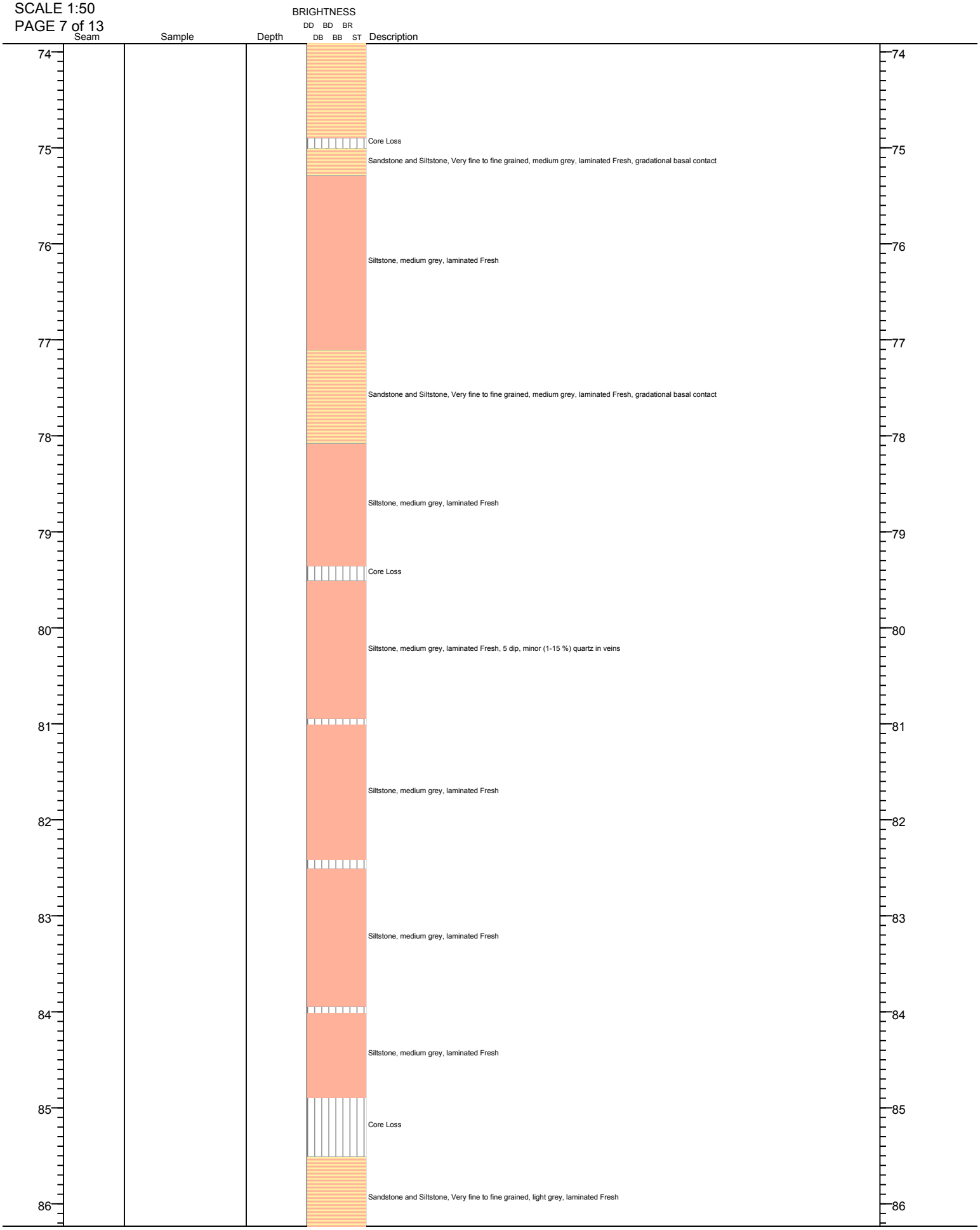
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-04
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		87		Core Loss
				Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) quartz in veins
		88		Core Loss
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, 5 dip, minor (1-15 %) quartz in veins
		89		Core Loss
		90		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins
		91		Core Loss
		92		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz in veins
		93		
		94		Core Loss
		95		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
		96		Core Loss
				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
		97		Core Loss
		98		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh

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HOLE DHPN-17-04
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BB BR ST DB	Description
		99		Core Loss
				Sandstone, Very fine to fine grained, light grey, laminated Fresh
		100		Core Loss
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
		101		Sandstone, Very fine to fine grained, light grey, massive Fresh, minor (1-15 %) quartz in veins
				Core Loss
		102		Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins
		103		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
				Core Loss
		104		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
		105		Core Loss
		106		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact, 10 dip
		107		
		108		Siltstone, medium grey, laminated Fresh, sharp and parallel basal contact
				Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat
		109		Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated
		110		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh

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PANORAMA NORTH
HOLE DHPN-17-04
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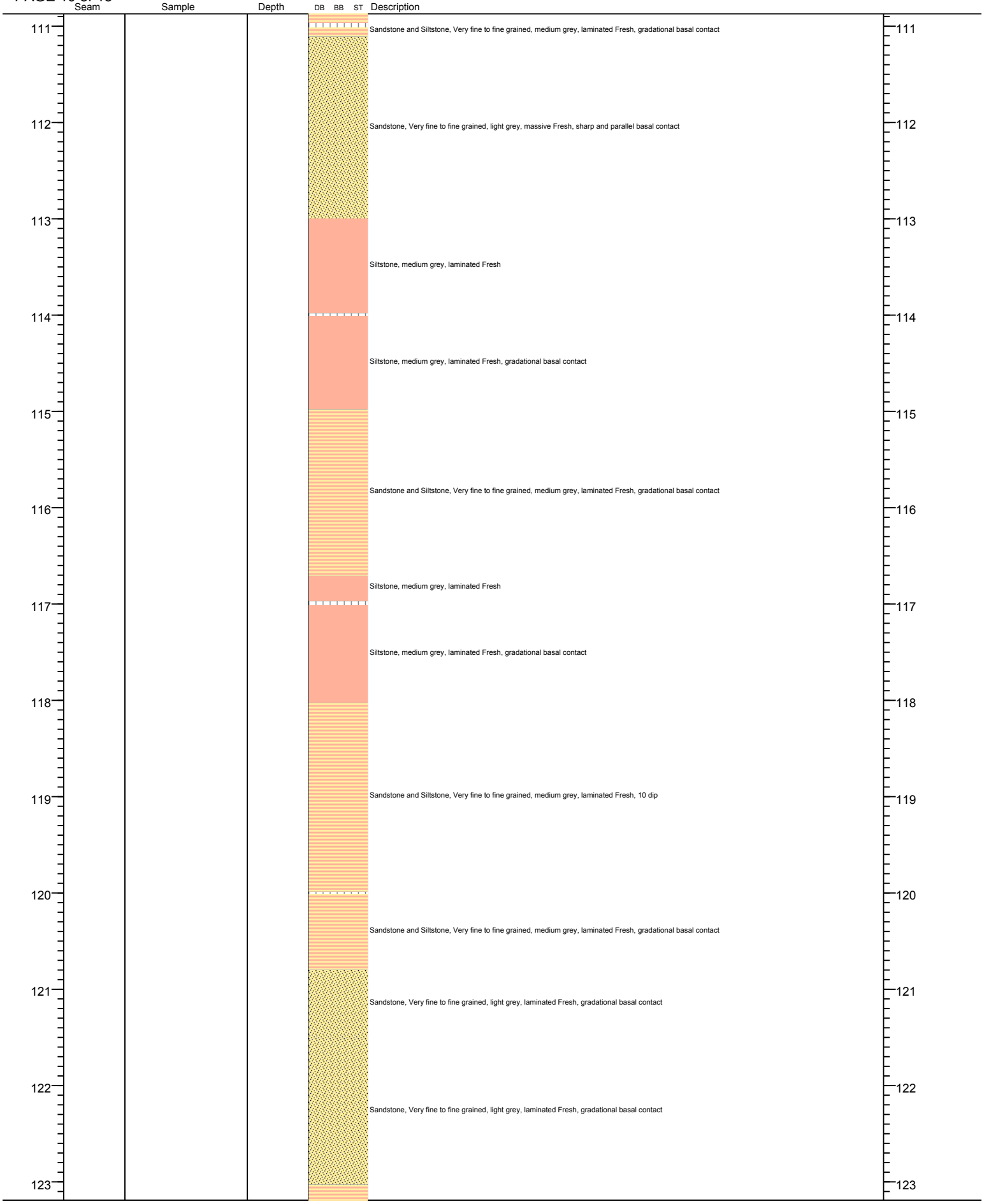
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-04
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact
	PN170165	126.00		Siltstone, medium grey, laminated Fresh, gradational basal contact
	PN170166	126.21		Coal, interbanded dull and bright bands(40-60%), black, laminated common (15-40%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated
	PN170167	126.41		Coal, interbanded dull and bright bands(40-60%), black, laminated common (15-40%) Siltstone bands Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated
	PN160168	126.67		Coal, bright with dull bands (60-90%), dark grey, laminated Fresh, gradational basal contact
	PN170169	126.98		Coal, interbanded dull and bright bands(40-60%), black, laminated abundant (40-60%) Siltstone bands Fresh, gradational basal contact
	PN170170	127.23		Carbonaceous Siltstone, dark grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated
	PN170171	127.71		Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, faulted at basal contact, minor (1-15 %) pyrite disseminated
	PN170172	128.19		Siltstone, medium grey, laminated Fresh
		128.41		Siltstone, medium grey, laminated Fresh
				Core Loss
				Siltstone, medium grey, laminated Fresh, gradational basal contact
				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) pyrite nodules

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PANORAMA NORTH
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD DB	BD BB	BR ST	Description
						Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
						Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, sharp and oblique, 20 dip, minor (1-15 %) quartz in veins
	PN170173	139.48				Siltstone, medium grey, laminated Fresh, sharp and oblique, 20 dip, minor (1-15 %) quartz in veins
	PN170174	139.68				Coal, dull with minor bright bands (1-10%), black, laminated Fresh, faulted at basal contact, common (15-40 %) quartz in cleat
	PN170175	139.89				Coal, dull with minor bright bands (1-10%), black, laminated Fresh, faulted at basal contact, common (15-40 %) quartz in cleat
	PN170176	140.14				Coal, dull with minor bright bands (1-10%), black, laminated Fresh, faulted at basal contact, common (15-40 %) quartz in cleat
	PN170177	140.34				Siltstone, medium grey, laminated Fresh, rare (<1 %) quartz in veins
		140.54				Siltstone, medium grey, laminated Fresh, rare (<1 %) quartz in veins
						Siltstone, medium grey, laminated Fresh, fractured at basal contact
						Core Loss
						Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on joints
						Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
						Core Loss
						Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, minor (1-15 %) quartz on joints
						Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, sharp and parallel basal contact
						Siltstone, medium grey, laminated Fresh, faulted at basal contact, minor (1-15 %) pyrite on bedding planes

136 137 138 139 140 141 142 143 144 145 146 147

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PANORAMA NORTH
HOLE DHPN-17-04
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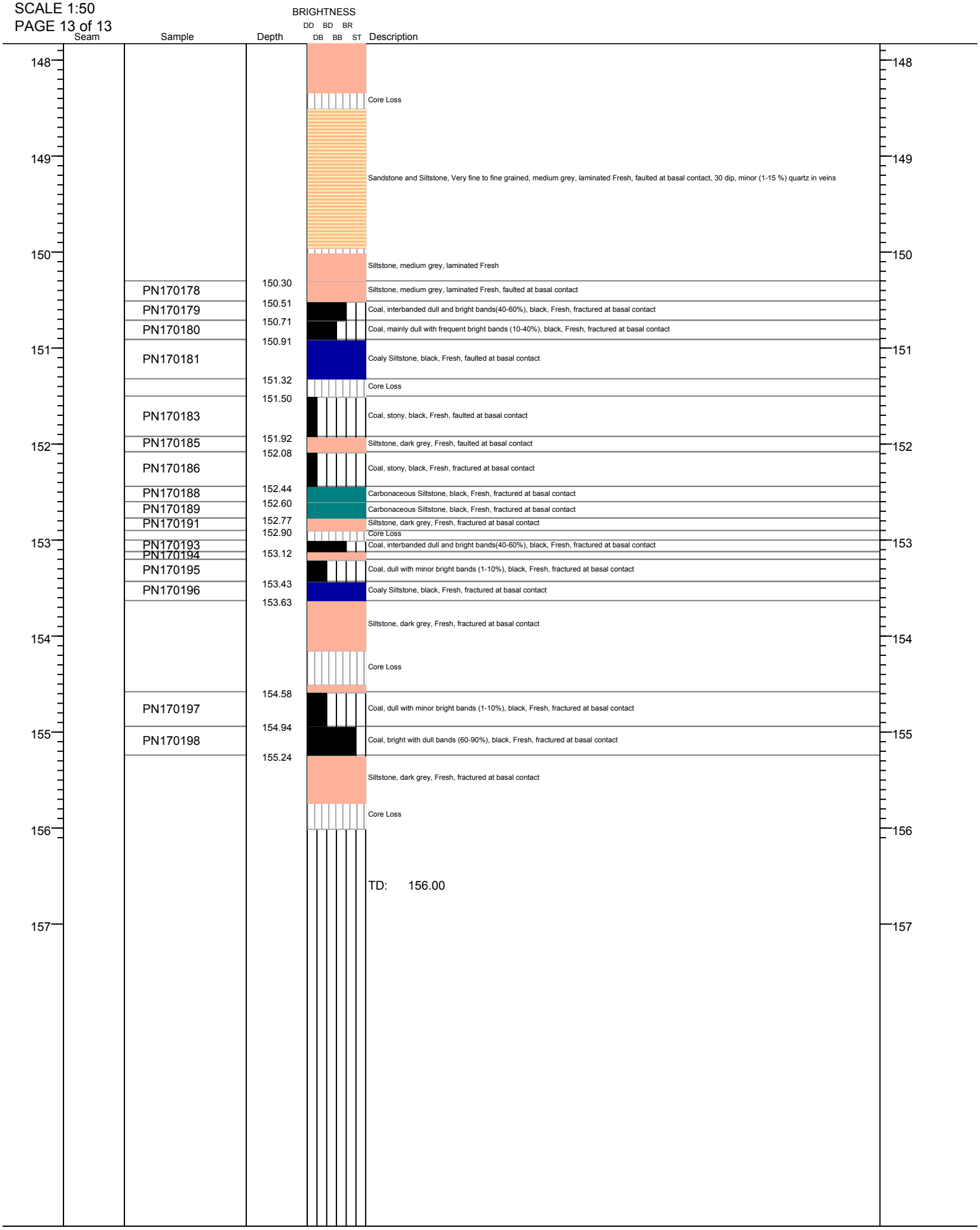
GEOPHYSICAL PROFILE



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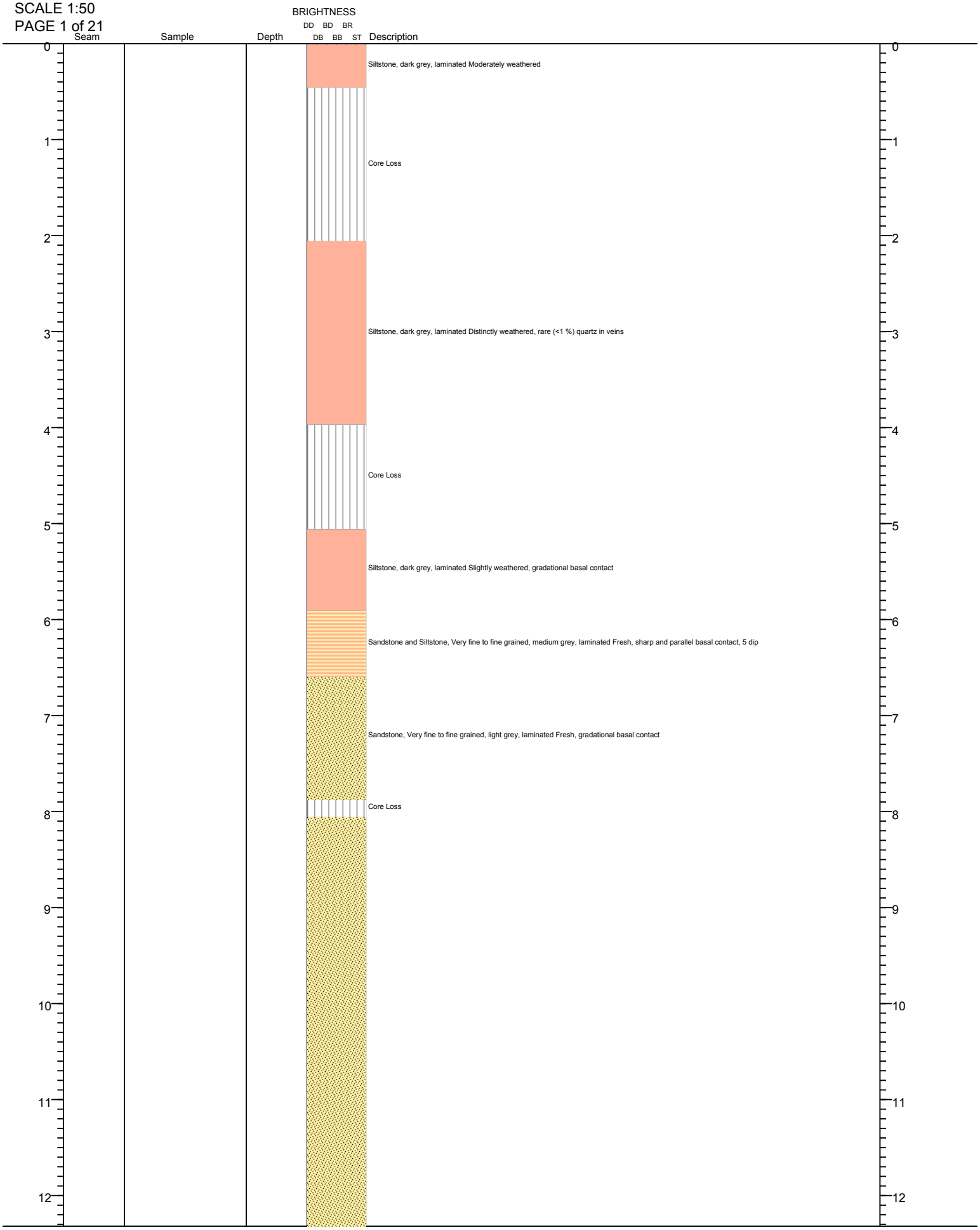
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-05
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
				Sandstone, Very fine to fine grained, light grey, massive Siltstone bands Fresh, sharp and parallel basal contact
	PN170199	16.99		Coal, bright with dull bands (60-90%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat
		17.18		Siltstone, dark grey, laminated Fresh, gradational basal contact
				Sandstone, Very fine to fine grained, light grey, massive Fresh
				Sandstone, Very fine to fine grained, light grey, massive Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in veins
				Core Loss
				Sandstone, Very fine to fine grained, light grey, massive Fresh, 15 dip

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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		25		
		26		Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz on bedding planes
		27		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact
		28		Siltstone, medium grey, laminated Fresh, gradational basal contact
		29		
		30		
		31		
		32		Sandstone, Very fine to fine grained, light grey, massive Fresh, common (15-40 %) quartz on joints
		33		
		34		
		35		Core Loss
				Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact
		36		
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) quartz on bedding planes

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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		37		
		38		Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
		39		Sandstone and Siltstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, 10 dip, minor (1-15 %) quartz on bedding planes
		40		
		41		Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) quartz in veins
		42		
		43		
		44		
		45		Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins
		46		
		47		
		48		
		49		

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PANORAMA NORTH
HOLE DHPN-17-05
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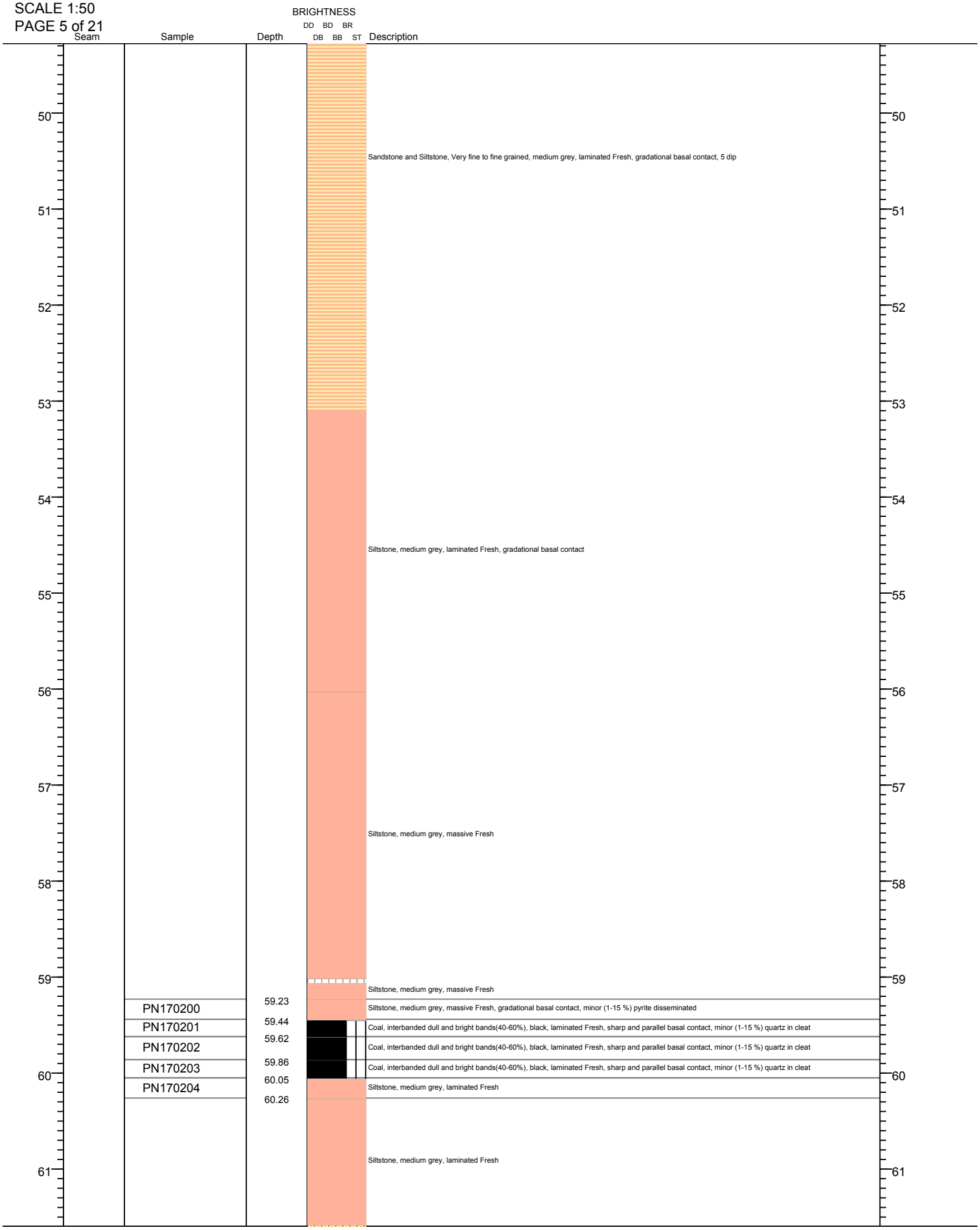
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-05
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		62		Sandstone, Very fine to fine grained, light grey, laminated Fresh
				Core Loss
		63		Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact
		64		Siltstone, medium grey, laminated Fresh, gradational basal contact, minor (1-15 %) pyrite disseminated
		65		
		66		Sandstone, Very fine to fine grained, light grey, massive Fresh, gradational basal contact, minor (1-15 %) clay on joints
		67		
		68		
		69		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh
		70		
		71		
		72		
		73		

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HOLE DHPN-17-05
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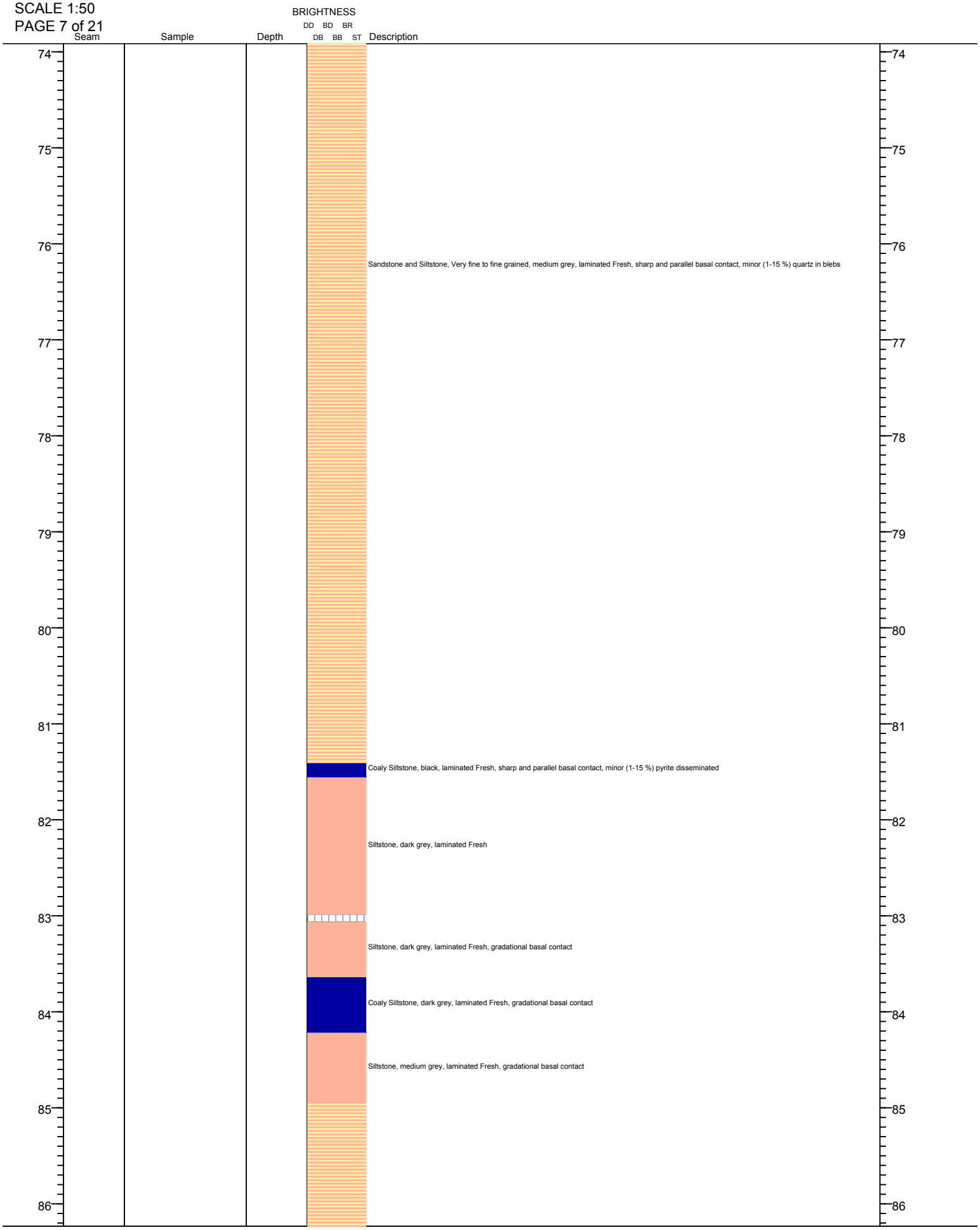
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-05
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		87		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact
		88		
		89		
		90		Sandstone, Very fine to fine grained, light grey, laminated Fresh, 10 dip, minor (1-15 %) quartz in blebs
		91		
		92		Core Loss
				Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in blebs
		93		
				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact
		94		
		95		
		96		Sandstone, Very fine to fine grained, light grey, laminated Fresh, minor (1-15 %) quartz in veins
		97		
		98		Core Loss

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PANORAMA NORTH
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		99		Sandstone, Very fine to fine grained, light grey, laminated Fresh, gradational basal contact, minor (1-15 %) quartz in veins
		100		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, 5 dip
		101		
		102		Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact
		103		
		104		Siltstone, dark grey, laminated Fresh, gradational basal contact
		105		
		106		Sandstone, Very fine to fine grained, light grey, laminated Fresh, sharp and parallel basal contact
		107		Coal, interbanded dull and bright bands(40-60%), black, laminated Fresh, sharp and parallel basal contact, minor (1-15 %) quartz in cleat
		108		Siltstone, medium grey, laminated Fresh, gradational basal contact
		109		
		110		

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PANORAMA NORTH
HOLE DHPN-17-05
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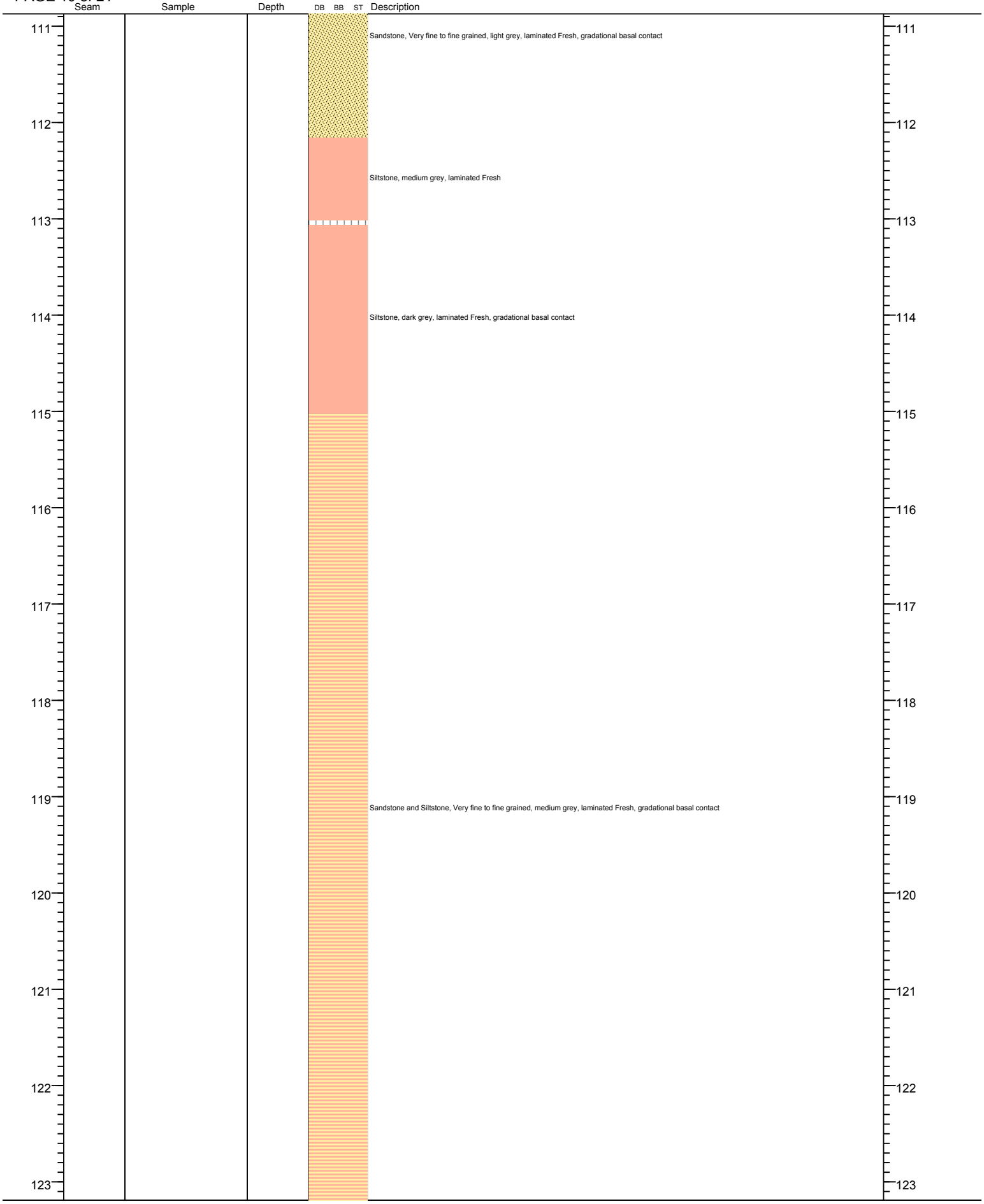

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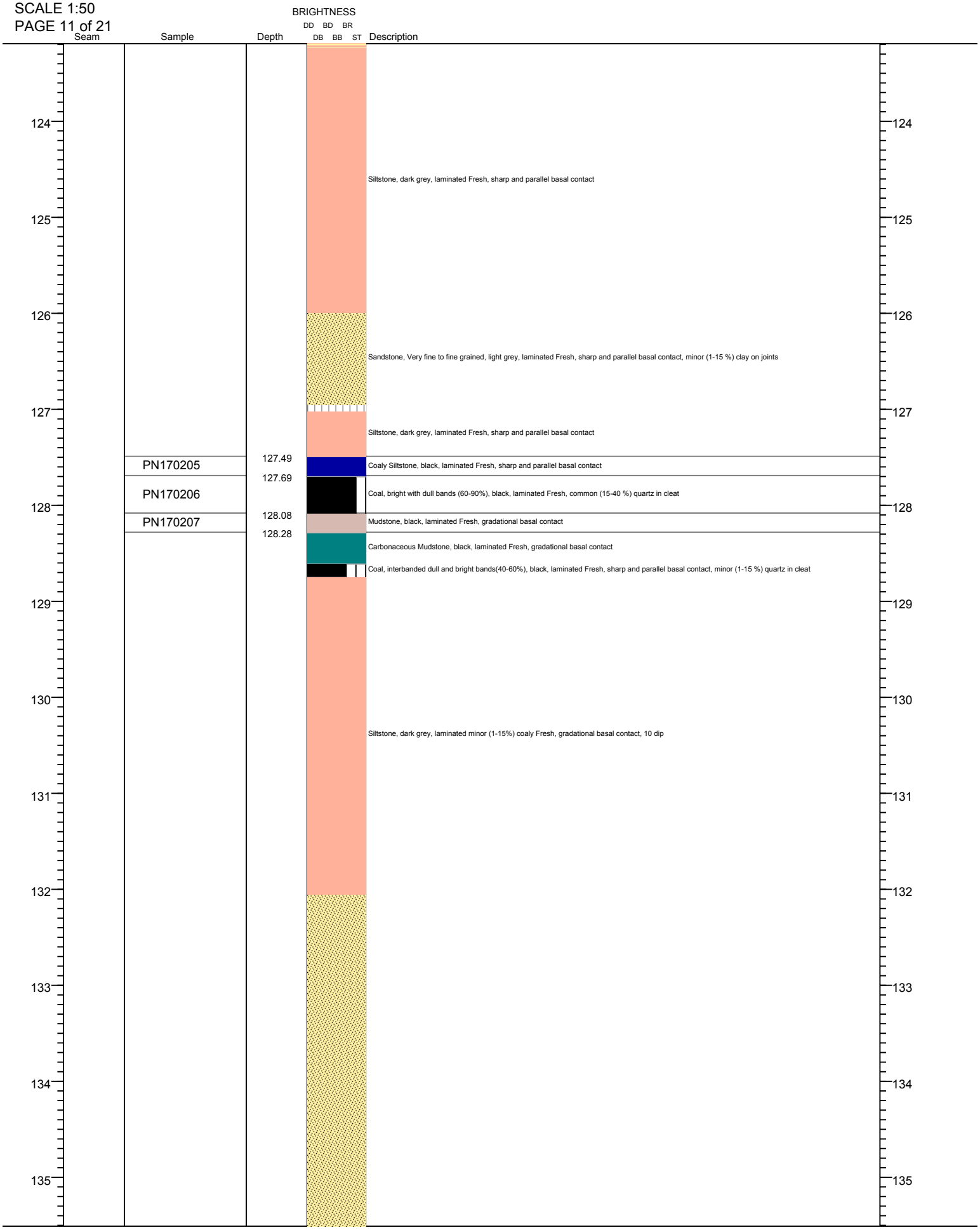
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-05
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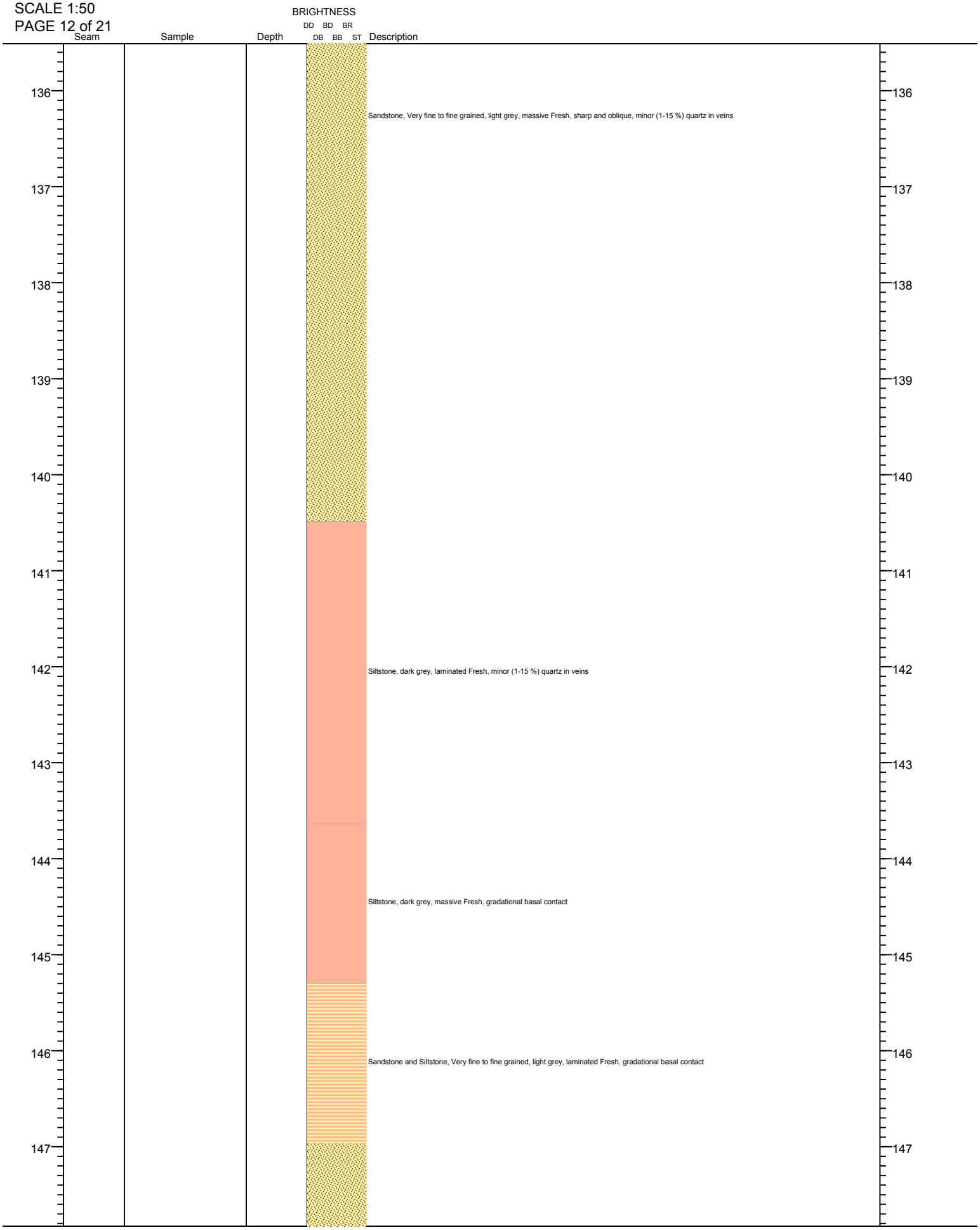
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-05
SCALE 1:50
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GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
				Sandstone, Very fine to fine grained, massive Fresh, 25 dip
				Sandstone and Siltstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact
				Siltstone, medium grey, laminated Fresh, faulted at basal contact
				Mudstone, dark grey, massive Fresh, sharp and oblique
				Core Loss
	PN170208	154.26		Coaly Siltstone, black, Fresh, gradational basal contact, common (15-40 %) quartz in veins
	PN170209	154.47		Coal, bright with dull bands (60-90%), black, Fresh, gradational basal contact, minor (1-15 %) quartz in cleat
	PN170210	154.69		Carbonaceous Siltstone, black, Fresh, gradational basal contact
		154.90		Carbonaceous Siltstone, black, laminated Fresh, gradational basal contact
				Sandstone, Fine grained, light grey, massive Fresh, sharp and parallel basal contact

148 149 150 151 152 153 154 155 156 157 158 159 160

ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-05
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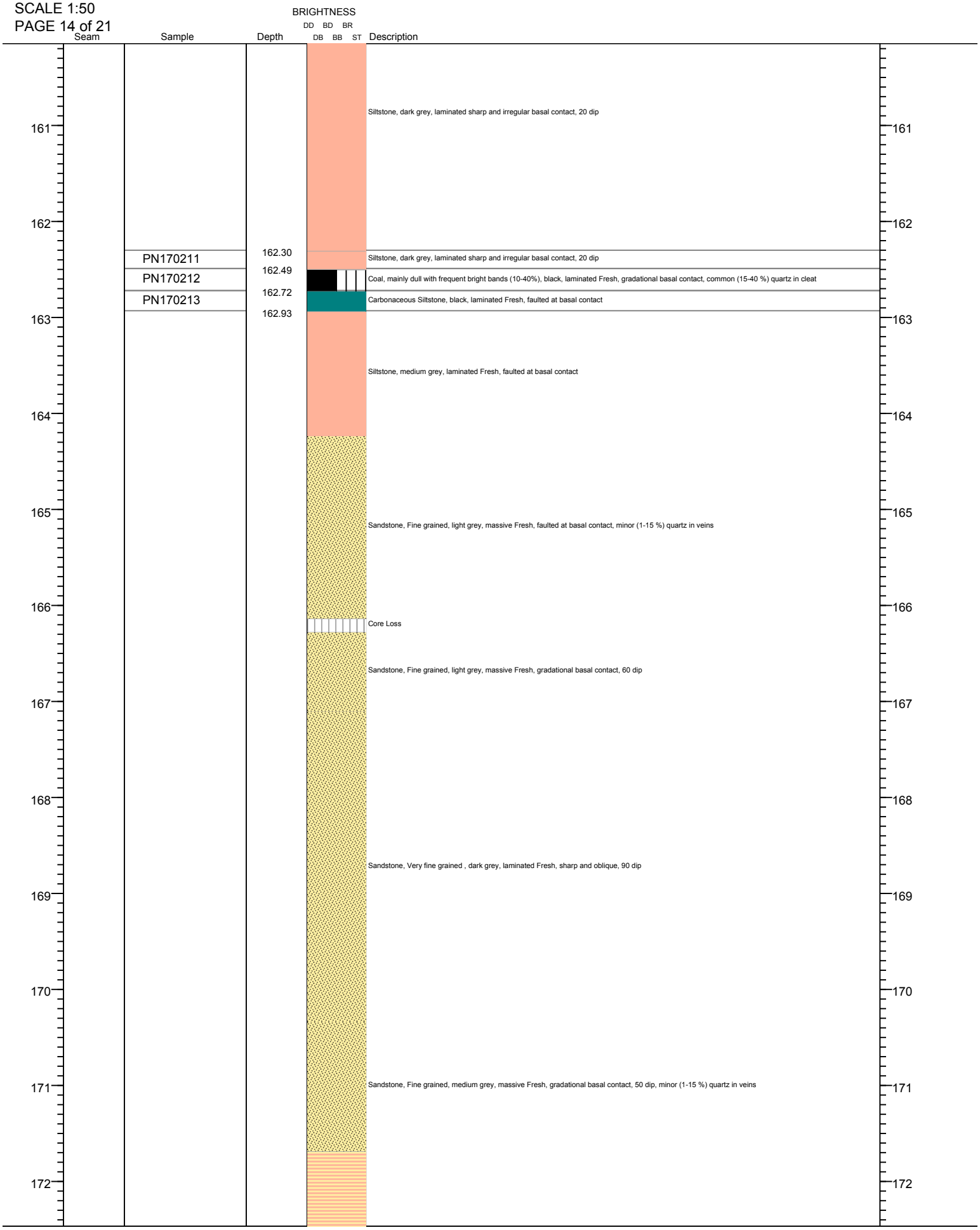
GEOPHYSICAL PROFILE



