

PART III

HYDROGEOLOGIC INFORMATION

1) Regional Hydrogeologic Characteristics

As described in Illinois State Geological Survey Circulars 192, 198, 207, 212, 222, 225, 232, 248, Coop 1, etc., other sources or personal knowledge provide the following required hydrogeologic information.

A) Describe the major and minor surficial aquifers of the permit area and adjacent areas.

RESPONSE: *Major surficial aquifers – None
Minor surficial aquifers – Scattered and discontinuous sand and gravel deposits occur throughout the shadow area in northeast to southeast trending belts.*

B) List the major and minor drift, bedrock valley, and buried bedrock valley aquifers of the area.

RESPONSE: *Major drift aquifers - None.*

Minor drift aquifers – Drift filled valleys associated with East Fork Shoal Creek and its larger tributaries have been found to contain thicker sand and gravel deposits. Drift deposits to the west and south east are generally thin with minimal water yields contained within the glacial till.

Major bedrock valley aquifers - None.

Minor bedrock valley aquifers – None.

Major buried bedrock valley aquifers – None.

Minor buried bedrock valley aquifers – None.

C) List the major and minor bedrock aquifers in the area.

RESPONSE: *Major bedrock aquifers - None.*

Minor bedrock aquifers – Pennsylvanian sandstones have been a source of water for small domestic and farm supply throughout the central and south central portions of the county.

- D) List the generalized water yield, supply, and potential use of these aquifers.

RESPONSE: *The proposed mine is located in the glaciated upland area of south-central Montgomery County. It is situated at the headwaters of the major drainage systems of the region. In this area, no specific geologic unit has been identified as a major surficial aquifer. According to Illinois State Geological Survey (ISGS) Circular 225, the best potential sources of groundwater are sand and gravel deposits in the major valley systems. However, many of the surficial sand and gravel deposits throughout the county are narrow and discontinuous. The bottomlands of the East Fork Shoal Creek drainage system have been found to contain thicker deposits and have produced sufficient yields for communities such as Nokomis to the north. Drift aquifers are generally thin with low yields throughout the permit area. The Pennsylvanian age sandstone bedrock aquifers can usually provide only enough water for individual domestic and farm supplies. Yields from wells completed in these formations are usually less than 10 gallons per minute with yields less than 5 gallons per minute common. The low permeability of the Pennsylvanian System rocks causes the water in the deeper formations to be highly mineralized. Therefore, some deeper bedrock aquifers may contain water whose quality is unsatisfactory without expensive treatment and, generally, are not developed. Recharge to these bedrock aquifers is primarily from precipitation which percolates into and through the overlying unconsolidated materials.*

2) Area Specific Hydrogeologic Characteristics

- A) 1) Provide a description of the areal and structural geology of the permit, shadow area and adjacent areas for the deeper of either the stratum immediately below the lowest coal seam to be mined, or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. Provide logs showing the lithologic characteristics including physical properties and thickness of each stratum and the location of groundwater where encountered. Provide location and elevations of test borings or core samplings on pre-mining land use map or other designated map.

RESPONSE: *The mine is located in the west-central part of the Illinois Basin. The principal coal seam with mineable thickness is the Herrin No. 6, and is a part of the Carbondale Formation of the Middle Pennsylvanian Age. All overlying strata up to the unconsolidated soils also belong to the Pennsylvanian System. The soils materials were deposited during the Pleistocene and range from 110 to 190 feet. The soils zone consists of clays, gravels, and discontinuous sand deposits and does not perform reliably as an aquifer.*

There are no major aquifers in the mine area or in the adjacent area. The shallower Pennsylvanian sandstones and limestones may be considered as minor aquifers with low permeability and porosity and are more mineralized

with depth. Yields are low in the range of 1 to 10 gallons per minute. Use of these resources has been limited to small domestic and farm supplies.

Regional dip for the Herrin No. 6 seam is to the east and southeast at less than one percent. However, variations occur locally in the strata as evidence from the borings and surrounding mines in the No. 6 Seam. The depth to the No. 6 Seam ranges from 450 vertical feet to 525 vertical feet with seam floor elevations ranging from 165 feet above mean sea level (MSL) in the northwest corner of the shadow area and an elevation of 64 feet above MSL in the east.

The Herrin No. 6 seam is overlain by a black shale regionally identified as the Anna Shale. The thickness of the Anna Shale is zero to 6 feet as found in the corehole data. The Brereton Limestone is found as the next unit above the Anna Shale. This limestone is described as hard. It ranges in thickness from zero to 16 feet.

The immediate floor of the Herrin No. 6 seam is described as claystone or underclay. This material is clay rich and is non-calcareous. The thickness ranges from 0 to 3 feet. Beneath this material, the floor material grades to claystone with limestone nodules and then limestone.

The locations of the boreholes drilled within the proposed shadow boundary area and the previously approved shadow boundary area are shown on Map 4 – Hydro-Geological Map. The boreholes were drilled and logged by Goff and Pruitt Drilling, Inc., Magnum Drilling Services, Inc. and Hawkey & Kline Coring & Drilling, Inc. Lithological logs are shown in Attachment III.2.A.1 – Boring Logs.

- 2) Provide chemical analyses of each stratum down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining.

The analyses shall identify those strata that may contain acid or toxic-forming or alkalinity-producing materials and determine their content.

RESPONSE: *A detailed acid/base account has been generated from Corehole 08-03-17-04. Corehole 08-03-17-04 was drilled in the adjacent shadow area. The results are shown in Attachment III.2.A.2 – Acid Base Accountability.*

- 3) Provide coal seam(s) name and number and an analysis of the coal seam(s) as to total sulfur and pyritic sulfur. On the pre-mining land use, operation, or other designated map show all coal crop lines and the strike and dip of the coal to be mined.

RESPONSE: *The coal seam to be mined is the Herrin No. 6 Seam. Corehole 08-03-17-04 coal quality yielded the following results.*

Herrin No. 6 Seam Sulfur Analysis

<i>Pyritic Sulfur</i>	<i>2.14% Dry</i>
<i>Organic Sulfur</i>	<i>1.97% Dry</i>
<i>Sulfate Sulfur</i>	<i><u>0.19% Dry</u></i>
<i>Total Sulfur</i>	<i>4.03% Dry</i>

Refer to Attachment III.2.A.3 - Sulfur Forms Result Sheet from Appalachian Laboratories, Inc. for analysis data sheets and more information. Refer to Map 11 – Coal Seam Structure Base Map for the coal seam contours and the strike and dip of the coal to be mined. No coal crop lines of the Herrin No. 6 Seam are located within the mine reserve area.

- 4) For room and pillar mining operations, the thickness and engineering properties of clay or soft rocks such as clayshale, if any, in the stratum immediately above and below each coal seam to be mined.

RESPONSE: *N/A. The Deer Run Mine is a longwall mining operation.*

- 5) Applicants may request that the Department waive in whole or in part the information required under questions 2 thru 4 above. Waiver requests should be submitted to the Department for review prior to submission of an application. Applications containing unapproved waiver requests may result in prolonging the application review or in application denial.

RESPONSE: *N/A. A waiver of the above information is not being requested.*

B) Ground Water Information

- 1) Provide the location on the hydrologic or other designated map, and ownership of existing wells, springs, and other ground water resources for the permit area and adjacent area.

RESPONSE: *Refer to Map 4 – Hydro-Geological Map for the location of known existing wells, springs, and other ground water resources within the proposed shadow boundary area and within 1/2 mile of the proposed shadow boundary area.*

Refer to Attachment III.2.B.1 – Surface Owners Water Well Survey in this application for a list of well owners and pertinent well information within the

proposed shadow boundary area and within ½ mile of the proposed shadow boundary area. A water well survey has been conducted for every known surface land owner within the ½ mile outside the shadow boundary area. Information collected from the individual landowners as received from this survey is included in this chart. Locations of the wells can be correlated from this chart to Map 4 – Hydro-Geological Map by using the Water Well alphanumeric ID. Landowners can also be identified by referencing the Parcel ID numbers in the chart to Map 2 – Identification of Interests.

- 2) Provide a description of seasonal ground water quality including at a minimum the following:

pH
total dissolved solids
hardness
alkalinity
acidity
sulfates
total iron
total manganese
total chlorides

RESPONSE: *Refer to Attachment III.2.B.2 – Groundwater Quality Summary for a summary of groundwater quality results that were collected and analyzed at the nearby surface facilities site of the Deer Run Mine. This is a collection of groundwater quality data that has been required to be monitored as per the requirements of Permit No. 399.*

- 3) Provide a description of seasonal ground water quantity including at a minimum the appropriate rates of discharge or usage and the elevation of potentiometric surface of the coal to be mined, and in each water-bearing stratum above the coal to be mined, and in each water-bearing stratum below the coal to be mined which may be potentially impacted.

RESPONSE: *The seasonal ground water quantity for the proposed shadow area should be very similar to the approved shadow area. The location of potentiometric surface of the coal to be mined is undetermined. Possible water bearing strata could be the Trivoli Sandstone located approximately 200± feet vertically above the No. 6 coal seam, the Gimlet Sandstone located approximately 100± feet vertically above the No. 6 coal seam, and the Anvil Rock Sandstone located approximately 35± feet above the No. 6 coal seam. ISGS data for the region indicates that the potential of water production is minimal and the potential for groundwater recharge is limited due to the extent of impermeable shales found above and below the sandstones and coal beds. Clayey till is deposited across the area, and the till is characteristically underlain by shale. This geologic setting impedes productive groundwater recharge, and adherently provides a*

hydrogeologic setting where both horizontal and vertical permeability are low to very low.

There are known water supply wells that are drilled into the Trivoli Sandstone. They are not, however, located within the proposed shadow boundary area. The locations of the wells are east of the proposed shadow area and are outside the limits of Map 4 – Hydro-Geological Map. The Trivoli Sandstone is identified on Map 5 – Trivoli Sandstone Map.

The primary water bearing unit within the unconsolidated deposits located above the bedrock stratum is a saturated sand layer that is generally encountered within 20 feet to 25 feet of the ground surface. Intermittent and discontinuous granular outwash deposits are present at deeper depths. These deposits are generally confined within a hard basal till.

Many residents within the proposed shadow boundary area and the adjacent areas receive their primary water supply from rural and municipal water systems. Of the 112 known groundwater wells within the proposed shadow boundary and half mile buffer, the water uses are known for 75 wells through returned well questionnaires from property owners. Majority of the well questionnaires designated multiple uses per well. Approximately half (41) of the wells are used for drinking water, 33 used for bathing, 36 for stock watering, and 59 for garden watering. Refer to Attachment III.2.B.1 – Surface Owners Water Well Surveys for a complete list of groundwater wells and notes on uses. Refer to Attachment III.2.B.1.A – Table of Water Well Usage for breakdown of each water wells multiple uses.

C) Surface Water Information

- 1) Provide the name, location, ownership, and description of all surface water bodies, lakes, streams, impoundments, and springs within and adjacent to the proposed permit and shadow areas. Provide the location of any discharge or drainage into any surface water bodies listed above.

RESPONSE: *The location of the proposed mining area is within the upper reaches of larger watersheds and provide varied physical relief. The physical ground survey of the shadow area as well as the review of aerial photographs of the area indicates that one impoundment of more than 20-acre feet is located over the area planned for subsidence. The water reservoir, known as Coffeen Lake, is located over the Eastern edge of the projected mine panels. Refer to Map 2 – Identification of Interests for ownership information. The lake is utilized as a cooling reservoir for the nearby Coffeen Power Station. This body of water does not serve as a significant water source for any public water supply system.*

Streams above the proposed shadow areas are considered to be intermittent and are charged by runoff from precipitation events. In addition, there are small farms ponds within and adjacent to the proposed shadow area. Refer to Map 2 – Identification of Interests for ownership information for ponds within and adjacent to the proposed shadow area. Refer to Map 4 – Hydro-Geological Map for drainage locations into and out of surface water bodies within the proposed shadow area and the adjacent areas.

There are no known springs within or adjacent to the proposed shadow area.

2) Provide for surface water bodies listed under 2)(c)(1) above information on surface water quality and quantity sufficient to demonstrate seasonal variation and water usage.

a) Water quality description shall include at a minimum, baseline information as follows:

pH
total suspended solids
total dissolved solids
alkalinity
acidity
sulfates
total iron
total manganese
total chlorides

RESPONSE:

No known public water supplies in a surface water body exist within the proposed shadow boundary area. Water usage from surface water bodies within the proposed shadow boundary area is expected to be minimal and limited to domestic animal drinking water and recreational purposes.

b) Water quantity description shall include at a minimum base information on seasonal flow rates.

RESPONSE: *Streams within the proposed shadow area only flow in direct response to precipitation. Thus, the flow rates vary depending on the size of the watershed, antecedent moisture conditions, and the amount of precipitation.*

D) Protection of Hydrologic Balance

1) The applicant shall provide a determination of the probable hydrologic consequences, (PHC) on the proposed permit area, proposed shadow area and adjacent areas with respect to the hydrologic regime and water quality

and quantity in surface and ground water systems under all seasonal conditions. The determination of PHC shall include findings on the following:

- a) Will the proposed operations have adverse impacts to the hydrologic balance;

RESPONSE: *No surface disturbance is proposed by this application. The impacts to the hydrologic balance within the proposed shadow boundary area are similar to the impacts addressed in the previously approved shadow area in Permit No. 399.*

Underground Mining Operations Impacts to Surface Water

High extraction mining in the proposed shadow area can be expected to cause surface subsidence as detailed in the subsidence control plan contained in Part IV.3.B. of this application. Although changes in the surface elevations will occur, adverse impacts to the quantity and quality of surface water in the shadow area and adjacent area are not anticipated.

The shadow area topography is generally characterized by gently rolling terrain with several morainal hills throughout portions of the permit area. Surface elevations ranging from approximately 600 feet along the larger stream channels located in the western and eastern portions of the shadow area to over 600 feet at the crest of moraines between adjacent drainage courses in the western and eastern portions of the shadow area. The proposed mining area is located beneath the headwater reaches of the named and unnamed streams that drain the permit area. These streams exhibit dendritic drainage patterns and have relatively steep gradients typical of upland headwater drainages in the area. The proposed longwall panels are laid out in an east-west direction while the majority of the streams in the shadow area generally flow towards the south and southwest. Thus, the subsidence troughs generally will be oriented perpendicular and at angles to the direction of stream flow. This can be evidenced by an evaluation of Map 4 – Hydro-Geological Map. Bearcat Creek and the tributaries to Bearcat Creek located at the headwaters of the watershed mostly flow to the southwest. There are a couple of tributaries to Bearcat Creek located in the southern portion of the proposed shadow area that flow generally to the west. For these locations, the subsidence trough will be oriented parallel to the direction of stream flow. A portion of McDavid Branch located in the northeastern portion of the proposed shadow boundary area flows south into Coffeen Lake. The tributaries into Coffeen Lake located in the eastern portion of the proposed shadow boundary area generally flow to the east. For these locations, the subsidence trough will be oriented parallel to the direction of stream flow. Refer to Map 8 – Post Subsidence Contour Map for the subsidence trough locations in relation to existing streams located within the shadow boundary area.

Subsidence related changes in the shadow area topography can produce surface depressions with localized ponding of surface water or interception of ground water where the water table is near the surface. The proposed subsidence mitigation plan calls for re-establishing pre-mining drainage patterns by grading and/or tiling to drain areas of trapped or standing water.