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PANORAMA NORTH
HOLE DHPN-17-05
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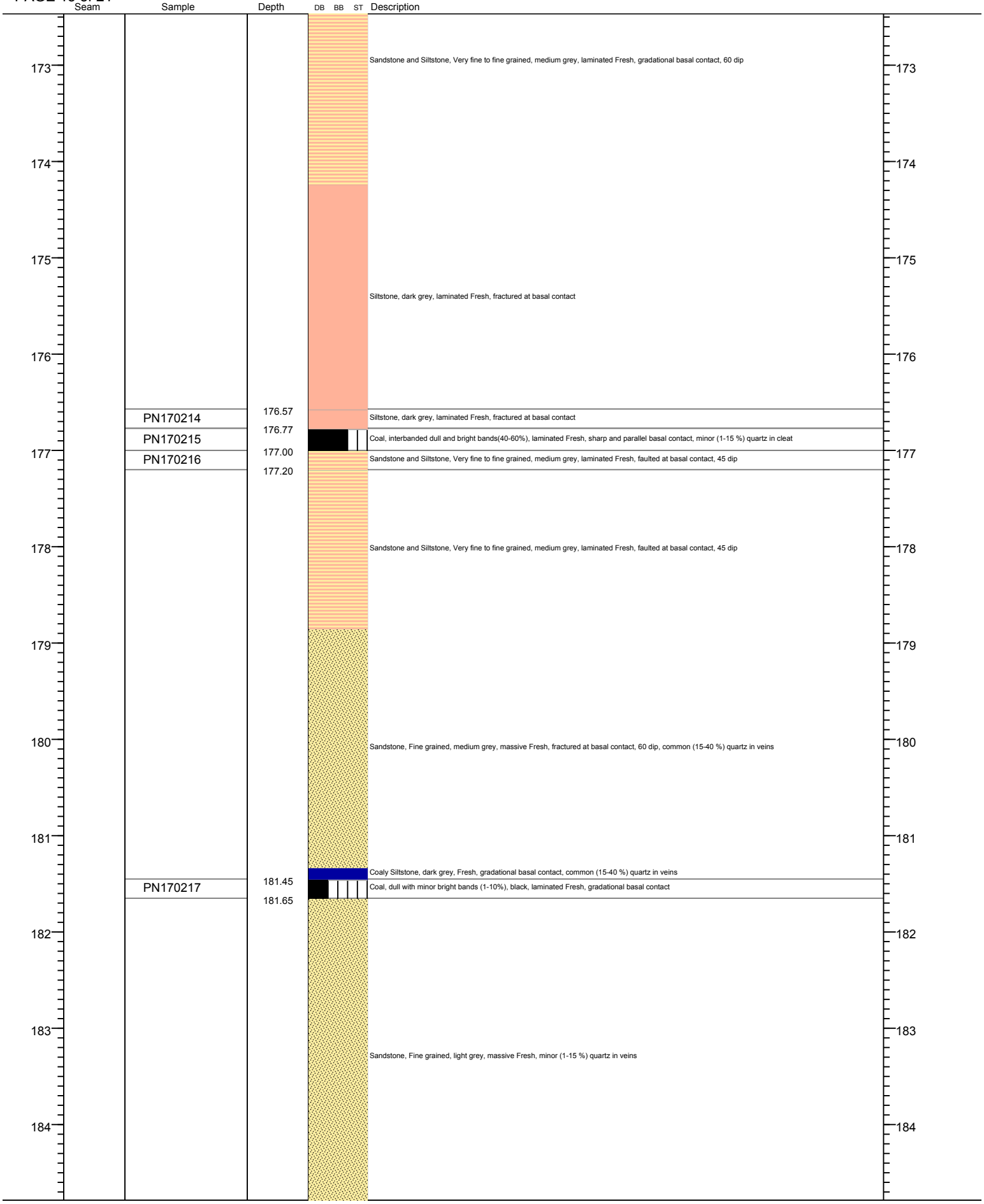
GEOPHYSICAL PROFILE



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HOLE DHPN-17-05
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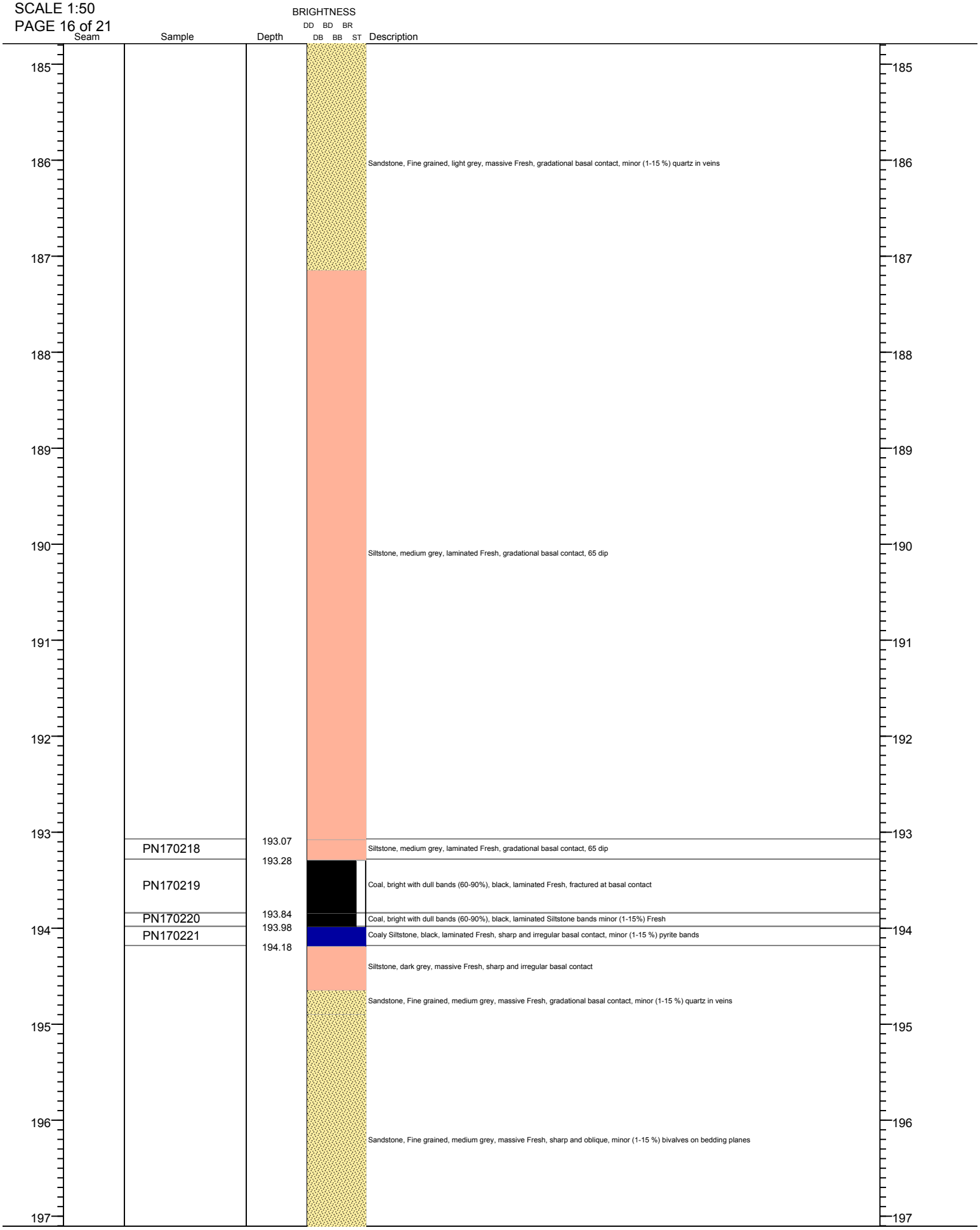
GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-05
SCALE 1:50

GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		198		Sandstone, Fine grained, medium grey, massive Fresh, sharp and oblique, minor (1-15 %) bivalves on bedding planes
		199		Siltstone, medium grey, massive Fresh, faulted at basal contact, 50 dip, minor (1-15 %) quartz in veins
		200		
		201		
		202		
		203		Sandstone and Siltstone, Very fine grained , medium grey, laminated Fresh, gradational basal contact
		204		
		205		
		206		
		207		Sandstone, Very fine to fine grained, medium grey, laminated Fresh, gradational basal contact
		208		
		209		

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PANORAMA NORTH
HOLE DHPN-17-05
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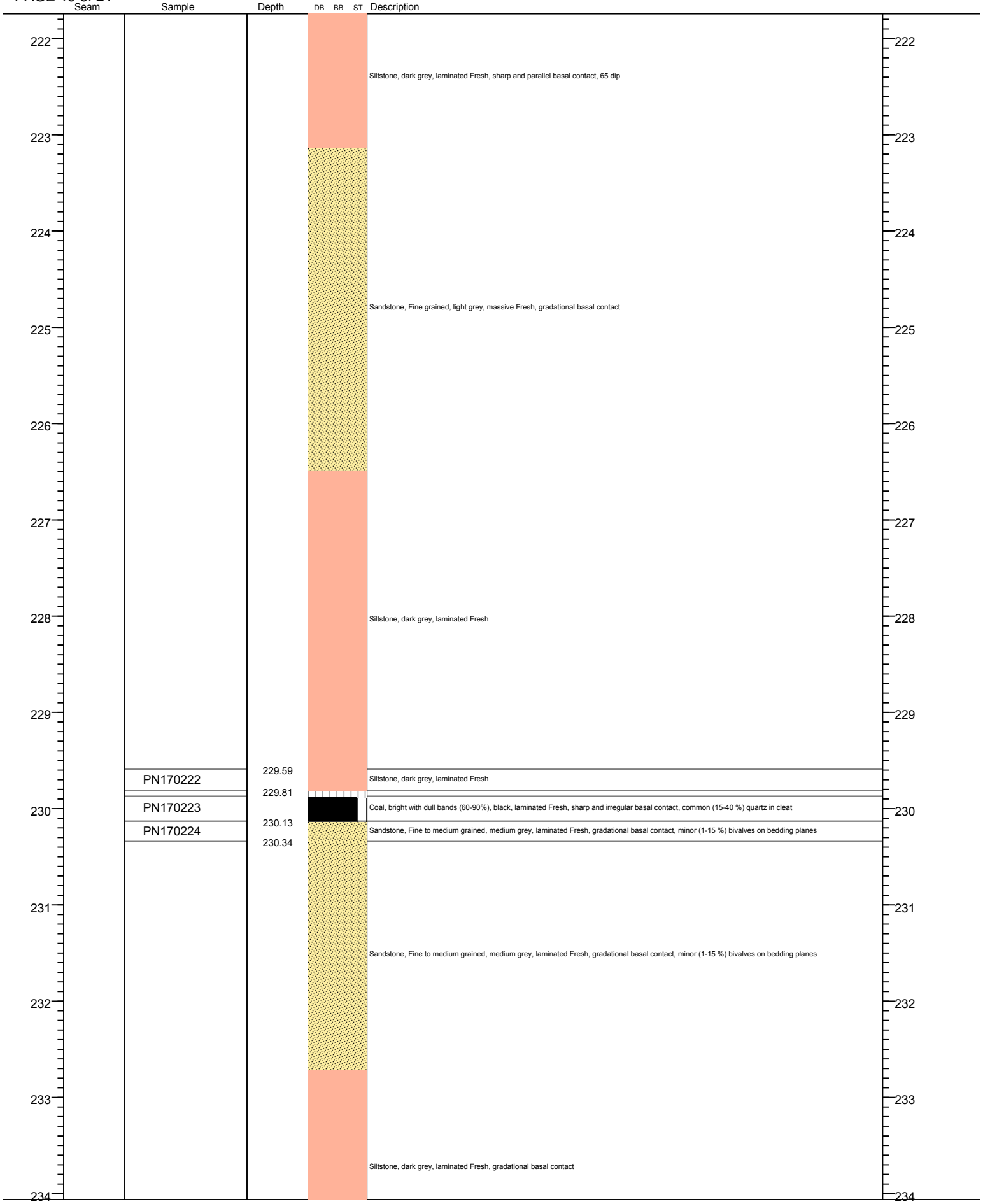
GEOPHYSICAL PROFILE

Seam	Sample	Depth	BRIGHTNESS DD BD BR DB BB ST	Description
		210		
		211		
				Sandstone and Siltstone, Very fine to fine grained, dark grey, laminated Fresh, sharp and parallel basal contact, 60 dip
		212		
		213		
				Sandstone, Fine grained, light grey, laminated Fresh
		214		
		215		Sandstone, Fine grained, light grey, laminated Fresh, gradational basal contact
		216		
		217		
		218		
		219		Sandstone and Siltstone, Fine grained, medium grey, laminated Fresh, minor (1-15 %) bivalves on bedding planes
		220		
		221		

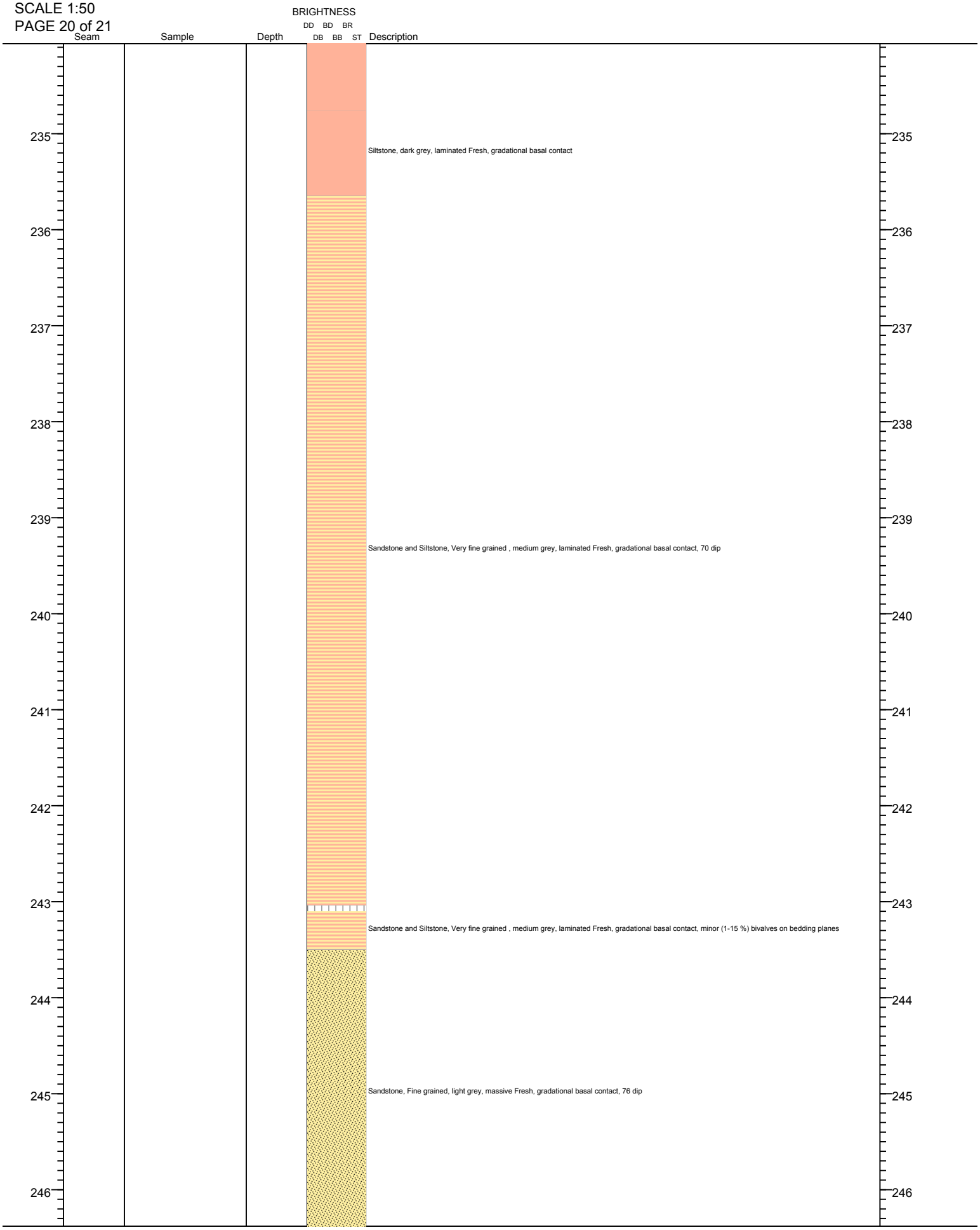
ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-05
SCALE 1:50
PAGE 19 of 21

GEOPHYSICAL PROFILE



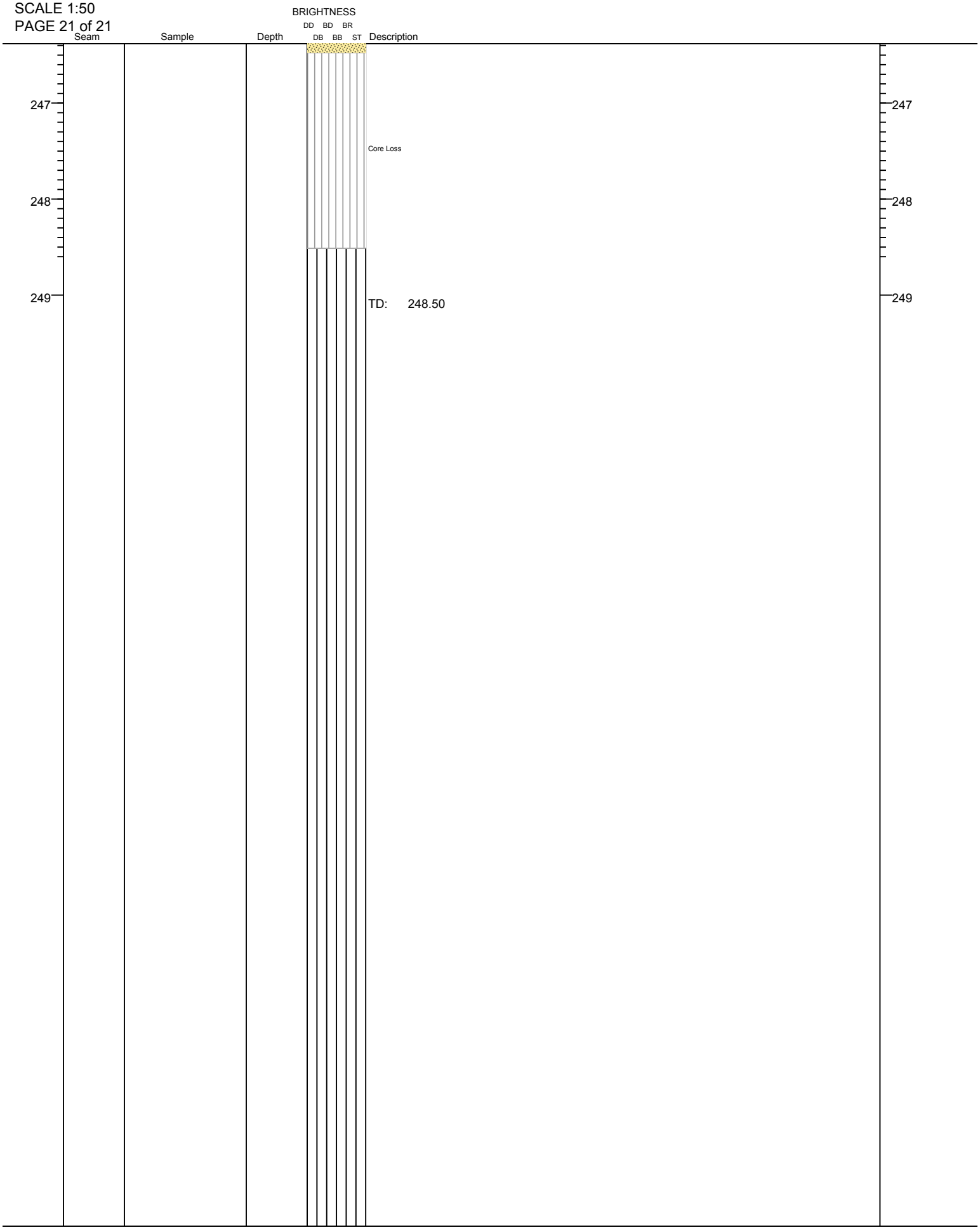
ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-05
SCALE 1:50
PAGE 20 of 21

GEOPHYSICAL PROFILE



ATRUM COAL
PANORAMA NORTH
HOLE DHPN-17-05
SCALE 1:50
PAGE 21 of 21

GEOPHYSICAL PROFILE

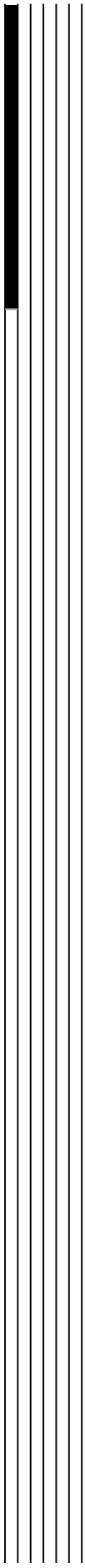


ATRUM COAL
PANORAMA NORTH
HOLE TRPN-17-01
SCALE 1:50
PAGE 1 of 1

GEOPHYSICAL PROFILE

Seam

BRIGHTNESS
DD BD BR
DB BB ST



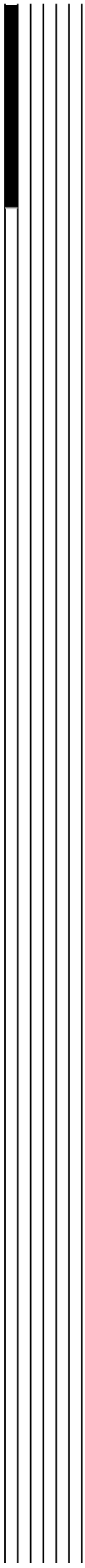
TD: 2.40

ATRUM COAL
PANORAMA NORTH
HOLE TRPN-17-02
SCALE 1:50
PAGE 1 of 1

GEOPHYSICAL PROFILE

Seam

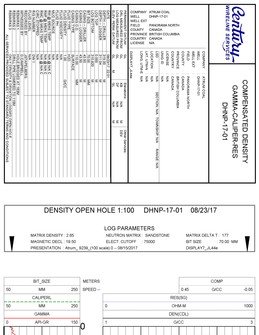
BRIGHTNESS
DD BD BR
DB BB ST

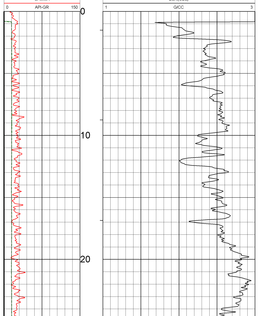


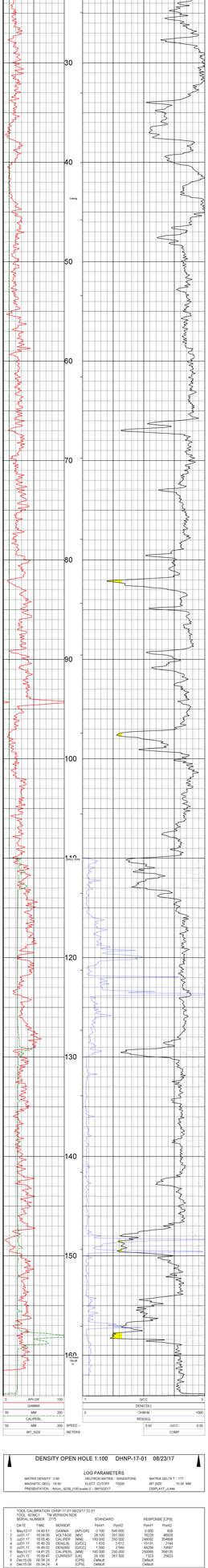
TD: 1.60

APPENDIX 3

Geophysical Logs







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TOOL 8238C1 TM VERSION 5026
SERIAL NUMBER 2775

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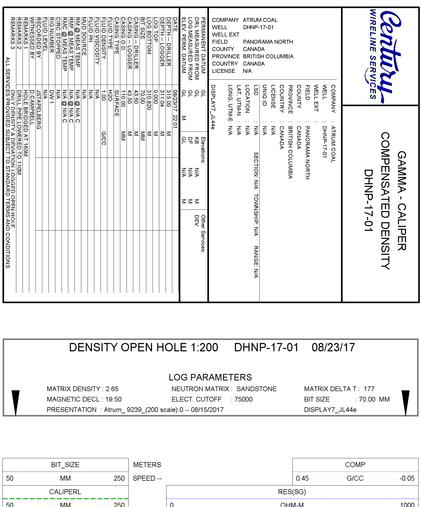
					Point1	Point2	Point1	Point2
1	May10,17	14:40:51	GAMMA	[API-GR]	0.100	545.000	0.000	608
2	Jul31,17	16:09:05	VOLTAGE	[MV]	39.100	291.300	16226	46828
3	Jul31,17	16:09:05	DENS(S)	[G/CC]	1.600	2.600	10131	2144
4	Jul31,17	16:46:29	DENS(S)	[G/CC]	1.600	2.612	10131	2144
5	Jul31,17	16:45:02	DENS(B)	[G/CC]	1.590	2.580	48256	12587
6	Jul31,17	16:45:02	DENS(B)	[G/CC]	1.590	2.580	27000	39400
7	Jul31,17	16:09:41	CURRENT	[UA]	39.100	291.300	7323	20623
8	Dec15,09	09:34:24	F	[CPS]	Default		Default	
9	Dec15,09	09:34:24	K	[CPS]	Default		Default	


Century WIRELINE SERVICES
GAMMA - CALIPER
COMPENSATED DENSITY
DHNP-17-01
COMPANY ATRUM COAL
WELL DHNP-17-01
WELL EXT
FIELD PANORAMA NORTH
COUNTY CANADA
PROVINCE BRITISH COLUMBIA
COUNTRY CANADA
LICENSE N/A
COMPANY ATRUM COAL
WELL DHNP-17-01
WELL EXT
FIELD PANORAMA NORTH
COUNTY CANADA
PROVINCE BRITISH COLUMBIA
COUNTRY CANADA
LEGAL ID N/A
LEGAL DESC N/A
LAT / LATITUDE N/A
LONG / LITUDE N/A
SECTION N/A TOWNSHIP N/A RANGE N/A
DEPTH - DRILLER 3100
LOG TOP - LOGGER 3100
BIT SIZE 70.00 MM
CASING - DRILLER 2775 M
CASING - LOGGER 2775 M
FLUID TYPE
FLUID DENSITY
FLUID LEVEL
SOURCE OF SAMPLE
RM @ MEAS TEMP
RMF @ MEAS TEMP
RMC @ MEAS TEMP
SOURCE RMF / RMC
RM @ BHT
TIME CIRC STOPPED
TIME LOGGER ON BOTTOM
MAX REC TEMP
EQUIP / LOCATION
RECORDED BY
WITNESSED BY
RUN NUMBER
DEPTH DRILLER
SCHLUMBERGER DEPTH
BOTTOM LOGGED INTERVAL
TOP LOGGED INTERVAL
CASING FLUID TYPE
SALINITY
DENSITY / VISCOSITY
PH / FLUID LOSS
SOURCE OF SAMPLE
RM @ MEASURED TEMP
RMF @ MEASURED TEMP
RMC @ MEASURED TEMP
SOURCE OF RMF / RMC
RM @ BHT
TIME CIRCULATION STOPPED
TIME LOGGER ON BOTTOM
LOGGING DISCO
MAX RECORDED TEMP
EQUIPMENT / LOCATION
RECORDED BY
WITNESSED BY
REMARKS 1
REMARKS 2
REMARKS 3
TOOL STRING (TOP TO BOTTOM)
GAMMA
CALIPER
DENSITY
DENSITY
DENSITY

DETAILED DENSITY
GAMMA - CALIPER - RES.
DHNP-17-01

Century WIRELINE SERVICES

COMPANY	ATRUM COAL
WELL	DHNP-17-01
WELL EXT	
FIELD	PANORAMA NORTH
COUNTY	CANADA
PROVINCE	BRITISH COLUMBIA
COUNTRY	CANADA
LICENSE	N/A
UNIQ ID	N/A
LSD	N/A SECTION: N/A TOWNSHIP: N/A RANGE: N/A
LOCATION	N/A
LAT, UTM-N	N/A
LONG, UTM-E	N/A

DISPLAY7_JL44e

PERMANENT DATUM	GL		Elevations:			Other Services:
DRL MEASURED FROM	GL		KB	N/A	M	DEV
LOG MEASURED FROM	GL		DF	N/A	M	
ELEV. PERM. DATUM	GL	M	GL	N/A	M	

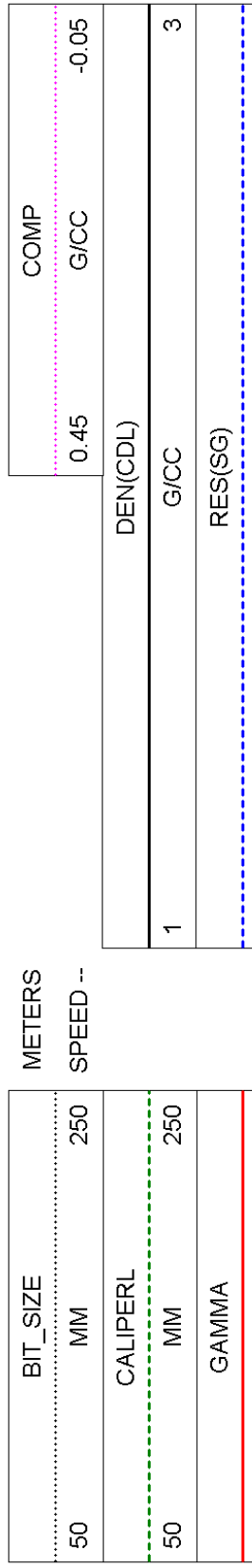
DATE	08/23/17 22:01			
DEPTH -- DRILLER	315.00	M		
DEPTH -- LOGGER	311.04	M		
LOG TOP	0.000	M		
LOG BOTTOM	310.820	M		
BIT SIZE	70.00	MM		
CASING -- DRILLER	43.50	M		
CASING -- LOGGER	43.50	M		
CASING O.D.	110.00	MM		
CASING TYPE	SURFACE			
FLUID TYPE	H2O			
FLUID DENSITY	1.00	G/CC		
FLUID VISCOSITY	N/A			
FLUID PH	N/A			
MUD SOURCE	N/A			
RM @ MEAS TEMP	N/A @ N/A C			
RMF @ MEAS TEMP	N/A @ N/A C			
RMC @ MEAS TEMP	N/A @ N/A C			
CIRC STOPPED	N/A			
RIG NUMBER	DW 1			
FLUID LEVEL	N/A			
RECORDED BY	JSTAPELBERG			
WITNESSED BY	D.CAMPBELL			
REMARKS 1	HOLE BRIDGED AT 163M			
REMARKS 2	DRILL PIPE LOWERED TO 110M			
REMARKS 3	ONLY DENSITY & DEVIATION LOGGED OPEN HOLE			

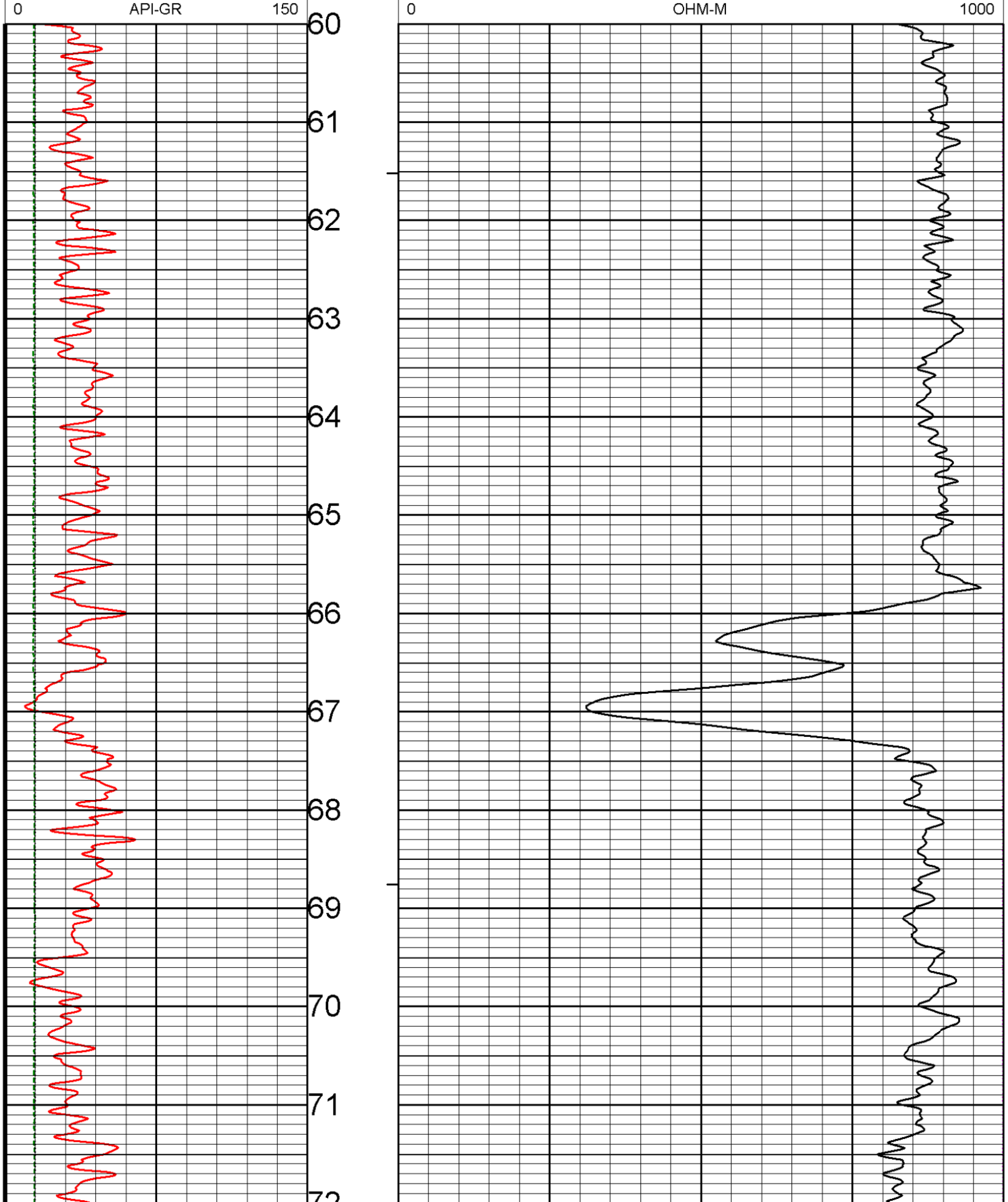
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177	
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 70.00 MM	
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e	

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OHM-M
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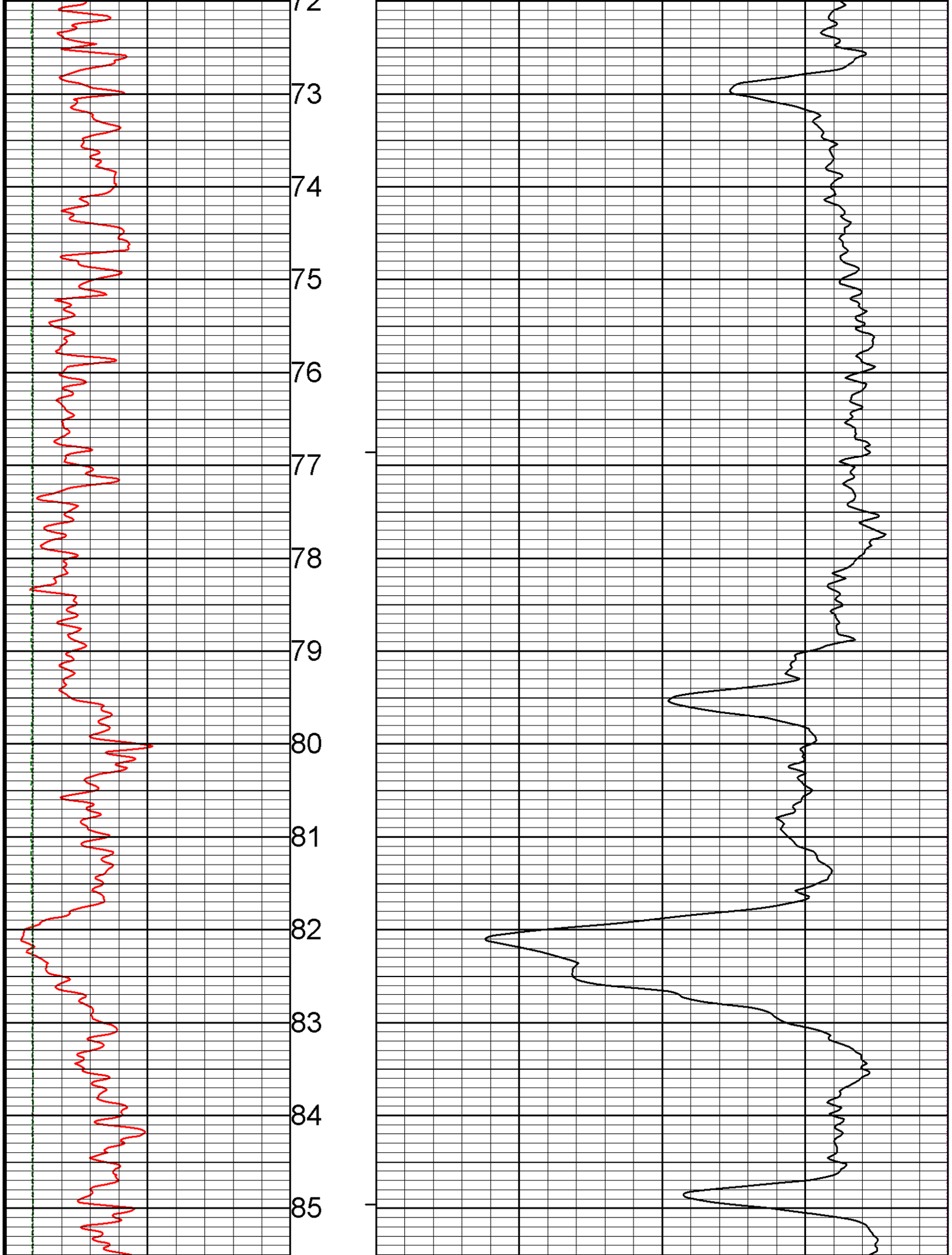
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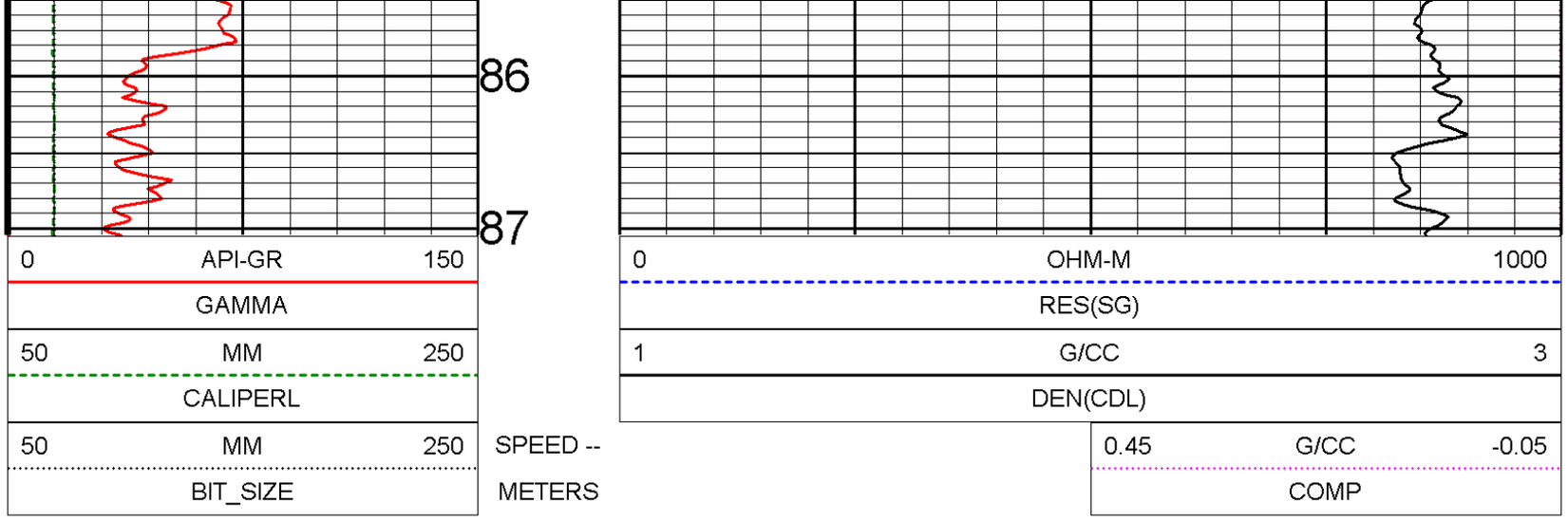


DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

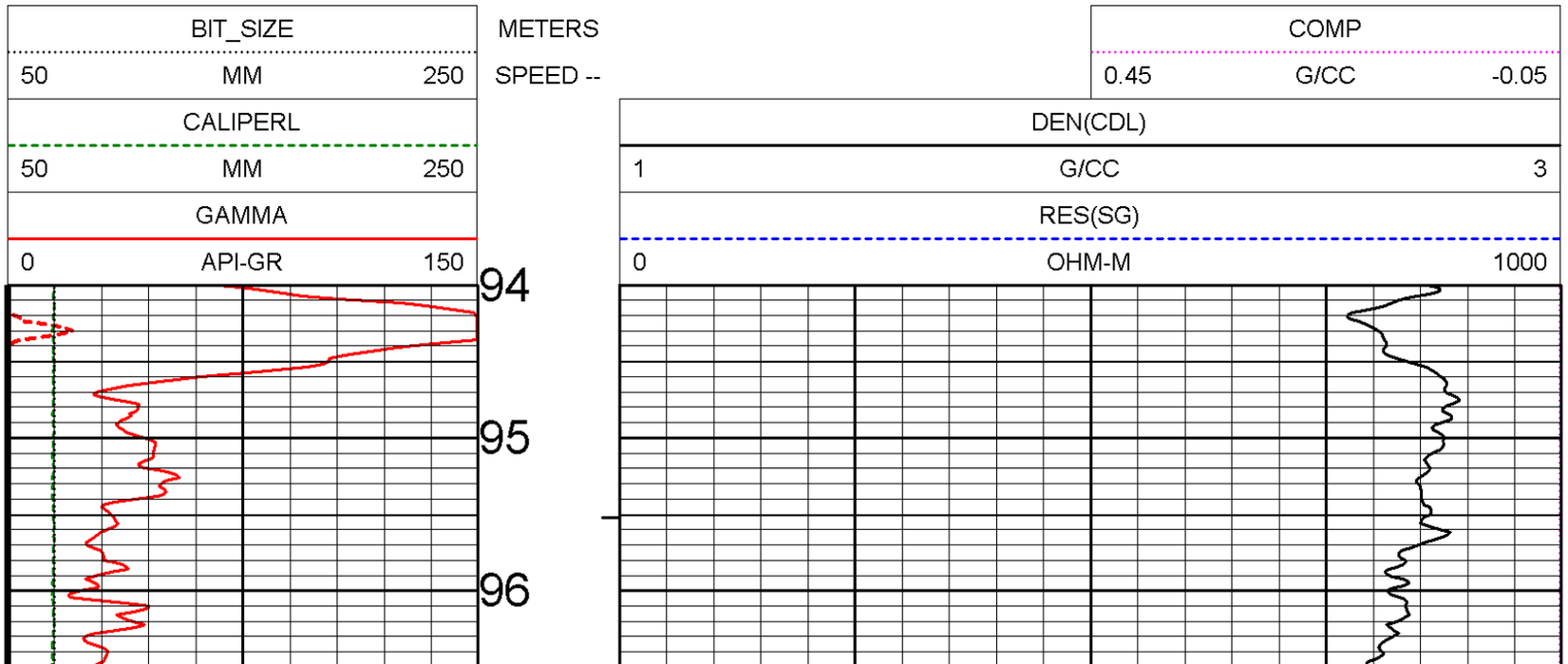
LOG PARAMETERS

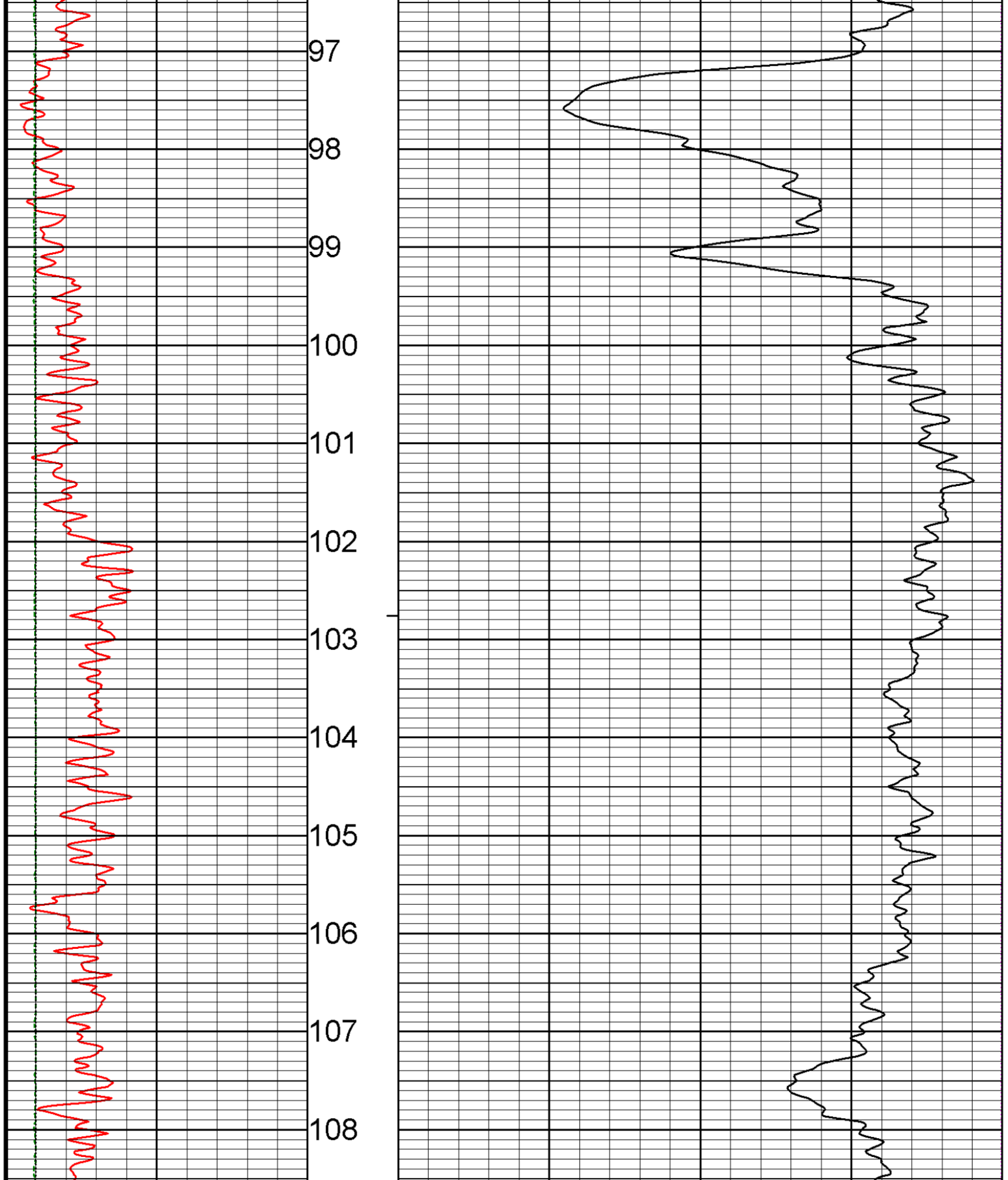
MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

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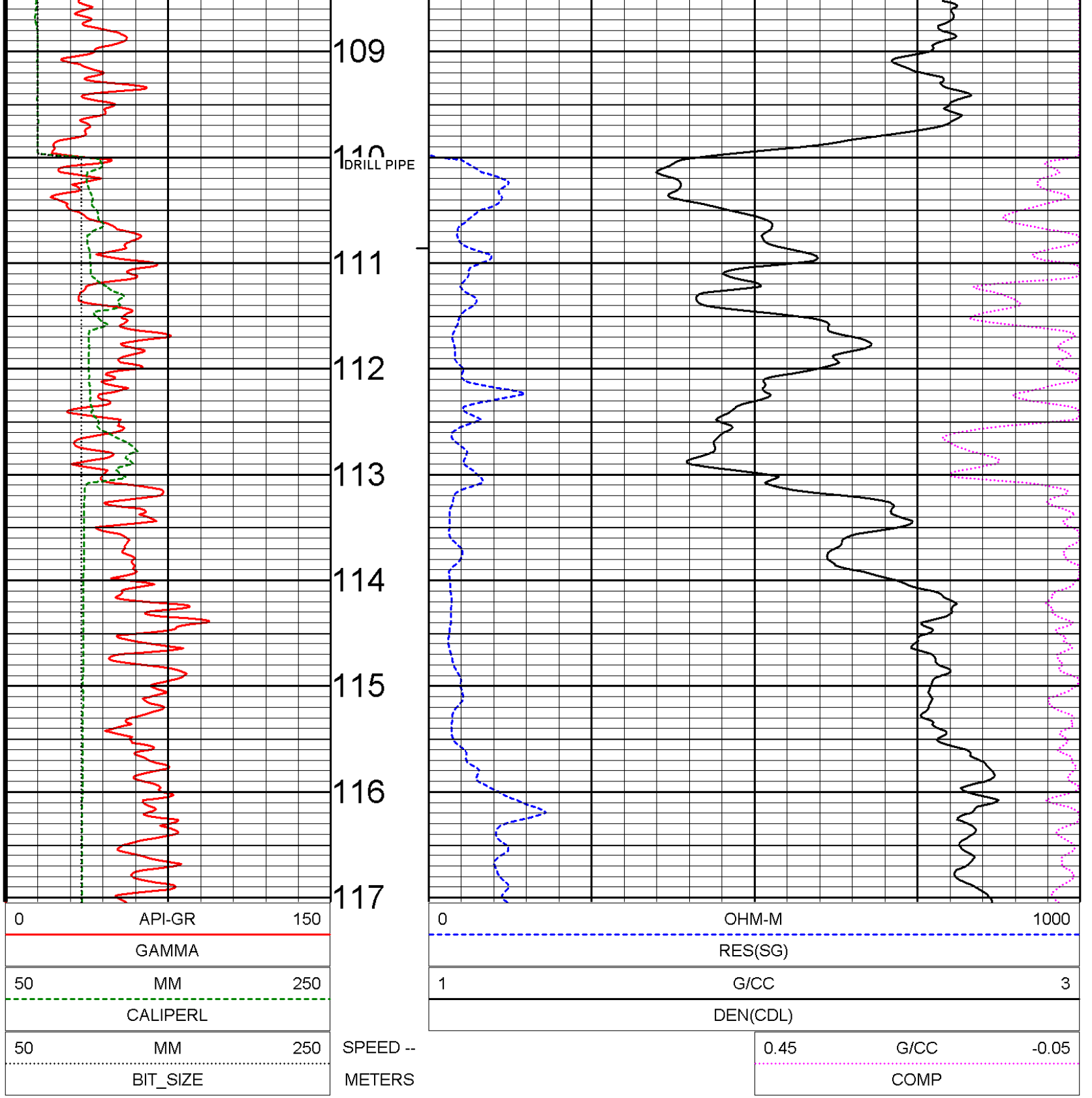

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

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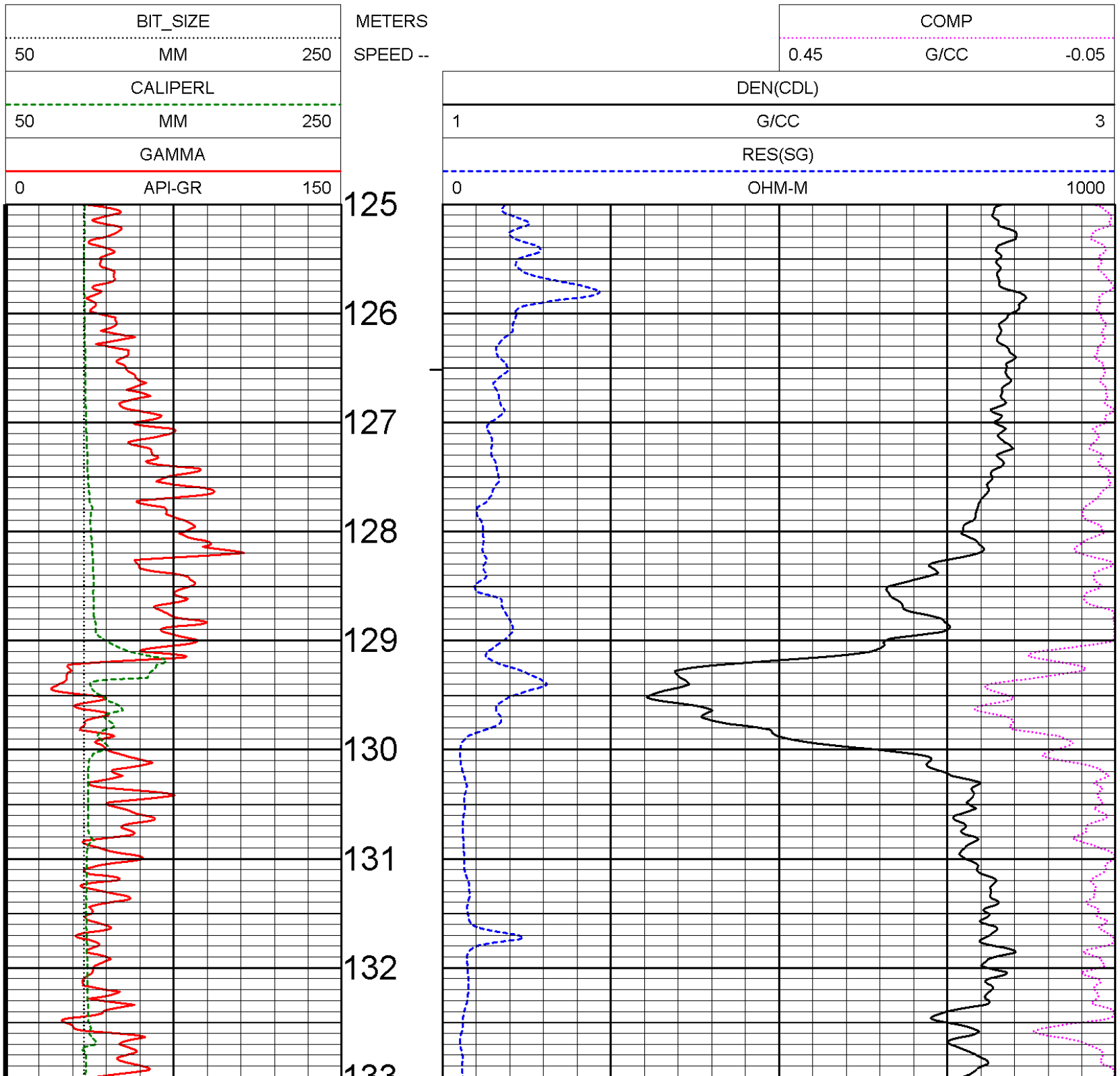
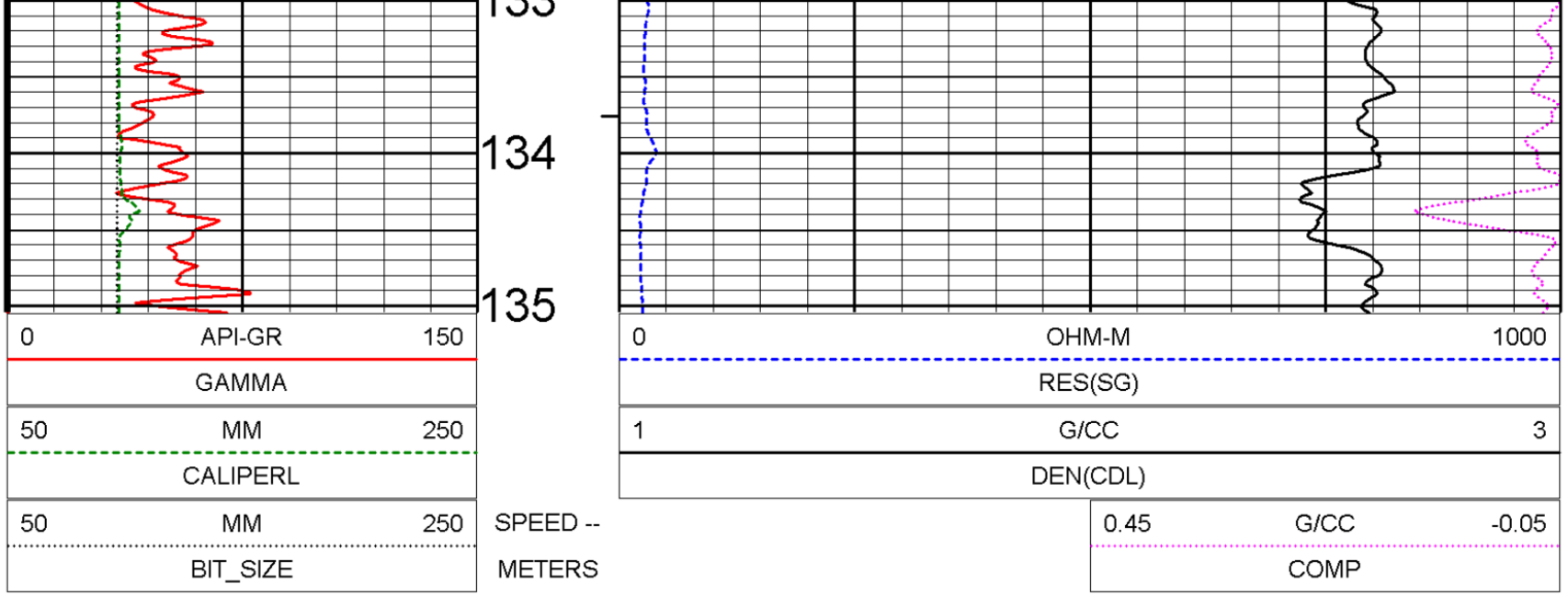
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e





DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

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MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
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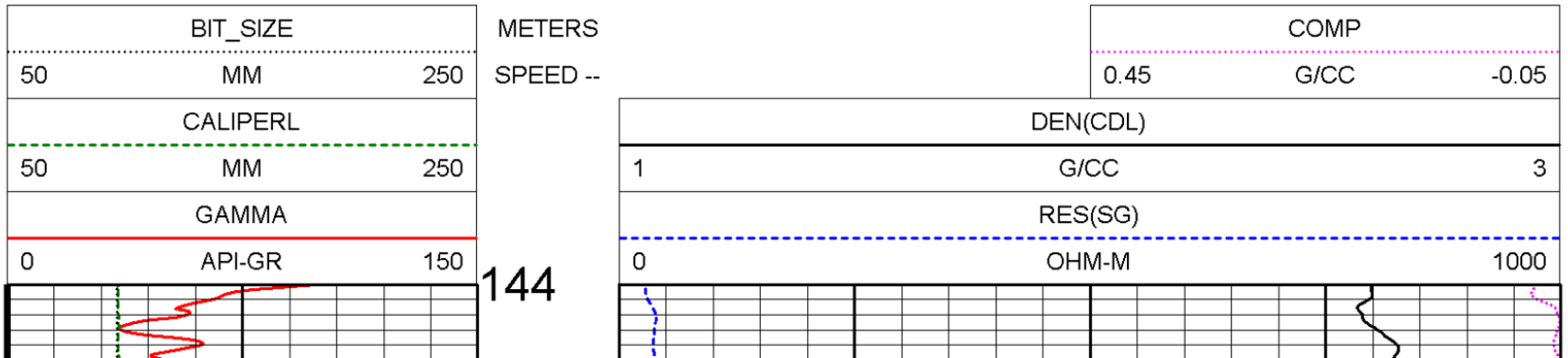
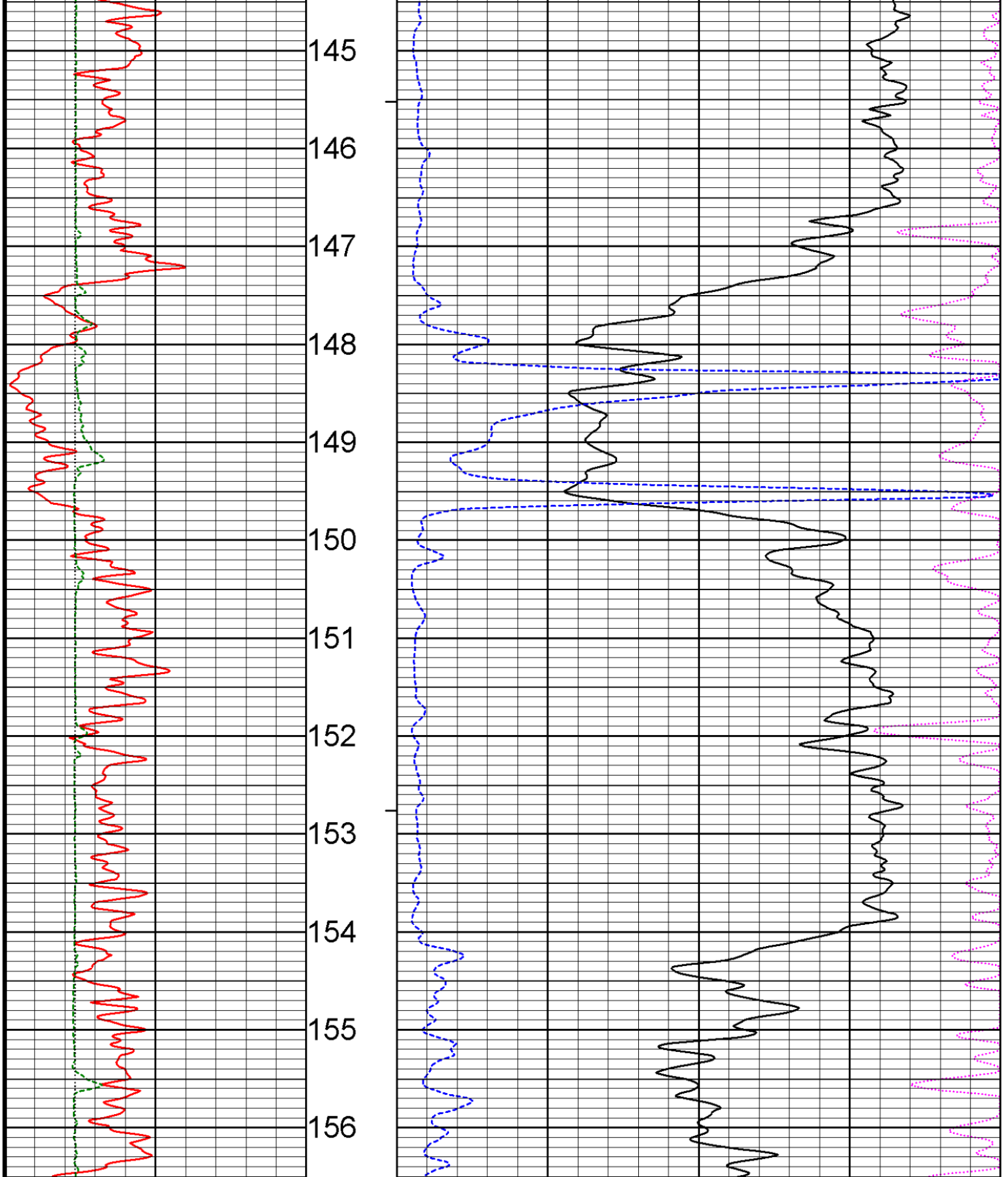
BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

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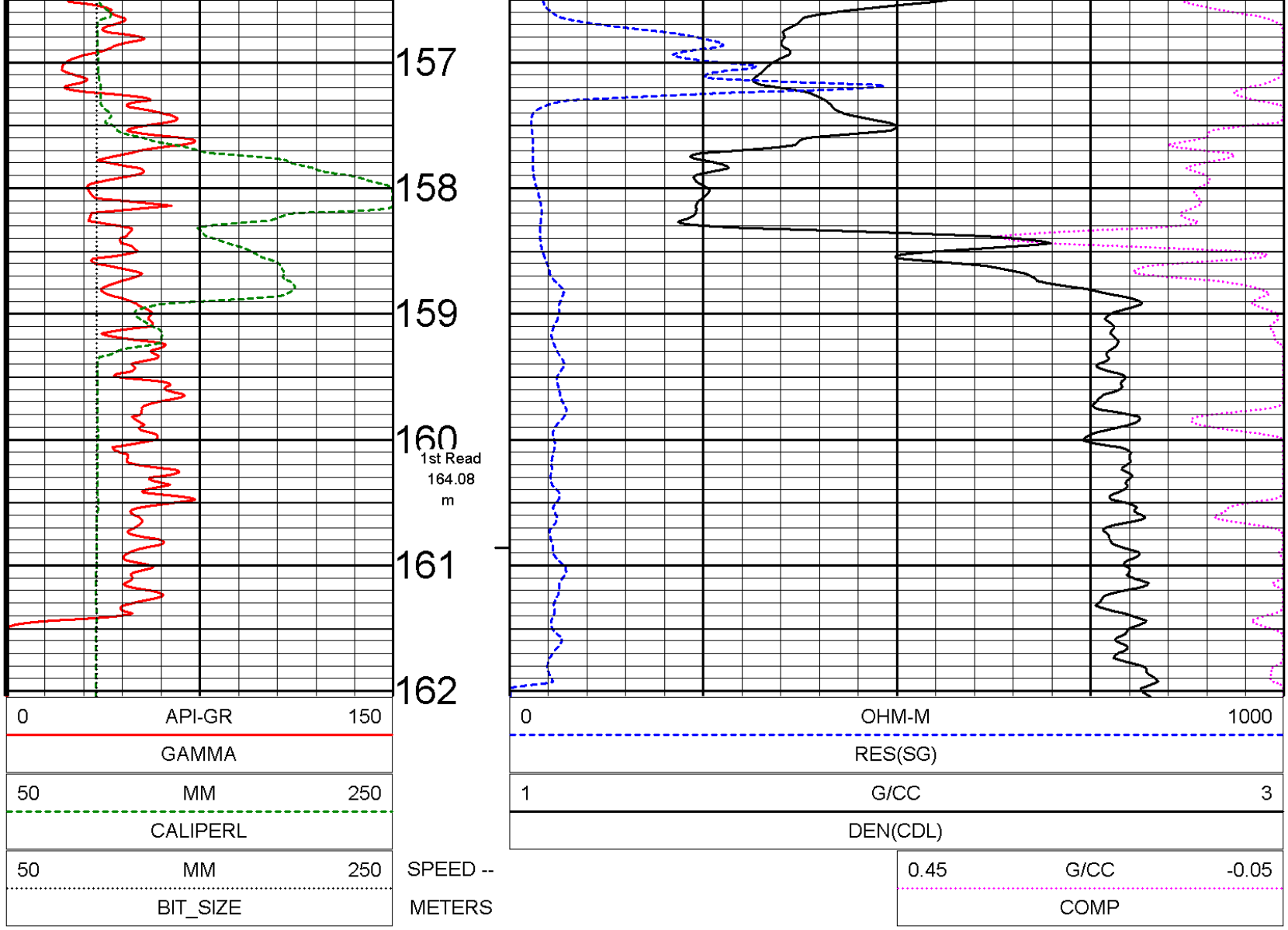

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 70.00 MM
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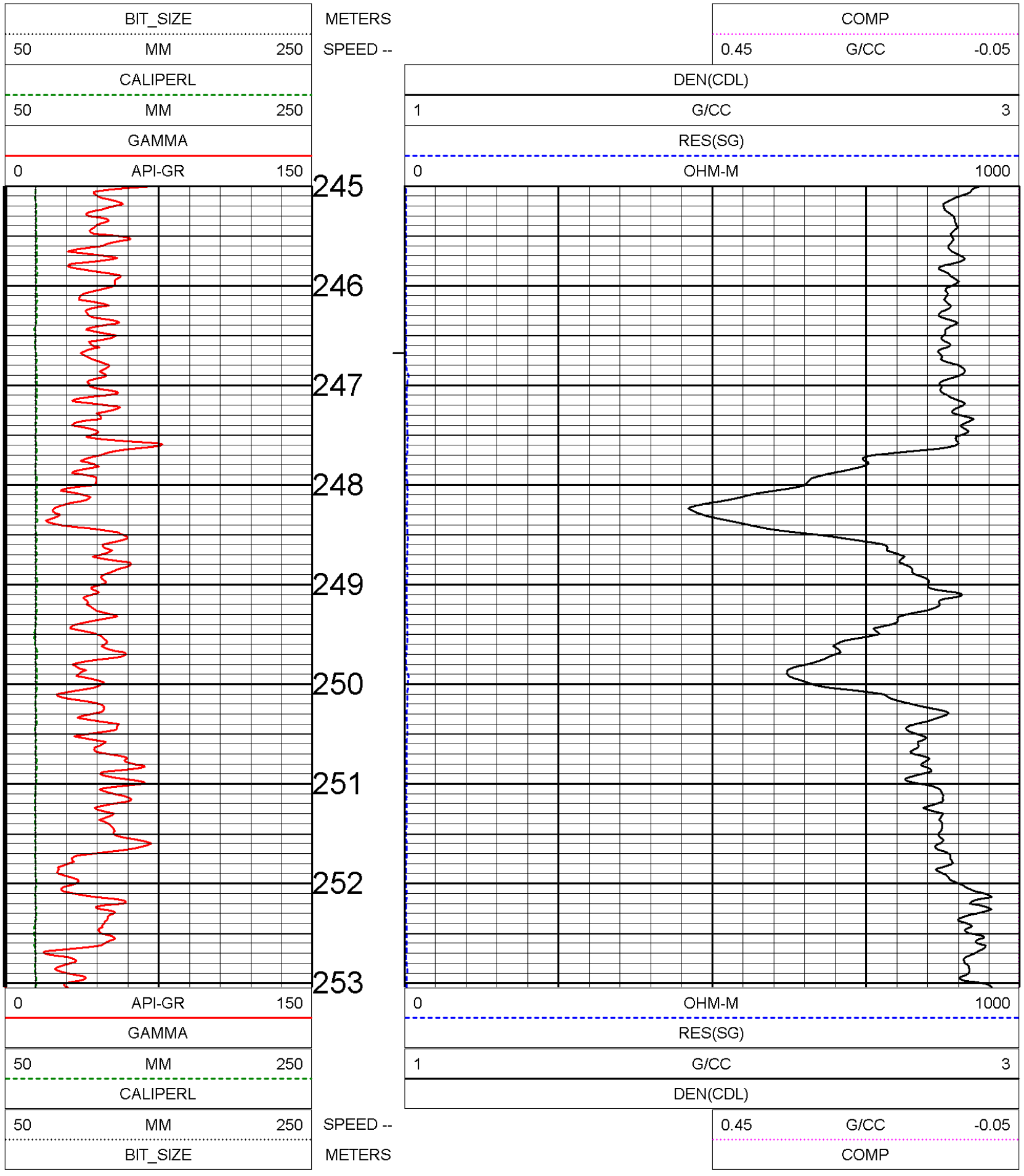

BIT_SIZE
METERS
COMP
50 MM 250
SPEED --
0.45 G/CC -0.05
CALIPERL
DEN(CDL)
50 MM 250
1 G/CC 3
GAMMA
RES(SG)
0 API-GR 150
0 OHM-M 1000
245
246
247
248
249
250
251
252
253
0 API-GR 150
0 OHM-M 1000
GAMMA
RES(SG)
50 MM 250
1 G/CC 3
CALIPERL
DEN(CDL)
50 MM 250
SPEED --
0.45 G/CC -0.05
BIT_SIZE
METERS
COMP

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

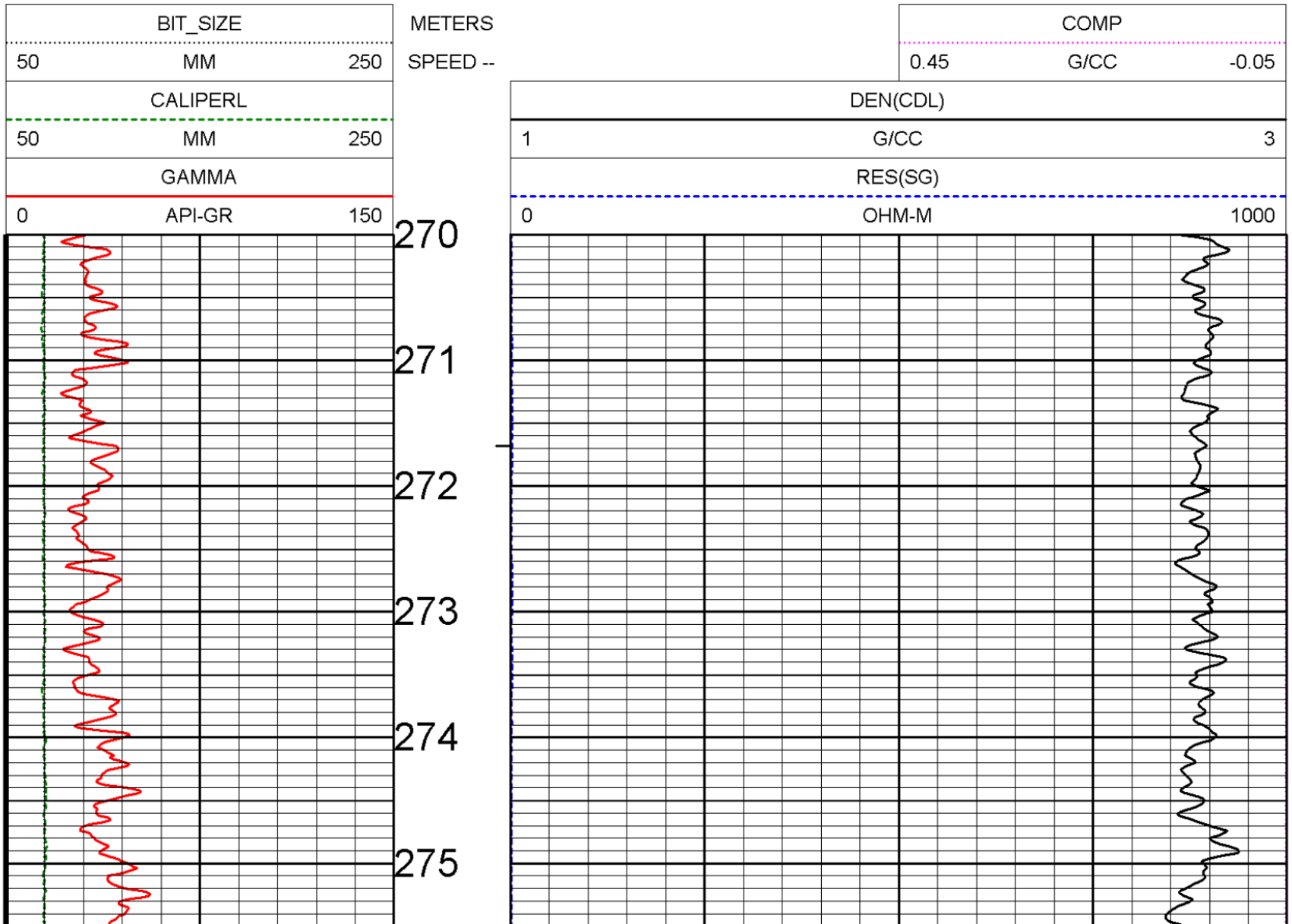
LOG PARAMETERS

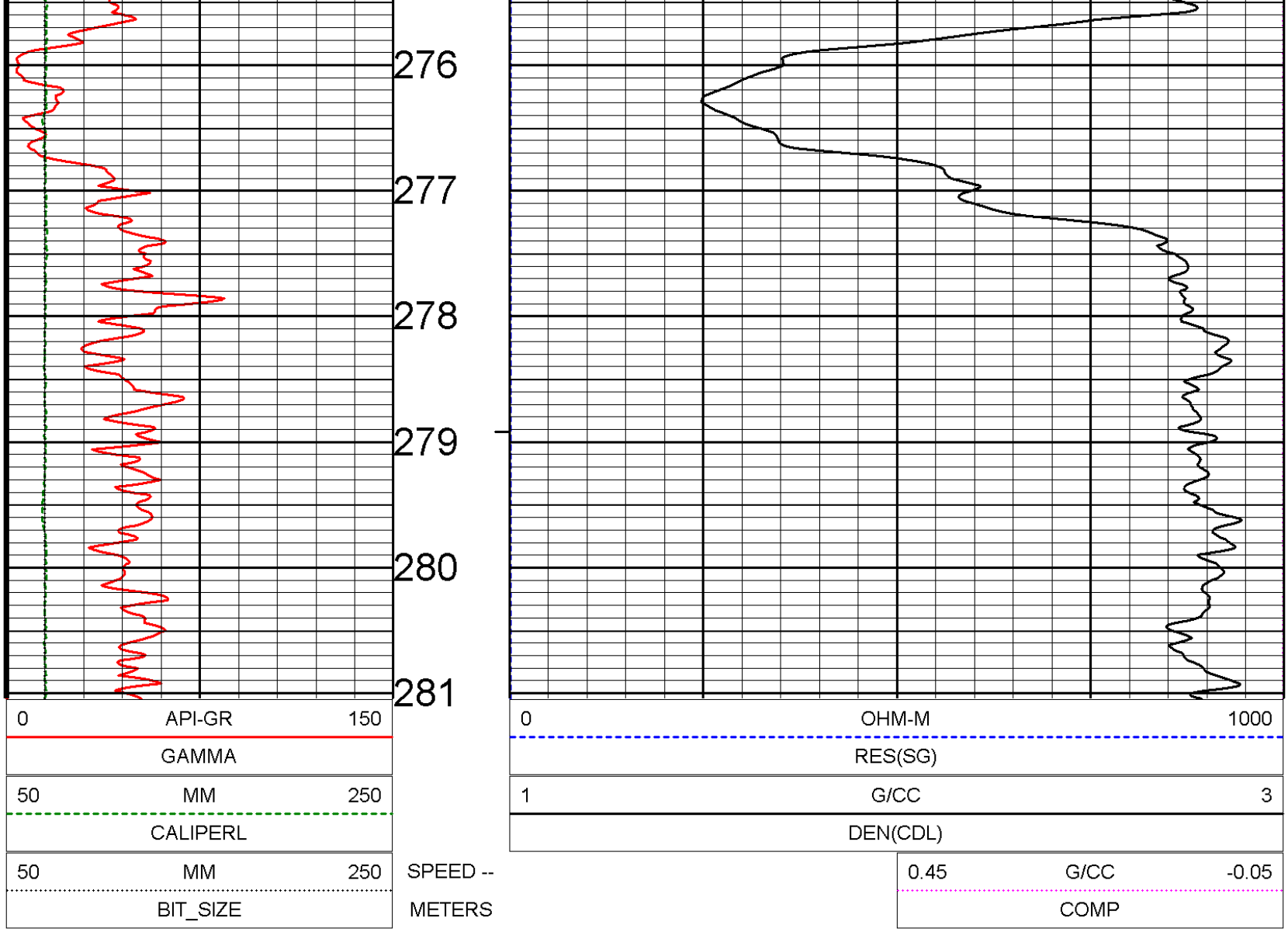
MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e





DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

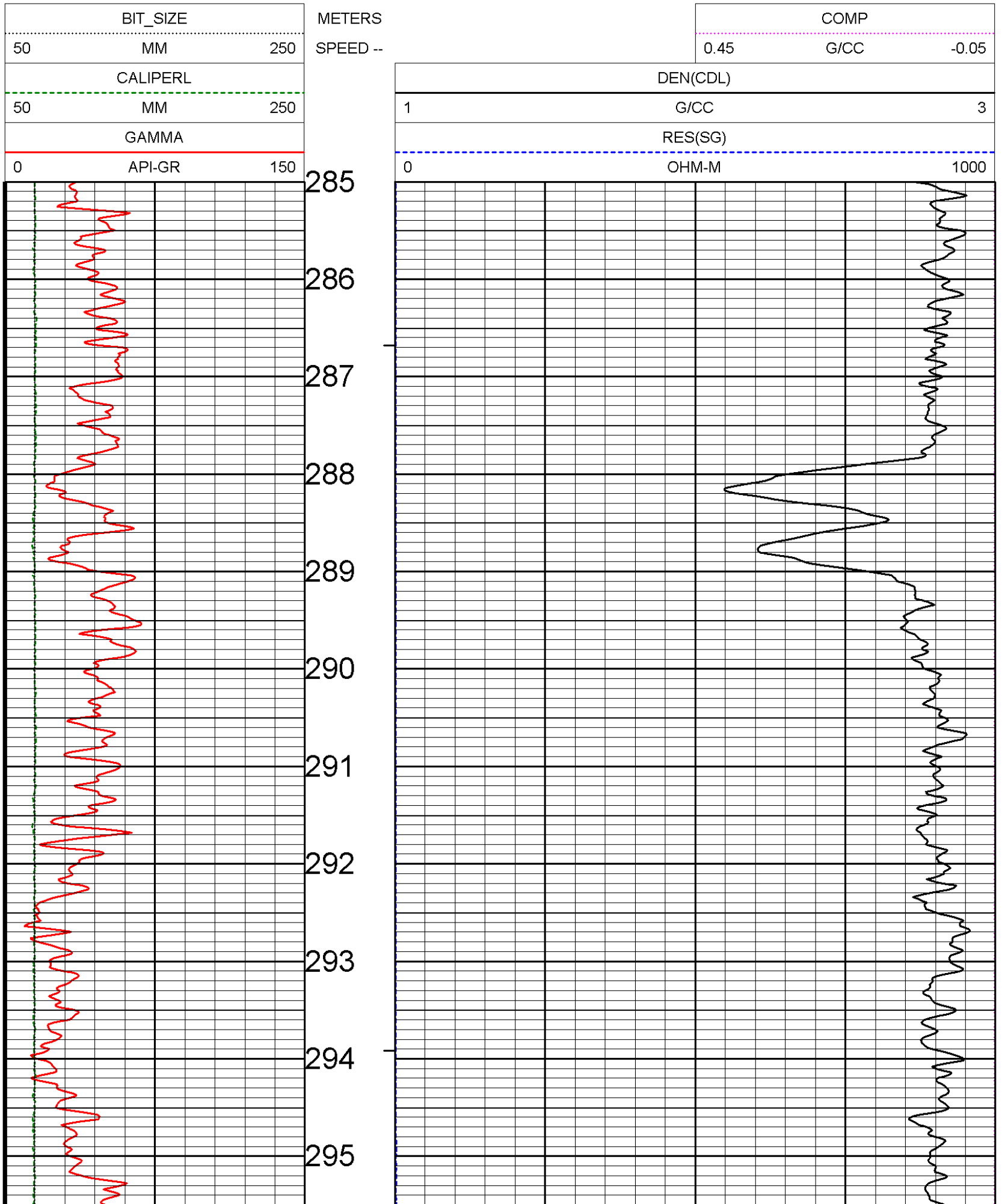
LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 70.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e


BIT_SIZE
50 MM 250
CALIPERL
50 MM 250
GAMMA
0 API-GR 150
METERS
SPEED --
COMP
0.45 G/CC -0.05
DEN(CDL)
1 G/CC 3
RES(SG)
0 OHM-M 1000
285
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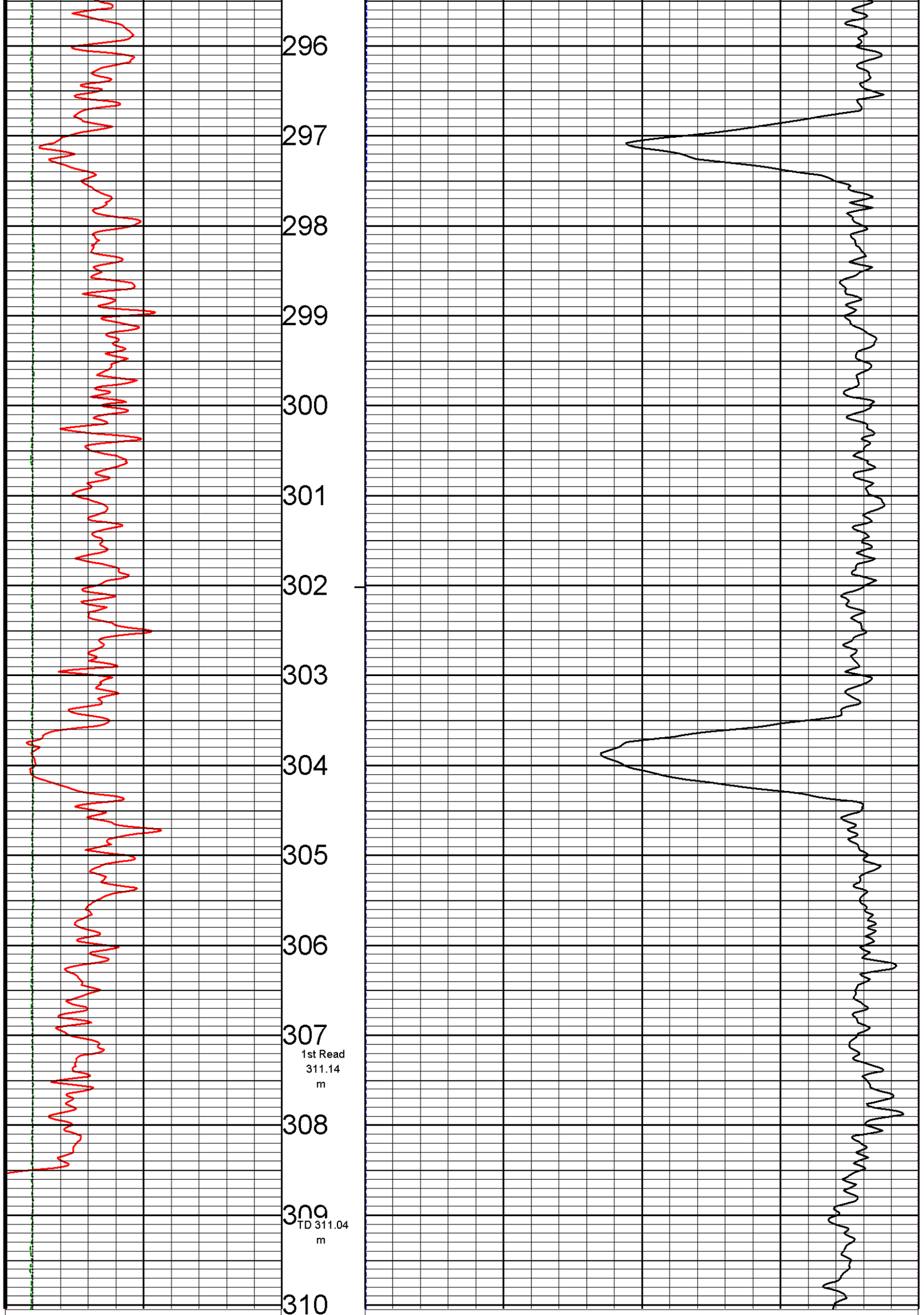
295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302
303
304
305
306
307
1st Read
311.14
m
308
309
TD 311.04
m
310

0	API-GR	150		0	OHM-M	1000
	GAMMA				RES(SG)	
50	MM	250		1	G/CC	3
	CALIPERL				DEN(CDL)	
50	MM	250	SPEED --	0.45	G/CC	-0.05
	BIT_SIZE		METERS		COMP	

DETAILED DENSITY 1:50 DHNP-17-01 08/23/17

LOG PARAMETERS

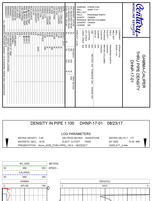
MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177

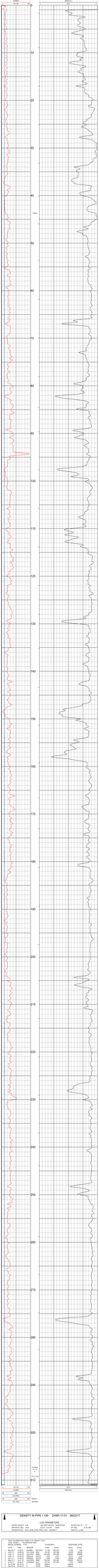
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 70.00 MM

PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017 DISPLAY7_JL44e

TOOL CALIBRATION DHNP-17-01 08/23/17 22:01
TOOL 9239C1 TM VERSION 5026
SERIAL NUMBER 2775

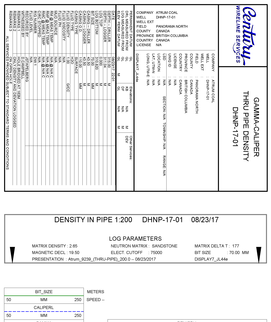
	DATE	TIME	SENSOR		STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	May10,17	14:40:51	GAMMA	[API-GR]	0.100	545.000	0.000	608
2	Jul31,17	16:09:05	VOLTAGE	[MV]	28.100	261.300	16226	46928
3	Jul31,17	16:05:45	CALIPER	[MM]	100.000	200.000	248092	354698
4	Jul31,17	16:45:29	DEN(LS)	[G/CC]	1.620	2.612	15131	2144
5	Jul31,17	16:45:02	DEN(SS)	[G/CC]	1.590	2.580	48256	19587
6	May10,17	14:41:25	CALIPERL	[MM]	100.000	200.000	250066	356135
7	Jul31,17	16:09:47	CURRENT	[UA]	28.100	261.300	7323	25623
8	Dec15,09	09:34:24	F	[CPS]	Default		Default	
9	Dec15,09	09:34:24	X	[CPS]	Default		Default	





TOOL 1208-XA/1208-XB, GAMMA RAY SONDE 1208-XA
CASING, NOMINAL - 7# NEW/SCH 40/STD

	CASING			STANDARD		PEDIFORD (CSG)	
	Inside	Outside	Weight	Inside	Outside	Inside	Outside
1	4 inch	4 inch	9.5 lb/ft	3.826	4.000	3.826	4.000
2	4½ inch	4 1/2 in	10.5 lb/ft	3.927	4.101	3.927	4.101
3	4½ inch	4 1/2 in	11.6 lb/ft	3.875	4.101	3.875	4.101
4	4½ inch	4 1/2 in	13.5 lb/ft	3.795	4.101	3.795	4.101
5	4½ inch	4 1/2 in	15.1 lb/ft	3.701	4.101	3.701	4.101
6	4½ inch	4 1/2 in	16.6 lb/ft	3.647	4.101	3.647	4.101
7	5 inch	5 inch	11.5 lb/ft	4.560	5.000	4.560	5.000
8	5 inch	5 inch	13 lb/ft	4.494	5.000	4.494	5.000
9	5 inch	5 inch	15 lb/ft	4.408	5.000	4.408	5.000
10	5 inch	5 inch	18 lb/ft	4.276	5.000	4.276	5.000
11	5 inch	5 inch	20.8 lb/ft	4.156	5.000	4.156	5.000
12	5 inch	5 inch	23.2 lb/ft	4.044	5.000	4.044	5.000
13	5½ inch	5 1/2 in	14 lb/ft	5.012	5.500	5.012	5.500
14	5½ inch	5 1/2 in	15.5 lb/ft	4.950	5.500	4.950	5.500
15	5½ inch	5 1/2 in	17 lb/ft	4.892	5.500	4.892	5.500
16	5½ inch	5 1/2 in	20 lb/ft	4.778	5.500	4.778	5.500
17	5½ inch	5 1/2 in	23 lb/ft	4.670	5.500	4.670	5.500
18	5½ inch	5 1/2 in	26 lb/ft	4.548	5.500	4.548	5.500
19	5½ inch	5 1/2 in	29.7 lb/ft	4.420	5.500	4.420	5.500
20	5½ inch	5 1/2 in	32.6 lb/ft	4.310	5.500	4.310	5.500
21	5½ inch	5 1/2 in	35.3 lb/ft	4.210	5.500	4.210	5.500
22	5½ inch	5 1/2 in	38 lb/ft	4.110	5.500	4.110	5.500
23	5½ inch	5 1/2 in	40.5 lb/ft	4.020	5.500	4.020	5.500
24	5½ inch	5 1/2 in	43 lb/ft	3.920	5.500	3.920	5.500
25	5½ inch	5 1/2 in	45.5 lb/ft	3.826	5.500	3.826	5.500
26	5½ inch	5 1/2 in	48 lb/ft	3.732	5.500	3.732	5.500
27	5½ inch	5 1/2 in	50.5 lb/ft	3.640	5.500	3.640	5.500
28	5½ inch	5 1/2 in	53 lb/ft	3.548	5.500	3.548	5.500
29	5½ inch	5 1/2 in	55.5 lb/ft	3.460	5.500	3.460	5.500
30	5½ inch	5 1/2 in	58 lb/ft	3.370	5.500	3.370	5.500
31	5½ inch	5 1/2 in	60.5 lb/ft	3.280	5.500	3.280	5.500
32	5½ inch	5 1/2 in	63 lb/ft	3.190	5.500	3.190	5.500
33	5½ inch	5 1/2 in	65.5 lb/ft	3.100	5.500	3.100	5.500
34	5½ inch	5 1/2 in	68 lb/ft	3.010	5.500	3.010	5.500
35	5½ inch	5 1/2 in	70.5 lb/ft	2.920	5.500	2.920	5.500
36	5½ inch	5 1/2 in	73 lb/ft	2.830	5.500	2.830	5.500
37	5½ inch	5 1/2 in	75.5 lb/ft	2.740	5.500	2.740	5.500
38	5½ inch	5 1/2 in	78 lb/ft	2.650	5.500	2.650	5.500
39	5½ inch	5 1/2 in	80.5 lb/ft	2.560	5.500	2.560	5.500
40	5½ inch	5 1/2 in	83 lb/ft	2.470	5.500	2.470	5.500
41	5½ inch	5 1/2 in	85.5 lb/ft	2.380	5.500	2.380	5.500
42	5½ inch	5 1/2 in	88 lb/ft	2.290	5.500	2.290	5.500
43	5½ inch	5 1/2 in	90.5 lb/ft	2.200	5.500	2.200	5.500
44	5½ inch	5 1/2 in	93 lb/ft	2.110	5.500	2.110	5.500
45	5½ inch	5 1/2 in	95.5 lb/ft	2.020	5.500	2.020	5.500
46	5½ inch	5 1/2 in	98 lb/ft	1.930	5.500	1.930	5.500
47	5½ inch	5 1/2 in	100.5 lb/ft	1.840	5.500	1.840	5.500
48	5½ inch	5 1/2 in	103 lb/ft	1.750	5.500	1.750	5.500
49	5½ inch	5 1/2 in	105.5 lb/ft	1.660	5.500	1.660	5.500
50	5½ inch	5 1/2 in	108 lb/ft	1.570	5.500	1.570	5.500
51	5½ inch	5 1/2 in	110.5 lb/ft	1.480	5.500	1.480	5.500
52	5½ inch	5 1/2 in	113 lb/ft	1.390	5.500	1.390	5.500
53	5½ inch	5 1/2 in	115.5 lb/ft	1.300	5.500	1.300	5.500
54	5½ inch	5 1/2 in	118 lb/ft	1.210	5.500	1.210	5.500
55	5½ inch	5 1/2 in	120.5 lb/ft	1.120	5.500	1.120	5.500
56	5½ inch	5 1/2 in	123 lb/ft	1.030	5.500	1.030	5.500
57	5½ inch	5 1/2 in	125.5 lb/ft	0.940	5.500	0.940	5.500
58	5½ inch	5 1/2 in	128 lb/ft	0.850	5.500	0.850	5.500
59	5½ inch	5 1/2 in	130.5 lb/ft	0.760	5.500	0.760	5.500
60	5½ inch	5 1/2 in	133 lb/ft	0.670	5.500	0.670	5.500
61	5½ inch	5 1/2 in	135.5 lb/ft	0.580	5.500	0.580	5.500
62	5½ inch	5 1/2 in	138 lb/ft	0.490	5.500	0.490	5.500
63	5½ inch	5 1/2 in	140.5 lb/ft	0.400	5.500	0.400	5.500
64	5½ inch	5 1/2 in	143 lb/ft	0.310	5.500	0.310	5.500
65	5½ inch	5 1/2 in	145.5 lb/ft	0.220	5.500	0.220	5.500
66	5½ inch	5 1/2 in	148 lb/ft	0.130	5.500	0.130	5.500
67	5½ inch	5 1/2 in	150.5 lb/ft	0.040	5.500	0.040	5.500
68	5½ inch	5 1/2 in	153 lb/ft	0.000	5.500	0.000	5.500
69	5½ inch	5 1/2 in	155.5 lb/ft	0.000	5.500	0.000	5.500
70	5½ inch	5 1/2 in	158 lb/ft	0.000	5.500	0.000	5.500
71	5½ inch	5 1/2 in	160.5 lb/ft	0.000	5.500	0.000	5.500
72	5½ inch	5 1/2 in	163 lb/ft	0.000	5.500	0.000	5.500
73	5½ inch	5 1/2 in	165.5 lb/ft	0.000	5.500	0.000	5.500
74	5½ inch	5 1/2 in	168 lb/ft	0.000	5.500	0.000	5.500
75	5½ inch	5 1/2 in	170.5 lb/ft	0.000	5.500	0.000	5.500
76	5½ inch	5 1/2 in	173 lb/ft	0.000	5.500	0.000	5.500
77	5½ inch	5 1/2 in	175.5 lb/ft	0.000	5.500	0.000	5.500
78	5½ inch	5 1/2 in	178 lb/ft	0.000	5.500	0.000	5.500
79	5½ inch	5 1/2 in	180.5 lb/ft	0.000	5.500	0.000	5.500
80	5½ inch	5 1/2 in	183 lb/ft	0.000	5.500	0.000	5.500
81	5½ inch	5 1/2 in	185.5 lb/ft	0.000	5.500	0.000	5.500
82	5½ inch	5 1/2 in	188 lb/ft	0.000	5.500	0.000	5.500
83	5½ inch	5 1/2 in	190.5 lb/ft	0.000	5.500	0.000	5.500
84	5½ inch	5 1/2 in	193 lb/ft	0.000	5.500	0.000	5.500
85	5½ inch	5 1/2 in	195.5 lb/ft	0.000	5.500	0.000	5.500
86	5½ inch	5 1/2 in	198 lb/ft	0.000	5.500	0.000	5.500
87	5½ inch	5 1/2 in	200.5 lb/ft	0.000	5.500	0.000	5.500
88	5½ inch	5 1/2 in	203 lb/ft	0.000	5.500	0.000	5.500
89	5½ inch	5 1/2 in	205.5 lb/ft	0.000	5.500	0.000	5.500
90	5½ inch	5 1/2 in	208 lb/ft	0.000	5.500	0.000	5.500
91	5½ inch	5 1/2 in	210.5 lb/ft	0.000	5.500	0.000	5.500
92	5½ inch	5 1/2 in	213 lb/ft	0.000	5.500	0.000	5.500
93	5½ inch	5 1/2 in	215.5 lb/ft	0.000	5.500	0.000	5.500
94	5½ inch	5 1/2 in	218 lb/ft	0.000	5.500	0.000	5.500
95	5½ inch	5 1/2 in	220.5 lb/ft	0.000	5.500	0.000	5.500
96	5½ inch	5 1/2 in	223 lb/ft	0.000	5.500	0.000	5.500
97	5½ inch	5 1/2 in	225.5 lb/ft	0.000	5.500	0.000	5.500
98	5½ inch	5 1/2 in	228 lb/ft	0.000	5.500	0.000	5.500
99	5½ inch	5 1/2 in	230.5 lb/ft	0.000	5.500	0.000	5.500
100	5½ inch	5 1/2 in	233 lb/ft	0.000	5.500	0.000	5.500



DENSITY IN PIPE 1:200 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 70.00 MM
PRESENTATION : Atrium_8256_[THRU-PIPE]_2013 – 09/25/2017 DISPLAY7_4.4w

BIT_SIZE METERS
50 MM 250 SPEED –
CALIPER1
50 MM 250
GAMMA
0 API-GR 150
DENCOL1
4 GCC 3

Casing

1st Read 311.14
2nd Read 311.04

0 API-GR 150
GAMMA
50 MM 250 SPEED –
CALIPER1
50 MM 250 METERS
BIT_SIZE
4 GCC 3
DENCOL1

DENSITY IN PIPE 1:200 DHNP-17-01 08/23/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 70.00 MM
PRESENTATION : Atrium_8256_[THRU-PIPE]_2013 – 09/25/2017 DISPLAY7_4.4w

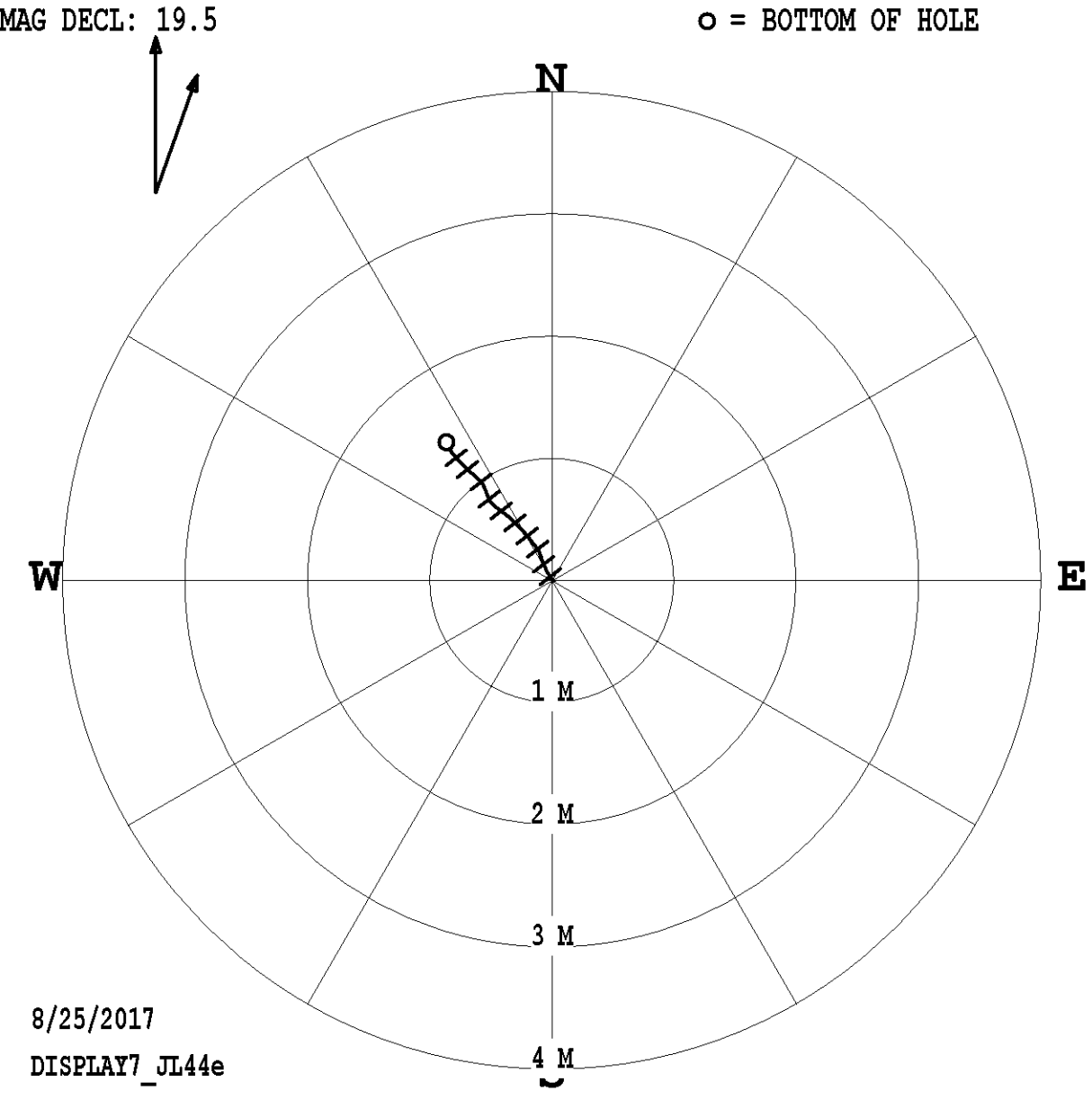
TOOL CALIBRATION: DHNP-17-01 09/23/17 22:01
TOOL : 9235CI TM VERSION 5026
SERIAL NUMBER : 2772

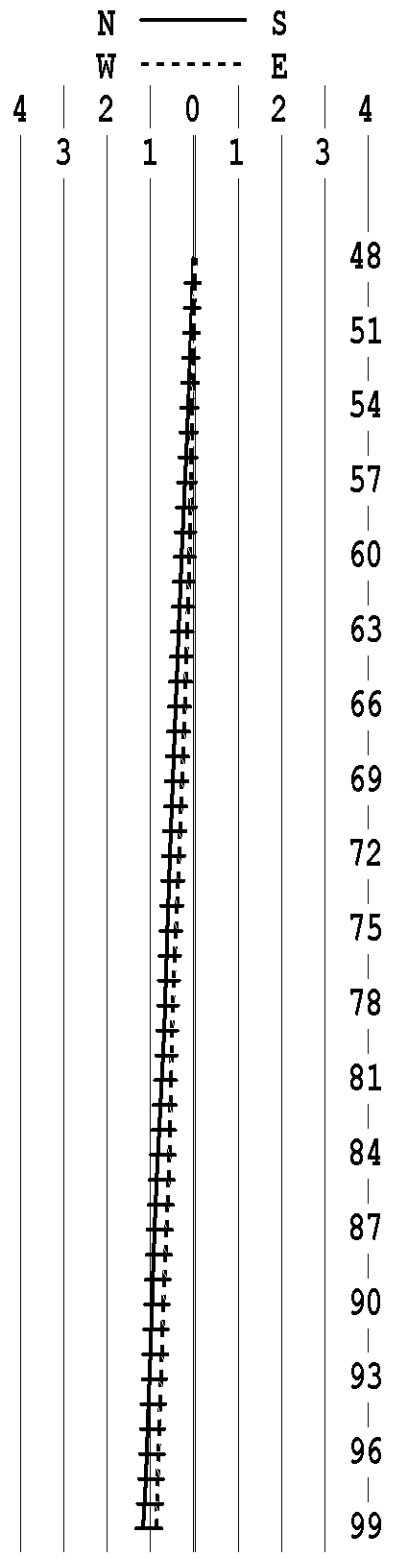
	DATE	TIME	SENSOR	STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	Jul31,17	16:40:51	GAMMA [API-GR]	0.100	545.000	1000	4928
2	Jul31,17	16:55:05	VOLTAGE [MV]	39.100	291.300	16236	46929
3	Jul31,17	16:05:45	CALIPER [MM]	100.000	200.000	248302	354956
4	Jul31,17	16:40:29	DENLSS [GCC]	1.620	2.612	15131	2144
5	Jul31,17	16:45:22	DENSSS [GCC]	1.590	2.580	46256	10587
6	Jul31,17	16:51:47	DENCOL1 [GCC]	104.100	291.300	46256	10587
7	Jul31,17	16:52:47	CURRENT [UA]	39.100	291.300	7323	25823
8	Dec15,09	09:34:24	F [CPS]	Default	Default	Default	Default
9	Dec15,09	09:34:24	A [CPS]	Default	Default	Default	Default

PLAN VIEW
COMPU-LOG DEVIATION

CLIENT: ATRUM COAL
LOCATION: PANORAMA NORTH
HOLE ID: DHNP-17-01
DATE OF LOG: 08/24/17
PROBE: 9058A 2630
MAG DECL: 19.5

DISTANCE: 1.42 M
AZIMUTH: 322.53
TRUE DEPTH: 99.72 M
SCALE: 1 M/Division
+ = 5 M INCR
o = BOTTOM OF HOLE





DHNP-17-01_08-24-17_01-50_9058A_.02_48.00_99.72_DEVI

* * * * * * * COMPU-LOG - VERTICAL DEVIATION * * * * * * *

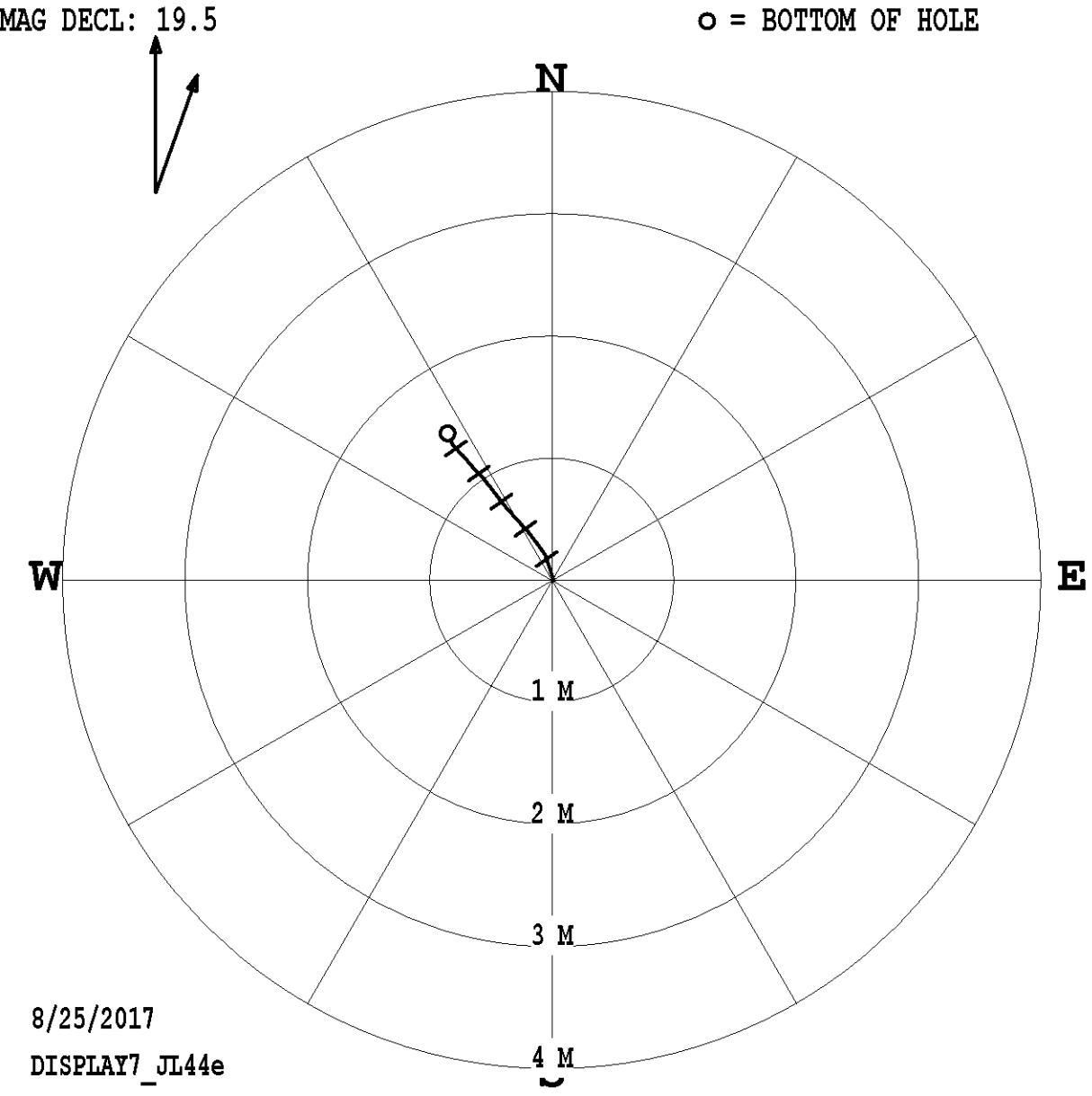
CLIENT : ATRUM COAL
FIELD OFFICE : CENTURY
DATA FROM : N/A
MAG. DECL. : 19.500
HOLE ID. : DHNP-17-01
DATE OF LOG : 08/24/17
PROBE : 9058A , 2630
DEPTH UNITS : METERS
LOG: DHNP-17-01_08-24-17_01-50_9058A_.02_48.00_99.72_DEVI.log

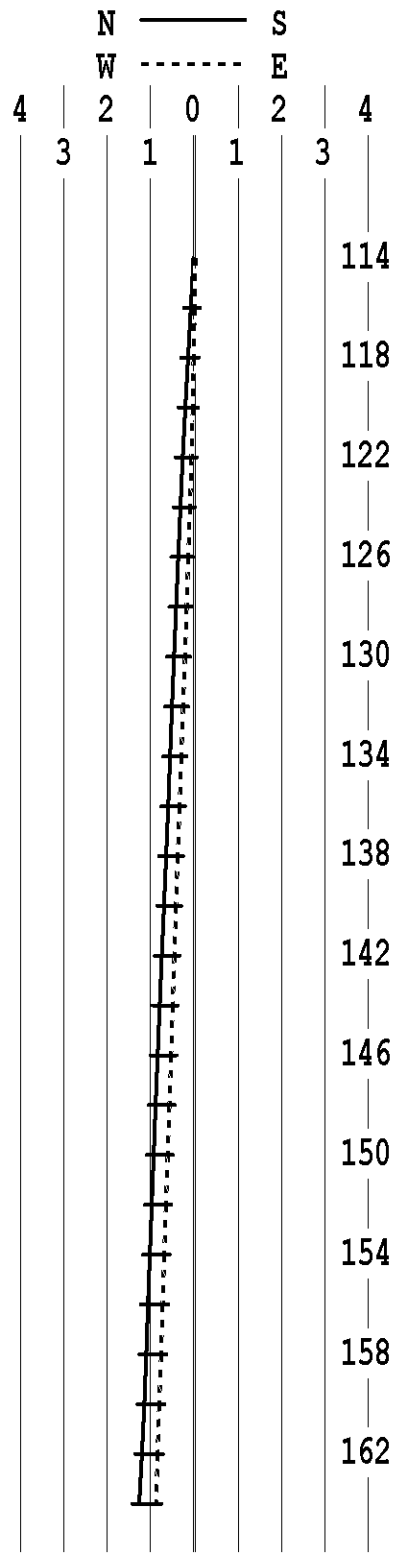
CABLE DEPTH	TRUE DEPTH	NORTH DEV.	EAST DEV.	DISTANCE	AZIMUTH	SANG	SANGB
48.00	48.02	-0.00	0.02	0.0	107.3	1.5	324.1
49.00	49.02	0.02	0.00	0.0	0.3	1.5	320.4
50.00	50.02	0.03	-0.02	0.0	335.8	1.3	323.8
51.00	51.02	0.05	-0.03	0.1	331.8	1.3	327.0
52.00	52.02	0.07	-0.04	0.1	330.9	1.3	329.6
53.00	53.02	0.09	-0.05	0.1	331.6	1.7	321.5
54.00	54.02	0.11	-0.06	0.1	332.7	1.3	333.8
55.00	55.02	0.13	-0.07	0.2	332.5	1.3	329.1
56.00	56.02	0.16	-0.08	0.2	333.2	1.6	343.4
57.00	57.02	0.18	-0.09	0.2	334.5	1.6	343.4
58.00	58.02	0.21	-0.10	0.2	335.4	1.6	340.7
59.00	59.02	0.23	-0.10	0.3	336.0	1.6	338.2
60.00	60.02	0.26	-0.12	0.3	335.4	1.6	322.4
61.00	61.02	0.28	-0.14	0.3	334.2	1.6	322.4
62.00	62.02	0.30	-0.15	0.3	333.2	1.6	321.1
63.00	63.02	0.32	-0.17	0.4	332.4	1.6	321.2
64.00	64.02	0.34	-0.19	0.4	331.6	1.6	320.7
65.00	65.02	0.37	-0.20	0.4	330.8	1.5	318.9
66.00	66.02	0.39	-0.22	0.4	330.2	1.8	317.7
67.00	67.01	0.41	-0.24	0.5	329.5	1.7	317.3
68.00	68.01	0.43	-0.26	0.5	328.7	1.8	315.3
69.00	69.01	0.45	-0.28	0.5	327.9	1.8	313.6
70.00	70.01	0.47	-0.30	0.6	327.2	1.7	315.2
71.00	71.01	0.49	-0.33	0.6	326.6	1.7	314.9
72.00	72.01	0.52	-0.35	0.6	326.0	1.7	313.3
73.00	73.01	0.53	-0.37	0.7	325.3	1.7	308.3
74.00	74.01	0.55	-0.39	0.7	324.5	1.7	307.7
75.00	75.01	0.57	-0.42	0.7	323.8	1.6	310.0
76.00	76.01	0.59	-0.44	0.7	323.2	1.7	307.6
77.00	77.01	0.61	-0.46	0.8	322.5	1.7	307.0
78.00	78.01	0.62	-0.48	0.8	322.1	1.5	316.6
79.00	79.01	0.64	-0.50	0.8	322.0	1.6	326.0
80.00	80.01	0.67	-0.51	0.8	322.4	1.7	334.0
81.00	81.01	0.69	-0.53	0.9	322.8	1.7	334.5
82.00	82.01	0.72	-0.54	0.9	323.4	1.7	339.5
83.00	83.01	0.75	-0.55	0.9	323.8	1.8	336.8
84.00	84.01	0.78	-0.56	1.0	324.3	2.0	337.8
85.00	85.01	0.81	-0.58	1.0	324.3	1.7	316.2
86.00	86.01	0.83	-0.60	1.0	324.0	1.8	318.6
87.00	87.01	0.85	-0.62	1.1	323.8	1.8	315.0
88.00	88.01	0.87	-0.65	1.1	323.4	1.7	305.5
89.00	89.00	0.89	-0.67	1.1	323.0	1.6	311.6
90.00	90.00	0.91	-0.69	1.1	322.7	1.6	315.7
91.00	91.00	0.93	-0.71	1.2	322.5	1.5	315.5
92.00	92.00	0.95	-0.73	1.2	322.4	1.6	318.6
93.00	93.00	0.97	-0.75	1.2	322.3	1.6	320.0
94.00	94.00	0.99	-0.77	1.2	322.2	1.5	315.9
95.00	95.00	1.01	-0.78	1.3	322.1	1.6	317.9
96.00	96.00	1.03	-0.80	1.3	322.0	1.6	314.3
97.00	97.00	1.05	-0.82	1.3	322.0	1.7	326.1
98.00	98.00	1.07	-0.83	1.4	322.2	2.1	335.4
99.00	99.00	1.11	-0.85	1.4	322.4	2.4	328.3
99.72	99.50	1.13	-0.86	1.4	322.5	2.4	328.3

PLAN VIEW
COMPU-LOG DEVIATION

CLIENT: ATRUM COAL
LOCATION: PANORAMA NORTH
HOLE ID: DHNP-17-01
DATE OF LOG: 08/24/17
PROBE: 9058A 2630
MAG DECL: 19.5

DISTANCE: 1.47 M
AZIMUTH: 324.65
TRUE DEPTH: 164.48 M
SCALE: 1 M/Division
+ = 10 M INCR
o = BOTTOM OF HOLE





DHNP-17-01_08-24-17_07-44_9058A_.02_114.00_164.48_DEVI

* * * * * * * COMPU-LOG - VERTICAL DEVIATION * * * * * * *

CLIENT : ATRUM COAL
FIELD OFFICE : CENTURY
DATA FROM : N/A
MAG. DECL. : 19.500
HOLE ID. : DHNP-17-01
DATE OF LOG : 08/24/17
PROBE : 9058A , 2630
DEPTH UNITS : METERS
LOG: DHNP-17-01_08-24-17_07-44_9058A_.02_114.00_164.48_DEVI.log

CABLE DEPTH	TRUE DEPTH	NORTH DEV.	EAST DEV.	DISTANCE	AZIMUTH	SANG	SANGB
114.00	114.02	-0.00	0.02	0.0	107.3	1.9	340.1
115.00	115.02	0.03	0.01	0.0	12.1	1.8	342.3
116.00	116.02	0.06	-0.00	0.1	355.0	1.9	341.4
117.00	117.02	0.09	-0.02	0.1	350.0	1.8	340.9
118.00	118.02	0.12	-0.03	0.1	347.7	1.8	341.4
119.00	119.02	0.15	-0.04	0.2	346.4	1.8	341.7
120.00	120.02	0.18	-0.05	0.2	345.6	1.7	341.9
121.00	121.02	0.21	-0.06	0.2	344.9	1.8	339.1
122.00	122.02	0.23	-0.07	0.2	342.8	1.8	325.1
123.00	123.02	0.26	-0.09	0.3	340.7	1.8	323.9
124.00	124.02	0.28	-0.11	0.3	339.0	1.7	323.5
125.00	125.02	0.31	-0.13	0.3	337.6	1.8	323.1
126.00	126.02	0.33	-0.14	0.4	336.4	1.7	322.9
127.00	127.01	0.36	-0.16	0.4	335.4	1.7	323.0
128.00	128.01	0.38	-0.18	0.4	334.5	1.7	321.9
129.00	129.01	0.40	-0.20	0.4	333.6	1.7	319.1
130.00	130.01	0.42	-0.22	0.5	332.7	1.7	318.0
131.00	131.01	0.44	-0.24	0.5	331.8	1.8	314.9
132.00	132.01	0.47	-0.26	0.5	331.0	1.7	317.4
133.00	133.01	0.49	-0.28	0.6	330.3	1.7	317.6
134.00	134.01	0.51	-0.30	0.6	329.7	1.6	315.8
135.00	135.01	0.53	-0.32	0.6	329.2	1.7	319.6
136.00	136.01	0.55	-0.34	0.6	328.7	1.7	316.9
137.00	137.01	0.58	-0.36	0.7	328.3	1.6	318.0
138.00	138.01	0.60	-0.38	0.7	327.8	1.7	315.5
139.00	139.01	0.62	-0.40	0.7	327.6	1.7	319.5
140.00	140.01	0.65	-0.41	0.8	327.3	1.7	320.9
141.00	141.01	0.67	-0.43	0.8	327.1	1.6	321.6
142.00	142.01	0.69	-0.45	0.8	326.9	1.7	323.2
143.00	143.01	0.72	-0.47	0.9	326.8	1.7	320.1
144.00	144.01	0.74	-0.49	0.9	326.6	1.7	318.7
145.00	145.01	0.76	-0.50	0.9	326.5	1.7	316.9
146.00	146.01	0.79	-0.52	0.9	326.4	1.7	322.4
147.00	147.01	0.81	-0.54	1.0	326.2	1.7	320.9
148.00	148.01	0.83	-0.56	1.0	326.1	1.7	325.9
149.00	149.01	0.85	-0.58	1.0	325.9	1.7	315.3
150.00	150.00	0.87	-0.60	1.1	325.6	1.6	316.6
151.00	151.00	0.89	-0.62	1.1	325.3	1.6	315.1
152.00	152.00	0.91	-0.64	1.1	325.1	1.6	318.7
153.00	153.00	0.94	-0.66	1.1	325.0	1.5	318.1
154.00	154.00	0.96	-0.67	1.2	324.8	1.5	318.6
155.00	155.00	0.98	-0.69	1.2	324.7	1.6	320.6
156.00	156.00	1.00	-0.71	1.2	324.6	1.5	320.1
157.00	157.00	1.02	-0.73	1.2	324.5	1.4	313.3
158.00	158.00	1.04	-0.74	1.3	324.3	1.6	310.2
159.00	159.00	1.06	-0.77	1.3	324.1	1.7	323.1
160.00	160.00	1.08	-0.79	1.3	324.0	1.9	315.0
161.00	161.00	1.10	-0.81	1.4	323.8	1.9	321.7
162.00	162.00	1.13	-0.82	1.4	324.0	1.9	353.3
163.00	163.00	1.16	-0.84	1.4	324.3	1.9	339.2
164.00	164.00	1.19	-0.85	1.5	324.6	1.9	337.9
164.48	164.26	1.20	-0.85	1.5	324.6	1.9	337.8

Century WIRELINE SERVICES

GAMMA-CALIPER
THRU PIPE DENSITY
DHNP-17-02B

COMPANY	ATRUM COAL
WELL	DHNP-17-02B
WELL EXT	
FIELD	PANORAMA NORTH
COUNTY	CANADA
PROVINCE	BRITISH COLUMBIA
COUNTRY	CANADA
LICENSE	N/A

COMPANY	: ATRUM COAL
WELL	: DHNP-17-02B
WELL EXT	:
FIELD	: PANORAMA NORTH
COUNTY	: CANADA
PROVINCE	: BRITISH COLUMBIA
COUNTRY	: CANADA
LICENSE	: N/A
UNIQ ID	: N/A
LSD	: N/A SECTION: N/A TOWNSHIP: N/A RANGE: N/A
LOCATION	: N/A
LAT, UTM-N	: N/A
LONG, UTM-E	: N/A

DISPLAY7_JL44e

PERMANENT DATUM	GL		Elevations:	
DRL MEASURED FROM	GL		KB	N/A
LOG MEASURED FROM	GL		DF	N/A
ELEV. PERM. DATUM	GL	M	N/A	M
				M
			Other Services:	
			DEV	
			DEN	