Longwall and other high-extraction mining methods cause collapse, fracturing, bed separation, and bedding plane slips in the roof strata above the mined seam. The height of the disturbed zone depends on the thickness of the mined coal, geometry of the mined panel, the rate of mining face advancement, and the geological characteristics of the overburden. The area of disturbance above a high-extraction mining area is generally divided into four zones, based on the extent and type of disturbance. The four zones are: the zone of primary caving where the immediate roof collapses irregularly to fill the mined void; the fractured zone where strata breakage and bed separation occur along existing bedding planes; the continuous bending or deformation zone where strata between the fractured zone and the surface bend downward without breaking; and the surface zone where tensile strain at the surface causes shallow fractures to develop.

Subsidence effects on the quantity of surface water can be created by two mechanisms resulting from the full-extraction mining operations. These two mechanisms are the progression of cracking and caving of the bedrock above the mining area and surface cracking resulting from horizontal strains created by deformation within the subsidence trough. The combined height of the caved and fractured zones where changes in permeability due to subsidence occur has been described by various investigators to range from 30 to 60 times the thickness of the extracted seam. The lower end of this range is typical of areas where the overburden is composed of a high percentage of weak and more elastic strata similar to the geologic conditions at the Deer Run Mine. On the other hand, the upper end of this range was recorded only in mining with overburden composed entirely of brittle rock (limestone and sandstone). Therefore, considering the presence of mostly more elastic shales in the overburden, it is estimated that the impacts of subsidence on strata permeability would reach up to 40 times the mining height. Based on an average extraction height of 9 feet, this would indicate the zone of disturbance could reach 360 feet above the mine opening. Therefore, based on the thickness of the consolidated overburden in the permit area, the cracked and caved zone is not likely to reach the surface and cause loss of stream flow.

The other mechanism which could impact creek flow is surface cracking resulting from subsidence-induced strains due to deformation above the caved zone. Infiltration from the creek to the shallow ground water regime through the alluvial deposits along the streams already occurs. The occurrence of tensile cracks on the surface will not necessarily result in increased loss of flow

from the streams. Several studies of the impacts of subsidence on surface water bodies have indicated that the subsidence cracks are limited in depth by the development of compressive stresses replacing the tensile stresses that cause surface cracking. Development of this type of crack would be limited due to the thickness of the unconsolidated alluvium material. Further, the presence of the fine-grained sediments in the stream beds will hasten the process of sealing the cracks. The presence of over 400 feet of overburden between the surficial deposits and mined coal, composed of approximately 60% elastic rock types (shales, siltstones and claystones), will also limit the potential flow of water from the creek.

The proposed subsidence mitigation plan assures the re-establishing of pre-mining drainage patterns by grading and/or tiling to drain areas of trapped or standing water. Subsidence can also affect wells and ponds, by increasing the permeability of the strata and temporarily lowering water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore, the slight decrease of water levels after mining in some wells does not materially affect the post-mining water availability. Studies have indicated that aquifers in unconsolidated materials are not typically impacted by subsidence. Therefore, wells completed in the surficial deposits are not expected to be impacted by the planned subsidence mining.

All proposed underground mining will be below drainage, so no water from the mine voids will gravity flow into surface waters. During mining, pumpage from the mine to the surface may increase surface quantities but only marginally given the size of the receiving stream. Since the quantity will be only marginally increased during mining, any effect on quality will also be small. The net effect during mining, although marginal, will be similar to the effects caused by the surface activities (i.e. increased mineralization). After mining, no impacts to the surface water quality are anticipated.

Underground Mining Operations Impacts to Ground Water – No significant, detrimental impacts on drinking, domestic and residential water supplies are anticipated due to the proposed mining operations for several reasons. Although planned subsidence mining methods are proposed, the geologic conditions of the Deer Run Mine are favorable for limiting the impacts of any planned subsidence on both surface and ground water hydrology. The unconsolidated soil deposit which lies at the surface is composed of fine-grained materials consisting primarily of clay and silt with lesser amounts of sand. The soil thickness is generally from about 110 to 190 feet and the minimum thickness of the consolidated overburden between the mined coal and the bottom of the surficial deposits is approximately 310 feet. Based on the nature and thickness of the consolidated overburden in the permit area,

subsidence is not likely to have significant, long-term impacts on ground water supplies.

Numerous studies have been conducted to determine the effects of surface subsidence due to underground mining on unconsolidated and bedrock aquifers. Booth and Spande described the impacts of longwall mining the No. 6 Coal Seam in south-central Illinois. At the subject mine location, the coal seam was about 10 feet thick and was being mined at a depth of about 725 feet. The major aquifers above the mined coal seam included the Mt. Carmel Sandstone and alluvial and glacial sediments. The results of the study indicated some increase in permeability of the sandstone strata after undermining, and a temporary decrease in water levels of up to 36 feet. The water levels recovered gradually after the longwall face passed, and within a month returned to the approximate pre-mining levels. Other studies were conducted of a longwall mining operation in Saline County, Illinois where the No. 6 Coal Seam was 5.6 feet thick and about 400 feet below the ground surface. The studies concluded that the subsidence slightly increased the permeability of the Trivoli Sandstone aquifer, located approximately 213 feet above the mined coal. No impacts on permeability or water levels in the glacial drift aquifer were noticed. A third study was conducted of the impacts of a longwall mining operation on glacial and sandstone aquifers at a mine in western Illinois mining the No. 6 Coal Seam. The coal seam at this mine was 6.5 feet thick and the coal is overlain by 140 to 240 feet of bedrock and 70 to 160 feet of unconsolidated glacial sediments. The Trivoli Sandstone, a major aquifer in the area, is located about 150 feet above the mined coal. This study concluded that the subsidence increased the hydraulic conductivity of the Trivoli Sandstone by about one order of magnitude, and by two to three orders of magnitude in the shales. The study also found water levels in the glacial aquifers were increased due to the impacts of subsidence, and water levels in the sandstone decreased. It should be pointed out that the sandstone and shales for this latter case were within the caving and fracture zones described above.

Should subsidence affect a ground water supply, the impacts would be expected to be similar to the impacts described in the first two studies discussed above. Therefore, the potential impacts due to planned subsidence on water supply wells located above a mining panel in the bedrock aquifer could be a temporary lowering of water levels. The water levels should recover to pre-mining levels within a few weeks after subsidence occurs. The possibility of decreasing water levels after subsidence has occurred is typically caused by increasing permeability of the water bearing strata. However, the decrease in water level in most wells is compensated for by an increased well yield. Therefore, the slight decrease of water levels after mining in some wells does not materially affect the post-mining water availability. The studies have indicated that aquifers in unconsolidated materials are not typically impacted by subsidence, even if shallow bedrock aquifers are impacted. Therefore, wells completed in

the surficial deposits are not expected to be impacted by the planned subsidence mining.

- b) Are acid forming or toxic forming materials present that could result in contamination of surface and/or ground water supplies;

RESPONSE: *N/A. There is no surface disturbance proposed by this application.*

- c) Will the proposed operations result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent areas which is used for legitimate purposes; and

RESPONSE: *The proposed operations are not expected to contaminate, reduce or interrupt any underground or surface sources of water within the shadow boundary revision area or adjacent areas used for legitimate purposes.*

- d) What impact(s) will the proposed operations have on including, but not limited to the following parameters:

RESPONSE: *Since no surface disturbance is proposed by this permit revision, this section does not apply.*

- i) Sediment yield from the disturbed area;
 - ii) Acidity;
 - iii) Total suspended solids;
 - iv) Total dissolved solids;
 - v) Flooding or stream flow alterations;
 - vi) Availability of surface and ground water; and
- 2) The Department will review permit revision applications to determine whether a new or updated PHC determination will be needed. Prior to submission of a permit revision application, applicants must contact the Department for this determination. Sufficient information on the proposed revision must be submitted with the request for the PHC determination to allow the Department to make its determination.

RESPONSE: *Refer to the response given in Part III.2.D.1.a for an update to the Probable Hydrologic Consequences taking into account the proposed shadow boundary area and adjacent areas.*

- 3) Surface Water Monitoring Program
- a) Has an N.P.D.E.S. permit been applied for?
Yes X No _____

RESPONSE: *An NPDES Permit has been applied for and issued.*

- b) 1) Has an N.P.D.E.S. permit been obtained?
Yes X No _____

If yes, give the permit number, the date issued, the expiration date, and the number of discharge points monitored. If additional discharge points are proposed by this application, list discharge numbers. Locate on the Water Monitoring Map and number all discharge points for the proposed permit area.

RESPONSE: *NPDES Permit No. IL0078727 was originally issued on May 29, 2009. The permit expiration date is April 30, 2014. A renewal to the NPDES Permit has been applied for and is currently being processed by the Agency. The permit was issued for seven discharge points.*

No additional outlets are proposed by this permit application.

- 2) In accordance with 35 Ill. Adm. Code 406.101(b), is the applicant requesting that monitoring and reporting be on the basis of grab samples?
Yes X No _____

- c) Are N.P.D.E.S. reports to be submitted to satisfy the reporting requirements?
Yes X No _____

If yes, provide the NPDES monitoring program including sampling method, sampling frequency and parameters to be analyzed. If not, submit a proposed monitoring and reporting program. Discharge information sheet is given in Schedule A and/or form 2C or 2D. Schedule A should be completed for all proposed discharge points. An estimate of the expected discharge concentration for each listed parameter must be indicated (or marked N/A) and a basis for that estimation provided.

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

If ammonia is to be utilized in wastewater treatment, indicate the discharge(s) resulting from this treatment and provide an estimate

of the expected concentration (mg/l) of ammonia nitrogen (as N) from the discharge(s).

RESPONSE: *N/A. Ammonia will not be used for the treatment of wastewater.*

- d) Give a brief description of the water sampling and flow measurement equipment which will be used to monitor the discharges.

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

- e) List the name and address of the laboratories which will perform the effluent and ground water sampling analyses.

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

- f) Discuss the expected impact this mining operation will have on surface water flows and quality and the effect this will have on downstream water uses.

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

- g) Is this proposed mining area covered by existing IEPA Subtitle D permits?

Yes _____ No X

If yes,

- 1) List the permit number(s)

- 2) Do the proposed mining boundaries exactly coincide with IEPA permitted boundaries?

Yes _____ No _____

(If no, delineate the IEPA Subtitle D permitted boundaries on the Water Monitoring Map).

- h) Are the TDS related conditions requested under 35 Ill. Adm. Code 406.203 (from water quality requirements of

Subtitle 3 for the discharge of total dissolved solids, chloride, sulfate, iron and manganese)?

Yes _____ No X

If yes, provide the following:

- 1) Show that the discharge(s) will not cause an adverse effect on the environment in and around the receiving stream, by either:

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

- a) Demonstrating that the discharge will contain a concentration less than or equal to 3,500 mg/l sulfate and 1,000 mg/l chloride; or,

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

- b) through actual stream studies.

- 2) Show that the discharge(s) will not adversely affect any public water supply.

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

- 3) Provide a detailed discussion of how you intend to comply with the good mining practices of 35 Ill. Adm. Code 406.204.

RESPONSE: *N/A. No additional surface disturbance or sediment control structures are proposed by this revision application.*

- 4) Ground Water Monitoring Program

- a) Describe in detail a proposed monitoring plan that will measure the amount and duration of any changes to the ground water system resulting from the mining operation. Parameters to be monitored are given in Schedule B. Monitoring should be on a quarterly basis with reports due within one month of the end of each quarter as follows:

Quarter	Report Due
January, February, March	May 1

April, May, June
July, August, September
October, November, December

August 1
November 1
February 1

RESPONSE: *N/A. No additional surface disturbance is proposed by this revision application.*

- b) Provide a drilling log and completion information and/or a diagram of each well proposed as a monitoring well.

RESPONSE: *N/A. No new monitoring wells will be installed as part of this permit application.*

- c) Locate wells and springs, on or within 1/2 mile of the permit area and shadow area on a hydrologic map. If any of these wells are to be employed for monitoring, designate on hydrologic map and complete Schedule B.

RESPONSE: *Refer to Map 4 – Hydro-Geological Map for the location of wells located on and within 1/2 mile of the proposed shadow boundary area. Required monitoring of groundwater monitoring wells within the surface permit areas of the Deer Run Mine is covered in other permit applications.*

- d) Discuss any reported problems of maintenance, or ground water quantity and quality which have occurred at the wells and springs listed above.

RESPONSE: *There are no known or reported water quality problems that have occurred.*

- e) Will this operation have any discharges to, or pump water from abandoned underground mines?

Yes _____ No X _____

If yes, submit a detailed discussion.

- 5) Identify the general land uses of the watersheds upstream of the proposed permit area and any potential pollution sources which could significantly affect the stream quality at the mine area.

RESPONSE: *The upstream land uses include pasture, forest, cropland and rural residential. There are no known sources of pollution that could significantly affect stream quality. Runoff from agricultural fields could contain herbicides and pesticides used during the farming operations.*

- 6) Provide names and addresses of all public water supplies within ten miles of the proposed permit boundaries.

Name	Location	Distance from Permit Boundary	Type (Surface or Well)
<i>City of Hillsboro, IL</i>	<i>912 St. Louis St., Hillsboro, IL 62049</i>	<i>2.5 miles</i>	<i>Surface</i>
<i>Montgomery County Water Co.</i>	<i>P.O. Box 343, Hillsboro, IL 62049</i>	<i>2.0 miles</i>	<i>Surface</i>
<i>City of Litchfield</i>	<i>120 E. Ryder Street, Litchfield, IL 62056</i>	<i>7.0 miles</i>	<i>Surface</i>
<i>City of Witt</i>	<i>P.O. Box 281, Witt, IL 62094</i>	<i>9.0 miles</i>	<i>Well</i>
<i>City of Fillmore</i>	<i>222 S. Logan, P.O. Box 106 Fillmore, IL 62032</i>	<i>9.0 miles</i>	<i>Well</i>

RESPONSE: *The surface facilities of the Deer Run Mine are served with public utility water by the City of Hillsboro. The area within 10 miles of the permit area is served with public utility water provided by the sources listed above. The source of the water supply for the City of Hillsboro and for a portion of Montgomery County Water Company is Glenn Shoals Lake, in which the intake is located approximately 2.5 miles north of the permit area. Lake Hillsboro is a backup water supply for the City of Hillsboro and the intake is located 2.1 miles north of the permit area. The source of water for the City of Litchfield and a portion of Montgomery County Water Company is Lake Lou Yaeger, which is located approximately 7 miles northwest of the permit area. The source of water for the City of Witt and a portion of Montgomery County Water Company are groundwater wells drilled within the unconsolidated deposits and are located approximately 9 miles northeast of the permit area. The source of water for the City of Fillmore are groundwater wells drilled within the unconsolidated deposits and are located approximately 9 miles east of the permit area. There are no other known public water supply sources within ten miles of the permit boundary.*

- 7) Discuss the possible effects that this mining operation will have on the above-listed public water supplies and explain what precautions will be taken to prevent an adverse impact from occurring.

RESPONSE: *No impacts are expected because the surface and groundwater supplies identified above are not located within the direct watershed of the permit area. This permit application is for the expansion of the shadow boundary to permit planned subsidence induced by longwall mining. None of the surface water or groundwater resources identified are within the proposed shadow boundary*

expansion area or within 1/2 mile of the proposed shadow boundary expansion area.