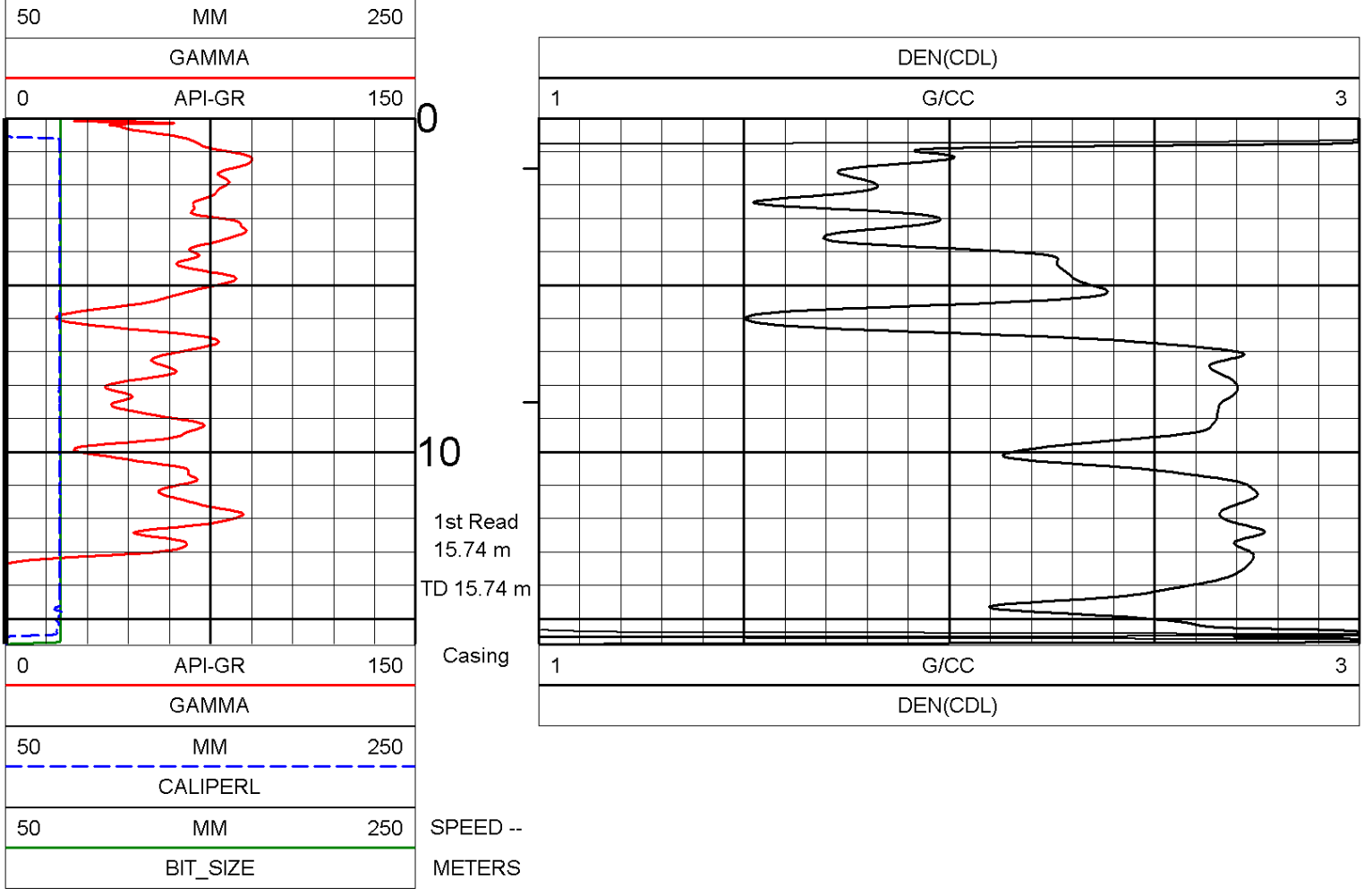
DATE	08/26/17 06:53	
DEPTH -- DRILLER	16.00	M
DEPTH -- LOGGER	15.74	M
LOG TOP	0.000	M
LOG BOTTOM	15.740	M
BIT SIZE	97.00	MM
CASING -- DRILLER	16.00	M
CASING -- LOGGER	15.74	M
CASING O.D.	110.00	MM
CASING TYPE	SURFACE	
FLUID TYPE	H2O	
FLUID DENSITY	1.00	G/CC
FLUID VISCOSITY	N/A	
FLUID PH	N/A	
MUD SOURCE	N/A	
RM @ MEAS TEMP	N/A @ N/A C	
RMF @ MEAS TEMP	N/A @ N/A C	
RMC @ MEAS TEMP	N/A @ N/A C	
CIRC STOPPED	N/A	
RIG NUMBER	DW 2	
FLUID LEVEL	N/A	
RECORDED BY	JSTAPELBERG	
WITNESSED BY	D.CAMPBELL	
REMARKS 1		
REMARKS 2		
REMARKS 3		

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

DENSITY IN PIPE 1:200 DHNP-17-02B 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_(THRU-PIPE)_200.0 -- 08/25/2017 DISPLAY7_JL44e



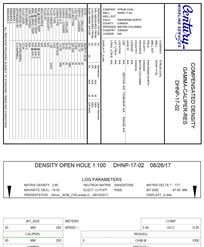
DENSITY IN PIPE 1:200 DHNP-17-02B 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_(THRU-PIPE)_200.0 -- 08/25/2017 DISPLAY7_JL44e

TOOL CALIBRATION DHNP-17-02B 08/26/17 06:53
TOOL 9239C1 TM VERSION 5026
SERIAL NUMBER 2783

	DATE	TIME	SENSOR		STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	Aug01,17	13:33:36	GAMMA	[API-GR]	0.100	545.000	0.000	646
2	Aug01,17	13:32:00	VOLTAGE	[MV]	28.700	307.700	16476	52909
3	May24,17	10:28:21	CALIPER	[MM]	76.200	150.000	230561	386867
4	Aug01,17	14:00:22	DEN(LS)	[G/CC]	1.620	2.612	16385	2289
5	Aug01,17	14:00:47	DEN(SS)	[G/CC]	1.590	2.580	54604	21878
6	Aug01,17	13:33:14	CALIPERL	[MM]	101.600	200.000	243652	354478
7	Aug01,17	13:31:19	CURRENT	[UA]	28.700	307.700	3957	13187
8	Nov13,13	07:18:33	F	[CPS]	Default		Default	
9	May24,17	15:01:21	X	[CPS]	Default		Default	



DENSITY OPEN HOLE 1:100 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY 2.65	NEUTRON MATRIX SANDSTONE	MATRIX DELTA T 171
MAGNETIC DECL 14.55	FLUID DENSITY 1000	BIT SIZE 97.50 MM
PRESENTATION Mnemo_ROW_FOR.mwd.2 - DAYLIGHT		DISPLAY1_A.mtp

BIT_SIZE	METERS		COMP
50 MM 250	SPEED 1		0.45 GCC 0.05
CALIPER1		RESIS1	
50 MM 250		0 OHM-M 1000	
GAMMA		DPHI1 PCT	
0 API 200		1 GCC 3	

0
10
20
Caving
Fault zone
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
Fault zone
220

GAMMA			
0 API 150		1 GCC 3	
CALIPER1		DPHI1 PCT	
50 MM 250		0 OHM-M 1000	
BIT_SIZE	SPEED 1	RESIS1	
50 MM 250	METERS	0.45 GCC 0.05	COMP

DENSITY OPEN HOLE 1:100 DHNP-17-02 08/26/17

LOG PARAMETERS

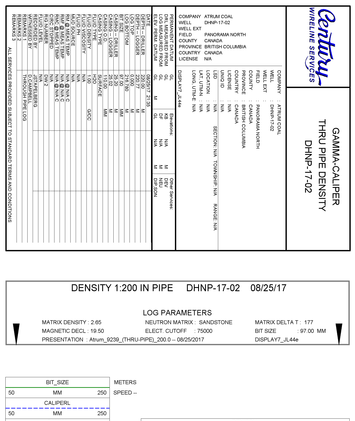
MATRIX DENSITY 2.65	NEUTRON MATRIX SANDSTONE	MATRIX DELTA T 171
MAGNETIC DECL 14.55	EJECT CUTOFF 75000	BIT SIZE 97.50 MM
PRESENTATION Mnemo_ROW_FOR.mwd.2 - DAYLIGHT		DISPLAY1_A.mtp

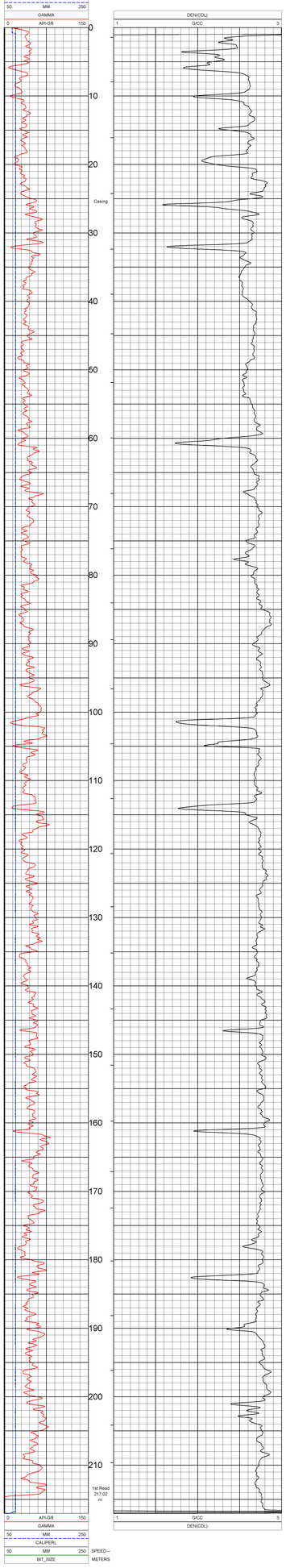
TOOL CALIBRATION: DHNP-17-02 DENSITY 22-28

TOOL ID/DEC: TM VERSION 5026

SONDE NUMBER: 2116

	DATE	TIME	SOURCE	STANDARD		RESPONSE (CPS)	
				Front	Back	Front	Back
1	Aug/01 17	13:30:36	GAMMA	API-GAM	0.100	545.002	0.002
2	Aug/01 17	13:52:50	VOLTAGE	MAX	45.100	557.700	19.674
3	Aug/01 17	14:00:22	VOLTAGE	MIN	35.100	0.000	0.000
4	Aug/01 17	14:02:22	DENS.SL	(CAL2)	1.600	2.813	16585
5	Aug/01 17	14:04:22	DENS.SL	(CAL1)	2.650	2.650	16585
6	Aug/01 17	17:03:14	CALIPER1	(MM)	101.600	50.000	21452
7	Aug/01 17	17:31:19	CURRENT	(UA)	28.700	357.700	1067
8	Aug/01 17	17:31:19		(CPS)	24000		24000
9	Aug/01 17	17:31:21		(CPS)	Default		Default

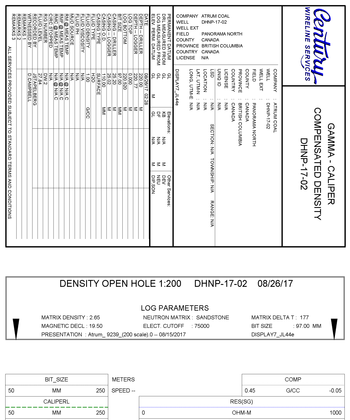




DENSITY 1:200 IN PIPE DHNP-17-02 08/25/17
LOG PARAMETERS
MATRIX DENSITY 2.65
MAGNETIC DECL. 19.50
PRESENTATION Atrum_9239_(THRU-PIPE)_200.0 – 08/25/2017
NEUTRON MATRIX SANDSTONE
ELECT CUTOFF 75000
MATRIX DELTA T 177
BIT SIZE 97.00 MM
DISPLAY7_iL44e

TOOL CALIBRATION DHNP-17-02 08/25/17 21:35
TOOL 9239C1 TM VERSION 5026
SERIAL NUMBER 2783

	DATE	TIME	SENSOR	STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	Aug01,17	13:33:36	GAMMA [API-GR]	0.100	545.000	0.000	646
2	Aug01,17	13:33:00	VOLTAGE [MV]	28.700	307.700	16476	53909
3	May24,17	10:28:21	CALIPER [MM]	76.200	150.000	230561	386867
4	Aug01,17	14:00:22	DEN(LS) [G/CC]	1.620	2.610	16385	2288
5	Aug01,17	14:00:41	DEN(SS) [G/CC]	1.590	2.580	54604	21678
6	Aug01,17	13:33:14	CALIPERL [MM]	101.600	200.000	243052	354478
7	Aug01,17	13:31:19	CURRENT [UA]	28.700	307.700	3957	13187
8	Nov13,13	07:18:33	F [CPS]	Default		Default	
9	May24,17	15:01:21	X [CPS]	Default		Default	


Century WIRELINE SERVICES
GAMMA - CALIPER
COMPENSATED DENSITY
DHNP-17-02
COMPANY ATRUM COAL
WELL DHNP-17-02
API
FIELD PANORAMA NORTH
COUNTY CANADA
PROVINCE BRITISH COLUMBIA
COUNTRY CANADA
LICENSE N/A
ENGINEERED FOR PANEL EXPERIENCE ELI LOWDEN EXPERIENCE EXPANDED TO
RUN NO. 1
PASS NO. 1
TOOL STRING (TOP TO BOTTOM)
TOOL TYPE
TOOL SERIAL NO.
TOOL DIAMETER
MAX REC. TEMP.
EQUIP. NO.
LOCATION
SONDE TYPE
SONDE SERIAL NO.
SONDE DIAMETER
SONDE MAX REC. TEMP.
SONDE EQUIP. NO.
SONDE LOCATION
SOURCE TYPE
SOURCE SERIAL NO.
SOURCE DIAMETER
SOURCE MAX REC. TEMP.
SOURCE EQUIP. NO.
SOURCE LOCATION
RUN NUMBER
TIME LOGGER ON BOTTOM
DEPTH DRILLER
DEPTH LOGGER
BOTTOM LOGGED INTERVAL
TOP LOGGED INTERVAL
CASING DRILLER SIZE
CASING DRILLER WEIGHT
CASING LOGGER SIZE
CASING LOGGER WEIGHT
BIT SIZE
TYPE FLUID IN HOLE
DENSITY
VISCOSITY
PH
FLUID LOSS
SOURCE OF SAMPLE
RM @ MEAS. TEMP.
RMF @ MEAS. TEMP.
RMC @ MEAS. TEMP.
SOURCE RMF
SOURCE RMC
RM @ BHT
TIME SINCE CIRCULATION
MAX REC. TEMP.
EQUIP. LOCATION
RECORDED BY
WITNESSED BY
Run 1
Pass 1
GAMMA
CALIPER
DENSITY
NA
NA
NA

DETAILED DENSITY
GAMMA - CALIPER - RES.
DHNP-17-02

Century WIRELINE SERVICES

COMPANY	ATRUM COAL
WELL	DHNP-17-02
WELL EXT	
FIELD	PANORAMA NORTH
COUNTY	CANADA
PROVINCE	BRITISH COLUMBIA
COUNTRY	CANADA
LICENSE	N/A

COMPANY	:	ATRUM COAL
WELL	:	DHNP-17-02
WELL EXT	:	
FIELD	:	PANORAMA NORTH
COUNTY	:	CANADA
PROVINCE	:	BRITISH COLUMBIA
COUNTRY	:	CANADA
LICENSE	:	N/A
UNIQ ID	:	N/A
LSD	:	N/A SECTION: N/A TOWNSHIP: N/A RANGE: N/A
LOCATION	:	N/A
LAT, UTM-N	:	N/A
LONG, UTM-E	:	N/A

DISPLAY7_JL44e

PERMANENT DATUM	GL		Elevations:			Other Services:	
DRL MEASURED FROM	GL		KB	N/A	M	DEV	
LOG MEASURED FROM	GL		DF	N/A	M	NEU	
ELEV. PERM. DATUM	GL	M	GL	N/A	M	DIP,SON	

DATE	08/26/17 02:28			
DEPTH -- DRILLER	220.00	M		
DEPTH -- LOGGER	220..77	M		
LOG TOP	0.000	M		
LOG BOTTOM	220.520	M		
BIT SIZE	97.00	MM		
CASING -- DRILLER	25.20	M		
CASING -- LOGGER	25.02	M		
CASING O.D.	110.00	MM		
CASING TYPE	SURFACE			
FLUID TYPE	H2O			
FLUID DENSITY	1.00	G/CC		
FLUID VISCOSITY	N/A			
FLUID PH	N/A			
MUD SOURCE	N/A			
RM @ MEAS TEMP	N/A @ N/A C			
RMF @ MEAS TEMP	N/A @ N/A C			
RMC @ MEAS TEMP	N/A @ N/A C			
CIRC STOPPED	N/A			
RIG NUMBER	DW 2			
FLUID LEVEL	27.84			
RECORDED BY	JSTAPELBERG			
WITNESSED BY	D.CAMPBELL			
REMARKS 1				
REMARKS 2				
REMARKS 3				

ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

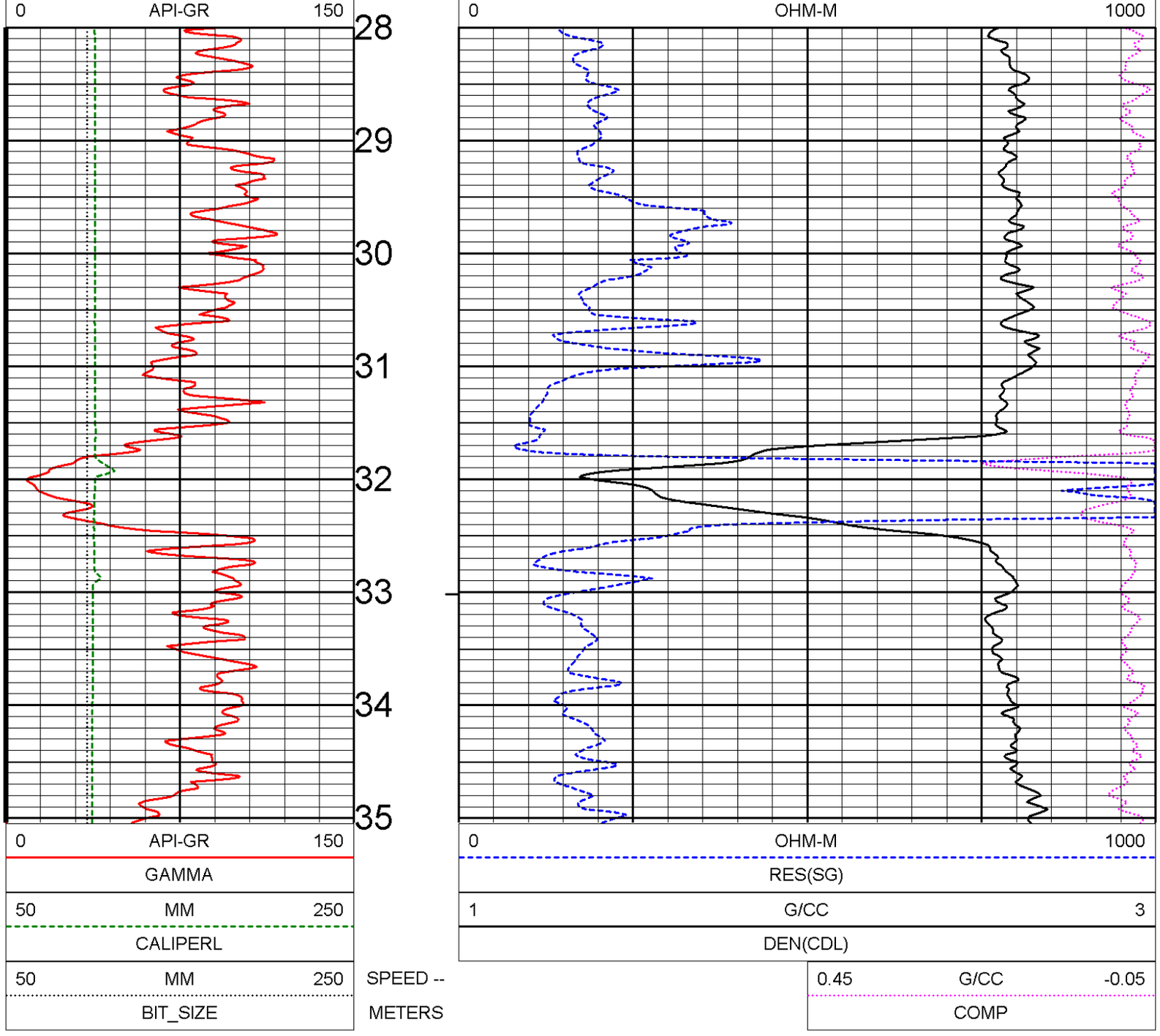
LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177	
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM	
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e	

BIT_SIZE	MM	250	50
CALIPERL	MM	250	50
GAMMA			

METERS
SPEED --

COMP	G/CC	-0.05	0.45
DEN(CDL)	G/CC	3	1
RES(SG)			



DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

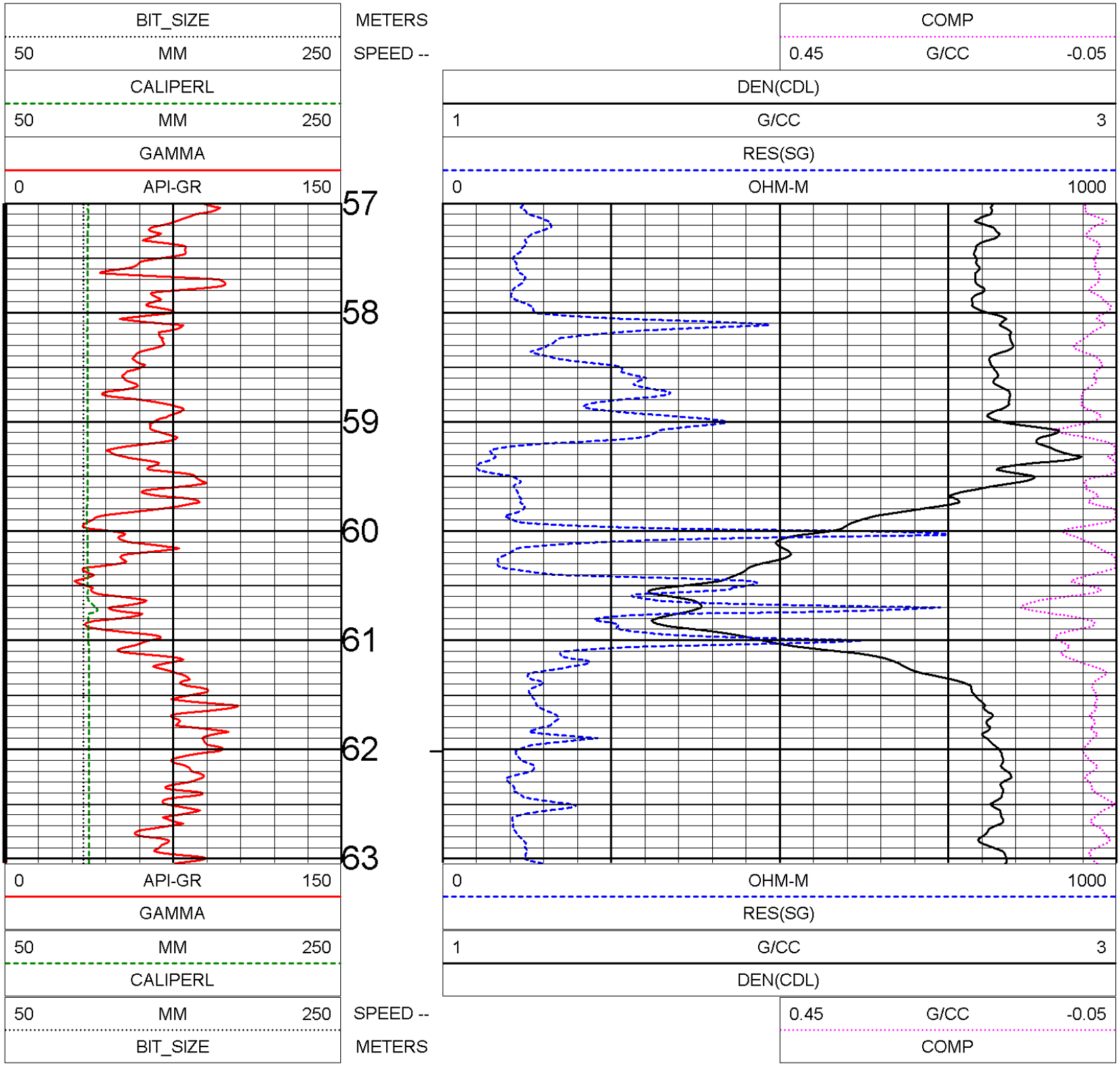
LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e



DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

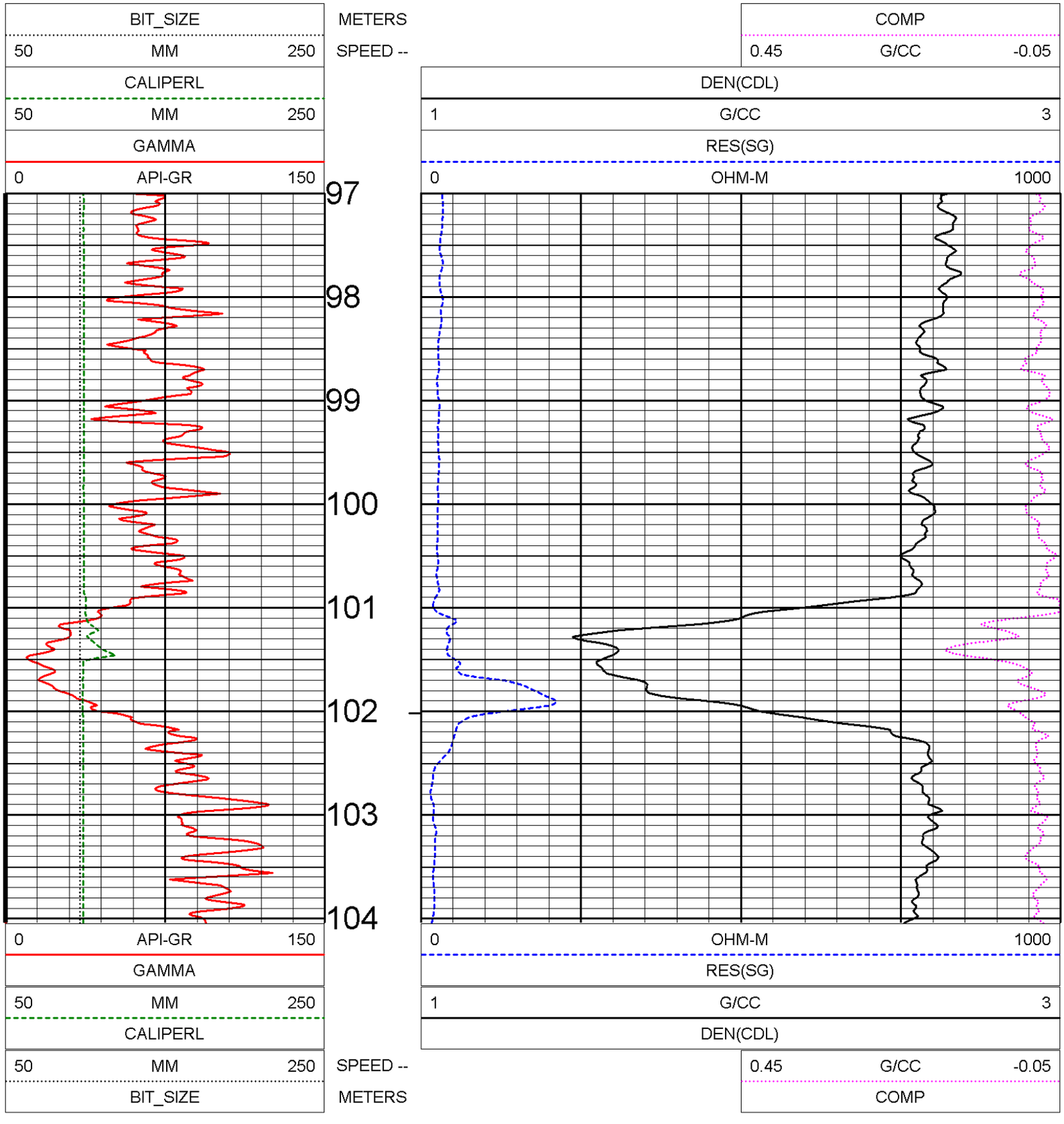
LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e



DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

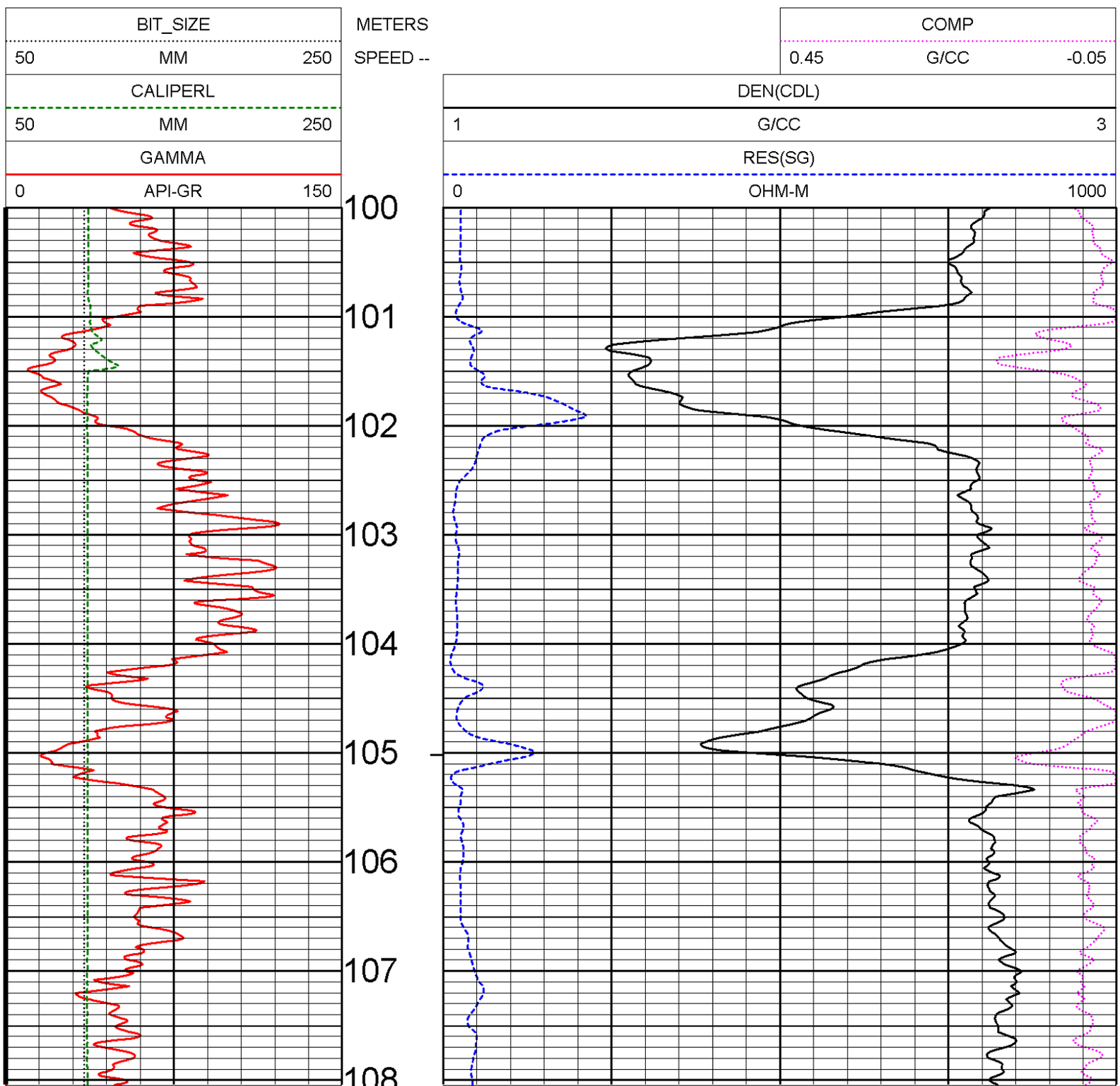
LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e



0	API-GR	150		0	OHM-M	1000		
GAMMA				RES(SG)				
50	MM	250		1	G/CC	3		
CALIPERL				DEN(CDL)				
50	MM	250	SPEED --				0.45	G/CC -0.05
BIT_SIZE			METERS				COMP	

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177

MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM

PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017 DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

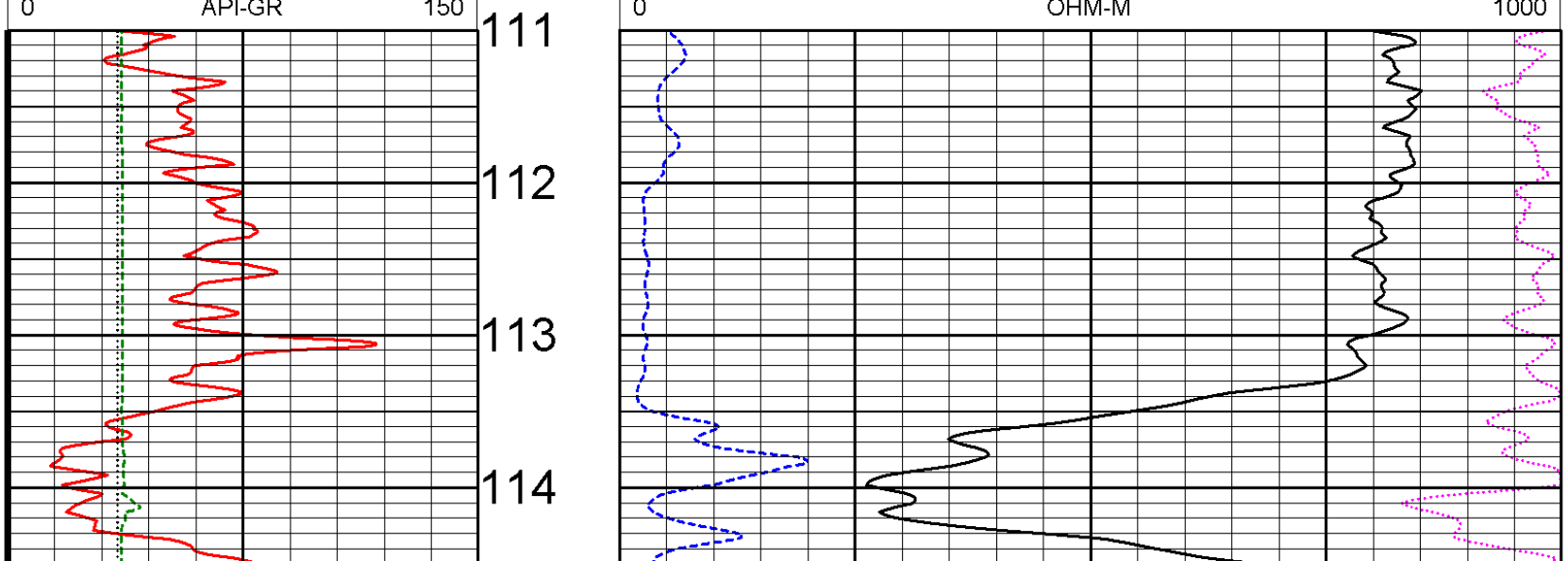
LOG PARAMETERS

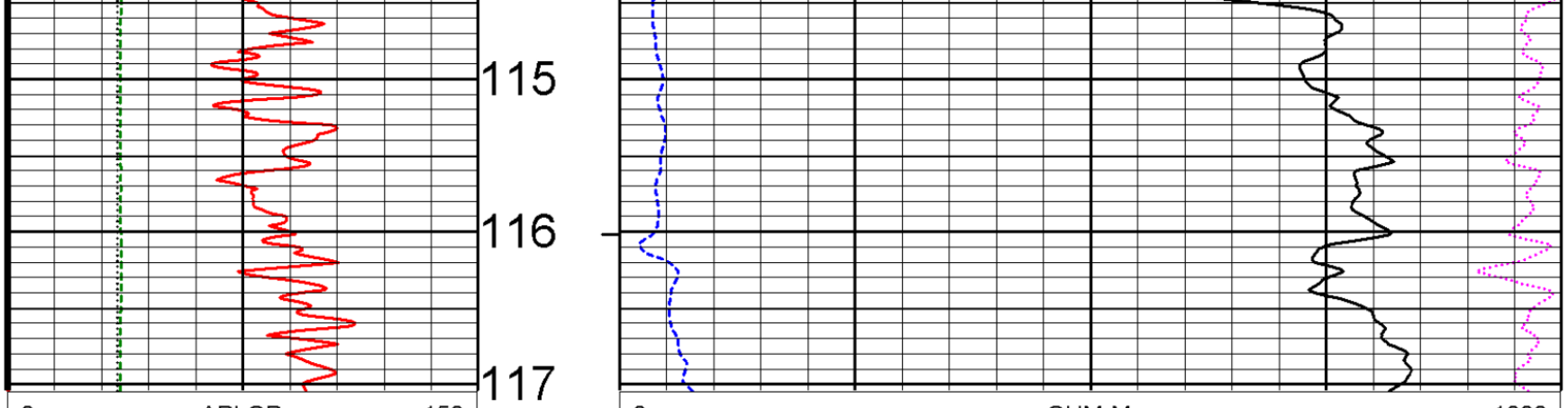
MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177

MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM

PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017 DISPLAY7_JL44e

BIT_SIZE			METERS				COMP	
50	MM	250	SPEED --				0.45	G/CC -0.05
CALIPERL				DEN(CDL)				
50	MM	250		1	G/CC	3		
GAMMA				RES(SG)				
0	API-GR	150		0	OHM-M	1000		





0	API-GR	150		0	OHM-M	1000
GAMMA				RES(SG)		
50	MM	250		1	G/CC	3
CALIPERL				DEN(CDL)		
50	MM	250	SPEED --	0.45	G/CC	-0.05
BIT_SIZE			METERS	COMP		

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

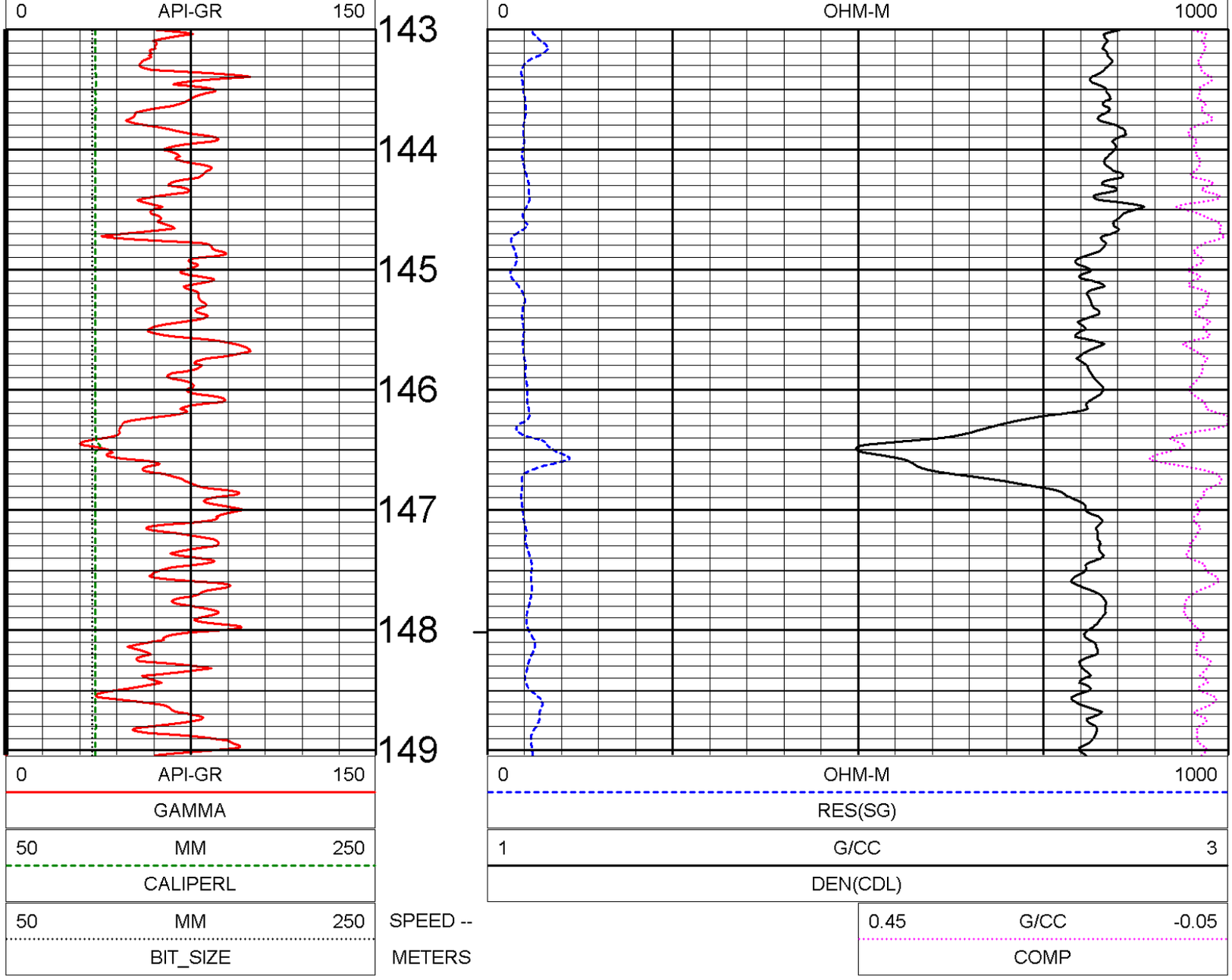
MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017 DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017 DISPLAY7_JL44e

BIT_SIZE			METERS	COMP		
50	MM	250	SPEED --	0.45	G/CC	-0.05
CALIPERL				DEN(CDL)		
50	MM	250		1	G/CC	3
GAMMA				RES(SG)		



DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

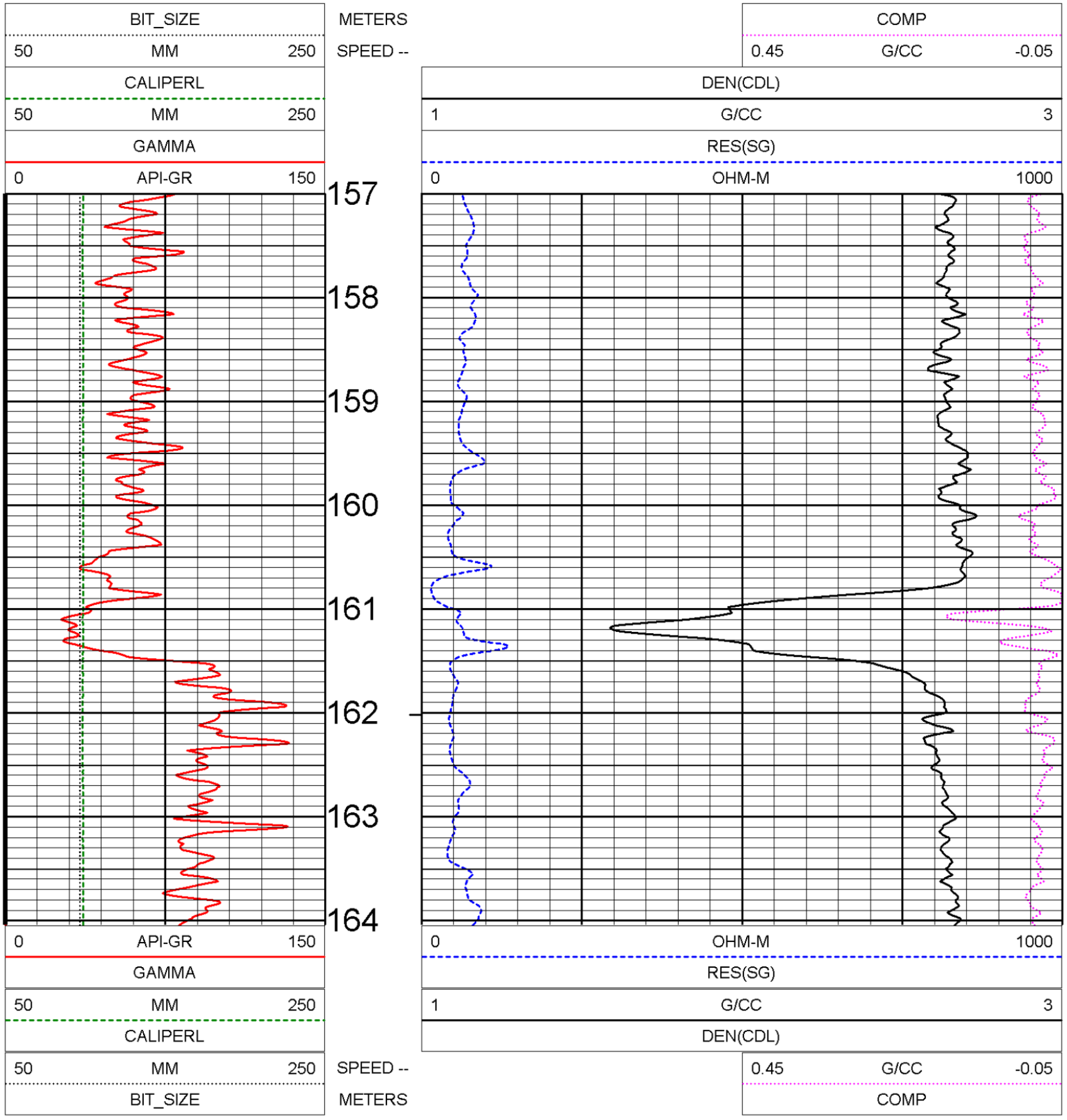
LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e


BIT_SIZE
METERS
COMP
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SPEED --
0.45 G/CC -0.05
CALIPERL
DEN(CDL)
50 MM 250
1 G/CC 3
GAMMA
RES(SG)
0 API-GR 150
0 OHM-M 1000
157
158
159
160
161
162
163
164
0 API-GR 150
0 OHM-M 1000
GAMMA
RES(SG)
50 MM 250
1 G/CC 3
CALIPERL
DEN(CDL)
50 MM 250
SPEED --
0.45 G/CC -0.05
BIT_SIZE
METERS
COMP

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

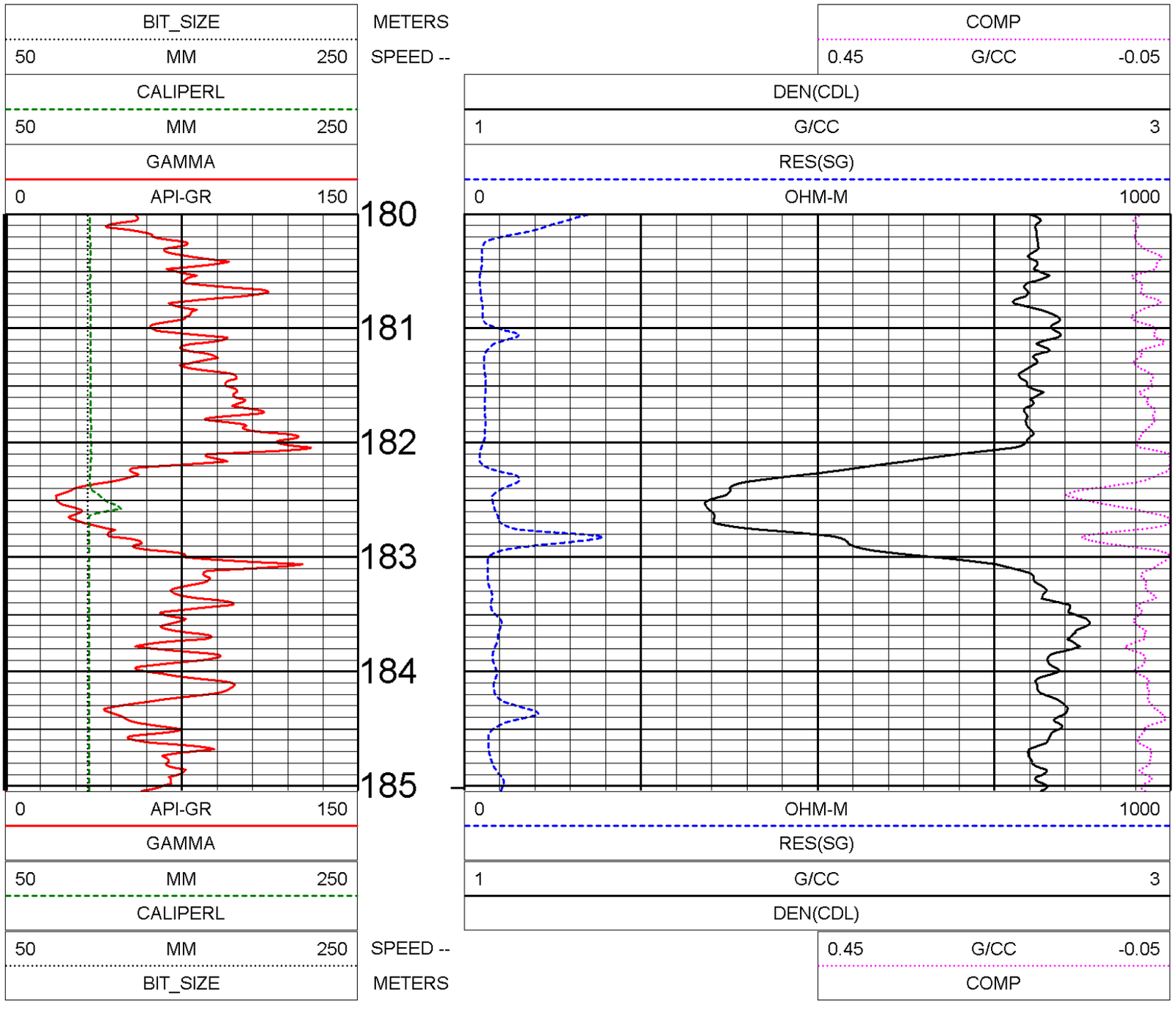
LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e



DETAILED DENSITY 1:50 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

TOOL CALIBRATION DHNP-17-02 08/26/17 02:28
TOOL 9239C1 TM VERSION 5026
SERIAL NUMBER 2783

					STANDARD		RESPONSE [CPS]	
	DATE	TIME	SENSOR		Point1	Point2	Point1	Point2
1	Aug01,17	13:33:36	GAMMA	[API-GR]	0.100	545.000	0.000	646
2	Aug01,17	13:32:00	VOLTAGE	[MV]	28.700	307.700	16476	52909
3	May24,17	10:28:21	CALIPER	[MM]	76.200	150.000	230561	386867
4	Aug01,17	14:00:22	DEN(LS)	[G/CC]	1.620	2.612	16385	2289
5	Aug01,17	14:00:47	DEN(SS)	[G/CC]	1.590	2.580	54604	21878
6	Aug01,17	13:33:14	CALIPERL	[MM]	101.600	200.000	243652	354478
7	Aug01,17	13:31:19	CURRENT	[UA]	28.700	307.700	3957	13187
8	Nov13,13	07:18:33	F	[CPS]	Default		Default	
9	May24,17	15:01:21	X	[CPS]	Default		Default	

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CENTER	
CABLE	
CONDUCTOR	
SHEATH	
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CONDUCTOR	
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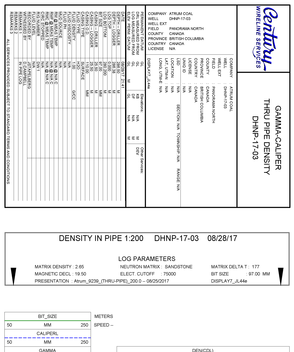
CONDUCTOR	
SHEATH	


GAMMA CALIPER THRU PIPE DENSITY DHNP-17-03
Certified
WIRELINE SERVICES
COMPANY ATHLAN COAL
WELL DHNP-17-03
WELL EXT
FIELD PANORAMA NORTH
COUNTY OMINECA
PROVINCE BRITISH COLUMBIA
COUNTRY CANADA
LICENSE NA
PROGRAM VERSION
PROCESSED
PROCESSED BY
WITNESS
RUN NUMBER
DRILLER
LOGGER
BOTTOM LOGGED INTERVAL
TOP LOGGED INTERVAL
CASING DRILLER
CASING LOGGER
BIT SIZE
TYPE FLUID
DENSITY
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FLUID LOSS
SOURCE OF SAMPLE
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RMF @ MEAS TEMP
RMC @ MEAS TEMP
SOURCE RMF RMC
RM @ BHT
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RECORDED BY
WITNESSED BY
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DEPTH LOGGER
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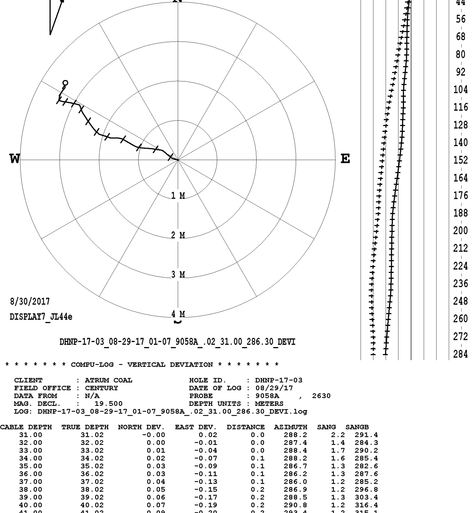
TOP LOG INTERVAL
CASING DRILLER
CASING LOGGER
BIT SIZE
TYPE FLUID
DENSITY VISCOSITY
PH
FLUID LOSS
SOURCE OF SAMPLE
RM @ MEAS TEMP
RMF @ MEAS TEMP
RMC @ MEAS TEMP
SOURCE RMF RMC
RM @ BHT
TIME CIRC
TIME LOGGER ON BOTTOM
MAX REC TEMP
EQUIP LOCATION
RECORDED BY
WITNESSED BY
TOOL TYPE (MNEMONIC)
SERIAL NO.
OD
MAX REC TEMP

PLAN VIEW
COMPU-LOG DEVIATION

CLIENT: ATRUM COAL
LOCATION: PANORAMA NORTH
HOLE ID: DHNP-17-03
DATE OF LOG: 08/29/17
PROBE: 9058A 2630
MAG DECL: 19.5

DISTANCE: 3.46 M
AZIMUTH: 304.40
TRUE DEPTH: 286.28 M
SCALE: 1 M/division
+ = 20 M INCR
O = BOTTOM OF HOLE



DHNP-17-03_08-29-17_01-07_9058A_02_31.00_286.30_DEVI

* * * * * * * COMPU-LOG - VERTICAL DEVIATION * * * * * * *

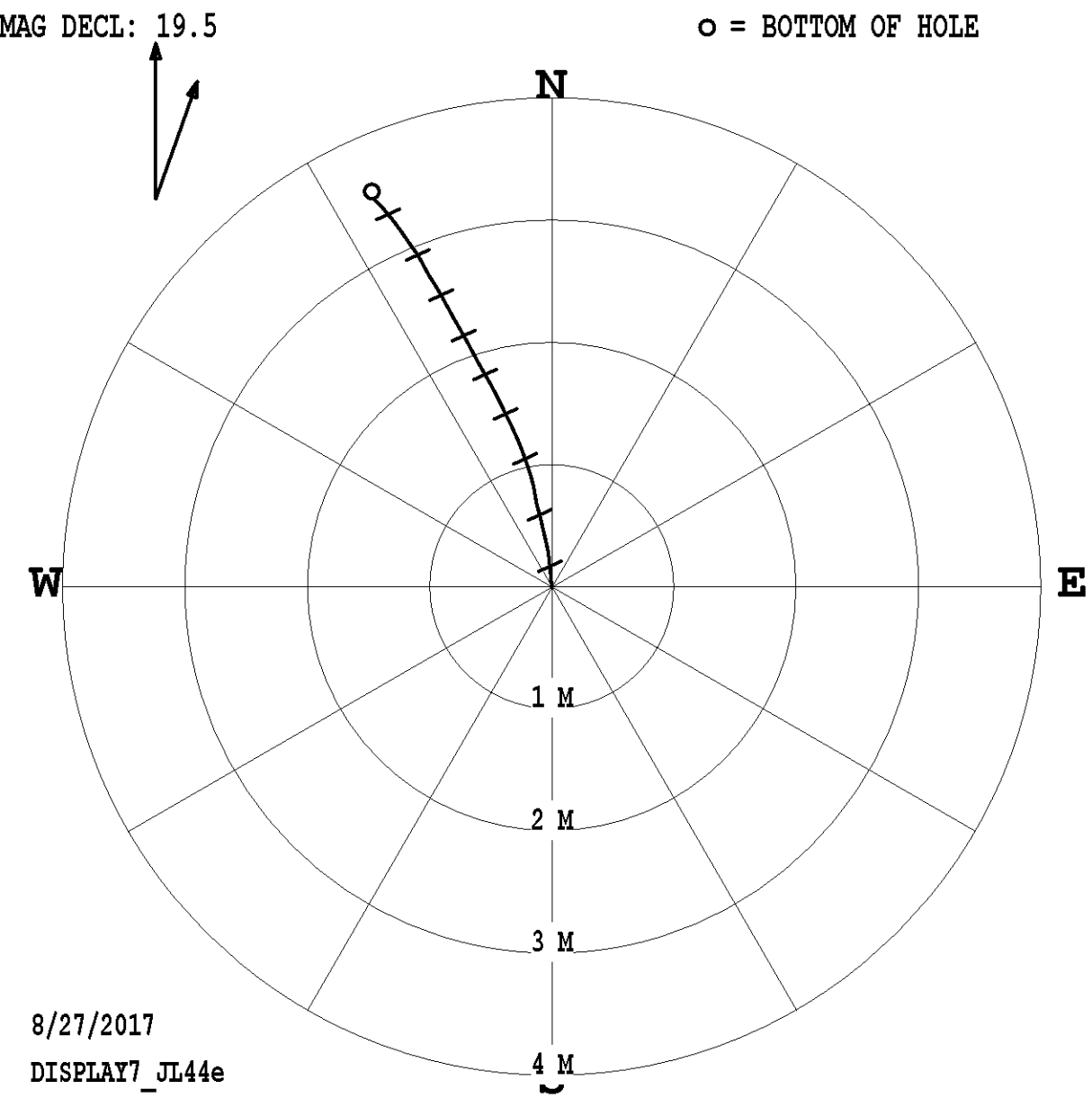
CLIENT : ATRUM COAL
FIELD OFFICE : CENTURY
DATA FROM : N/A
MAG. DECL. : 19.500
HOLE ID : DHNP-17-03
DATE OF LOG : 08/29/17
PROBE : 9058A , 2630
DEPTH UNITS : METERS
LOG: DHNP-17-03_08-29-17_01-07_9058A_02_31.00_286.30_DEVI.log

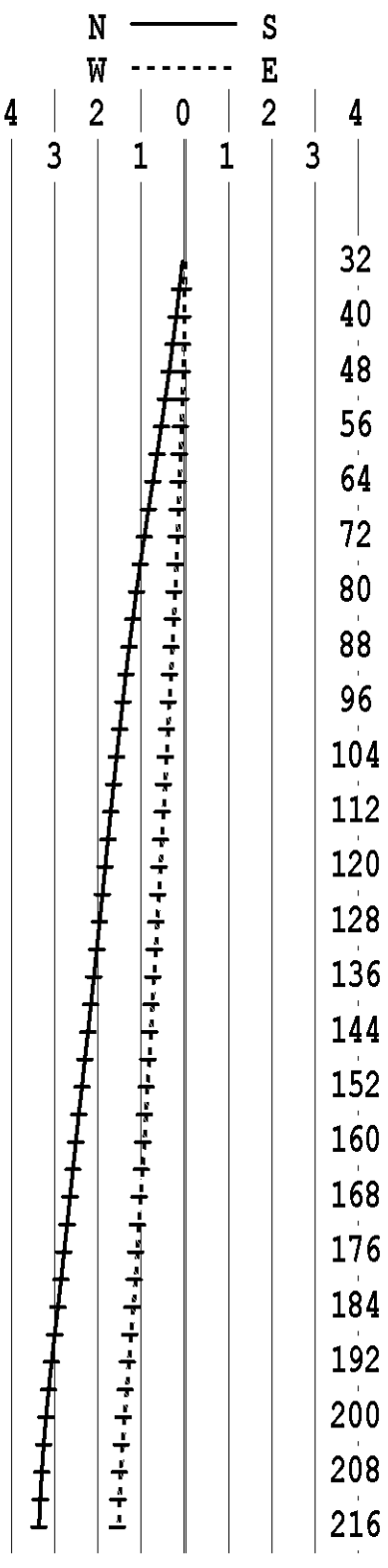
CABLE DEPTH	TRUE DEPTH	NORTH DEV.	EAST DEV.	DISTANCE	AZIMUTH	SANG	SANGE
31.00	31.02	-0.00	0.02	0.0	289.2	2.2	291.4
32.00	32.02	0.00	-0.01	0.0	287.4	1.4	288.8
33.00	33.02	0.01	-0.04	0.0	288.4	1.7	290.2
34.00	34.02	0.02	-0.07	0.1	288.2	1.6	289.8
35.00	35.02	0.03	-0.09	0.1	286.7	1.3	282.6
36.00	36.02	0.03	-0.11	0.1	286.2	1.3	287.6
37.00	37.02	0.04	-0.13	0.1	286.0	1.2	285.2
38.00	38.02	0.05	-0.15	0.2	286.9	1.2	296.8
39.00	39.02	0.06	-0.17	0.2	288.5	1.3	303.4
40.00	40.02	0.07	-0.19	0.2	290.8	1.2	316.4
41.00	41.02	0.09	-0.20	0.2	293.4	1.2	315.1
42.00	42.02	0.10	-0.22	0.2	294.5	1.2	304.9
43.00	43.02	0.11	-0.24	0.3	295.3	1.2	299.4
44.00	44.02	0.13	-0.25	0.3	296.4	1.3	308.2
45.00	45.02	0.14	-0.27	0.3	297.3	1.2	313.7
46.00	46.02	0.15	-0.28	0.3	298.2	1.2	310.7
47.00	47.02	0.17	-0.30	0.3	299.0	1.3	316.5
48.00	48.02	0.18	-0.32	0.4	299.9	1.3	315.6
49.00	49.02	0.20	-0.33	0.4	300.5	1.3	309.5
50.00	50.02	0.21	-0.35	0.4	301.0	1.3	308.4
51.00	51.02	0.22	-0.37	0.4	301.3	1.3	307.5
52.00	52.02	0.24	-0.39	0.5	301.6	1.3	304.1
53.00	53.02	0.25	-0.41	0.5	301.0	1.3	295.0
54.00	54.02	0.25	-0.43	0.5	300.0	1.2	278.1
55.00	55.01	0.25	-0.46	0.5	299.1	1.3	280.0
56.00	56.01	0.26	-0.48	0.5	298.3	1.3	280.0
57.00	57.01	0.26	-0.50	0.6	297.6	1.3	279.7
58.00	58.01	0.26	-0.52	0.6	296.8	1.3	279.7
59.00	59.01	0.27	-0.54	0.6	296.2	1.3	279.0
60.00	60.01	0.27	-0.57	0.6	295.6	1.3	277.8
61.00	61.01	0.28	-0.59	0.6	295.0	1.2	277.8
62.00	62.01	0.28	-0.61	0.7	294.5	1.2	280.2
63.00	63.01	0.28	-0.63	0.7	294.1	1.2	280.4
64.00	64.01	0.28	-0.65	0.7	293.6	1.2	277.2
65.00	65.01	0.29	-0.67	0.7	293.2	1.2	277.0
66.00	66.01	0.29	-0.69	0.7	292.7	1.2	275.5
67.00	67.01	0.29	-0.71	0.8	292.3	1.3	274.5
68.00	68.01	0.29	-0.74	0.8	291.7	1.3	274.3
69.00	69.01	0.29	-0.76	0.8	291.2	1.3	273.6
70.00	70.01	0.29	-0.78	0.8	290.7	1.3	272.7
71.00	71.01	0.30	-0.80	0.9	290.3	1.3	273.7
72.00	72.01	0.30	-0.82	0.9	289.8	1.3	274.2
73.00	73.01	0.30	-0.85	0.9	289.4	1.3	272.8
74.00	74.01	0.30	-0.87	0.9	289.1	1.2	272.3
75.00	75.01	0.30	-0.89	0.9	288.8	1.2	278.3
76.00	76.01	0.30	-0.91	1.0	288.5	1.2	275.6
77.00	77.01	0.31	-0.93	1.0	288.3	1.2	279.7
78.00	78.01	0.31	-0.95	1.0	288.1	1.2	279.0
79.00	79.01	0.32	-0.97	1.0	288.0	1.2	282.2
80.00	80.01	0.32	-0.99	1.0	287.8	1.2	282.7
81.00	81.01	0.32	-1.01	1.1	287.7	1.3	283.0
82.00	82.01	0.33	-1.03	1.1	287.6	1.2	283.8
83.00	83.01	0.33	-1.05	1.1	287.5	1.1	283.9
84.00	84.01	0.34	-1.07	1.1	287.6	1.2	284.7
85.00	85.01	0.35	-1.09	1.1	287.7	1.3	298.0
86.00	86.01	0.36	-1.11	1.2	288.0	1.3	298.8
87.00	87.01	0.37	-1.13	1.2	288.2	1.3	300.1
88.00	88.01	0.38	-1.15	1.2	288.4	1.3	300.7
89.00	89.01	0.39	-1.17	1.2	288.6	1.3	297.0
90.00	90.01	0.40	-1.19	1.3	288.8	1.3	300.7
91.00	91.01	0.42	-1.21	1.3	289.0	1.3	300.6
92.00	92.01	0.43	-1.23	1.3	289.2	1.4	300.5
93.00	93.01	0.44	-1.25	1.3	289.4	1.3	299.1
94.00	94.01	0.45	-1.27	1.3	289.6	1.3	300.0
95.00	95.01	0.46	-1.29	1.4	289.7	1.4	298.8
96.00	96.00	0.47	-1.31	1.4	289.9	1.4	301.8
97.00	97.00	0.49	-1.33	1.4	290.1	1.3	300.6
98.00	98.00	0.50	-1.35	1.4	290.2	1.4	296.4
99.00	99.00	0.51	-1.37	1.5	290.4	1.4	299.9
100.00	100.00	0.52	-1.39	1.5	290.6	1.3	300.9
101.00	101.00	0.53	-1.41	1.5	290.7	1.4	288.5
102.00	102.00	0.54	-1.43	1.5	290.6	1.5	286.8
103.00	103.00	0.55	-1.46	1.6	290.5	1.3	283.6
104.00	104.00	0.55	-1.48	1.6	290.4	1.3	280.0
105.00	105.00	0.55	-1.50	1.6	290.2	1.3	277.9
106.00	106.00	0.56	-1.52	1.6	290.0	1.3	276.5
107.00	107.00	0.56	-1.55	1.6	289.8	1.3	272.0
108.00	108.00	0.56	-1.57	1.7	289.6	1.2	268.5
109.00	109.00	0.56	-1.59	1.7	289.3	1.2	268.4
110.00	110.00	0.56	-1.61	1.7	289.1	1.2	268.6
111.00	111.00	0.56	-1.63	1.7	288.9	1.2	267.7
112.00	112.00	0.56	-1.65	1.7	288.6	1.2	270.0
113.00	113.00	0.56	-1.67	1.8	288.4	1.2	268.1
114.00	114.00	0.56	-1.69	1.8	288.2	1.1	274.2
115.00	115.00	0.56	-1.71	1.8	288.1	1.0	283.4
116.00	116.00	0.56	-1.73	1.8	288.1	1.0	288.8
117.00	117.00	0.57	-1.74	1.8	288.1	1.0	290.9
118.00	118.00	0.58	-1.76	1.9	288.1	1.0	291.4
119.00	119.00	0.58	-1.78	1.9	288.1	1.0	287.7
120.00	120.00	0.59	-1.79	1.9	288.2	1.0	289.4
121.00	121.00	0.59	-1.81	1.9	288.2	1.0	287.1
122.00	122.00	0.60	-1.83	1.9	288.2	1.0	286.4
123.00	123.00	0.60	-1.84	1.9	288.1	0.9	284.8
124.00	124.00	0.61	-1.86	2.0	288.1	1.0	287.3
125.00	125.00	0.61	-1.87	2.0	288.1	0.9	290.5
126.00	126.00	0.62	-1.89	2.0	288.1	0.9	283.5
127.00	127.00	0.62	-1.90	2.0	288.1	0.8	284.8
128.00	128.00	0.63	-1.91	2.0	288.1	0.8	285.2
129.00	129.00	0.63	-1.93	2.0	288.1	0.8	287.4
130.00	130.00	0.63	-1.94	2.0	288.1	0.8	287.2
131.00	131.00	0.64	-1.95	2.1	288.1	0.8	286.5
132.00	132.00	0.64	-1.96	2.1	288.1	0.8	287.5
133.00	133.00	0.65	-1.98	2.1	288.1	0.8	288.0
134.00	134.00	0.65	-1.99	2.1	288.1	0.8	288.0
135.00	135.00	0.66	-2.00	2.1	288.1	0.9	311.9
136.00	136.00	0.67	-2.01	2.1	288.3	0.9	316.3
137.00	137.00	0.68	-2.03	2.1	288.5	0.9	311.1
138.00	138.00	0.69	-2.04	2.2	288.7	0.9	312.5
139.00	139.00	0.70	-2.05	2.2	288.9	0.9	312.8
140.00	140.00	0.71	-2.06	2.2	289.0	0.9	313.5
141.00	141.00	0.72	-2.07	2.2	289.2	0.9	314.6
142.00	142.00	0.73	-2.09	2.2	289.4	0.9	316.2
143.00	143.00	0.74	-2.10	2.2	289.6	0.9	319.6
144.00	144.00	0.76	-2.11	2.2	289.7	0.9	317.5
145.00	145.00	0.77	-2.12	2.3	289.9	1.0	318.3
146.00	146.00	0.78	-2.13	2.3	290.1	0.9	324.0
147.00	147.00	0.79	-2.14	2.3	290.4	0.9	321.3
148.00	148.00	0.81	-2.15	2.3	290.6	1.0	323.9
149.00	149.00	0.82	-2.16	2.3	290.8	1.0	324.0
150.00	150.00	0.83	-2.17	2.3	291.0	1.0	323.6
151.00	151.00	0.85	-2.18	2.3	291.3	1.0	323.4
152.00	152.00	0.86	-2.19	2.4	291.5	1.0	324.3
153.00	153.00	0.88	-2.20	2.4	291.7	1.0	324.9
154.00	154.00	0.89	-2.21	2.4	291.9	1.0	324.7
155.00	154.99	0.91	-2.22	2.4	292.2	1.0	323.6
156.00	155.99	0.92	-2.23	2.4	292.4	1.1	322.6
157.00	156.99	0.94	-2.24	2.4	292.6	1.0	325.5
158.00	157.99	0.95	-2.25	2.4	292.9	1.0	324.1
159.00	158.99	0.96	-2.26	2.5	293.1	1.0	325.4
160.00	159.99	0.98	-2.27	2.5	293.3	1.0	325.3
161.00	160.99	0.99	-2.28	2.5	293.5	1.0	327.7
162.00	161.99	1.01	-2.29	2.5	293.7	1.0	329.8
163.00	162.99	1.02	-2.30	2.5	294.0	1.0	327.5
164.00	163.99	1.04	-2.31	2.5	294.2	1.0	326.0
165.00	164.99	1.05	-2.32	2.6	294.4	1.0	328.1
166.00	165.99	1.07	-2.33	2.6	294.6	1.0	326.4
167.00	166.99	1.09	-2.34	2.6	294.8	1.0	325.3
168.00	167.99	1.10	-2.35	2.6	295.1	1.0	324.6
169.00	168.99	1.12	-2.36	2.6	295.3	1.1	325.4
170.00	169.99	1.13	-2.37	2.6	295.5	1.0	328.3
171.00	170.99	1.15	-2.38	2.6	295.7	1.1	326.4
172.00	171.99	1.16	-2.39	2.7	295.9	1.0	325.4
173.00	172.99	1.18	-2.40	2.7	296.1	1.0	328.3
174.00	173.99	1.19	-2.41	2.7	296.3	0.9	334.3
175.00	174.99	1.21	-2.42	2.7	296.5	1.1	324.2
176.00	175.99	1.22	-2.43	2.7	296.7	0.9	341.2
177.00	176.99	1.24	-2.43	2.7	296.9	0.9	341.0
178.00	177.99	1.25	-2.44	2.7	297.1	0.9	337.1
179.00	178.99	1.26	-2.45	2.8	297.4	0.8	340.0
180.00	179.99	1.28	-2.45	2.8	297.6	0.8	338.0
181.00	180.99	1.29	-2.46	2.8	297.8	0.8	338.9
182.00	181.99	1.31	-2.46	2.8	298.0	0.8	338.2
183.00	182.99	1.32	-2.46	2.8	298.2	0.8	339.0
184.00	183.99	1.33	-2.47	2.8	298.4	0.8	342.2
185.00	184.99	1.35	-2.47	2.8	298.6	0.8	341.8
186.00	185.99	1.36	-2.48	2.8	298.8	0.8	337.9
187.00	186.99	1.37	-2.48	2.8	299.0	0.8	339.1
188.00	187.99	1.39	-2.49	2.9	299.1	0.8	336.6
189.00	188.99	1.40	-2.50	2.9	299.3	0.8	292.5
190.00	189.99	1.40	-2.52	2.9	299.2	0.8	284.0
191.00	190.99	1.40	-2.53	2.9	299.0	0.8	284.5
192.00	191.99	1.41	-2.54	2.9	298.9	0.8	284.6
193.00	192.99	1.41	-2.56	2.9	298.9	0.7	282.1
194.00	193.99	1.41	-2.57	2.9	298.8	0.7	283.3
195.00	194.99	1.42	-2.58	2.9	298.7	0.7	283.3
196.00	195.99	1.42	-2.59	3.0	298.7	0.7	282.9
197.00	196.99	1.42	-2.60	3.0	298.6	0.7	280.8
198.00	197.99	1.42	-2.62	3.0	298.6	0.7	278.9
199.00	198.99	1.43	-2.63	3.0	298.5	0.6	283.4
200.00	199.99	1.43	-2.64	3.0	298.4	0.7	283.3
201.00	200.99	1.43	-2.66	3.0	298.4	0.7	282.7
202.00	201.99	1.43	-2.66	3.0	298.3	0.7	281.5
203.00	202.99	1.44	-2.67	3.0	298.2	0.7	285.5
204.00	203.99	1.44	-2.69	3.0	298.2	0.7	284.4
205.00	204.99	1.44	-2.70	3.1	298.1	0.8	286.0
206.00	205.99	1.45	-2.71	3.1	298.1	0.7	281.3
207.00	206.99	1.45	-2.72	3.1	298.0	0.7	279.9
208.00	207.99	1.45	-2.73	3.1	297.9	0.6	279.0
209.00	208.99	1.45	-2.75	3.1	297.9	0.6	276.5
210.00	209.99	1.45	-2.76	3.1	297.8	0.6	276.2
211.00	210.99	1.46	-2.77	3.1	297.7	0.6	275.0
212.00	211.99	1.46	-2.78	3.1	297.7	0.6	280.5
213.00	212.99	1.46	-2.79	3.1	297.6	0.6	279.3
214.00	213.99	1.46	-2.80	3.2	297.6	0.6	280.1
215.00	214.99	1.46	-2.81	3.2	297.5	0.6	281.1
216.00	215.99	1.46	-2.82	3.2	297.5	0.6	279.6
217.00	216.99	1.46	-2.83	3.2	297.5	0.6	278.1
218.00	217.99	1.47	-2.84	3.2	297.3	0.6	277.2
219.00	218.99	1.47	-2.85	3.2	297.3	0.6	280.7
220.00	219.99	1.47	-2.86	3.2	297.2	0.6	279.4
221.00	220.99	1.47	-2.87	3.2	297.2	0.6	277.8
222.00	221.99	1.47	-2.88	3.2	297.1	0.6	276.1
223.00	222.99	1.47	-2.89	3.2	297.1	0.6	281.2
224.00	223.99	1.48	-2.90	3.3	297.0	0.6	275.0
225.00	224.99	1.48	-2.91	3.3	296.9	0.6	281.4
226.00	225.99	1.48	-2.92	3.3	296.9	0.6	279.0
227.00	226.99	1.48	-2.93	3.3	296.8	0.6	283.1
228.00	227.99	1.48	-2.94	3.3	296.8	0.6	285.6
229.00	228.99	1.49	-2.95	3.3	296.8	0.5	283.4
230.00	229.99	1.49	-2.96	3.3	296.7	0.5	287.9
231.00	230.99	1.49	-2.96	3.3	296.7	0.5	284.4
232.00	231.99	1.49	-2.97	3.3	296.7	0.4	285.4
233.00	232.99	1.50	-2.98	3.3	296.7	0.4	288.4
234.00	233.99	1.50	-2.98	3.3	296.7	0.4	289.5
235.00	234.99	1.50	-2.99	3.3	296.6	0.4	293.2
236.00	235.99	1.50	-3.00	3.4	296.6	0.4	289.1
237.00	236.99	1.50	-3.00	3.4	296.6	0.4	290.0
238.00	237.99	1.51	-3.01	3.4	296.6	0.4	292.2
239.00	238.99	1.51	-3.01	3.4	296.6	0.3	297.0
240.00	239.99	1.51	-3.02	3.4	296.6	0.4	359.9
241.00	240.99	1.52	-3.02	3.4	296.7	0.5	5.3
242.00	241.99	1.53	-3.02	3.4	296.9	0.5	10.2
243.00	242.99	1.54	-3.01	3.4	297.0	0.6	9.9
244.00	243.99	1.55	-3.01	3.4	297.2	0.6	10.6
245.00	244.99	1.56	-3.01	3.4	297.4	0.6	10.0
246.00	245.99	1.57	-3.01	3.4	297.6	0.6	11.2
247.00	246.99	1.58	-3.01	3.4	297.7	0.6	11.3
248.00	247.99	1.59	-3.00	3.4	297.9	0.6	11.6
249.00	248.99	1.60	-3.00	3.4	298.1	0.6	16.5
250.00	249.99	1.61	-3.00	3.4	298.2	0.6	12.7
251.00	250.99	1.62	-3.00	3.4	298.4	0.6	20.8
252.00	251.99	1.63	-2.99	3.4	298.6	0.5	20.5
253.00	252.99	1.64	-2.99	3.4	298.8	0.6	21.1
254.00	253.99	1.65	-2.99	3.4	298.9	0.6	14.6
255.00	254.99	1.66	-2.98	3.4	299.1	0.6	23.4
256.00	255.99	1.67	-2.98	3.4	299.3	0.6	26.6
257.00	256.99	1.68	-2.97	3.4	299.5	0.6	29.2
258.00	257.99	1.69	-2.97	3.4	299.6	0.6	30.2
259.00	258.99	1.70	-2.96	3.4	299.9	0.7	29.4
260.00	259.99	1.71	-2.96	3.4	300.1	0.7	32.0
261.00	260.99	1.72	-2.95	3.4	300.3	0.7	30.9
262.00	261.99	1.73	-2.94	3.4	300.5	0.7	34.4
263.00	262.99	1.74	-2.94	3.4	300.7	0.7	31.0
264.00	263.99	1.75	-2.93	3.4	300.9	0.7	36.0
265.00	264.99	1.76	-2.92	3.4	301.1	0.7	35.9
266.00	265.99	1.77	-2.91	3.4	301.3	0.7	41.7
267.00	266.99	1.78	-2.90	3.4	301.5	0.7	41.0
268.00	267.99	1.79	-2.90	3.4	301.7	0.7	38.0
269.00	268.99	1.80	-2.89	3.4	301.9	0.7	40.7
270.00	269.99	1.81	-2.88	3.4	302.1	0.7	40.9
271.00	270.99	1.82	-2.87	3.4	302.3	0.7	38.8
272.00	271.99	1.83	-2.86	3.4	302.6	0.8	63.5
273.00	272.99	1.84	-2.86	3.4	302.7	0.4	8.9
274.00	273.99	1.85	-2.86	3.4	302.8	0.8	356.9
275.00	274.99	1.85	-2.86	3.4	302.9	0.5	357.1
276.00	275.99	1.86	-2.86	3.4	303.0	0.5	347.3
277.00	276.99	1.87	-2.86	3.4	303.1	0.5	346.8
278.00	277.99	1.88	-2.87	3.4	303.2	0.4	347.3
279.00	278.98	1.88	-2.87	3.4	303.3	0.4	345.5
280.00	279.98	1.89	-2.87	3.4	303.4	0.5	342.5
281.00	280.98	1.90	-2.87	3.4	303.5	0.4	346.7
282.00	281.98	1.91	-2.87	3.4	303.6	0.5	352.9
283.00	282.98	1.92	-2.88	3.5	303.7	1.1	13.9
284.00	283.98	1.93	-2.87	3.5	303.9	0.8	35.2
285.00	284.98	1.94	-2.86	3.5	304.1	0.8	35.3
286.00	285.98	1.95	-2.85	3.5	304.4	0.8	35.4
286.30	286.28	1.95	-2.85	3.5	304.4	0.8	35.4

PLAN VIEW
COMPU-LOG DEVIATION

CLIENT: ATRUM COAL
LOCATION: PANORAMA NORTH
HOLE ID: DHNP-17-02
DATE OF LOG: 08/26/17
PROBE: 9411A 2371
MAG DECL: 19.5

DISTANCE: 3.55 M
AZIMUTH: 335.52
TRUE DEPTH: 219.64 M
SCALE: 1 M/Division
+ = 20 M INCR
o = BOTTOM OF HOLE



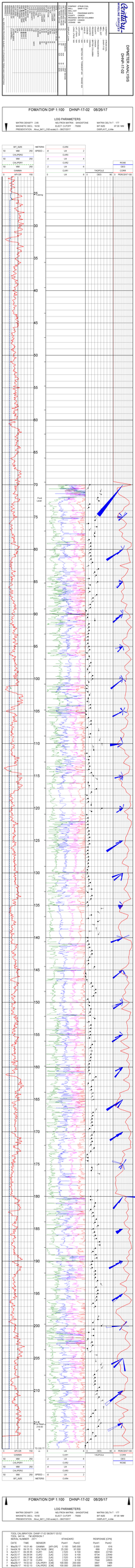


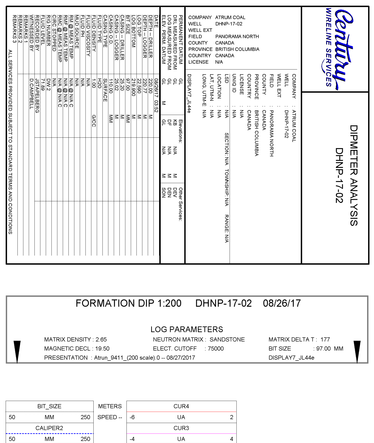
DHNP-17-02_08-26-17_03-52_9411A_005_30.000_219.680_DEVI

* * * * * * * COMPU-LOG - VERTICAL DEVIATION * * * * * * *

CLIENT : ATRUM COAL
FIELD OFFICE : CENTURY
DATA FROM : N/A
MAG. DECL. : 19.500
HOLE ID. : DHNP-17-02
DATE OF LOG : 08/26/17
PROBE : 9411A , 2371
DEPTH UNITS : METERS
LOG: DHNP-17-02_08-26-17_03-52_9411A_005_30.000_219.680_DEVI.log