- 8) Locate on the hydrologic map or other designated map all private water supplies and private water wells within 1/2 mile of permit area and within the permit and shadow areas itself.

RESPONSE: *Refer to Map 4 – Hydro-Geological Map for are all known private water supplies and private water wells within 1/2 mile of the proposed shadow area.*

- 9) Locate on the hydrologic map existing surface and ground water discharges into underground mines.

RESPONSE: *There are no known existing surface or ground water discharges into underground mines.*

- 10) Provide the locations of water supply intakes for current users of surface water flowing into, out of, and within a hydrologic area defined by the Department.

RESPONSE: *With the exception of Lake Hillsboro discussed previously, there are no known water supply intakes for current users of surface water flowing into, out of, and within a hydrologic area defined by the Department. Area domestic water use through the Public Service District is sourced from the Glenn Shoals Lake.*

ATTACHMENT III.2.A.1
BORING LOGS



**HILLSBORO
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07-03-03-01

Lithology Log

Received Electronically
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Aug 26, 2020
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Land Reclamation Division

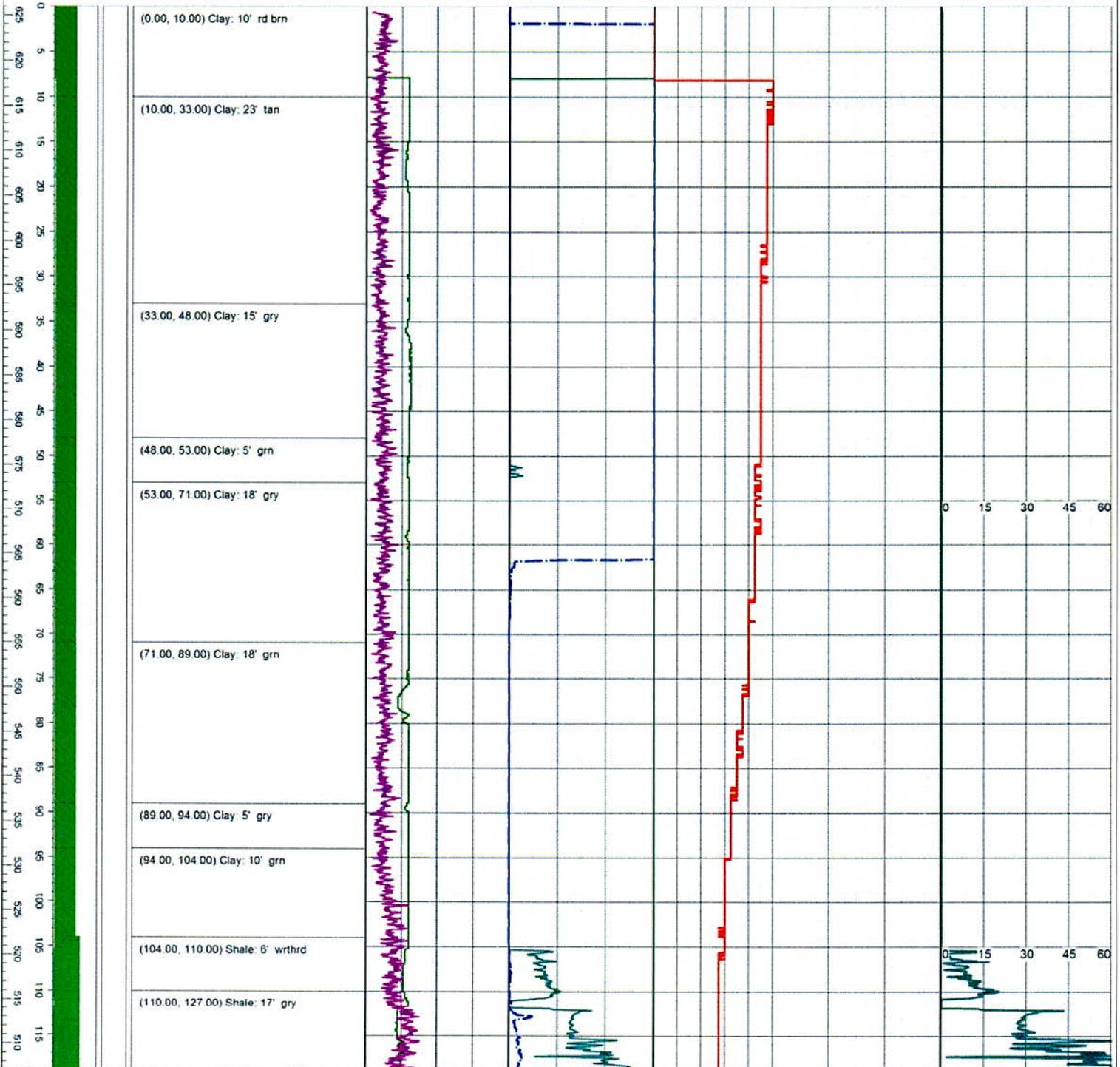
Easting: 2510447
Northing: 880238
Township: 7N
Range: 3W
Section: 3
County: Montgomery

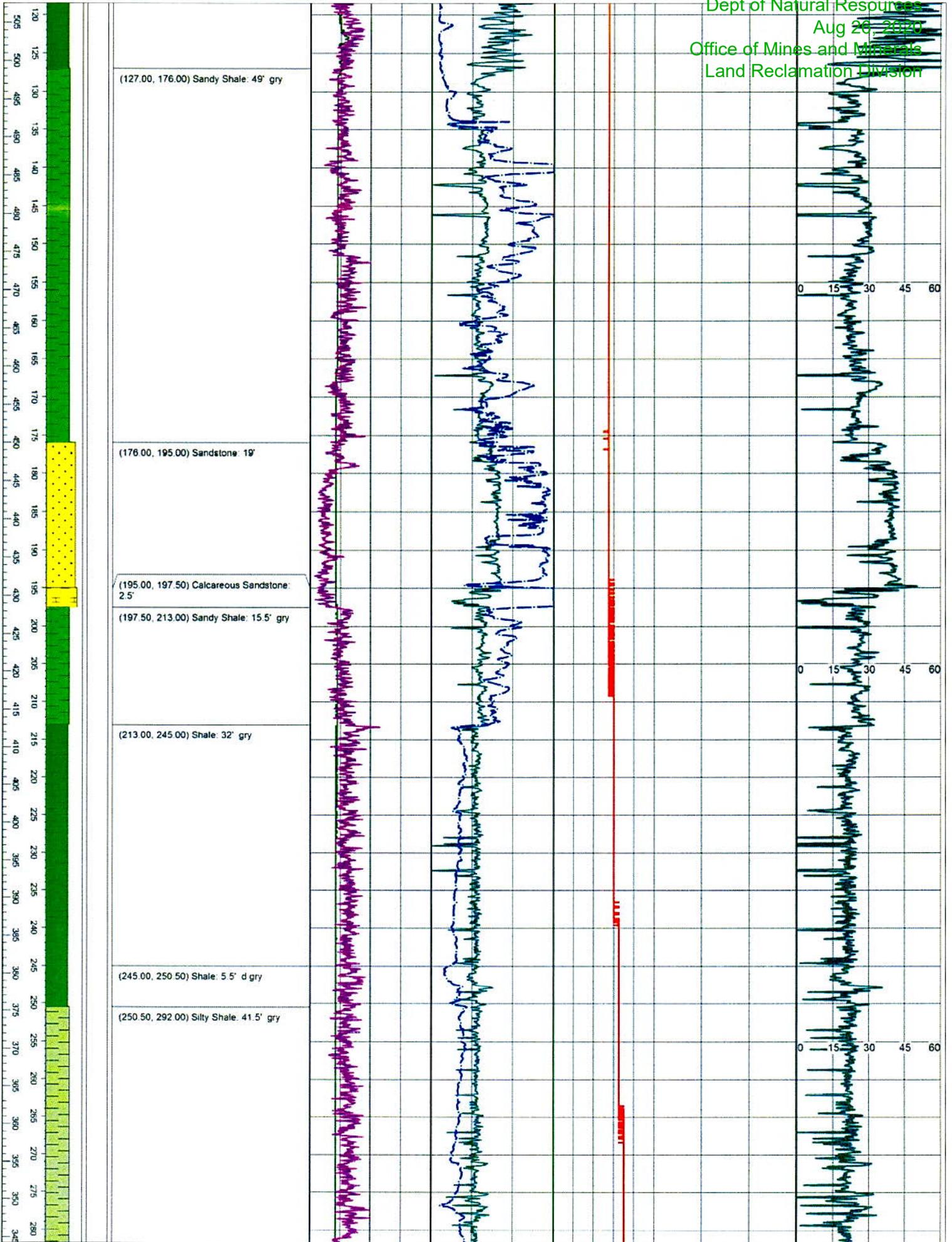
Total Depth (Driller): 530
Total Depth (Logger): 529.44
Elevation (GS): 626
Casing Depth: 112
Core Interval:

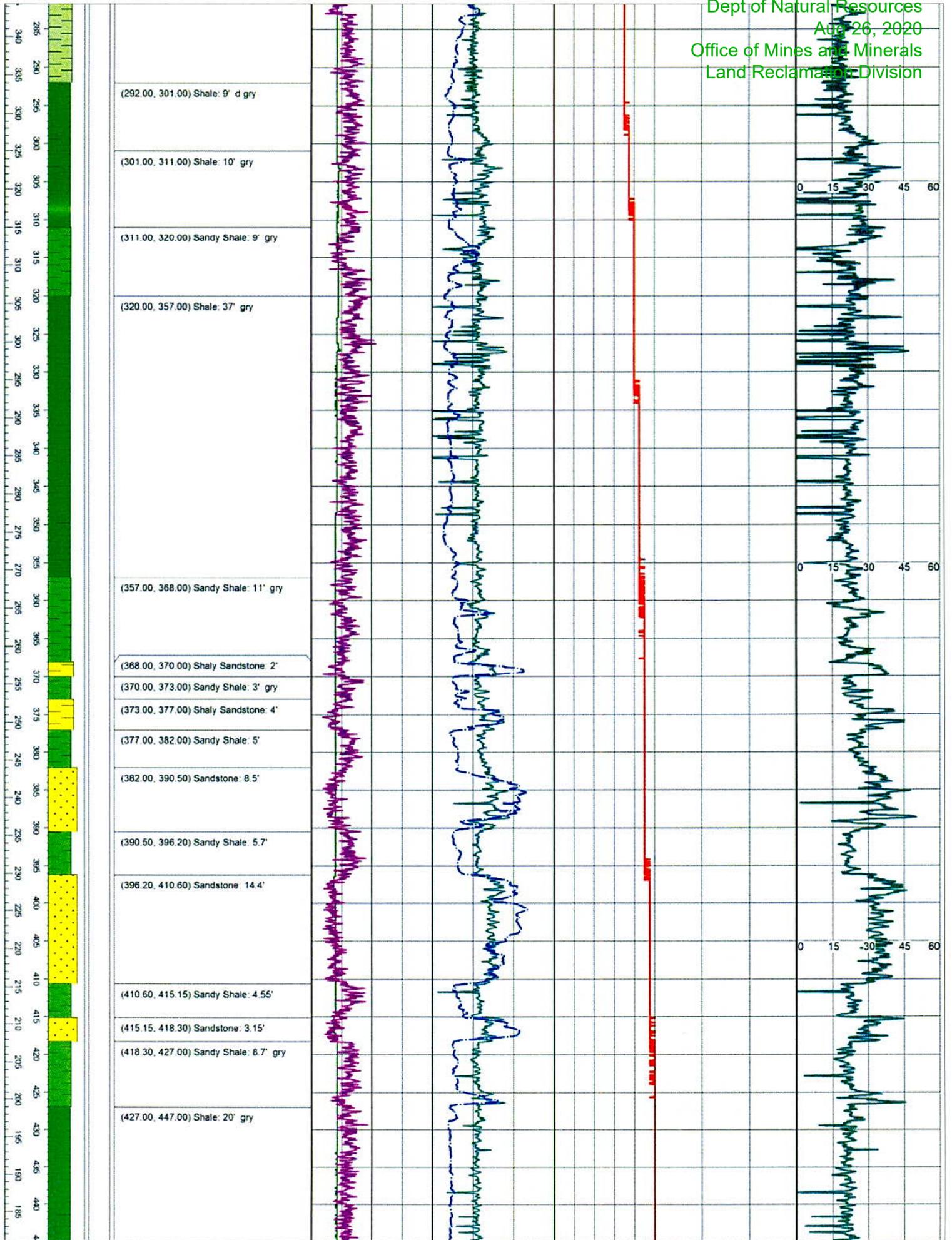
Drilled By: Hawkey & Kline
Cuttings Logged By: Driller, JTP
Core Logged By: JT Padgett
Geophysical Log Operator: Cardno
Completion Date: 12/19/2013

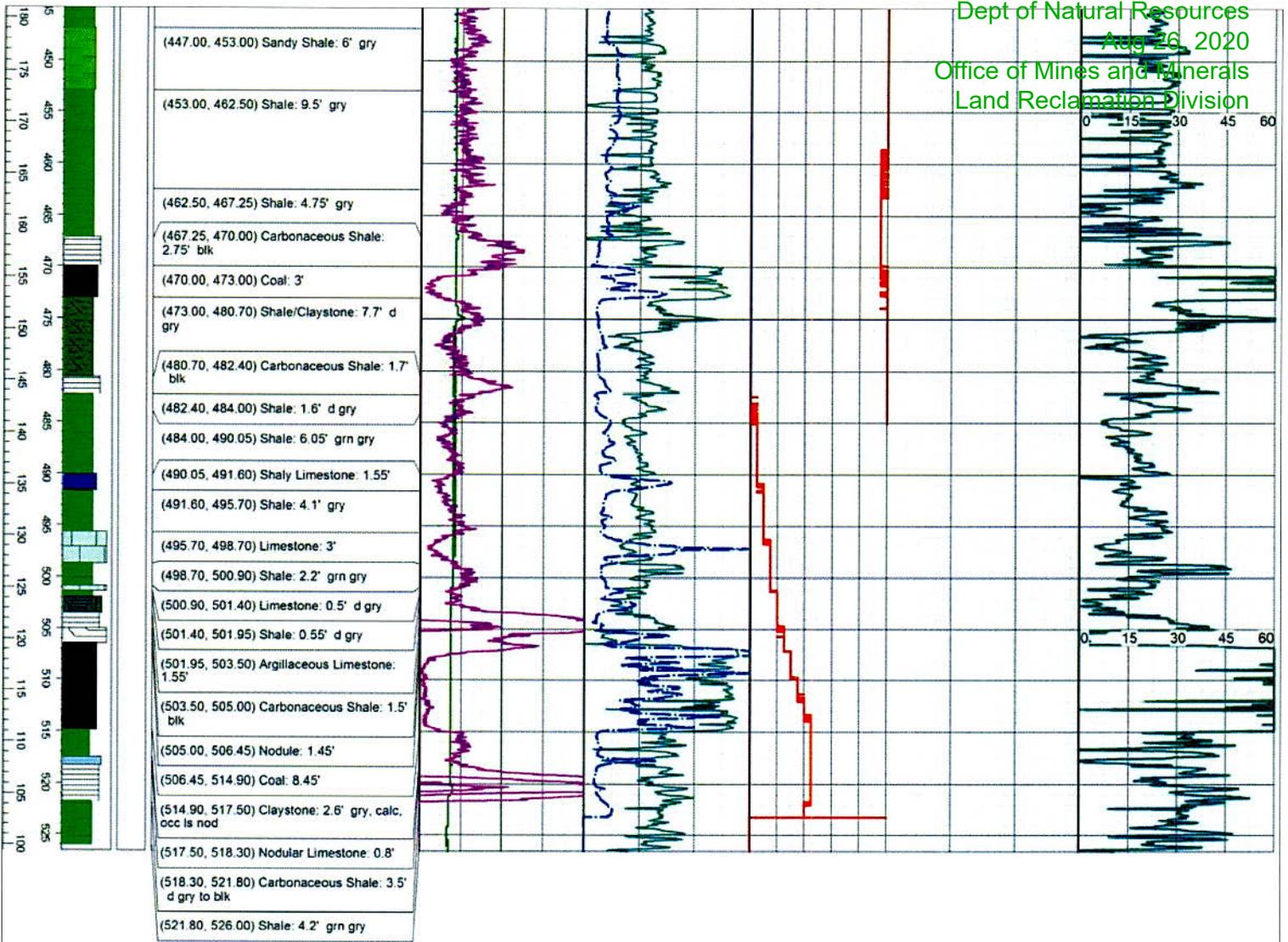
Notes:

Elevation Depth (Feet)	Casing/Coored Int	Lithology	Natural Gamma	Density	Temp	Est. UCS (psi)	Porosity
			0 — 500 Caliper 4 — 8	3.0 — 1.0 Resistivity 0 — 100	-1 — 1	100 — 100,000	0 — 60











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07-03-04-02

Lithology Log

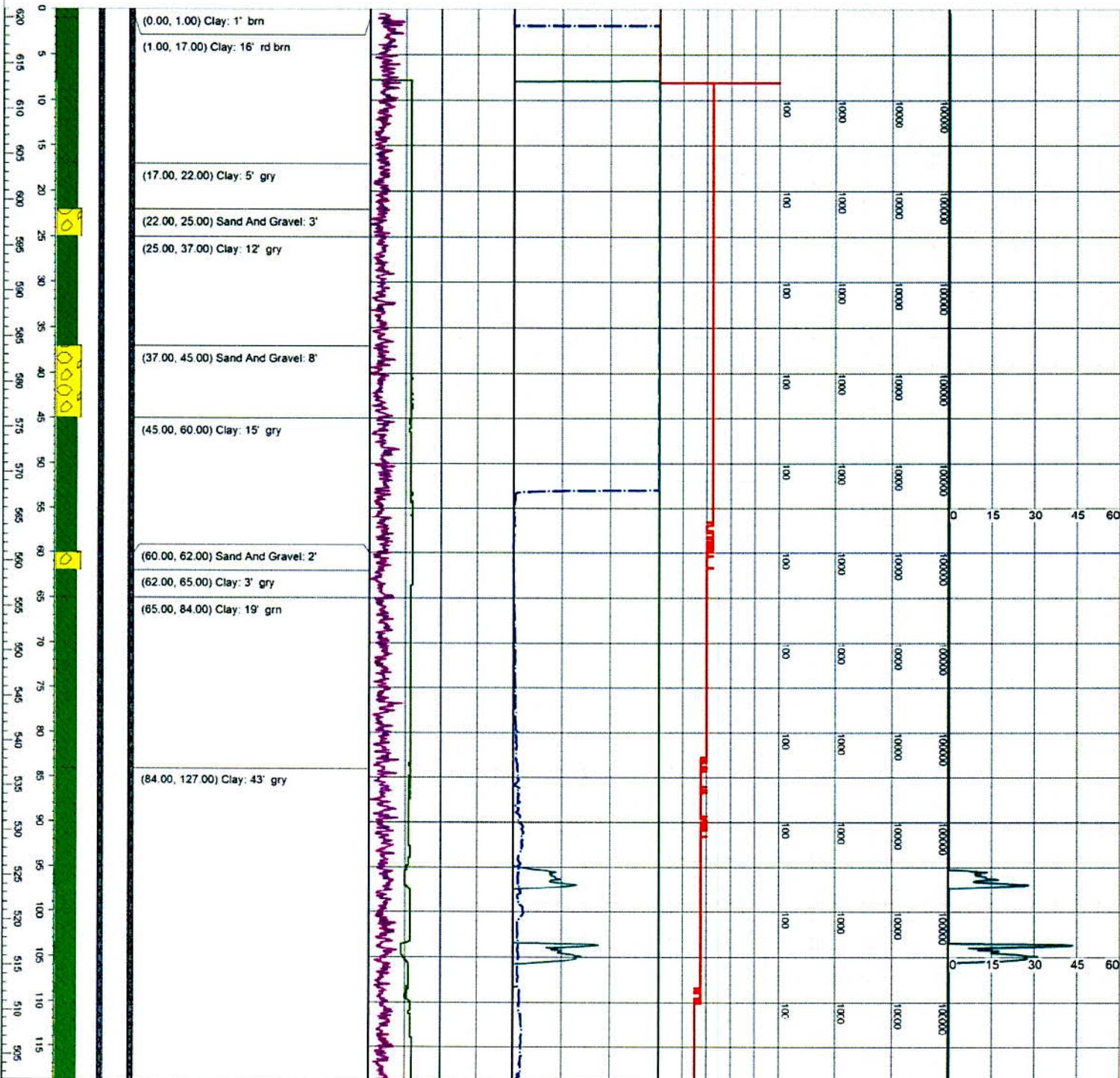
Easting: 2506563
 Northing: 877447
 Township: 7N
 Range: 3W
 Section: 4
 County: Montgomery

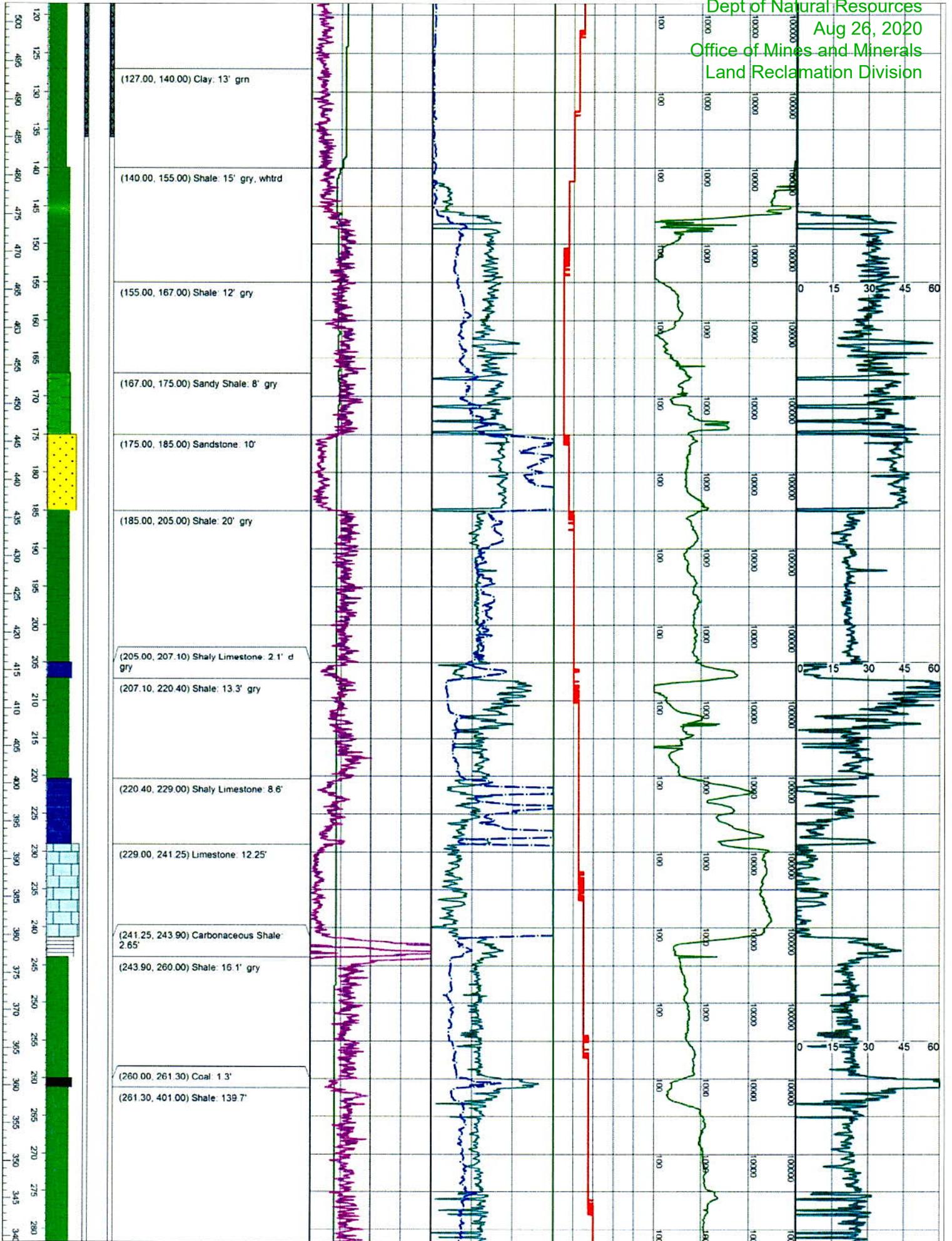
Total Depth (Driller): 537
 Total Depth (Logger): 538.12
 Elevation (GS): 621
 Casing Depth: 146
 Core Interval: 504-524

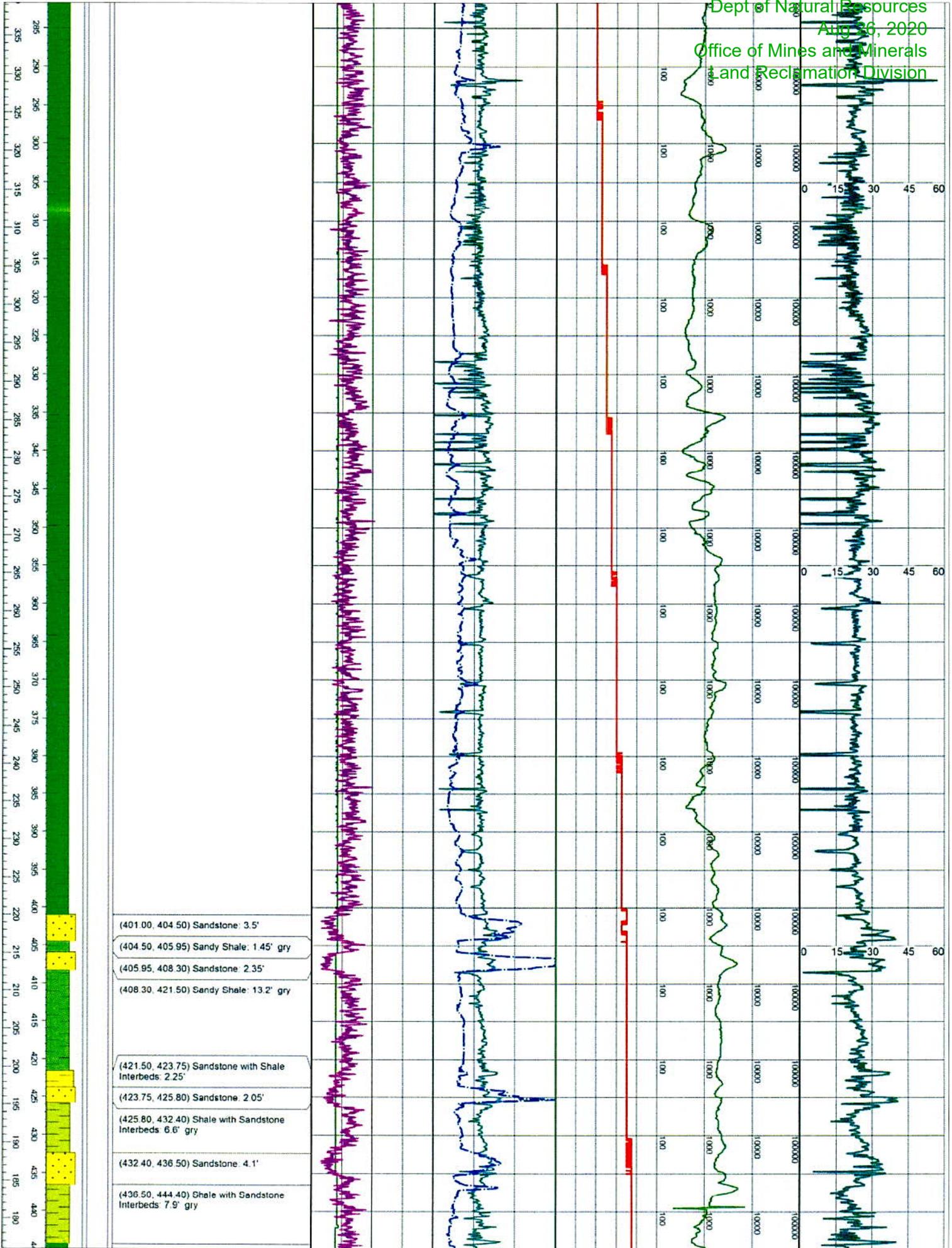
Drilled By: Hawkey & Kline
 Cuttings Logged By: Driller, JTP
 Core Logged By: JT Padgett
 Geophysical Log Operator: Cardno
 Completion Date: 10/28/2013