CABLE DEPTH	TRUE DEPTH	NORTH DEV.	EAST DEV.	DISTANCE	AZIMUTH	SANG	SANGB
30.00	30.00	-0.00	-0.00	0.0	206.0	0.3	72.9
31.00	31.00	0.01	-0.00	0.0	351.4	1.4	9.2
32.00	32.00	0.03	-0.00	0.0	351.8	1.0	352.4
33.00	33.00	0.05	-0.01	0.0	352.3	1.0	341.2
34.00	34.00	0.06	-0.01	0.1	352.8	1.1	344.2
35.00	35.00	0.08	-0.01	0.1	353.0	1.0	336.0
36.00	36.00	0.10	-0.01	0.1	353.1	1.0	1.9
37.00	37.00	0.12	-0.01	0.1	353.4	1.0	7.3
38.00	38.00	0.13	-0.02	0.1	353.5	1.2	338.7
39.00	39.00	0.15	-0.02	0.2	353.7	1.0	352.5
40.00	40.00	0.17	-0.02	0.2	353.8	1.0	348.9
41.00	41.00	0.19	-0.02	0.2	353.8	1.3	352.6
42.00	42.00	0.21	-0.02	0.2	353.8	1.0	0.1
43.00	43.00	0.23	-0.02	0.2	353.7	1.1	314.9
44.00	44.00	0.24	-0.03	0.2	353.7	0.9	344.1
45.00	45.00	0.26	-0.03	0.3	353.6	1.3	6.8
46.00	46.00	0.28	-0.03	0.3	353.5	1.4	349.4
47.00	47.00	0.30	-0.04	0.3	353.3	1.3	349.4
48.00	48.00	0.32	-0.04	0.3	352.9	1.3	345.7
49.00	49.00	0.35	-0.04	0.3	352.6	1.3	344.5
50.00	50.00	0.37	-0.05	0.4	352.3	1.3	346.7
51.00	51.00	0.39	-0.05	0.4	352.0	1.3	347.1
52.00	52.00	0.41	-0.06	0.4	351.7	1.3	348.2
53.00	53.00	0.43	-0.07	0.4	351.5	1.3	348.3
54.00	54.00	0.46	-0.07	0.5	351.2	1.3	345.2
55.00	55.00	0.48	-0.08	0.5	351.0	1.3	346.5
56.00	55.99	0.50	-0.08	0.5	350.9	1.3	346.0
57.00	56.99	0.52	-0.09	0.5	350.7	1.3	343.0
58.00	57.99	0.54	-0.09	0.6	350.5	1.3	346.8
59.00	58.99	0.57	-0.10	0.6	350.3	1.3	346.4
60.00	59.99	0.59	-0.10	0.6	350.2	1.4	345.5
61.00	60.99	0.61	-0.11	0.6	350.0	1.4	346.3
62.00	61.99	0.64	-0.11	0.6	349.8	1.4	345.0
63.00	62.99	0.66	-0.12	0.7	349.6	1.4	345.9
64.00	63.99	0.68	-0.13	0.7	349.5	1.0	341.4
65.00	64.99	0.71	-0.13	0.7	349.5	1.4	350.2
66.00	65.99	0.73	-0.14	0.7	349.5	1.4	350.0
67.00	66.99	0.76	-0.14	0.8	349.5	1.4	350.0
68.00	67.99	0.78	-0.14	0.8	349.5	1.4	350.6
69.00	68.99	0.80	-0.15	0.8	349.6	1.4	347.5
70.00	69.99	0.83	-0.15	0.8	349.5	1.4	349.8
71.00	70.99	0.85	-0.16	0.9	349.4	1.4	346.0
72.00	71.99	0.87	-0.16	0.9	349.3	1.4	344.8
73.00	72.99	0.90	-0.17	0.9	349.2	1.3	347.5
74.00	73.99	0.92	-0.18	0.9	349.0	1.4	338.9
75.00	74.99	0.94	-0.19	1.0	348.8	1.4	333.7
76.00	75.99	0.96	-0.19	1.0	348.7	1.0	358.6
77.00	76.99	0.99	-0.20	1.0	348.5	1.2	341.7
78.00	77.99	1.01	-0.21	1.0	348.4	1.1	347.8
79.00	78.99	1.03	-0.21	1.0	348.3	1.0	344.6
80.00	79.99	1.05	-0.22	1.1	348.1	1.2	331.9
81.00	80.99	1.07	-0.23	1.1	347.9	1.5	329.9
82.00	81.99	1.09	-0.24	1.1	347.8	1.3	323.2
83.00	82.99	1.11	-0.24	1.1	347.6	1.4	351.1
84.00	83.99	1.13	-0.25	1.2	347.5	1.5	327.2
85.00	84.99	1.15	-0.26	1.2	347.3	1.2	332.7
86.00	85.99	1.17	-0.27	1.2	347.2	1.2	343.4
87.00	86.99	1.19	-0.27	1.2	347.0	1.2	315.5
88.00	87.99	1.21	-0.28	1.2	346.8	1.2	332.7
89.00	88.99	1.22	-0.29	1.3	346.7	1.3	344.5
90.00	89.99	1.24	-0.30	1.3	346.5	1.3	328.0
91.00	90.99	1.26	-0.31	1.3	346.3	1.1	330.0
92.00	91.99	1.28	-0.31	1.3	346.2	1.1	320.4
93.00	92.98	1.30	-0.32	1.3	346.0	1.1	339.8
94.00	93.98	1.31	-0.33	1.4	345.9	1.1	332.5
95.00	94.98	1.33	-0.34	1.4	345.7	1.1	332.5
96.00	95.98	1.35	-0.35	1.4	345.5	1.0	331.9
97.00	96.98	1.37	-0.36	1.4	345.4	1.1	334.0
98.00	97.98	1.38	-0.36	1.4	345.2	1.1	335.9
99.00	98.98	1.40	-0.37	1.4	345.1	1.1	332.3
100.00	99.98	1.42	-0.38	1.5	345.0	0.9	337.3
101.00	100.98	1.43	-0.39	1.5	344.8	1.0	325.5
102.00	101.98	1.45	-0.40	1.5	344.7	1.2	338.1
103.00	102.98	1.47	-0.41	1.5	344.6	1.2	336.1
104.00	103.98	1.48	-0.41	1.5	344.4	1.2	329.0
105.00	104.98	1.50	-0.42	1.6	344.3	1.0	322.9
106.00	105.98	1.52	-0.43	1.6	344.2	1.0	336.8
107.00	106.98	1.54	-0.44	1.6	344.1	1.2	335.4
108.00	107.98	1.55	-0.45	1.6	343.9	1.0	328.2
109.00	108.98	1.57	-0.46	1.6	343.8	0.8	342.8
110.00	109.98	1.58	-0.46	1.7	343.7	1.0	330.6
111.00	110.98	1.60	-0.47	1.7	343.6	0.8	332.4
112.00	111.98	1.61	-0.48	1.7	343.4	0.9	331.5
113.00	112.98	1.63	-0.49	1.7	343.3	0.9	332.1
114.00	113.98	1.65	-0.50	1.7	343.2	1.0	349.0
115.00	114.98	1.66	-0.51	1.7	343.1	0.9	330.2
116.00	115.98	1.68	-0.51	1.8	343.0	0.8	316.7
117.00	116.98	1.69	-0.52	1.8	342.8	1.0	327.7
118.00	117.98	1.71	-0.53	1.8	342.7	1.1	327.9
119.00	118.98	1.72	-0.54	1.8	342.6	1.1	308.3
120.00	119.98	1.74	-0.55	1.8	342.5	0.9	326.8
121.00	120.98	1.75	-0.56	1.8	342.4	0.9	322.2
122.00	121.98	1.77	-0.57	1.9	342.3	0.9	323.1
123.00	122.98	1.78	-0.57	1.9	342.1	1.0	332.3
124.00	123.98	1.80	-0.58	1.9	342.0	1.0	331.5
125.00	124.98	1.81	-0.59	1.9	341.9	1.0	332.0
126.00	125.98	1.83	-0.60	1.9	341.8	1.0	336.7
127.00	126.98	1.85	-0.61	1.9	341.7	1.0	331.1
128.00	127.98	1.86	-0.62	2.0	341.6	1.0	330.8
129.00	128.98	1.88	-0.63	2.0	341.6	1.1	331.0
130.00	129.98	1.89	-0.63	2.0	341.5	1.0	330.5
131.00	130.98	1.91	-0.64	2.0	341.4	1.1	328.5
132.00	131.98	1.93	-0.65	2.0	341.3	1.0	331.2
133.00	132.98	1.94	-0.66	2.1	341.2	1.0	331.0
134.00	133.98	1.96	-0.67	2.1	341.1	1.1	329.6
135.00	134.98	1.97	-0.68	2.1	341.1	1.0	341.2
136.00	135.98	1.99	-0.69	2.1	341.0	0.9	357.5
137.00	136.98	2.01	-0.70	2.1	340.9	1.0	331.6
138.00	137.98	2.02	-0.70	2.1	340.8	1.0	318.3
139.00	138.98	2.04	-0.71	2.2	340.7	1.1	335.9
140.00	139.98	2.05	-0.72	2.2	340.6	1.1	330.5
141.00	140.98	2.07	-0.73	2.2	340.5	1.1	335.5
142.00	141.98	2.09	-0.74	2.2	340.5	1.1	327.8
143.00	142.98	2.10	-0.75	2.2	340.4	1.1	329.8
144.00	143.98	2.12	-0.76	2.3	340.3	1.1	329.8
145.00	144.98	2.14	-0.77	2.3	340.2	1.1	329.3
146.00	145.98	2.15	-0.78	2.3	340.1	1.0	333.7
147.00	146.98	2.17	-0.79	2.3	340.0	1.1	330.3
148.00	147.98	2.19	-0.80	2.3	340.0	1.1	332.5
149.00	148.98	2.20	-0.81	2.3	339.9	1.1	334.7
150.00	149.98	2.22	-0.82	2.4	339.8	1.1	332.1
151.00	150.98	2.24	-0.82	2.4	339.8	1.1	331.4
152.00	151.97	2.25	-0.83	2.4	339.7	1.1	328.9
153.00	152.97	2.27	-0.84	2.4	339.6	1.1	331.8
154.00	153.97	2.29	-0.85	2.4	339.6	1.2	333.2
155.00	154.97	2.30	-0.86	2.5	339.5	1.2	325.8
156.00	155.97	2.32	-0.87	2.5	339.4	1.0	334.8
157.00	156.97	2.34	-0.88	2.5	339.4	1.1	331.7
158.00	157.97	2.35	-0.89	2.5	339.3	1.1	333.7
159.00	158.97	2.37	-0.90	2.5	339.3	1.1	334.2
160.00	159.97	2.39	-0.91	2.6	339.2	1.1	334.3
161.00	160.97	2.40	-0.92	2.6	339.1	1.5	317.8
162.00	161.97	2.42	-0.93	2.6	339.1	1.1	327.2
163.00	162.97	2.44	-0.94	2.6	339.0	1.0	337.1
164.00	163.97	2.45	-0.95	2.6	338.9	1.1	329.8
165.00	164.97	2.47	-0.96	2.6	338.8	1.2	318.7
166.00	165.97	2.48	-0.97	2.7	338.8	1.3	313.7
167.00	166.97	2.50	-0.98	2.7	338.7	1.0	332.3
168.00	167.97	2.51	-0.99	2.7	338.6	1.1	327.7
169.00	168.97	2.53	-1.00	2.7	338.5	1.1	327.1
170.00	169.97	2.55	-1.01	2.7	338.5	1.1	330.9
171.00	170.97	2.56	-1.02	2.8	338.4	1.2	326.3
172.00	171.97	2.58	-1.02	2.8	338.3	1.2	330.2
173.00	172.97	2.60	-1.03	2.8	338.3	1.2	329.4
174.00	173.97	2.61	-1.04	2.8	338.3	1.1	332.0
175.00	174.97	2.63	-1.05	2.8	338.2	1.1	330.5
176.00	175.97	2.65	-1.06	2.9	338.2	1.1	330.4
177.00	176.97	2.67	-1.07	2.9	338.1	0.6	329.8
178.00	177.97	2.68	-1.08	2.9	338.1	0.9	344.3
179.00	178.97	2.70	-1.09	2.9	338.0	1.0	332.6
180.00	179.97	2.71	-1.10	2.9	338.0	1.1	348.5
181.00	180.97	2.73	-1.11	2.9	337.9	1.0	342.2
182.00	181.97	2.75	-1.12	3.0	337.8	1.2	329.6
183.00	182.97	2.76	-1.13	3.0	337.7	1.3	324.8
184.00	183.97	2.78	-1.15	3.0	337.6	1.3	328.9
185.00	184.97	2.80	-1.16	3.0	337.5	1.2	324.9
186.00	185.97	2.82	-1.17	3.1	337.4	1.4	321.5
187.00	186.97	2.84	-1.18	3.1	337.3	1.2	327.6
188.00	187.97	2.85	-1.20	3.1	337.3	1.2	325.9
189.00	188.97	2.87	-1.21	3.1	337.2	1.2	324.0
190.00	189.97	2.89	-1.22	3.1	337.1	1.3	321.1
191.00	190.97	2.91	-1.23	3.2	337.0	1.2	325.1
192.00	191.97	2.92	-1.24	3.2	336.9	1.2	324.5
193.00	192.97	2.94	-1.26	3.2	336.8	1.2	323.4
194.00	193.97	2.96	-1.27	3.2	336.8	1.2	322.5
195.00	194.97	2.97	-1.28	3.2	336.7	1.2	319.9
196.00	195.97	2.99	-1.29	3.3	336.6	1.2	319.0
197.00	196.97	3.00	-1.30	3.3	336.5	1.0	323.9
198.00	197.97	3.02	-1.32	3.3	336.4	1.1	322.8
199.00	198.97	3.03	-1.33	3.3	336.4	1.2	313.5
200.00	199.97	3.05	-1.34	3.3	336.3	1.1	320.7
201.00	200.97	3.06	-1.35	3.3	336.2	0.9	343.7
202.00	201.97	3.07	-1.36	3.4	336.1	1.0	313.9
203.00	202.96	3.09	-1.37	3.4	336.0	0.9	333.3
204.00	203.96	3.10	-1.38	3.4	335.9	0.9	318.1
205.00	204.96	3.11	-1.39	3.4	335.8	0.9	323.5
206.00	205.96	3.12	-1.40	3.4	335.8	0.8	320.9
207.00	206.96	3.13	-1.41	3.4	335.7	0.9	323.2
208.00	207.96	3.14	-1.42	3.4	335.6	0.7	299.9
209.00	208.96	3.15	-1.43	3.5	335.5	0.7	297.3
210.00	209.96	3.16	-1.44	3.5	335.5	0.6	309.3
211.00	210.96	3.17	-1.45	3.5	335.4	0.6	324.7
212.00	211.96	3.17	-1.45	3.5	335.4	0.5	306.7
213.00	212.96	3.18	-1.46	3.5	335.3	0.5	324.2
214.00	213.96	3.19	-1.47	3.5	335.3	0.4	329.0
215.00	214.96	3.19	-1.47	3.5	335.3	0.4	330.4
216.00	215.96	3.20	-1.47	3.5	335.3	0.3	342.0
217.00	216.96	3.21	-1.47	3.5	335.3	0.4	356.8
218.00	217.96	3.22	-1.47	3.5	335.4	0.7	10.8
219.00	218.96	3.22	-1.47	3.5	335.5	0.4	18.5
219.68	219.64	3.23	-1.47	3.6	335.5	0.7	4.4

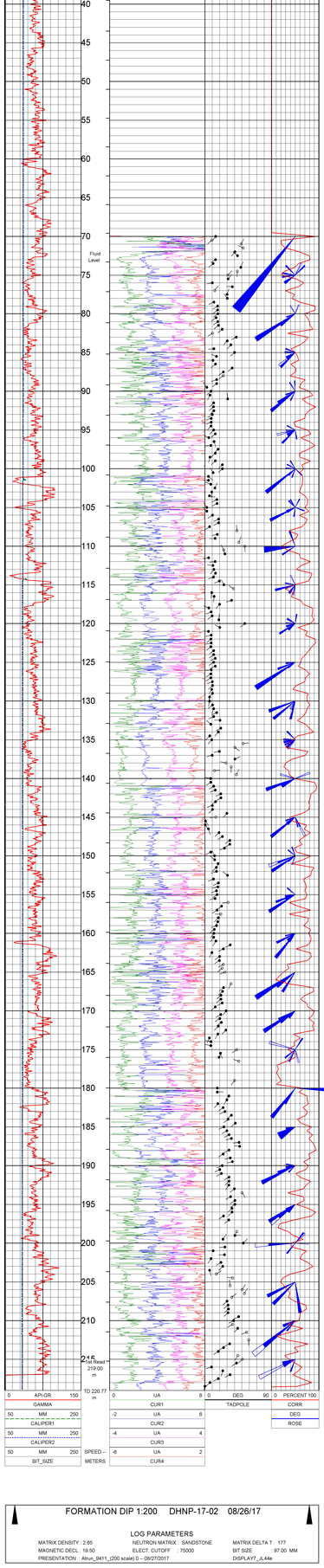

DIRECTIONAL SURVEYS
DHNP-17-02
FORMATION DIP 1:100 DHNP-17-02 08/26/17
LOG PARAMETERS
FORMATION DIP 1:100 DHNP-17-02 08/26/17
LOG PARAMETERS
TOOL CALIBRATION DHNP-17-01 08/29/17 03:52
TOOL SN738, TM VERSION 7.7
SERIAL NUMBER 277
STANDARD
RESPONSE (CPS)



FORMATION DIP 1:200 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL. : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrun_0411_(200 scale).0 – 08/27/2017 DISPLAY7_JL44e



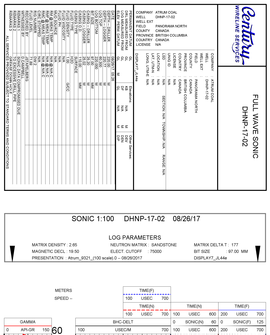
FORMATION DIP 1:200 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL. : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrun_0411_(200 scale).0 – 08/27/2017 DISPLAY7_JL44e

TOOL CALIBRATION DHNP-17-02 08/26/17 03:52
TOOL 5411A TM VERSION 7
SERIAL NUMBER 2371

	DATE	TIME	SENSOR		STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	May09,17	16:01:49	GAMMA	[API-GR]	0.100	545.000	0.000	616
2	Nov04,16	09:15:13	VOLTAGE	[MV]	25.200	91.000	668	2105
3	Apr20,17	09:26:35	CUR1	[UA]	2.520	9.100	6804	22790
4	Apr20,17	09:26:54	CUR2	[UA]	2.520	9.100	6734	22649
5	Apr20,17	09:27:06	CUR3	[UA]	2.520	9.100	6808	22796
6	Apr20,17	09:27:18	CUR4	[UA]	2.520	9.100	7544	24503
7	May09,17	16:02:02	CALIPER1	[CM]	100.000	200.000	3407	7488
8	May09,17	16:02:13	CALIPER2	[CM]	100.000	200.000	5865	9461



SONIC 1:100 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atlum_0021_1100 scale(1.0 - 09/26/2017 DISPLAY7_d.44e

METERS
SPEED --

TIME(F)
150 USEC/F 700

TIME(N)
100 USEC/M 700

GAMMA
0 API-GR 150

BHC-DELT
100 USEC/M 700

TIME(N)
100 USEC 600
SONIC(N) 40
200 USEC 700
SONIC(F) 125

TIME(F)
200 USEC 700
SONIC(F) 125

Fluid Level

1st Reading 2.9 Km

TD 220.10 m

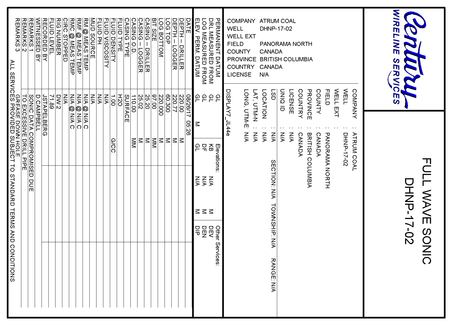
SONIC 1:100 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atlum_0021_1100 scale(1.0 - 09/26/2017 DISPLAY7_d.44e

TOOL CALIBRATION: DHNP-17-02 09/26/17 05:26
TOOL 3222A2 TM VERSION 4006
SERIAL NUMBER: 702

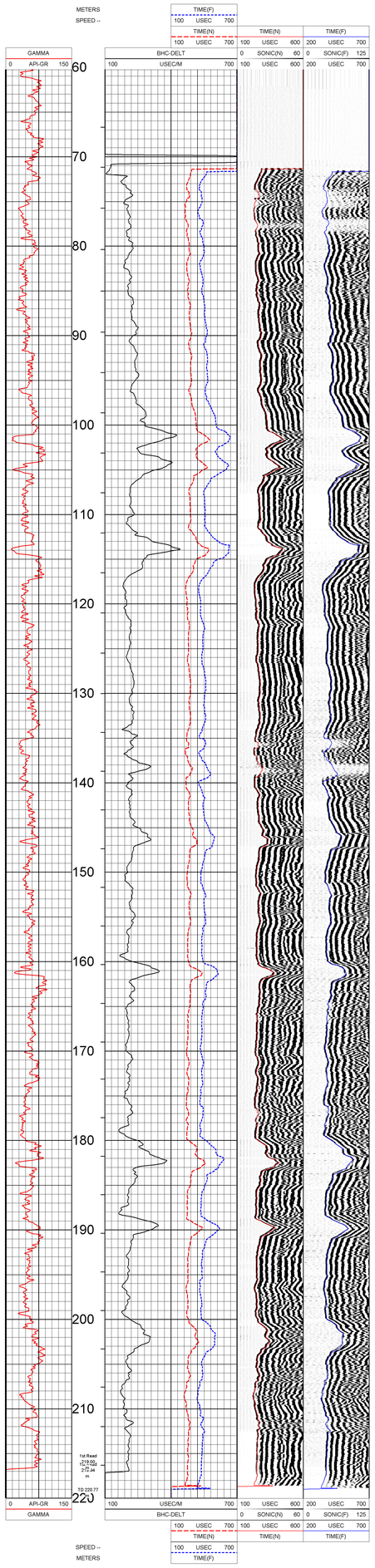
		STANDARD		RESPONSE [CPS]	
DATE	TIME	SENSOR	Point1 Point2	Point1	Point2
Mar/5,17	09:10:16	GAMMA (API-GR)	0.100 545.000	0.000	620



SONIC 1:200 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9321_(200 scale).0 -- 08/26/2017 DISPLAY7_JL44e



SONIC 1:200 DHNP-17-02 08/26/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T : 177
MAGNETIC DECL : 19.50 ELECT. CUTOFF : 75000 BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9321_(200 scale).0 -- 08/26/2017 DISPLAY7_JL44e

TOOL CALIBRATION DHNP-17-02 08/26/17 05:26
TOOL 9322A2 TM VERSION 4006
SERIAL NUMBER 702

	DATE	TIME	SENSOR		STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	Mar15,17	09:10:16	GAMMA	[API-GR]	0.100	545.000	0.000	620

Century WIRELINE SERVICES

DETAILED DENSITY
GAMMA - CALIPER - RES.
DHNP-17-05

COMPANY	ATRUM COAL
WELL	DHNP-17-05
WELL EXT	
FIELD	PANORAMA NORTH
COUNTY	CANADA
PROVINCE	BRITISH COLUMBIA
COUNTRY	CANADA
LICENSE	N/A

COMPANY	:	ATRUM COAL
WELL	:	DHNP-17-05
WELL EXT	:	
FIELD	:	PANORAMA NORTH
COUNTY	:	CANADA
PROVINCE	:	BRITISH COLUMBIA
COUNTRY	:	CANADA
LICENSE	:	N/A
UNIQ ID	:	N/A
LSD	:	N/A SECTION: N/A TOWNSHIP: N/A RANGE: N/A
LOCATION	:	N/A
LAT, UTM-N	:	N/A
LONG, UTM-E	:	N/A

DISPLAY7_JL44e

PERMANENT DATUM	GL		Elevations:			Other Services:
DRL MEASURED FROM	GL		KB	N/A	M	
LOG MEASURED FROM	GL		DF	N/A	M	
ELEV. PERM. DATUM	GL	M	GL	N/A	M	

DATE	09/05/17 09:24			
DEPTH -- DRILLER	247.00	M		
DEPTH -- LOGGER	242.02	M		
LOG TOP	-1.600	M		
LOG BOTTOM	241.800	M		
BIT SIZE	97.00	MM		
CASING -- DRILLER	6.00	M		
CASING -- LOGGER	6.00	M		
CASING O.D.	110.00	MM		
CASING TYPE	SURFACE			
FLUID TYPE	H2O			
FLUID DENSITY	1.00	G/CC		
FLUID VISCOSITY	N/A			
FLUID PH	N/A			
MUD SOURCE	N/A			
RM @ MEAS TEMP	N/A @ N/A C			
RMF @ MEAS TEMP	N/A @ N/A C			
RMC @ MEAS TEMP	N/A @ N/A C			
CIRC STOPPED	N/A			
RIG NUMBER	DW 1			
FLUID LEVEL	N/A			
RECORDED BY	JSTAPELBERG			
WITNESSED BY	D.CAMPBELL			
REMARKS 1	IN PIPE LOG ONLY			
REMARKS 2				
REMARKS 3				

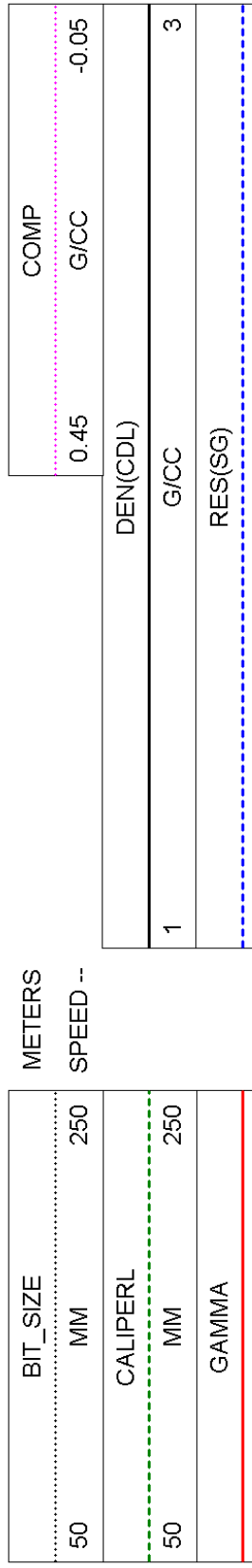
ALL SERVICES PROVIDED SUBJECT TO STANDARD TERMS AND CONDITIONS

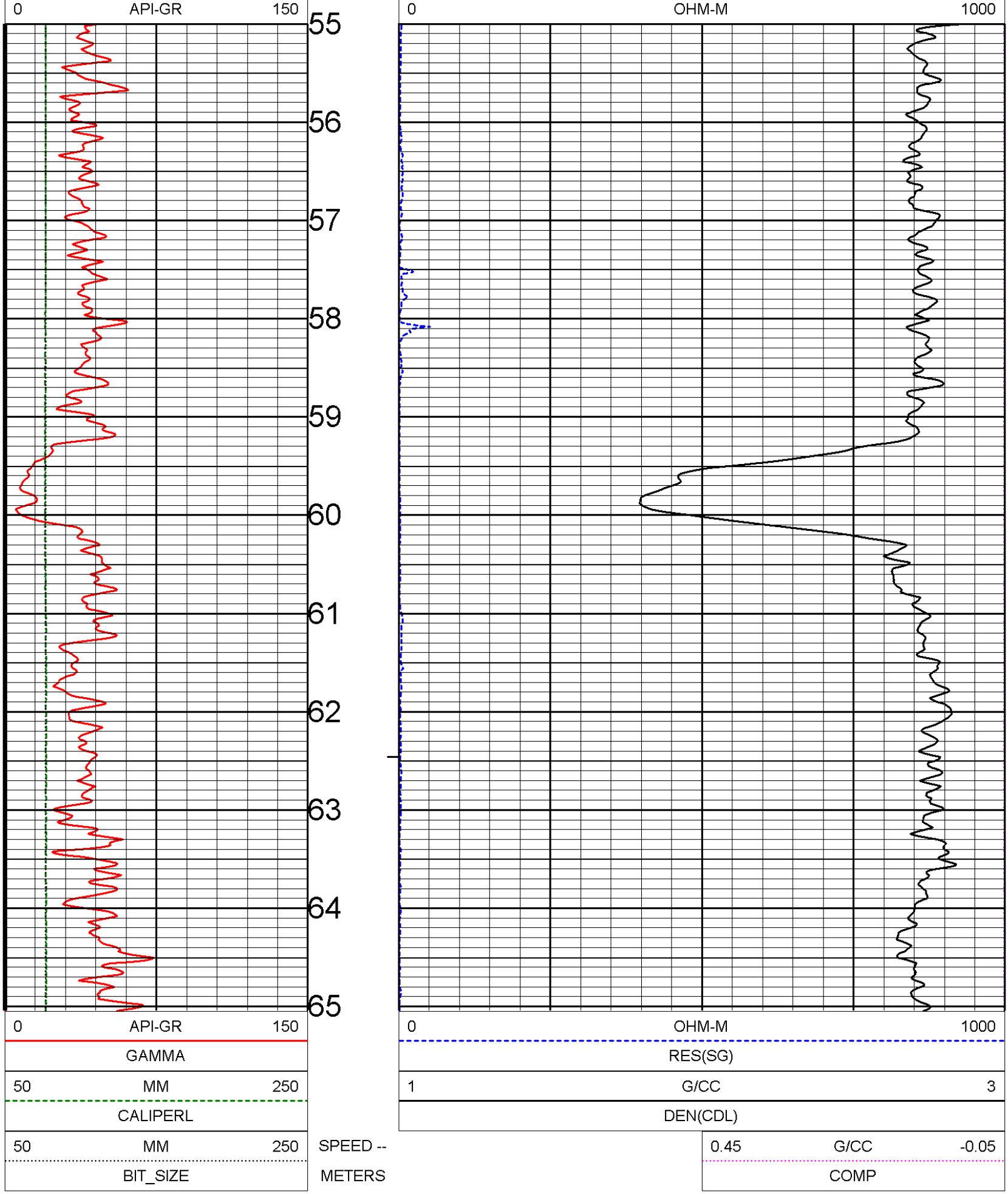
DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY	: 2.65	NEUTRON MATRIX	: SANDSTONE
MAGNETIC DECL	: 19.50	ELECT. CUTOFF	: 75000
PRESENTATION	: Atrum_9239_EXP.0 -- 08/15/2017		

MATRIX DELTA T	: 177
BIT SIZE	: 97.00 MM
DISPLAY7_JL44e	




0 API-GR 150
0 OHM-M 1000
55
56
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60
61
62
63
64
65
0 API-GR 150
GAMMA
50 MM 250
CALIPERL
50 MM 250
BIT_SIZE
SPEED --
METERS
0 OHM-M 1000
RES(SG)
1 G/CC 3
DEN(CDL)
0.45 G/CC -0.05
COMP

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

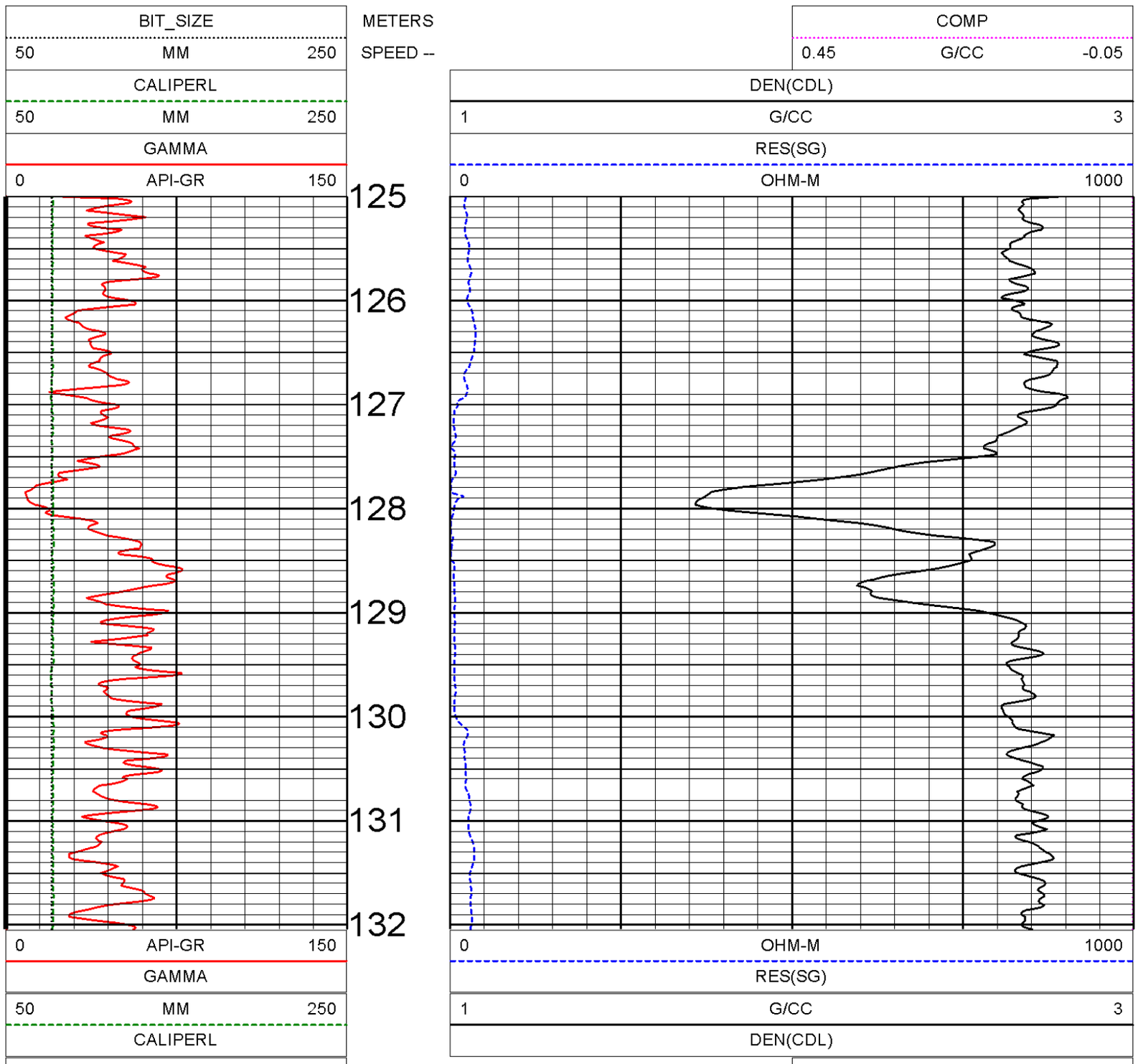
LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e



DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

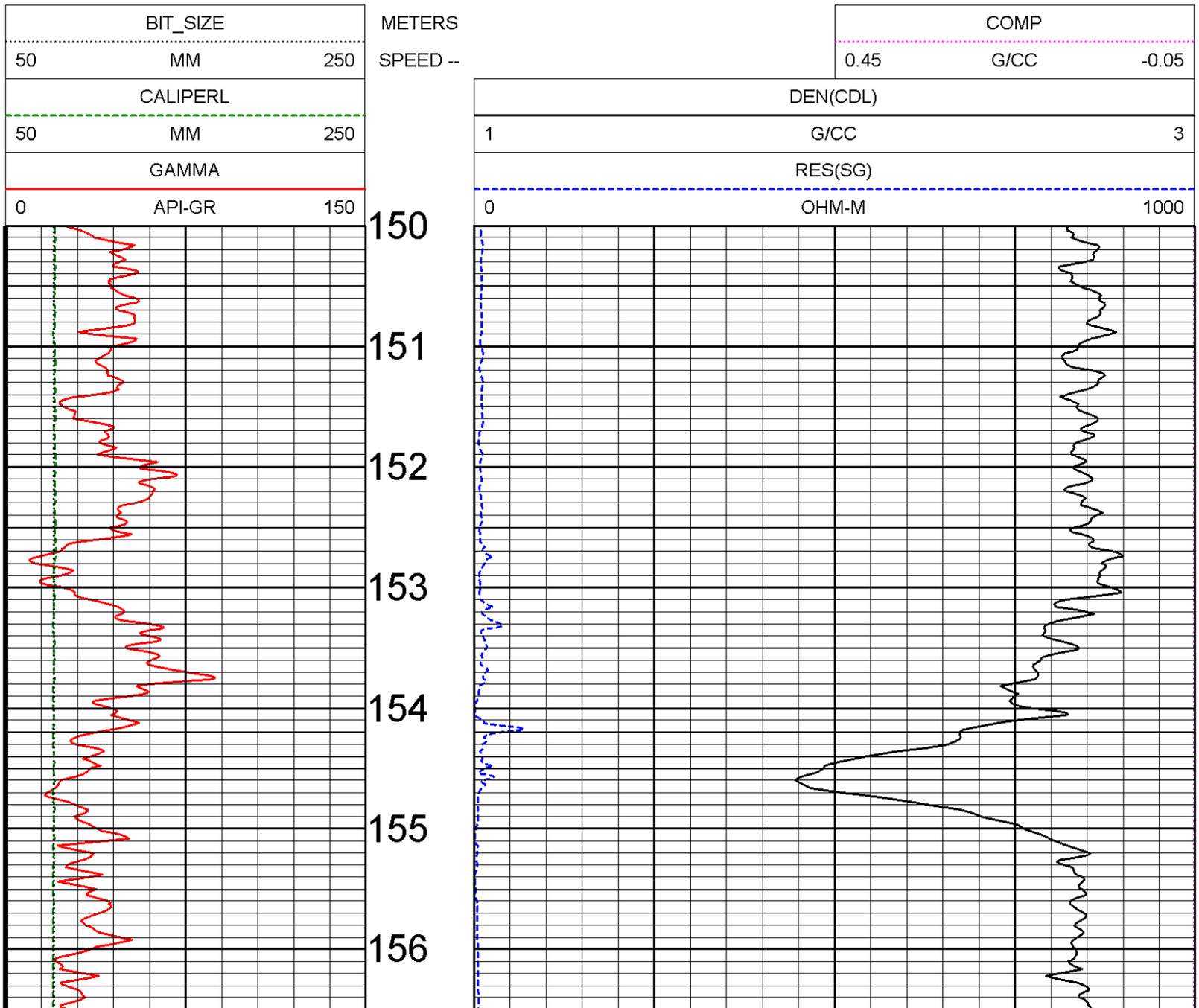
LOG PARAMETERS

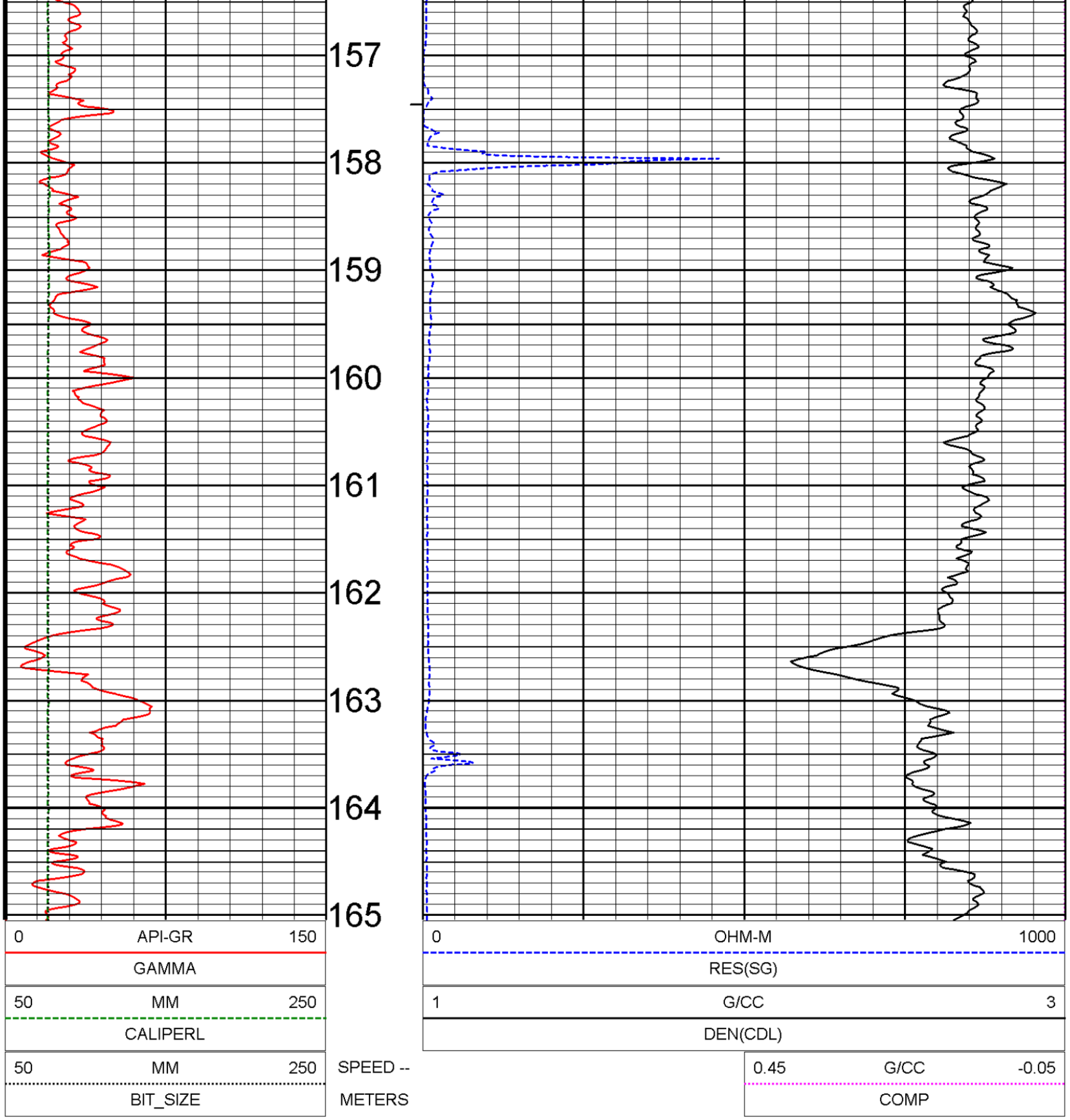
MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e




157
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165
0 API-GR 150
GAMMA
50 MM 250
CALIPERL
50 MM 250
BIT_SIZE
SPEED --
METERS
0 OHM-M 1000
RES(SG)
1 G/CC 3
DEN(CDL)
0.45 G/CC -0.05
COMP