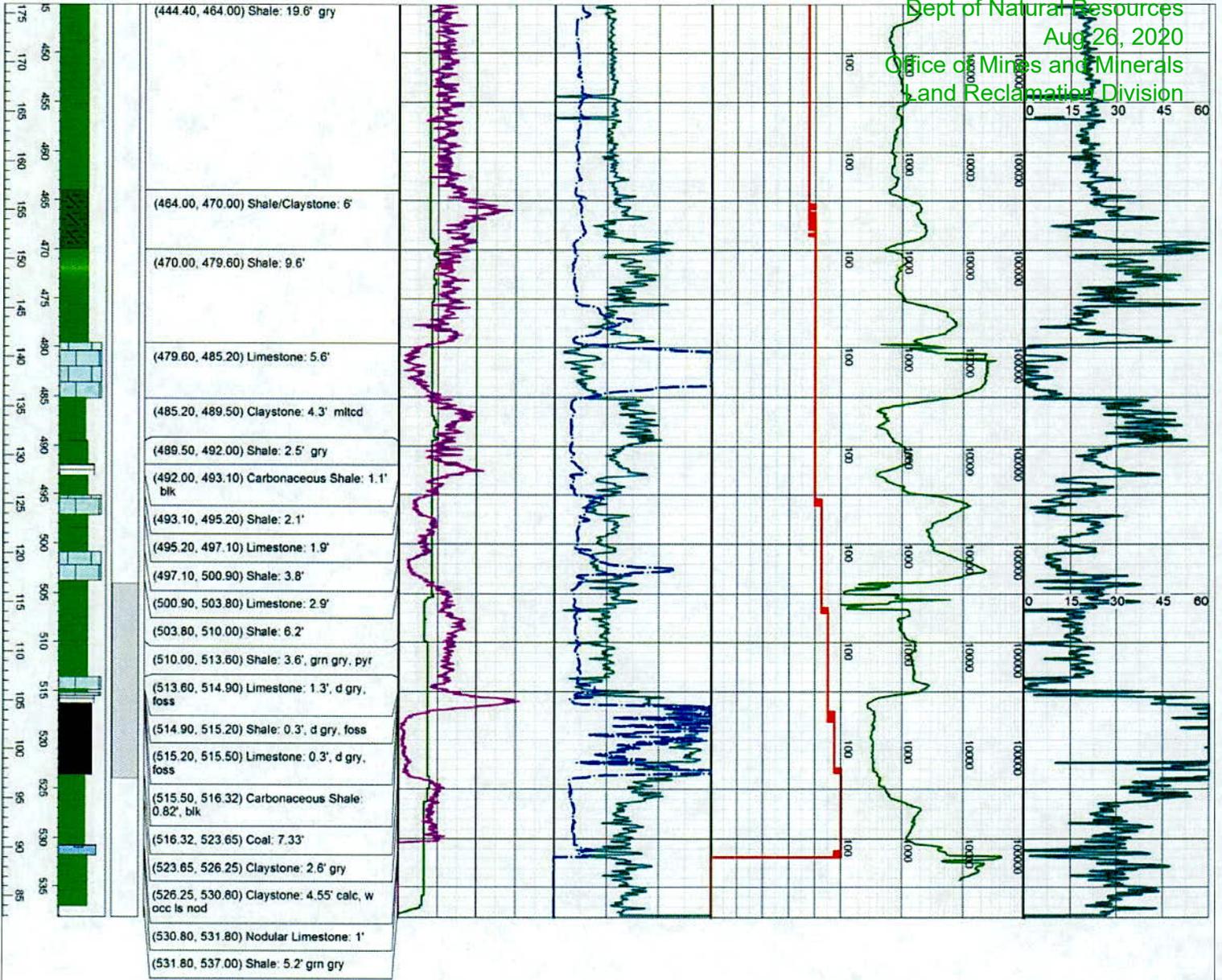
Notes:

Elevation	Depth (Feet)	Casing/Coored Int	Lithology	Natural Gamma 0 ————— 500 Caliper 4 ————— 8	Density 3.0 ————— 1.0 Resistivity 0 ————— 100	Temp -1 ————— 1	Est. UCS (psi) 100 ————— 100,000	Porosity 0 ————— 60
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HILLSBORO
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07-03-06-01

Lithology Log

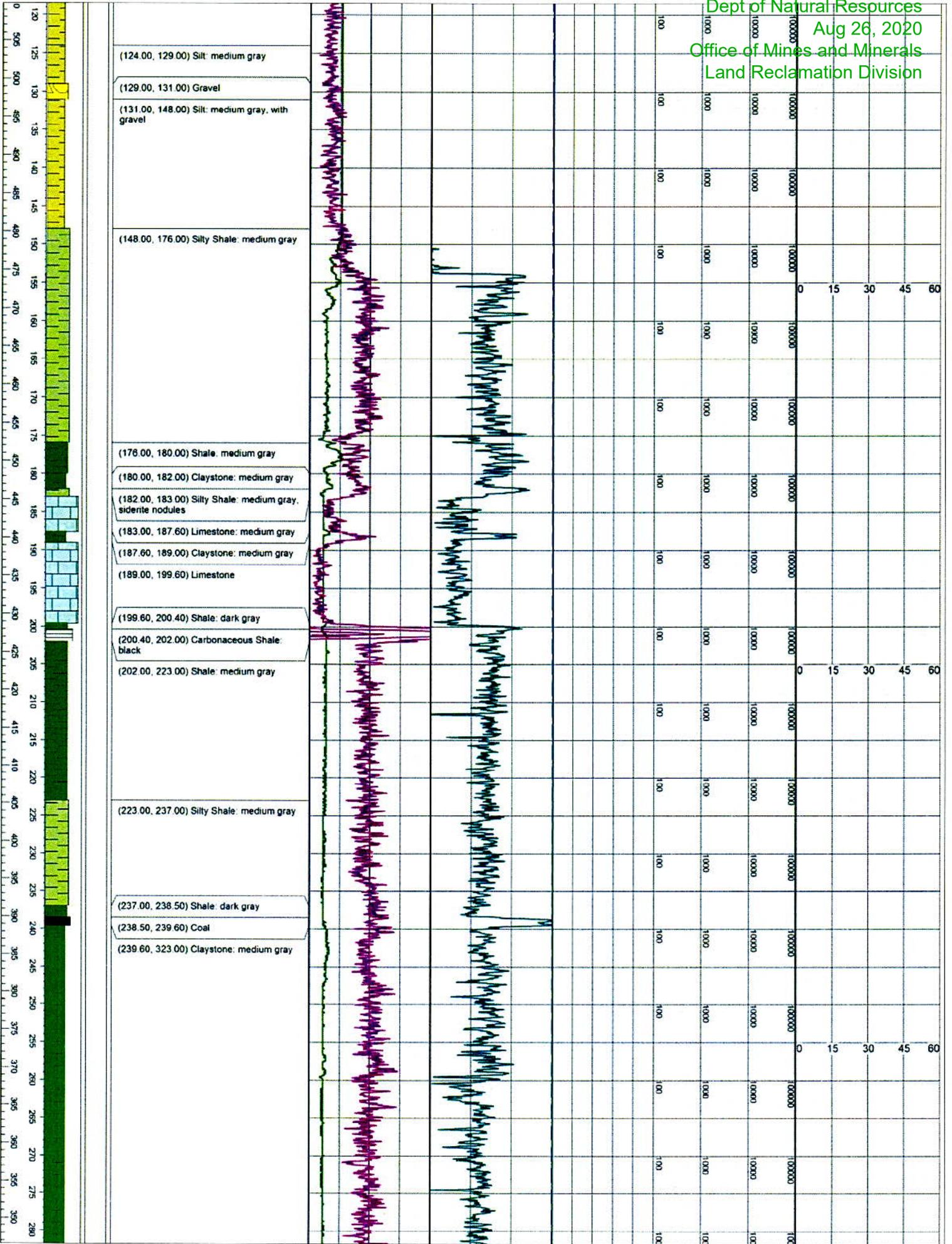
Easting: 2,497,229.810'
 Northing: 881,068.507'
 Township: 3W
 Range: 7N
 Section: 6
 County: Montgomery

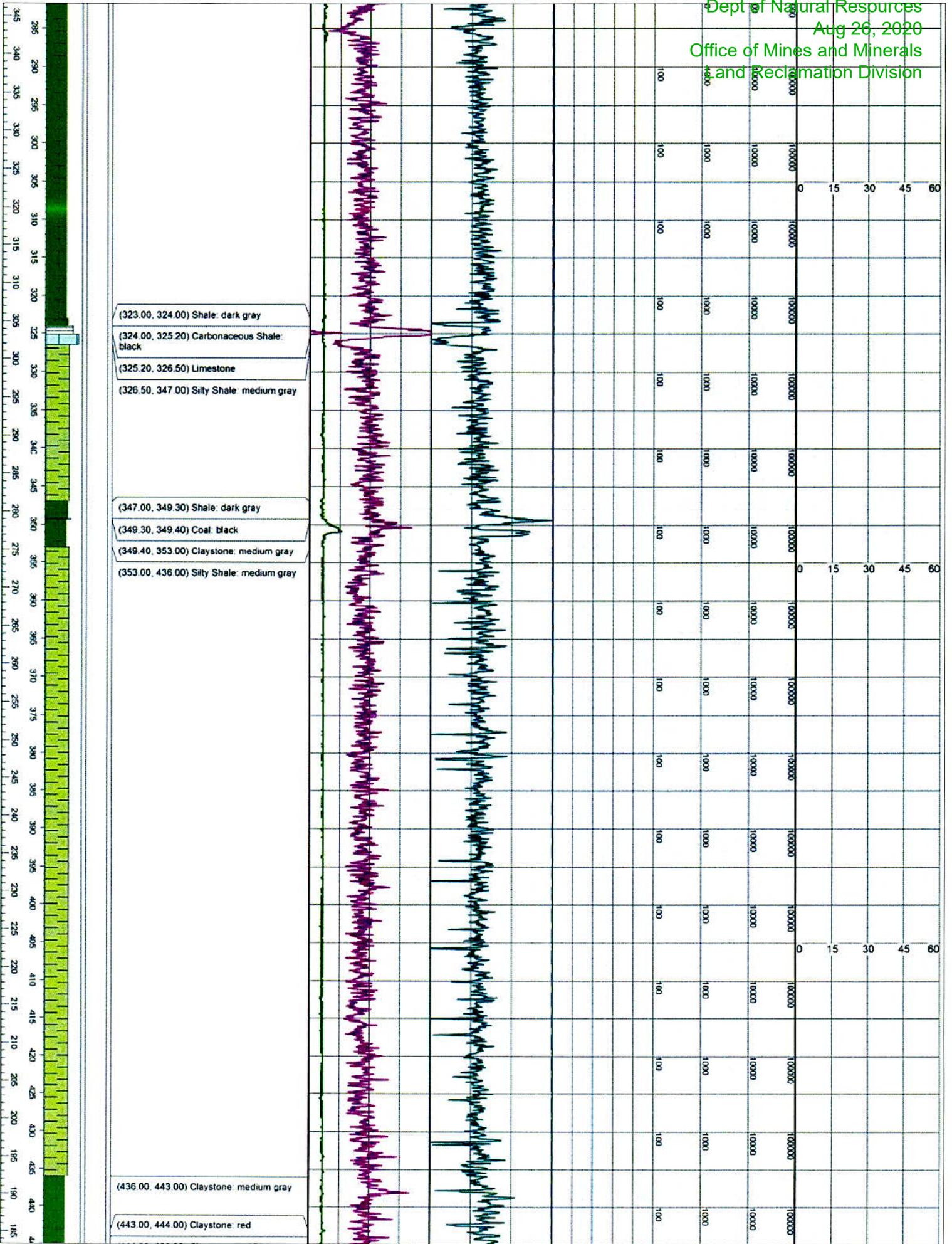
Total Depth (Driller): 520.1'
 Total Depth (Logger): 522'
 Elevation (GS): 628.350'
 Casing Depth: 153'
 Core Interval: 487' - 520.1'

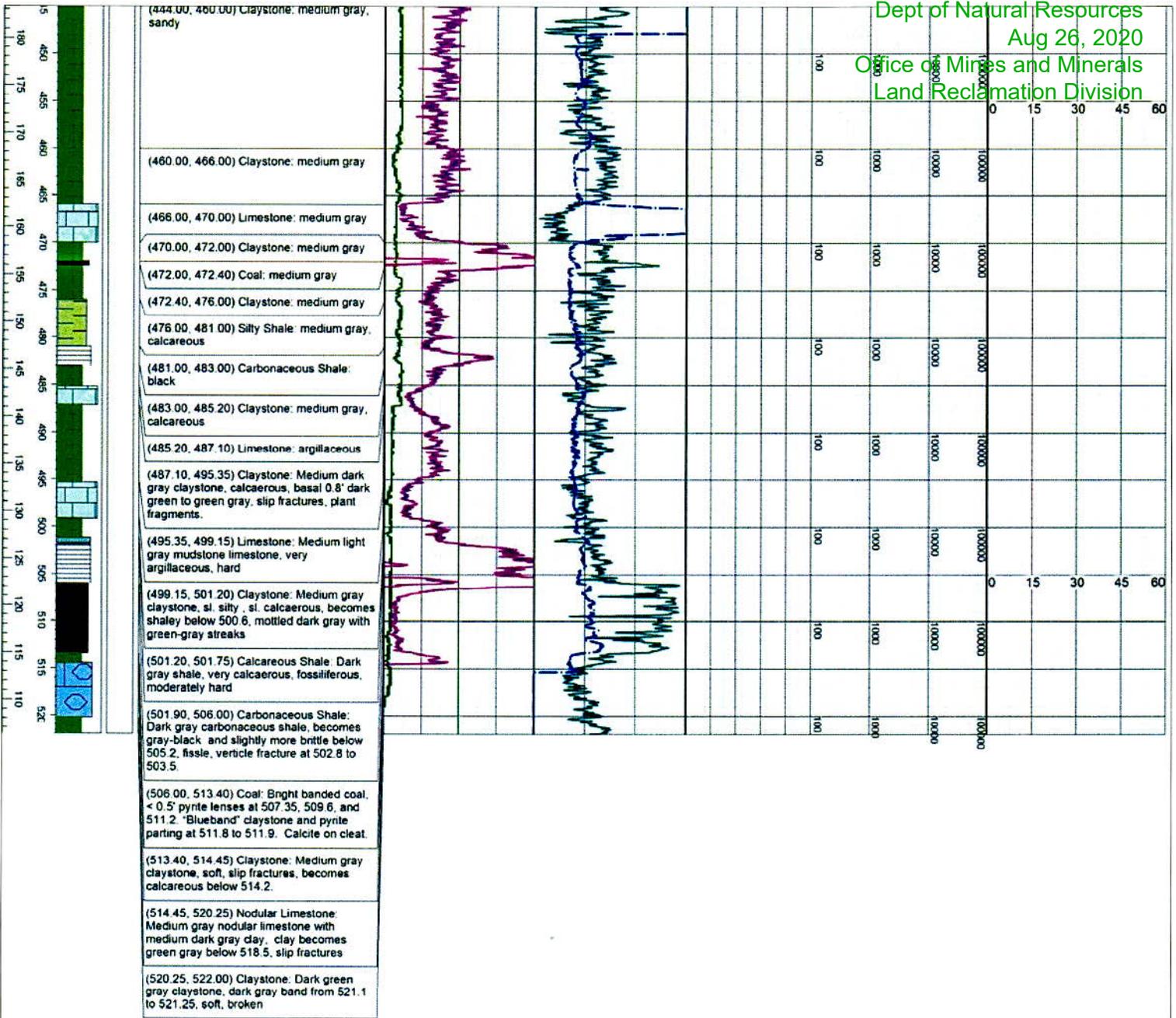
Drilled By: **Magnum Drilling**
 Cuttings Logged By: **Driller**
 Core Logged By: **J. T. Padgett**
 Geophysical Log Operator: **GLS**
 Completion Date: **1/24/2007**

Notes: Core adjusted 1.95' @ coal to match e-log











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07-03-07-103

Detail Lithology Log with Estimated UCS

Easting: 2495314.57
 Northing: 873556.99
 Township: 7N
 Range: 3W
 Section: 7
 County: Montgomery

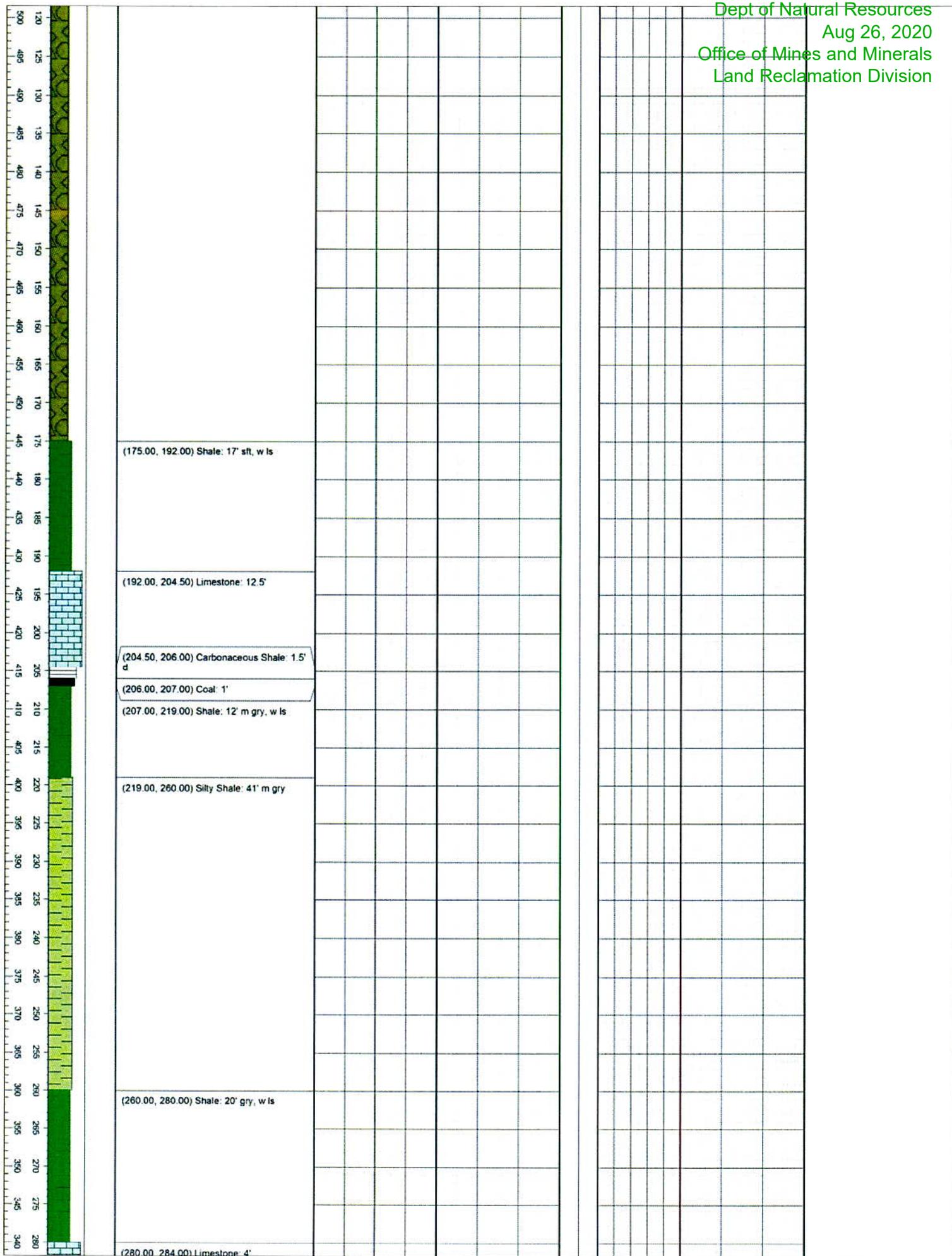
Total Depth (Driller): 517
 Total Depth (Logger):
 Elevation (GS): 620
 Casing Depth:
 Core Interval: 481 - 517

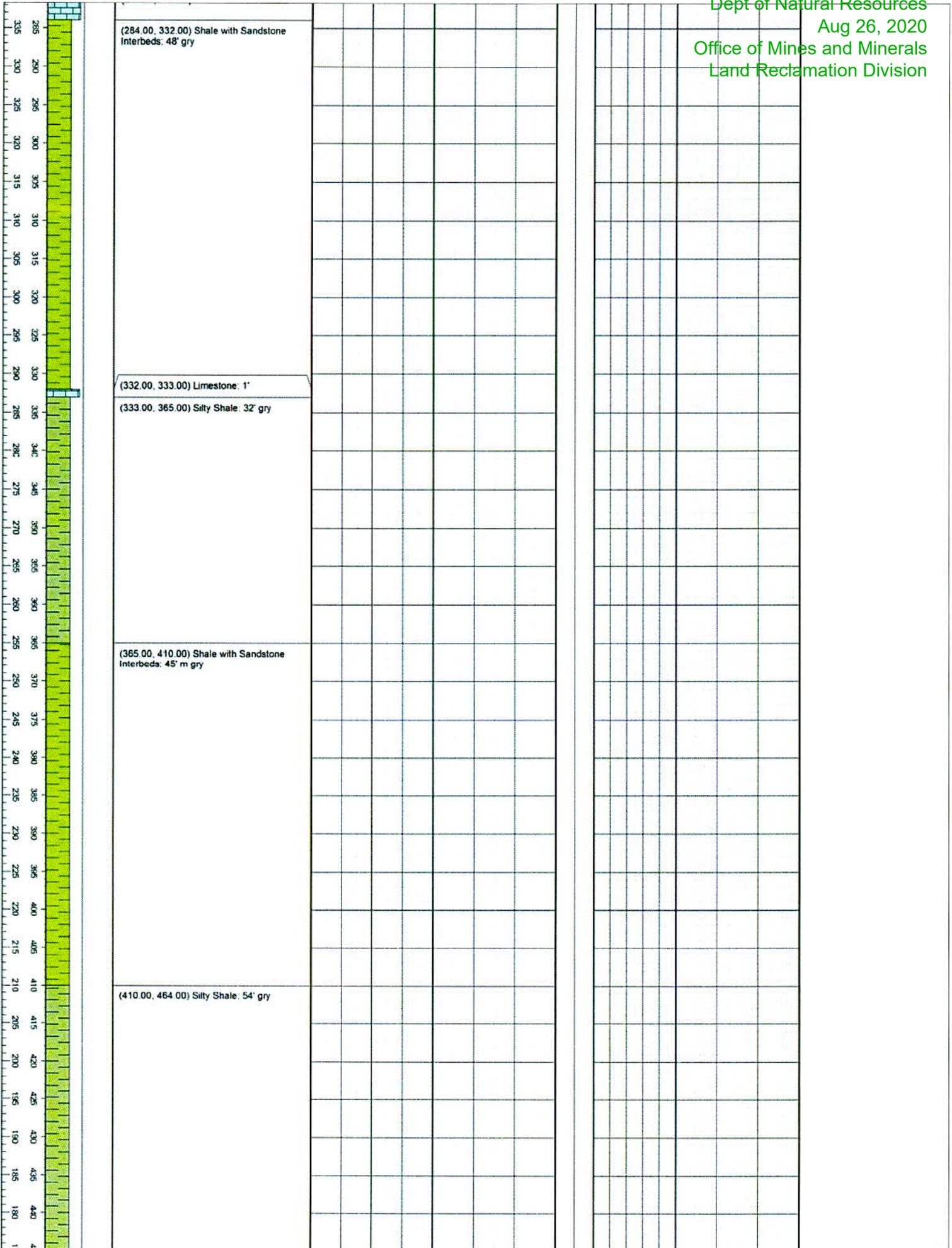
Drilled By:
 Cuttings Logged By:
 Core Logged By:
 Geophysical Log Operator:
 Completion Date:

Notes: Consol 103BB

Elevation Depth (feet)	Breaks	Lithology	Natural Gamma	Density	RQD (%)	Sonic Velocity	
			Caliper	Resistivity		NIOSH UCS (psi)	McNally UCS (psi)
0			0 — 500	3.0 — 1.0	0 — 100	160 — 40	100,000
4			4 — 8	0 — 100	0 — 100	100 — 100,000	100,000









**HILLSBORO
 ENERGY
 LLC**

07-03-08-108

Detail Lithology Log with Estimated UCS

Easting: 2498934.2	Total Depth (Driller): 516.5	Drilled By: Hoskins
Northing: 876191.19	Total Depth (Logger):	Cuttings Logged By:
Township: 7N	Elevation (GS): 616	Core Logged By:
Range: 3W	Casing Depth: 198	Geophysical Log Operator:
Section: 8	Core Interval: 486 - 516.5	Completion Date: 5/30/1962
County: Montgomery		

Notes: Consol 108BB

Elevation Depth (Feet)	Breaks	Lithology	Natural Gamma	Density	RQD (%)	Sonic Velocity
			Caliper	Resistivity	RMR	NIOSH UCS (psi) McNally UCS (psi)





HILLSBORO
 ENERGY
 LLC

07-03-09-01

Lithology Log

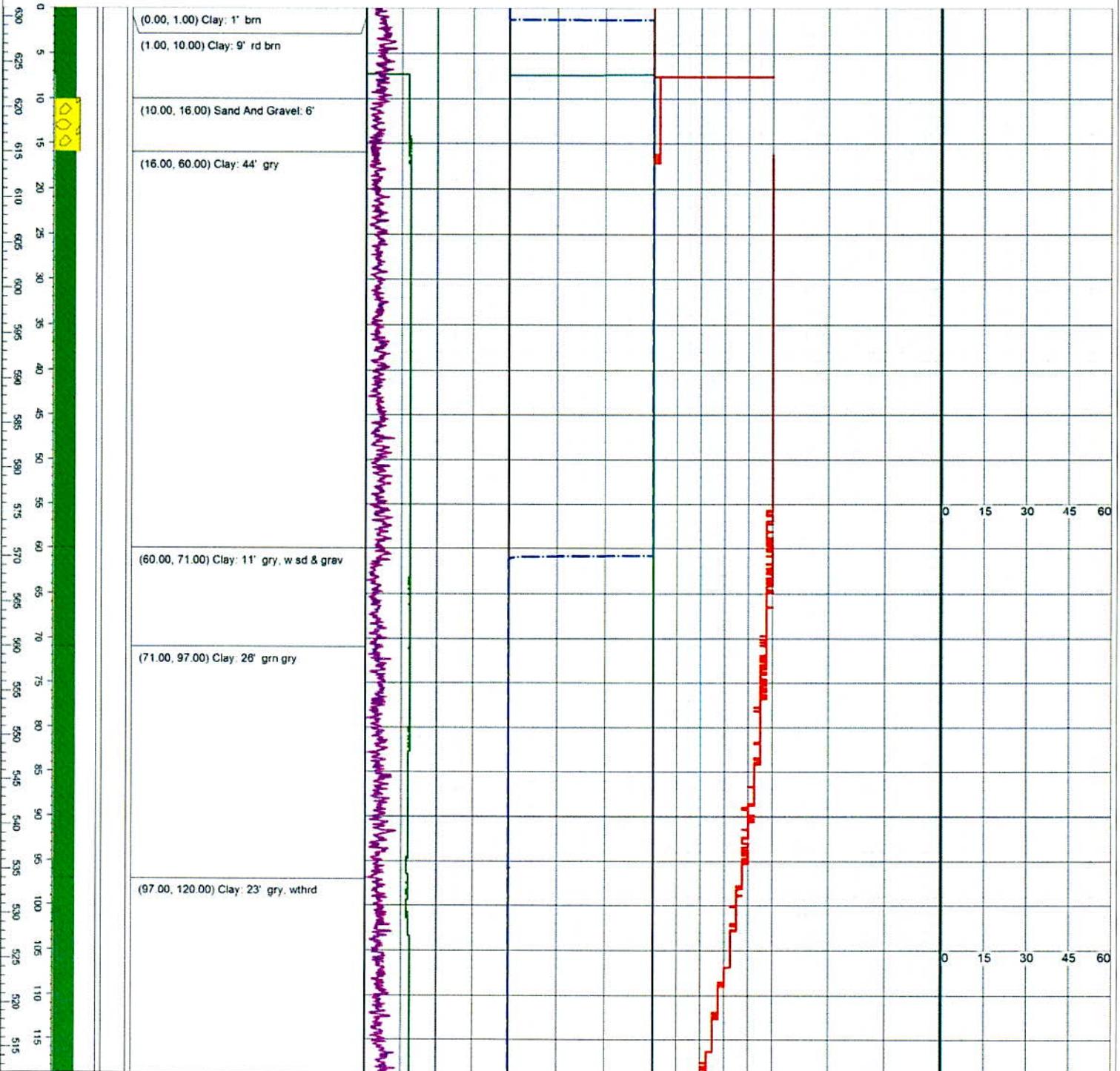
Easting: 2507564
 Northing: 874631
 Township: 7N
 Range: 3W
 Section: 9
 County: Montgomery

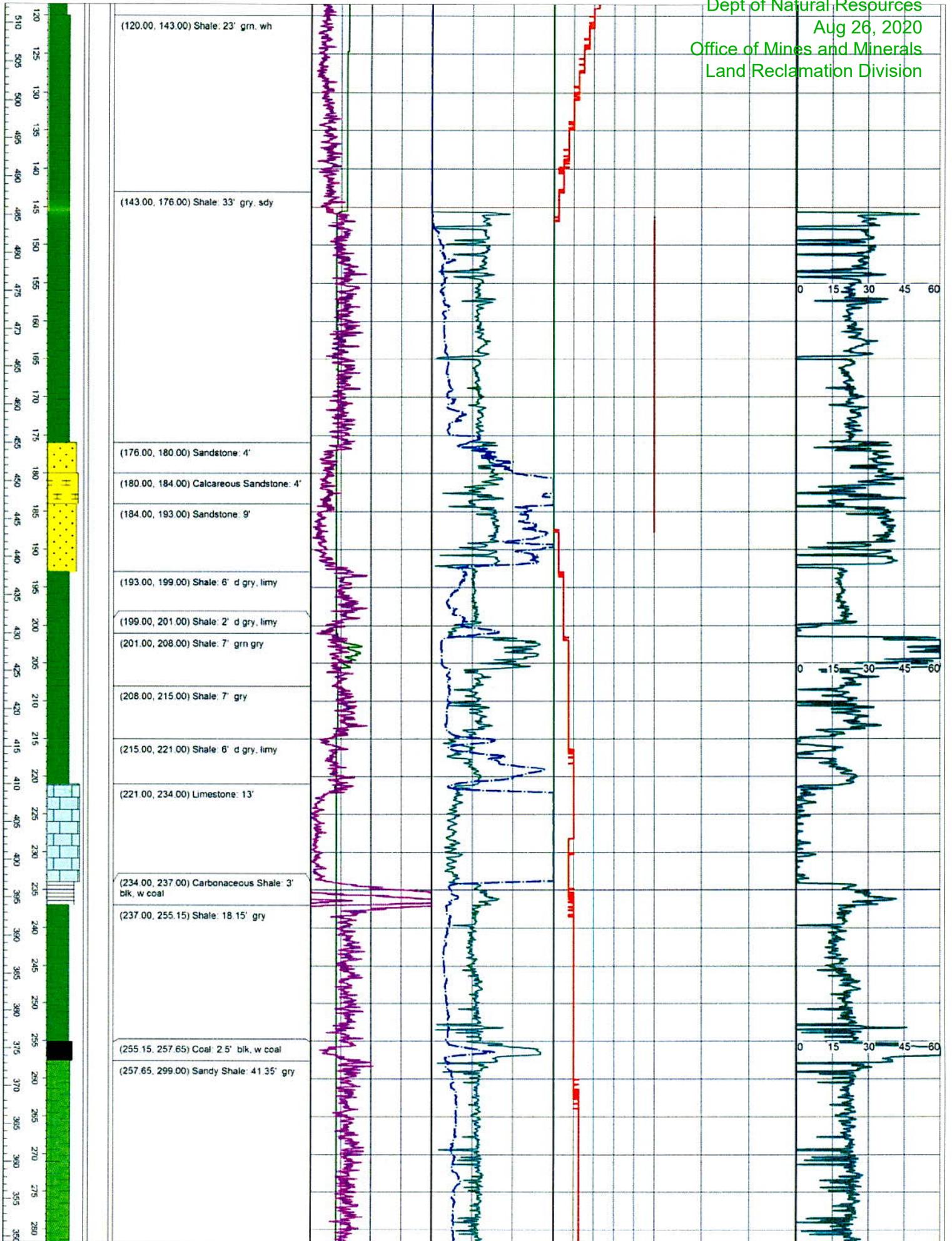
Total Depth (Driller): 542
 Total Depth (Logger): 542.43
 Elevation (GS): 631
 Casing Depth: 145
 Core Interval: 514 - 534