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

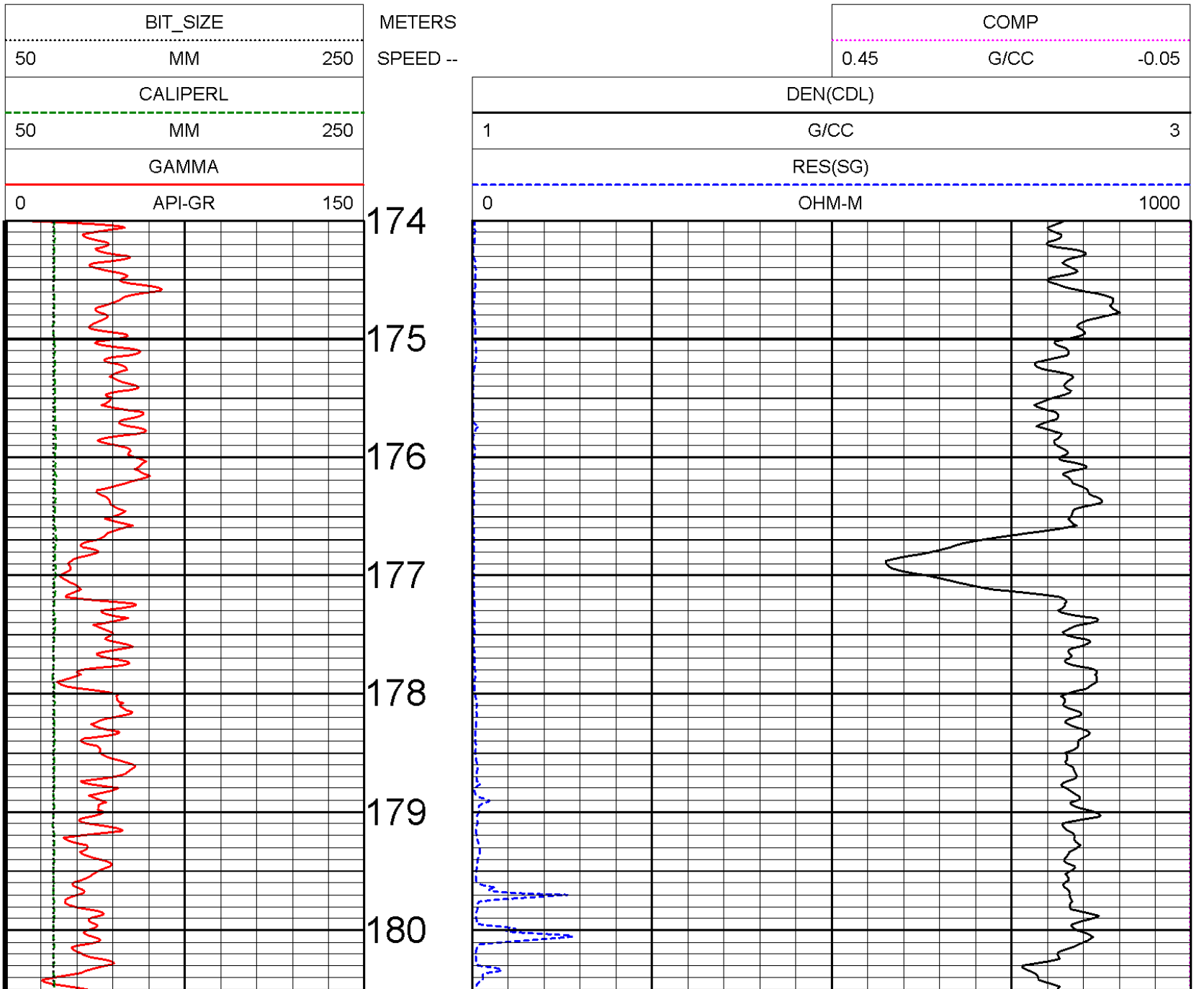
LOG PARAMETERS

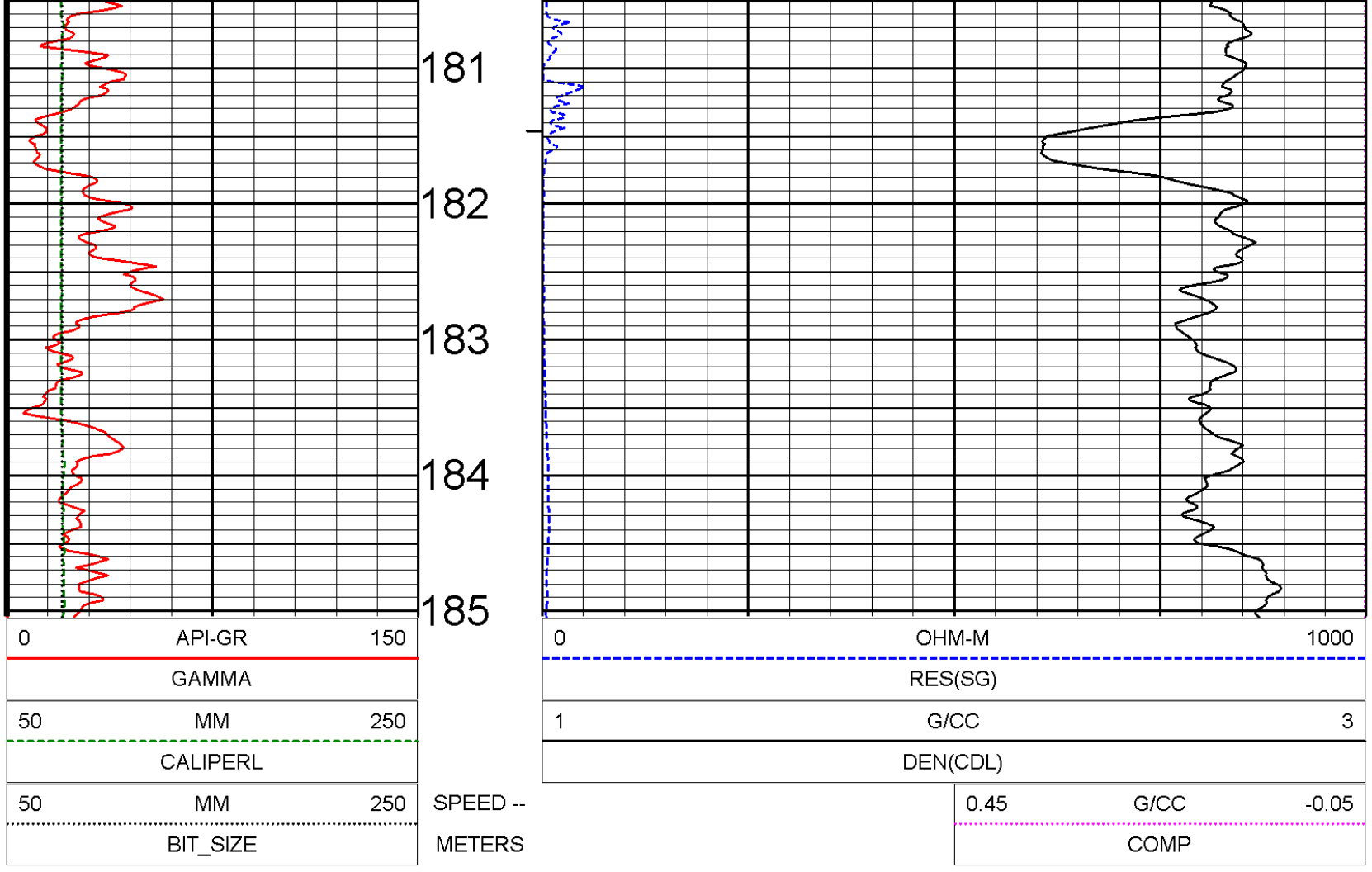
MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY : 2.65	NEUTRON MATRIX : SANDSTONE	MATRIX DELTA T : 177
MAGNETIC DECL : 19.50	ELECT. CUTOFF : 75000	BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017		DISPLAY7_JL44e





DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

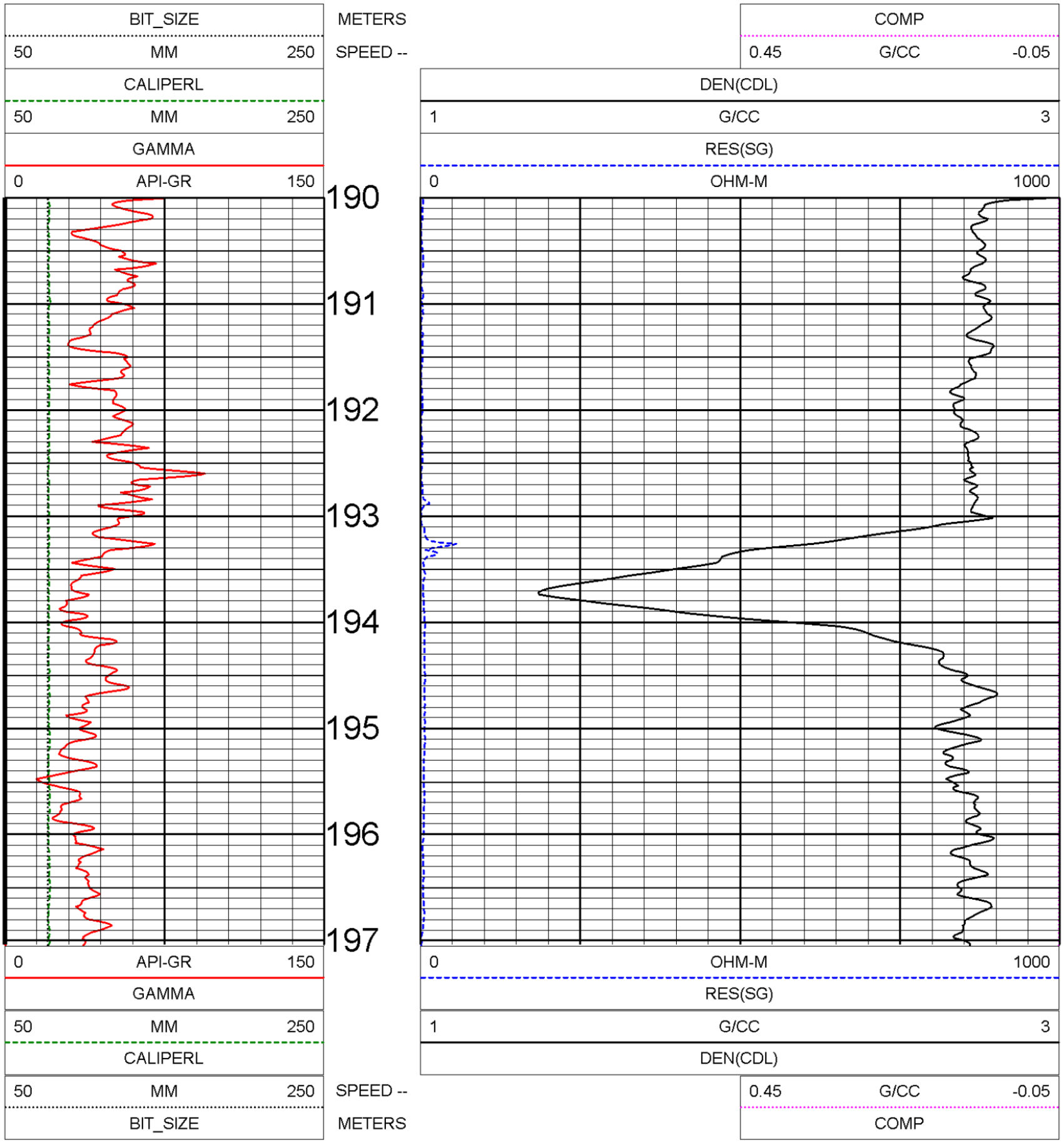
LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e


BIT_SIZE
METERS
COMP
50 MM 250
SPEED --
0.45 G/CC -0.05
CALIPERL
DEN(CDL)
50 MM 250
1 G/CC 3
GAMMA
RES(SG)
0 API-GR 150
0 OHM-M 1000
190
191
192
193
194
195
196
197
0 API-GR 150
0 OHM-M 1000
GAMMA
RES(SG)
50 MM 250
1 G/CC 3
CALIPERL
DEN(CDL)
50 MM 250
SPEED --
0.45 G/CC -0.05
BIT_SIZE
METERS
COMP

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

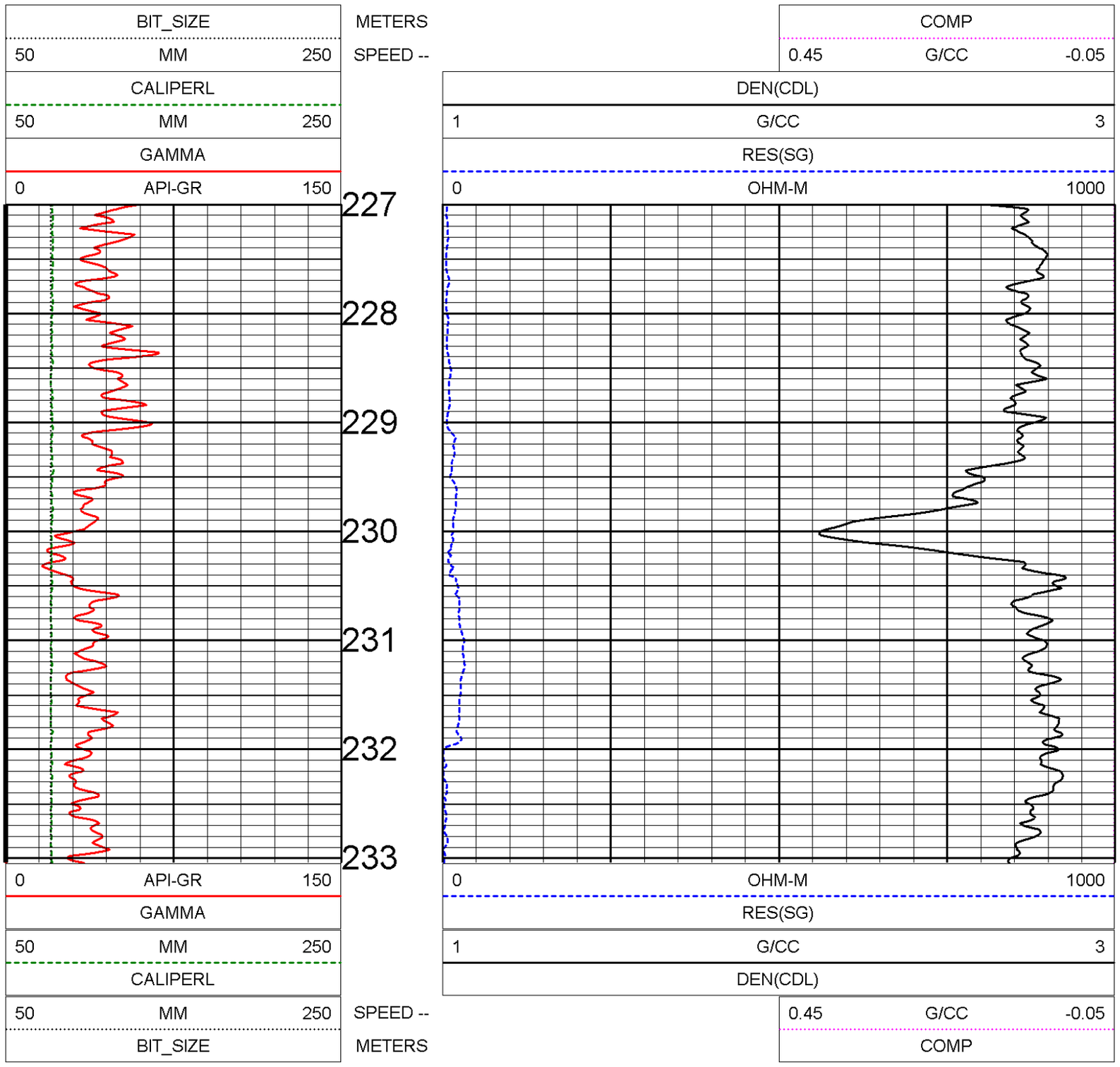
LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e



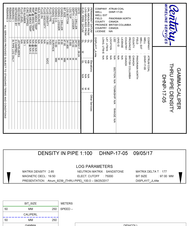
DETAILED DENSITY 1:50 DHNP-17-05 09/05/17

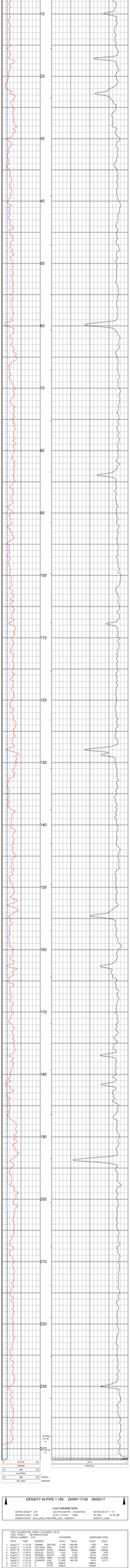
LOG PARAMETERS

MATRIX DENSITY : 2.65
NEUTRON MATRIX : SANDSTONE
MATRIX DELTA T : 177
MAGNETIC DECL : 19.50
ELECT. CUTOFF : 75000
BIT SIZE : 97.00 MM
PRESENTATION : Atrum_9239_EXP.0 -- 08/15/2017
DISPLAY7_JL44e

TOOL CALIBRATION DHNP-17-05 09/05/17 09:24
TOOL 9239C1 TM VERSION 5026
SERIAL NUMBER 2779

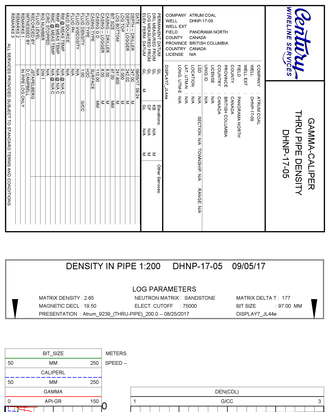
					STANDARD		RESPONSE [CPS]	
	DATE	TIME	SENSOR		Point1	Point2	Point1	Point2
1	Aug24,17	11:23:39	GAMMA	[API-GR]	0.100	545.000	1.000	633
2	Aug24,17	11:24:09	VOLTAGE	[MV]	27.800	240.700	13867	41913
3	Oct27,16	13:28:41	CALIPER	[CPS]	Default	Default	Default	Default
4	Aug24,17	11:05:01	DEN(LS)	[G/CC]	1.620	2.612	10364	1433
5	Aug24,17	11:05:50	DEN(SS)	[G/CC]	1.590	2.580	35719	15276
6	Aug24,17	11:25:04	CALIPERL	[MM]	101.600	200.000	145496	251965
7	Aug24,17	11:25:29	CURRENT	[UA]	27.800	240.700	5313	22771
8	Jun19,17	11:31:23	F	[CPS]	Default		Default	
9	Jun19,17	11:31:29	X	[CPS]	Default		Default	





TOOL CALIBRATION: CHART 17-05 DENSITY ON 28
TOOL SERIAL NUMBER 27151

SIGNAL NUMBER				27151			
	DATE	TIME	SENSOR		STANDARD		RESPONSE (CPS)
					Point1	Point2	Point1 Point2
1	Aug24.17	11:24:30	CALIPER	APX-UP2	2.165	240.700	1.5 1.5
2	Aug24.17	11:25:00	AUX Radial	APX	2.165	240.700	1.5001 4.4121
3	Aug24.17	11:25:30	CALIPER	[CAL]	Default	Default	Default Default
4	Aug24.17	11:26:00	AUX Radial	[APX]	2.165	240.700	1.5001 4.4121
5	Aug24.17	11:26:30	DENSITY	[DEN]	1.100	2.580	397.54 1010.8
6	Aug24.17	11:27:00	DENSITY	[DEN]	1.100	2.580	397.54 1010.8
7	Aug24.17	11:26:30	CURRENT	[UP]	21.842	240.700	324.5 2277.1
8	Aug24.17	11:27:00	- - - -	[UP]	Default	Default	Default Default
9	Aug24.17	11:27:30	- - - -	[UP]	Default	Default	Default Default



DENSITY IN PIPE 1:200 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T: 177
MAGNETIC DECL. : 19.50 ELECT. CUTOFF : 75000 BIT SIZE 97.00 MM
PRESENTATION : Atrum_9239_(THRU-PIPE)_200.0 – 09/25/2017 DISPLAY7_JL44e

BIT_SIZE
50 MM 250
CALIPER1
50 MM 250
GAMMA
0 API-GR 150

METERS
SPEED –

DEN(CDL)
1 G/CC 3

Casing

0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240

1st Read
241.80
m
2nd Read
241.92
m

0 API-GR 150
GAMMA
50 MM 250
CALIPER1
50 MM 250
BIT_SIZE

SPEED –
METERS

1 G/CC 3
DEN(CDL)

DENSITY IN PIPE 1:200 DHNP-17-05 09/05/17

LOG PARAMETERS

MATRIX DENSITY : 2.65 NEUTRON MATRIX : SANDSTONE MATRIX DELTA T: 177
MAGNETIC DECL. : 19.50 ELECT. CUTOFF : 75000 BIT SIZE 97.00 MM
PRESENTATION : Atrum_9239_(THRU-PIPE)_200.0 – 09/25/2017 DISPLAY7_JL44e

TOOL CALIBRATION DHNP-17-05 09/05/17 09:24
TOOL 9239IC1 TM VERSION 5026
SERIAL NUMBER 2719

	DATE	TIME	SENSOR		STANDARD Point1	STANDARD Point2	RESPONSE [CPS] Point1	RESPONSE [CPS] Point2
1	Aug24.17	11:23:39	GAMMA	[API-GR]	0.100	540.000	1.000	633
2	Aug24.17	11:24:09	VOLTAGE	[MV]	27.800	240.700	13667	41913
3	Oct27.16	13:29:41	CALIPER	[CPS]	Default	Default	Default	Default
4	Aug24.17	11:05:01	DEN(LS)	[G/CC]	1.620	2.612	10364	1433
5	Aug24.17	11:05:50	DEN(SS)	[G/CC]	1.500	2.580	30719	15276
6	Aug24.17	11:25:04	CALIPER1	[MM]	101.600	200.000	145496	251965
7	Aug24.17	11:25:29	CURRENT	[UA]	27.800	240.700	5313	22771
8	Jun19.17	11:31:23	F	[CPS]	Default	Default	Default	Default
9	Jun19.17	11:31:29	X	[CPS]	Default	Default	Default	Default

APPENDIX 4

Raw Coal Quality Certificates

GWIL INDUSTRIES Birtley Coal & Minerals Testing Division

Gwil Industries Inc.
7784 - 62nd St SE
Calgary, AB
T2C 5K2
Tel: (403) 253-8273
Email: info@birtley.ca
www.birtley.ca

CERTIFICATE OF ANALYSIS

CLIENT: **ATRUM COAL**

PROJECT: **ATRUM COAL - Panorama**

REPORT DATE: November 23, 2017 updated

samples crushed to pass -12mm

						STONE ANALYSIS ,air dried basis							
LAB ID	SAMPLE ID	From	To	Thickness	ADM %	MOIST%	ASH%	VOL%	F.C.%	%S	Cal/g	SG	BASIS
174162	PN170015	147.05	147.25	0.20	9.08	1.38	86.78	5.24	6.60	1.98	-	2.46	adb
	DHPN-17-01					10.33	78.90	4.76	6.00	1.80	-		arb
							87.99	5.31	6.69	2.01	-		db
174170	PN170023	149.68	149.88	0.20	1.78	1.24	79.04	13.49	6.23	0.08	-	2.48	adb
						3.00	77.63	13.25	6.12	0.08	-		arb
							80.03	13.66	6.31	0.09	-		db
174171	PN170024	155.20	155.37	0.17	1.28	1.01	75.09	4.38	19.52	0.14	-	1.93	adb
						2.28	74.13	4.32	19.27	0.14	-		arb
							75.86	4.42	19.72	0.14	-		db
174177	PN170030	158.33	158.59	0.26	5.65	0.90	88.23	9.54	1.33	0.11	-	2.68	adb
						6.50	83.25	9.00	1.25	0.10	-		arb
							89.03	9.63	1.34	0.11	-		db
174621	PN170032	275.64	275.84	0.20	1.20	1.60	79.80	8.55	10.05	1.65	-	2.47	adb
						2.78	78.84	8.45	9.93	1.63	-		arb
							81.10	8.69	10.21	1.68	-		db
174625	PN170036	276.91	277.06	0.15	0.71	0.89	89.50	4.55	5.06	1.60	-	2.52	adb
						1.59	88.86	4.52	5.02	1.59	-		arb
							90.30	4.59	5.11	1.61	-		db
174188	PN170063	100.81	101.01	0.20	1.22	1.04	84.32	8.70	5.94	0.91	-	2.31	adb
	DHPN-17-02					2.25	83.29	8.59	5.87	0.90	-		arb
							85.21	8.79	6.00	0.92	-		db
174192	PN170067	101.98	102.18	0.20	1.33	0.66	83.13	4.70	11.51	0.11	-	2.33	adb
						1.98	82.02	4.64	11.36	0.11	-		arb
							83.68	4.73	11.59	0.11	-		db
174183	PN170052	31.59	31.77	0.18	1.05	1.08	88.74	7.74	2.44	2.89	-	2.73	adb
						2.12	87.81	7.66	2.41	2.86	-		arb
							89.71	7.82	2.47	2.92	-		db
174187	PN170056	32.34	32.55	0.21	1.22	0.70	84.43	4.01	10.86	0.13	-	2.14	adb
						1.91	83.40	3.96	10.73	0.13	-		arb
							85.03	4.04	10.94	0.13	-		db
174206	PN170119	123.71	123.91	0.20	3.17	1.17	81.47	8.84	8.52	1.18	-	2.27	adb
	DHPN-17-03					4.30	78.89	8.56	8.25	1.14	-		arb
							82.43	8.94	8.62	1.19	-		db
174209	PN170122	124.98	125.12	0.14	0.97	0.48	52.45	40.35	6.72	0.08	920	2.36	adb *
						1.45	51.94	39.96	6.65	0.08	911		arb
							52.70	40.54	6.75	0.08	924		db
174213	PN170126	126.07	126.18	0.11	1.85	1.35	80.09	6.41	12.15	0.14	-	2.13	adb
						3.18	78.61	6.29	11.93	0.14	-		arb
							81.19	6.50	12.32	0.14	-		db
174214	PN170127	171.99	172.22	0.23	1.94	1.26	81.41	5.72	11.61	0.11	-	2.02	adb
						3.18	79.83	5.61	11.38	0.11	-		arb
							82.45	5.79	11.76	0.11	-		db
174216	PN170129	172.54	172.83	0.29	2.89	1.07	82.45	8.81	7.67	0.13	-	2.28	adb
						3.93	80.07	8.56	7.45	0.13	-		arb
							83.34	8.91	7.75	0.13	-		db
174222	PN170135	175.39	175.48	0.09	1.68	1.37	71.16	7.95	19.52	11.40	-	2.12	adb
						3.03	69.96	7.82	19.19	11.21	-		arb
							72.15	8.06	19.79	11.56	-		db
174225	PN170138	176.02	176.20	0.18	1.56	1.18	84.42	5.18	9.22	1.52	-	2.43	adb
						2.72	83.10	5.10	9.08	1.50	-		arb
							85.43	5.24	9.33	1.54	-		db

*Ash, CV & Volatile checked, possibly carbonates present (vigorously fizzed with 10% hot HCl)

Heather Dexter
Operations Manager
GWIL Industries

GWIL INDUSTRIES Birtley Coal & Minerals Testing Division

Gwil Industries Inc.
7784 - 62nd St SE
Calgary, AB
T2C 5K2
Tel: (403) 253-8273
Email: info@birtley.ca
www.birtley.ca

CERTIFICATE OF ANALYSIS

CLIENT: **ATRUM COAL**

PROJECT: **ATRUM COAL - Panorama**

REPORT DATE: November 23, 2017

samples crushed to pass -12mm

							RAW COAL ANALYSIS ,air dried basis								
LAB ID	SAMPLE ID	Seam Name	From	To	Thickness	Retain Grams	ADM %	MOIST%	ASH%	VOL%	F.C.%	%S	Cal/g	SG	BASIS
174622	PN17-0033 DHPN-17-01	Scow A	275.84	276.15	0.31	1012	1.18	2.32	15.74	6.43	75.51	5.29	6761	1.49	adb
								3.47	15.55	6.35	74.62	5.23	6681		arb
									16.11	6.58	77.30	5.42	6922		db
174623	PN17-0034 DHPN-17-01	Scow A	276.15	276.31	0.16	714	11.76	1.28	27.59	5.45	65.68	2.10	5789	1.32	adb *
								12.89	24.35	4.81	57.96	1.85	5108		arb
									27.95	5.52	66.53	2.13	5864		db
174624	PN17-0035 DHPN-17-01	Scow A	276.31	276.51	0.20	764	1.74	1.52	18.59	11.29	68.60	2.45	6280	1.48	adb
								3.23	18.27	11.09	67.41	2.41	6171		arb
									18.88	11.46	69.66	2.49	6377		db
174184	PN17-0053 DHPN-17-02	Claw C	31.77	31.93	0.16	651	3.00	0.91	42.22	7.29	49.58	11.60	4329	1.82	adb
								3.88	40.95	7.07	48.09	11.25	4199		arb
									42.61	7.36	50.04	11.71	4369		db
174185	PN17-0054 DHPN-17-02	Claw C	31.93	32.19	0.26	767	2.79	1.02	16.56	8.28	74.14	2.37	6740	1.48	adb
								3.78	16.10	8.05	72.07	2.30	6552		arb
									16.73	8.37	74.90	2.39	6809		db
174186	PN17-0055 DHPN-17-02	Claw C	32.19	32.34	0.15	488	1.91	0.85	19.11	9.72	70.32	0.60	6414	1.51	adb
								2.74	18.74	9.53	68.98	0.59	6291		arb
									19.27	9.80	70.92	0.61	6469		db
174189	PN17-0064 DHPN-17-02	Scow A	101.01	101.43	0.42	1361	3.98	0.92	26.06	5.62	67.40	2.19	6002	1.41	adb
								4.86	25.02	5.40	64.72	2.10	5763		arb
									26.30	5.67	68.03	2.21	6058		db
174190	PN17-0065 DHPN-17-02	Scow A	101.43	101.82	0.39	1267	4.20	1.68	22.45	5.39	70.48	0.41	6352	1.39	adb
								5.81	21.51	5.16	67.52	0.39	6085		arb
									22.83	5.48	71.68	0.42	6461		db
174191	PN17-0066 DHPN-17-02	Scow A	101.82	101.98	0.16	583	2.36	0.85	32.81	7.11	59.23	0.37	5347	1.54	adb
								3.19	32.04	6.94	57.83	0.36	5221		arb
									33.09	7.17	59.74	0.37	5393		db

*SG checked

Heather Dexter
Operations Manager
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CERTIFICATE OF ANALYSIS

CLIENT: **ATRUM COAL**

PROJECT: **ATRUM COAL - Panorama**

REPORT DATE: November 23, 2017

Dropped shattered 20X from 2 meter height and then screened at 31.5mm, +31.5mm hand knapped to pass 31.5mm and homogenized with natural 31.5mmx0. Representative 1/4 split taken for Raw Coal Analysis and 3/4 split retained.

								RAW COAL ANALYSIS ,air dried basis								
LAB ID	SAMPLE ID	Seam Name	From	To	Thickness	+31.5mm	-31.5mm	ADM %	MOIST%	ASH%	VOL%	F.C.%	%S	Cal/g	SG	BASIS
174163	170016 DHPN-17-01	Claw B	147.25	147.38	0.13	0	625	9.08	0.93	58.05	6.33	34.69	5.45	3033	1.71	adb
									9.93	52.78	5.76	31.54	4.96	2758		arb
						Retain =	467			58.59	6.39	35.02	5.50	3061		db
174164	170017	Claw B	147.4	147.65	0.25	378	1257	6.30	0.61	68.72	22.06	8.61	2.13	753	2.36	adb *
									6.87	64.39	20.67	8.07	2.00	706		arb
						Retain =	1224			69.14	22.20	8.66	2.14	758		db
174165	170018	Claw B	147.76	148.18	0.42	345	1603	7.78	0.71	42.12	8.85	48.32	2.61	4339	1.52	adb
									8.43	38.84	8.16	44.56	2.41	4001		arb
						Retain =	1445			42.42	8.91	48.67	2.63	4370		db
174166	170019	Claw B	148.18	148.25	0.07	561	92	0.90	0.44	50.42	38.77	10.37	0.04	1408	2.19	adb *
									1.34	49.97	38.42	10.28	0.04	1395		arb **
						Retain =	325			50.64	38.94	10.42	0.04	1414		db ***
174167	170020	Claw B	148.25	148.65	0.40	0	1628	7.32	0.81	13.36	6.82	79.01	0.57	7121	1.38	adb
									8.07	12.38	6.32	73.23	0.53	6600		arb
						Retain =	1218			13.47	6.88	79.66	0.57	7179		db
174168	170021	Claw B	148.65	149.00	0.35	0	1495	9.63	1.10	25.19	5.78	67.93	1.54	6017	1.25	adb
									10.62	22.76	5.22	61.39	1.39	5438		arb
						Retain =	1119			25.47	5.84	68.69	1.56	6084		db
174169	170022	Claw B	149.07	149.68	0.61	305	2402	4.45	0.86	32.76	6.16	60.22	0.59	5310	1.37	adb
									5.27	31.30	5.89	57.54	0.56	5074		arb
						Retain =	2025			33.04	6.21	60.74	0.60	5356		db
174172	170025	Claw C	155.37	156.00	0.63	368	3058	4.50	0.92	66.27	10.33	22.48	0.42	1934	1.74	adb
									5.38	63.29	9.87	21.47	0.40	1847		arb
						Retain =	2563			66.89	10.43	22.69	0.42	1952		db
174173	170026	Claw C	156.25	156.85	0.60	0	2201	5.76	1.31	49.85	6.94	41.90	0.47	3615	1.50	adb
									6.99	46.98	6.54	39.49	0.44	3407		arb
						Retain =	1548			50.51	7.03	42.46	0.48	3663		db
174174	170027	Claw C	156.85	157.15	0.30	500	1832	2.99	1.00	32.47	6.83	59.70	0.49	5414	1.44	adb
									3.96	31.50	6.63	57.91	0.48	5252		arb
						Retain =	1750			32.80	6.90	60.30	0.49	5469		db
174175	170028	Claw C	157.15	157.58	0.43	0	2557	6.11	1.69	86.27	5.37	6.67	1.65	426	2.20	adb
									7.70	81.00	5.04	6.26	1.55	400		arb
						Retain =	1917			87.75	5.46	6.78	1.68	433		db
174176	170029	Claw C	157.58	158.28	0.70	0	3974	11.24	1.30	70.58	7.09	21.03	1.41	1680	1.74	adb
									12.39	62.65	6.29	18.67	1.25	1491		arb
						Retain =	2974			71.51	7.18	21.31	1.43	1702		db

*Ash & CV checked
**small mass sample with most of the sample near 31.5mm after crushing to pass (1/2 split taken)
***possibly carbonates present (vigorously fizzed with 10% hot HCl)

Heather Dexter
Operations Manager
GWIL Industries

GWIL INDUSTRIES Birtley Coal & Minerals Testing Division

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www.birtley.ca

CERTIFICATE OF ANALYSIS

CLIENT: **ATRUM COAL**

PROJECT: **ATRUM COAL - Panorama**

REPORT DATE: November 23, 2017

Dropped shattered 20X from 2 meter height and then screened at 31.5mm, +31.5mm hand knapped to pass 31.5mm and homogenized with natural 31.5mmx0. Representative 1/4 split taken for Raw Coal Analysis and 3/4 split retained.

						RAW COAL ANALYSIS ,air dried basis										
LAB ID	SAMPLE ID	Seam Name	From	To	Thickness	+31.5mm	-31.5mm	ADM %	MOIST%	ASH%	VOL%	F.C.%	%S	Cal/g	SG	BASIS
174207	170120 DHPN-17-03		124.15	124.35	0.20	0	822	8.13	0.66	11.49	6.94	80.91	1.79	7368	1.31	adb
									8.74	10.56	6.38	74.33	1.64	6769		arb
						Retain =	615			11.57	6.99	81.45	1.80	7417		db
174208	170121		124.35	124.89	0.54	0	1504	9.04	0.52	8.24	6.53	84.71	0.53	7696	1.29	adb
									9.51	7.50	5.94	77.05	0.48	7000		arb
						Retain =	1125			8.28	6.56	85.15	0.53	7736		db
174210	170123		125.12	125.39	0.27	72	1342	7.01	1.15	33.08	7.13	58.64	0.38	5324	1.27	adb
									8.08	30.76	6.63	54.53	0.35	4951		arb
						Retain =	1060			33.46	7.21	59.32	0.38	5386		db
174211	170124		125.39	125.87	0.48	197	2333	3.58	0.96	24.71	7.34	66.99	0.43	6102	1.37	adb
									4.51	23.83	7.08	64.59	0.41	5884		arb
						Retain =	1896			24.95	7.41	67.64	0.43	6161		db
174212	170125		125.87	126.07	0.20	100	760	2.71	1.61	37.95	5.89	54.55	0.34	4777	1.45	adb
									4.28	36.92	5.73	53.07	0.33	4648		arb
						Retain =	644			38.57	5.99	55.44	0.35	4855		db
174215	170128		172.22	172.54	0.32	92	1568	2.40	1.70	34.02	7.20	57.08	0.45	5137	1.38	adb
									4.06	33.20	7.03	55.71	0.44	5014		arb
						Retain =	1242			34.61	7.32	58.07	0.46	5226		db
174217	170130		172.83	173.03	0.20	0	942	4.52	1.22	36.45	9.66	52.67	0.44	4854	1.38	adb
									5.68	34.80	9.22	50.29	0.42	4635		arb
						Retain =	704			36.90	9.78	53.32	0.45	4914		db
174218	170131		173.19	173.73	0.54	0	2766	3.78	2.06	20.84	6.06	71.04	2.36	6423	1.38	adb
									5.76	20.05	5.83	68.35	2.27	6180		arb
						Retain =	2074			21.28	6.19	72.53	2.41	6558		db
174219	170132		173.73	174.31	0.58	376	2297	3.34	1.66	29.09	6.11	63.14	1.46	5637	1.30	adb
									4.94	28.12	5.91	61.03	1.41	5449		arb
						Retain =	2002			29.58	6.21	64.21	1.48	5732		db
174220	170133		174.31	174.85	0.54	158	2429	3.97	2.06	29.80	6.51	61.63	1.03	5595	1.28	adb
									5.95	28.62	6.25	59.18	0.99	5373		arb
						Retain =	1936			30.43	6.65	62.93	1.05	5713		db
174221	170134		174.85	175.39	0.54	483	2028	3.12	1.36	39.52	5.42	53.70	1.03	4682	1.30	adb
									4.44	38.29	5.25	52.02	1.00	4536		arb
						Retain =	1878			40.06	5.49	54.44	1.04	4747		db
174223	170136		175.48	175.83	0.35	0	1861	4.77	2.11	35.35	7.13	55.41	1.82	5019	1.35	adb
									6.78	33.66	6.79	52.77	1.73	4780		arb
						Retain =	1394			36.11	7.28	56.60	1.86	5127		db
174224	170137		175.83	176.02	0.19	510	497	2.30	1.37	59.99	14.04	24.60	0.61	2229	1.73	adb
									3.64	58.61	13.72	24.03	0.60	2178		arb
						Retain =	752			60.82	14.24	24.94	0.62	2260		db

Heather Dexter
Operations Manager
GWIL Industries

APPENDIX 5

Maps

417526

418958

418957

417527

417086

417299

417084

418961

417525

417292

417296

418953

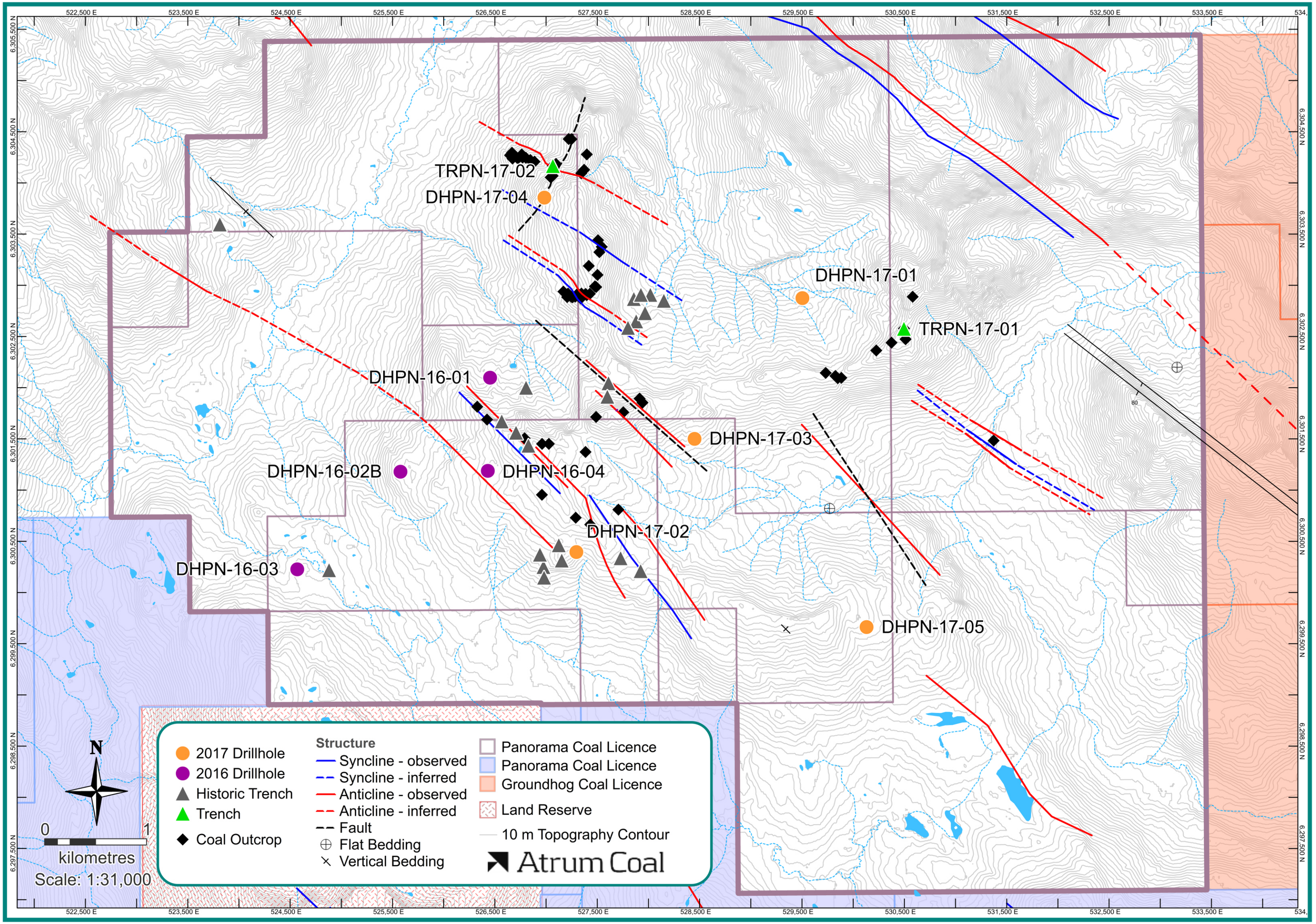
Panorama North Boundary
and Mechanical Work Permit Area

Panorama North Coal Licence
Panorama Coal Licence
Groundhog Coal Licence
Land Reserve

Atrum Coal

N

0 1
kilometres
Scale: 1:32,000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TRPN-17-02
DHPN-17-04
DHPN-17-01
TRPN-17-01
DHPN-16-01
DHPN-17-03
DHPN-16-02B
DHPN-16-04
DHPN-17-02
DHPN-16-03
DHPN-17-05
80
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0
1
kilometres
Scale: 1:31,000
2017 Drillhole
2016 Drillhole
Historic Trench
Trench
Coal Outcrop
Structure
Syncline - observed
Syncline - inferred
Anticline - observed
Anticline - inferred
Fault
Flat Bedding
Vertical Bedding
Panorama Coal Licence
Panorama Coal Licence
Groundhog Coal Licence
Land Reserve
10 m Topography Contour
Atrum Coal

TRPN-17-02

DHPN-17-04

DHPN-17-01

TRPN-17-01

DHPN-16-01

DHPN-17-03

DHPN-16-02B

DHPN-16-04

DHPN-17-02

DHPN-16-03

DHPN-17-05

N

0 1

kilometres

Scale: 1:30,000

Panorama North Coal Licence

Panorama Coal Licence

Groundhog Coal Licence

Land Reserve

2017 Drillhole

2017 Trench

2016 Drillhole

Historic Trench

Atrum Coal