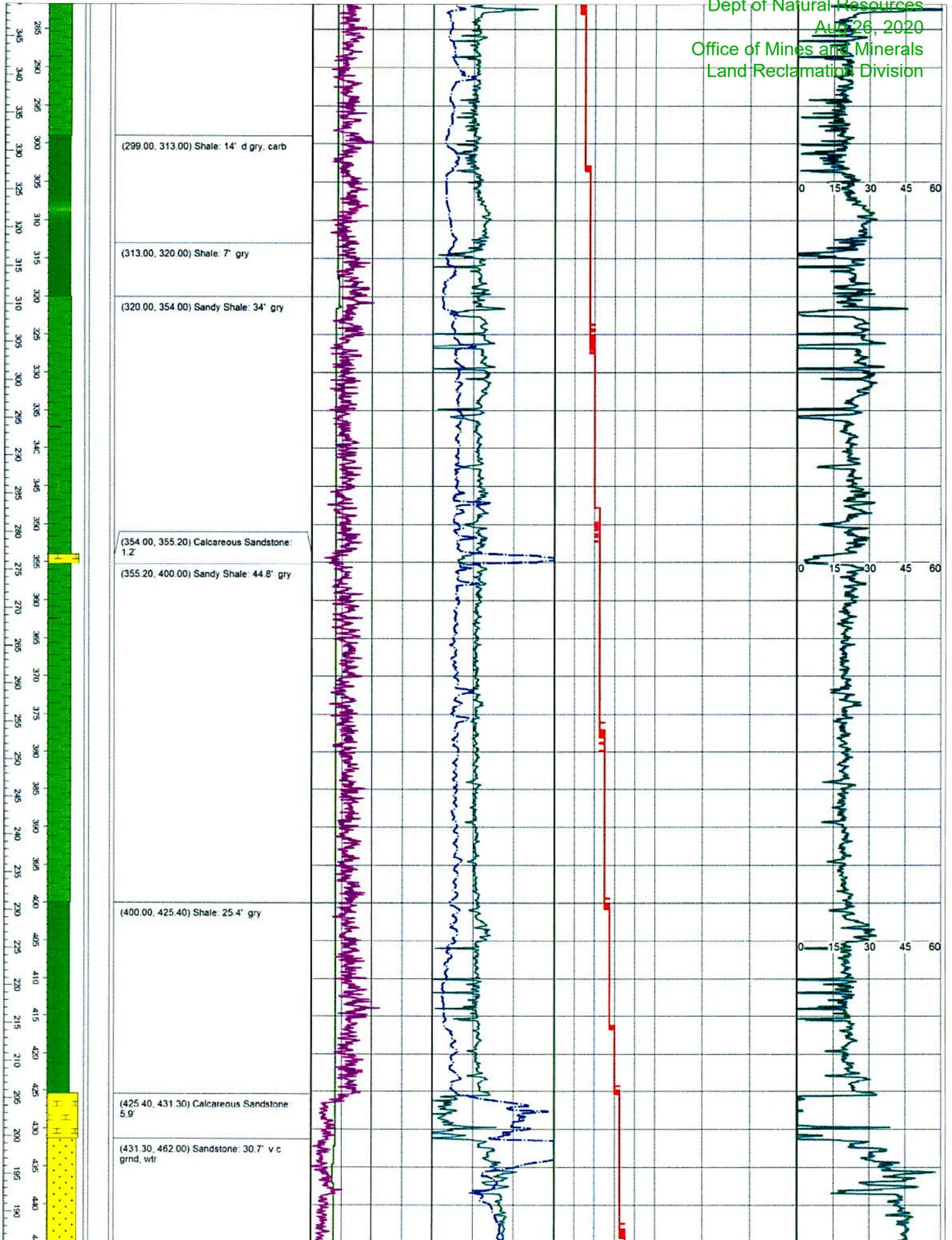
Drilled By: Hawkey & Kline
 Cuttings Logged By: Driller, JTP
 Core Logged By: JT Padgett
 Geophysical Log Operator: Cardno
 Completion Date: 10/22/2013

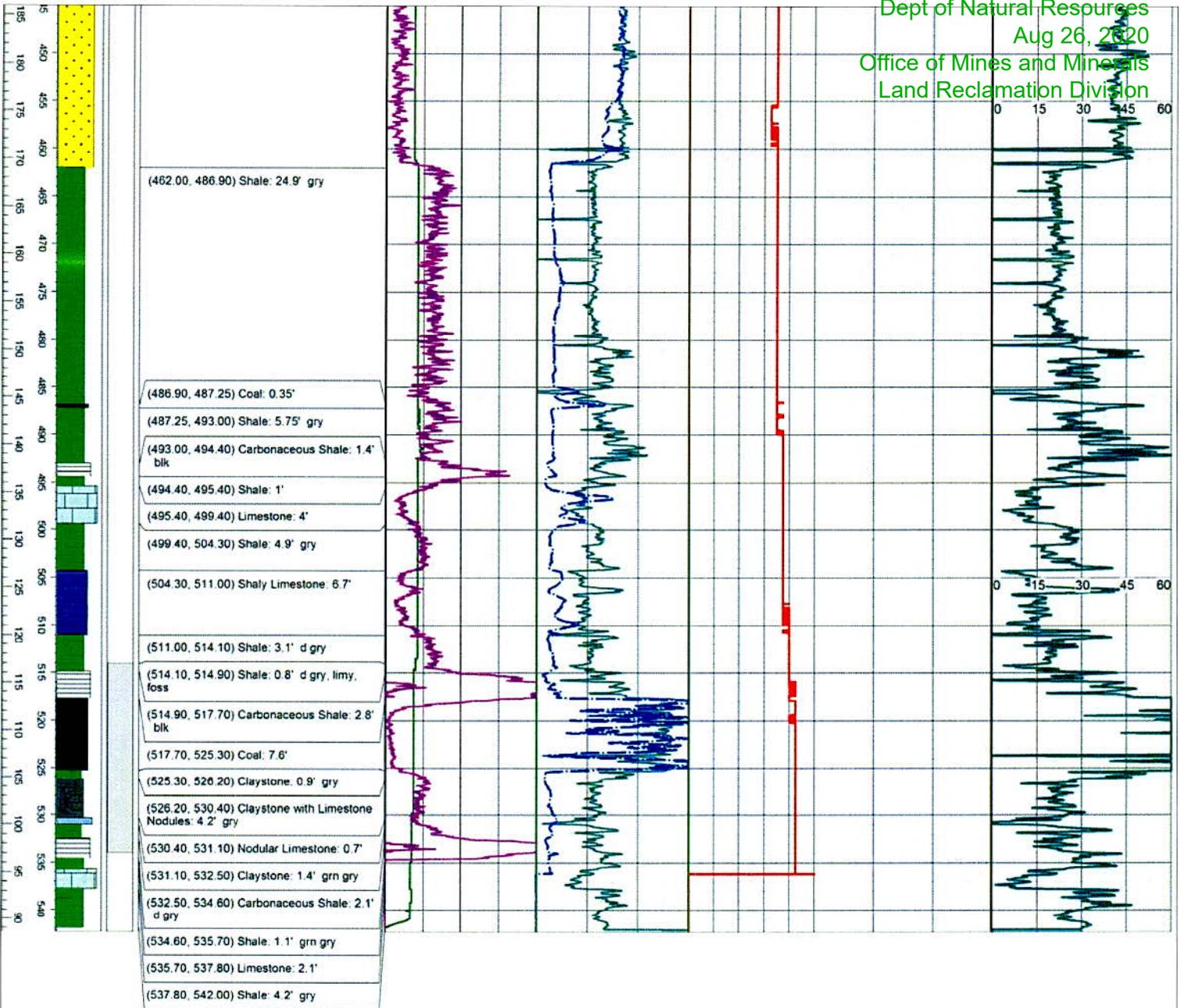
Notes: No Sonic Log

Elevation Depth (Feet)	Casing/Coored Int	Lithology	Natural Gamma	Density	Temp	Est. UCS (psi)	Porosity
			Caliper	Resistivity			











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08-03-30-12

Lithology Log

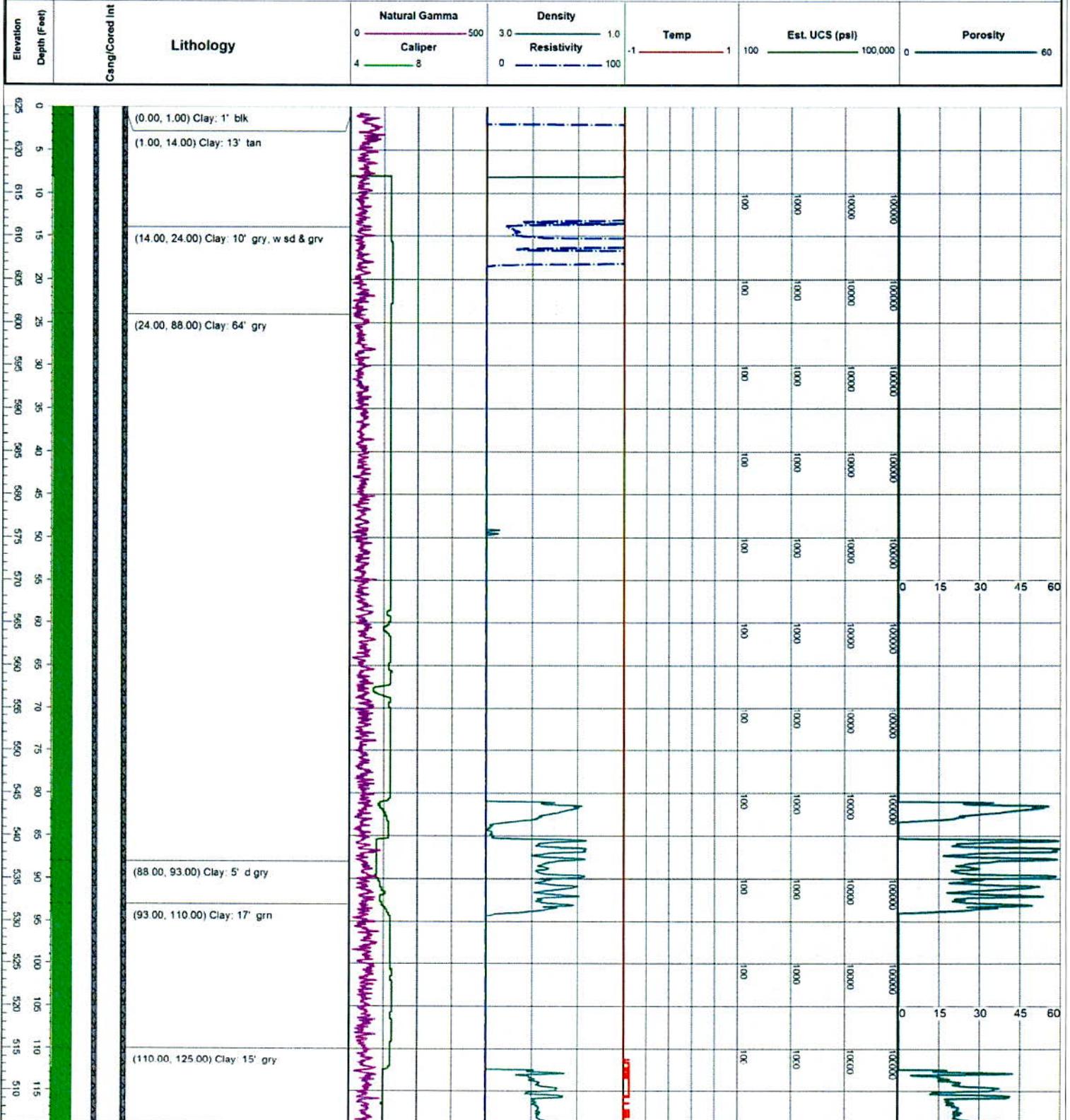
Received Electronically
Dept of Natural Resources
Aug 26, 2020
Office of Mines and Minerals
Land Reclamation Division

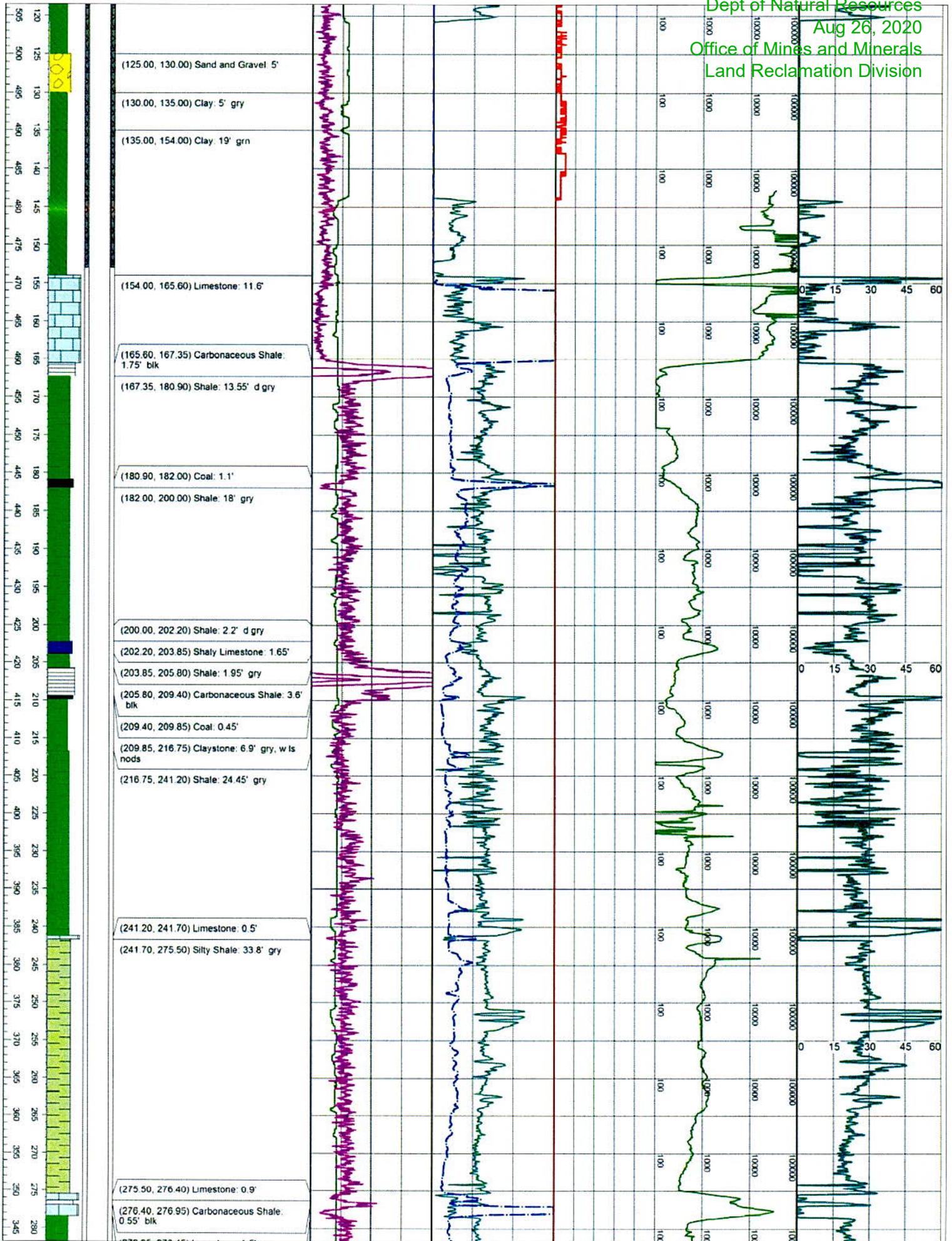
Easting: 2494063
Northing: 887059
Township: 8N
Range: 3
Section: 30
County: Montgomery

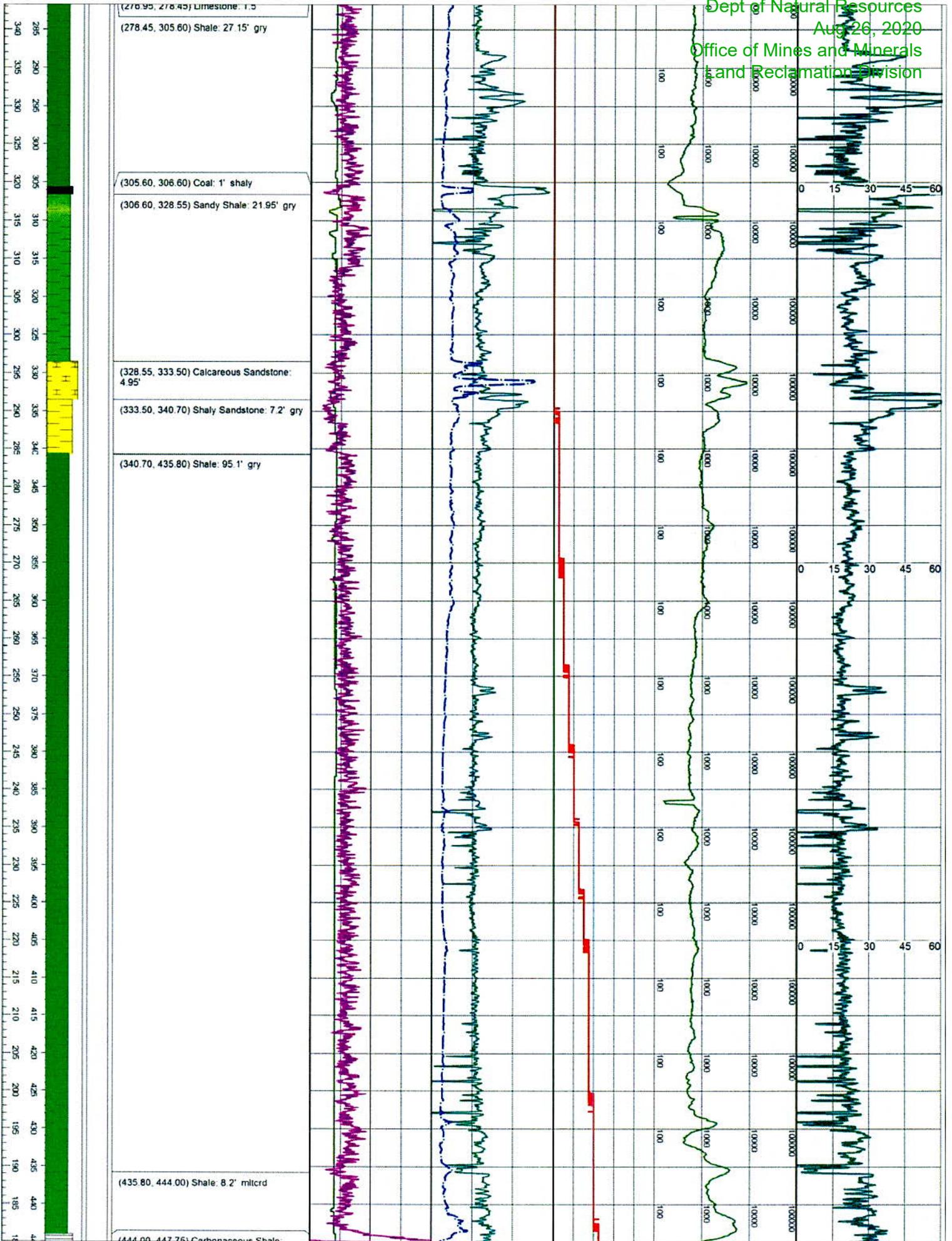
Total Depth (Driller): 483
Total Depth (Logger): 479.61
Elevation (GS): 625
Casing Depth: 153
Core Interval: No core

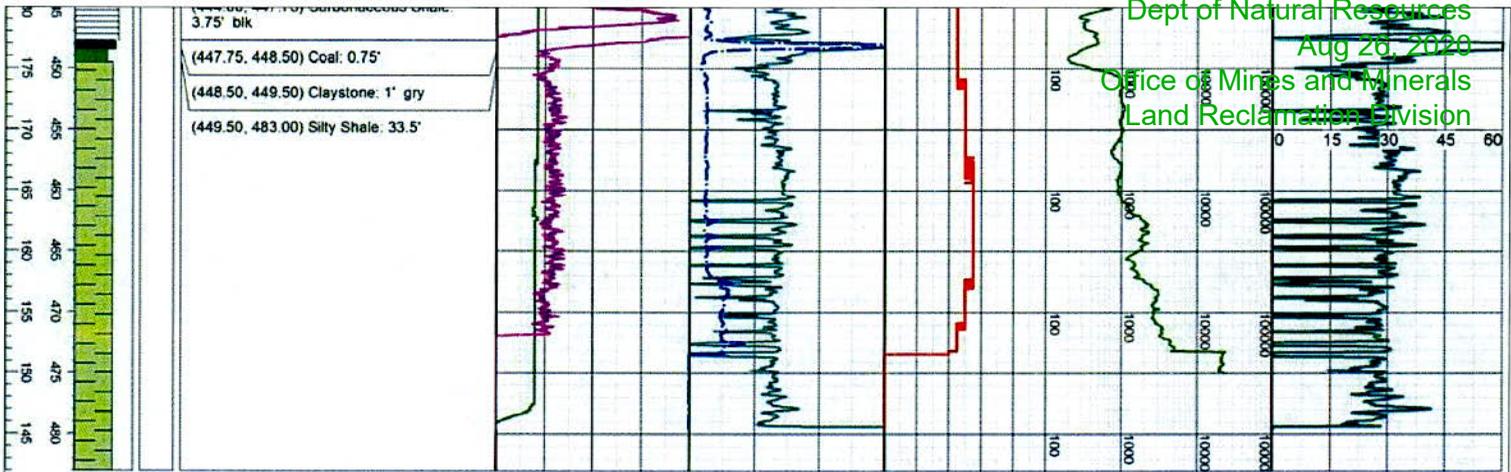
Drilled By: Hawkey & Kline
Cuttings Logged By: Driller, JTP
Core Logged By:
Geophysical Log Operator: Cardno
Completion Date: 1/15/2014

Notes:











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08-03-31-01

Lithology Log

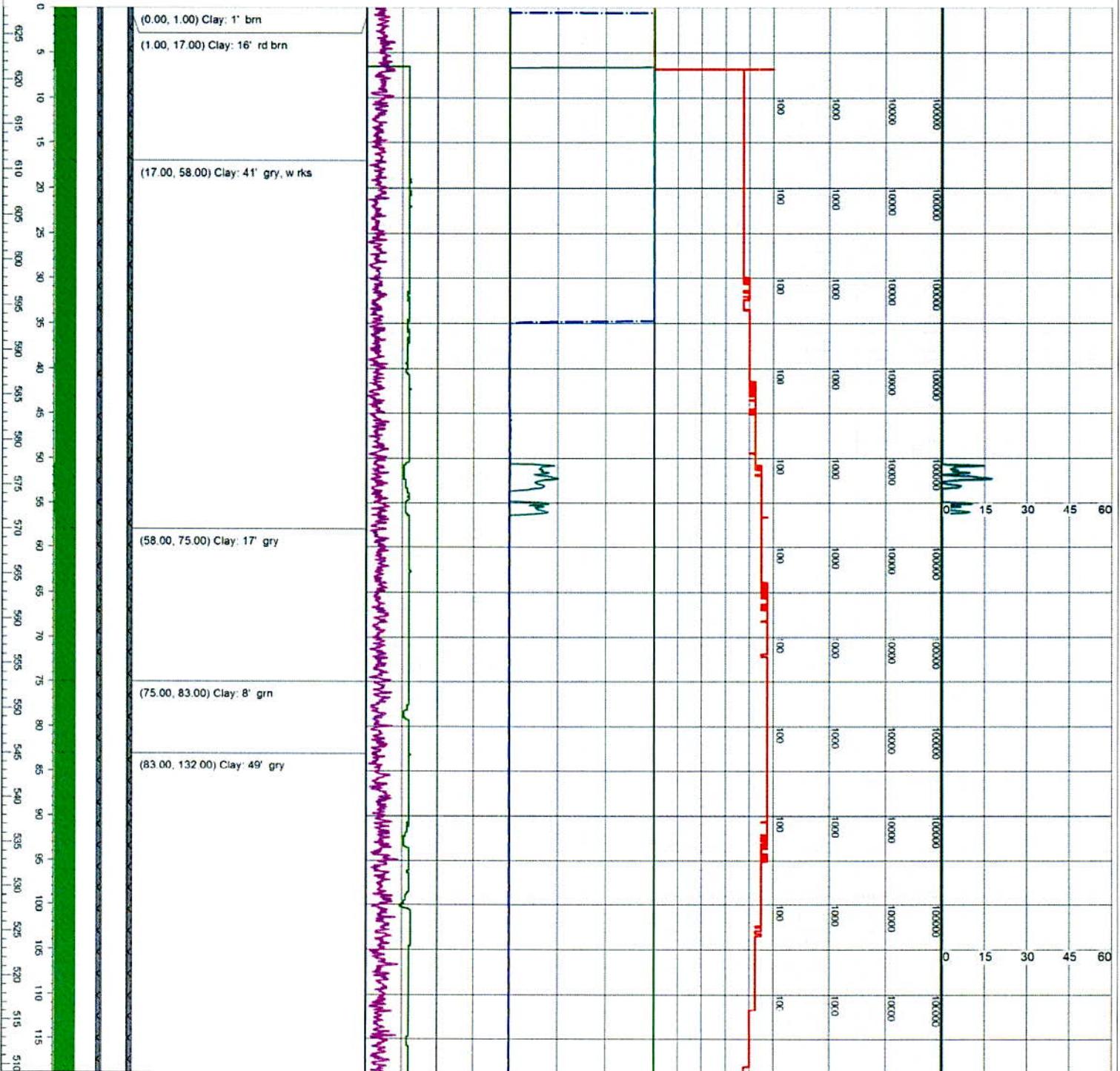
Easting: 24967515
 Northing: 628
 Township: 8N
 Range: 3W
 Section: 31
 County: Montgomery

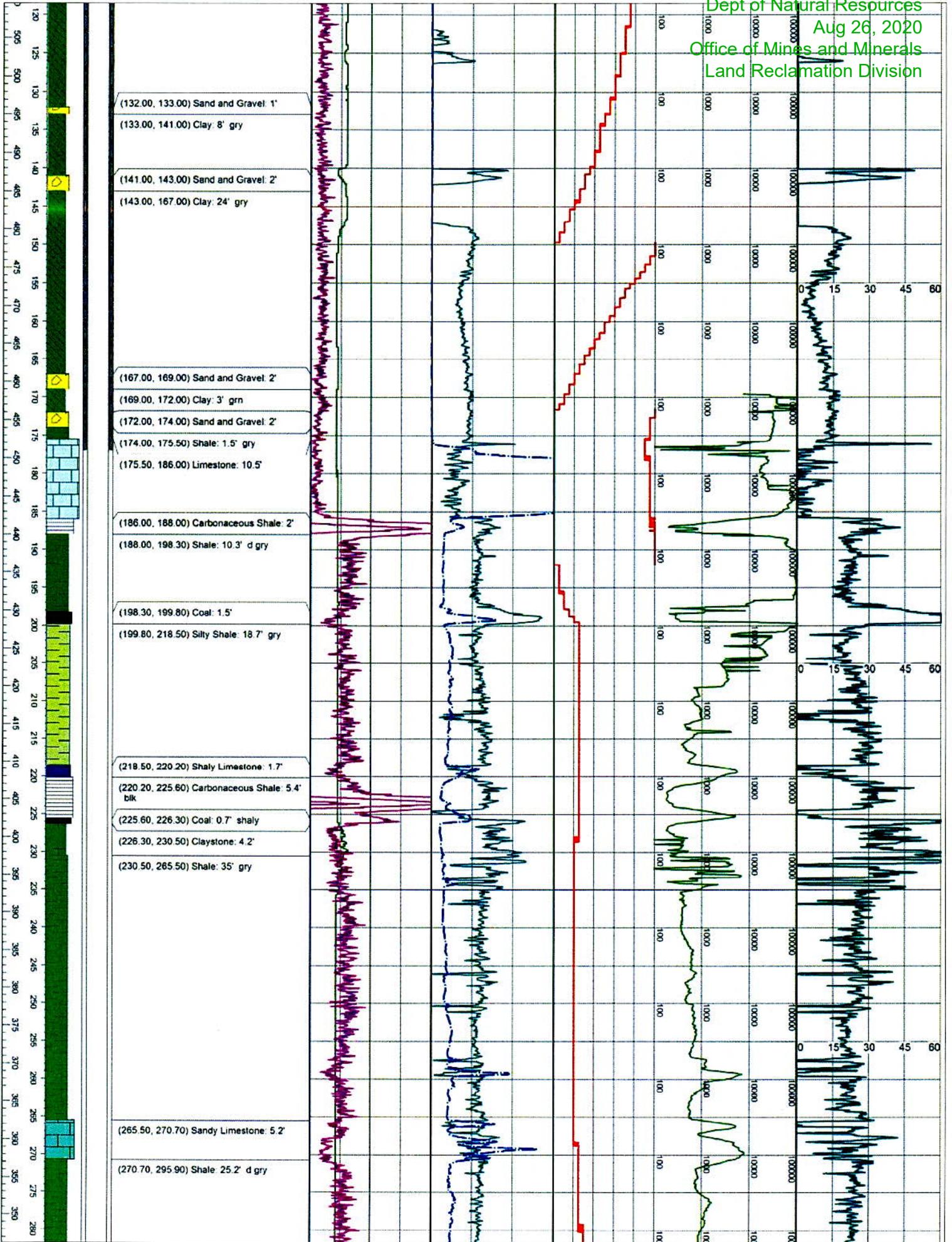
Total Depth (Driller): 501
 Total Depth (Logger): 500.89
 Elevation (GS): 628
 Casing Depth: 177
 Core Interval: 473-493

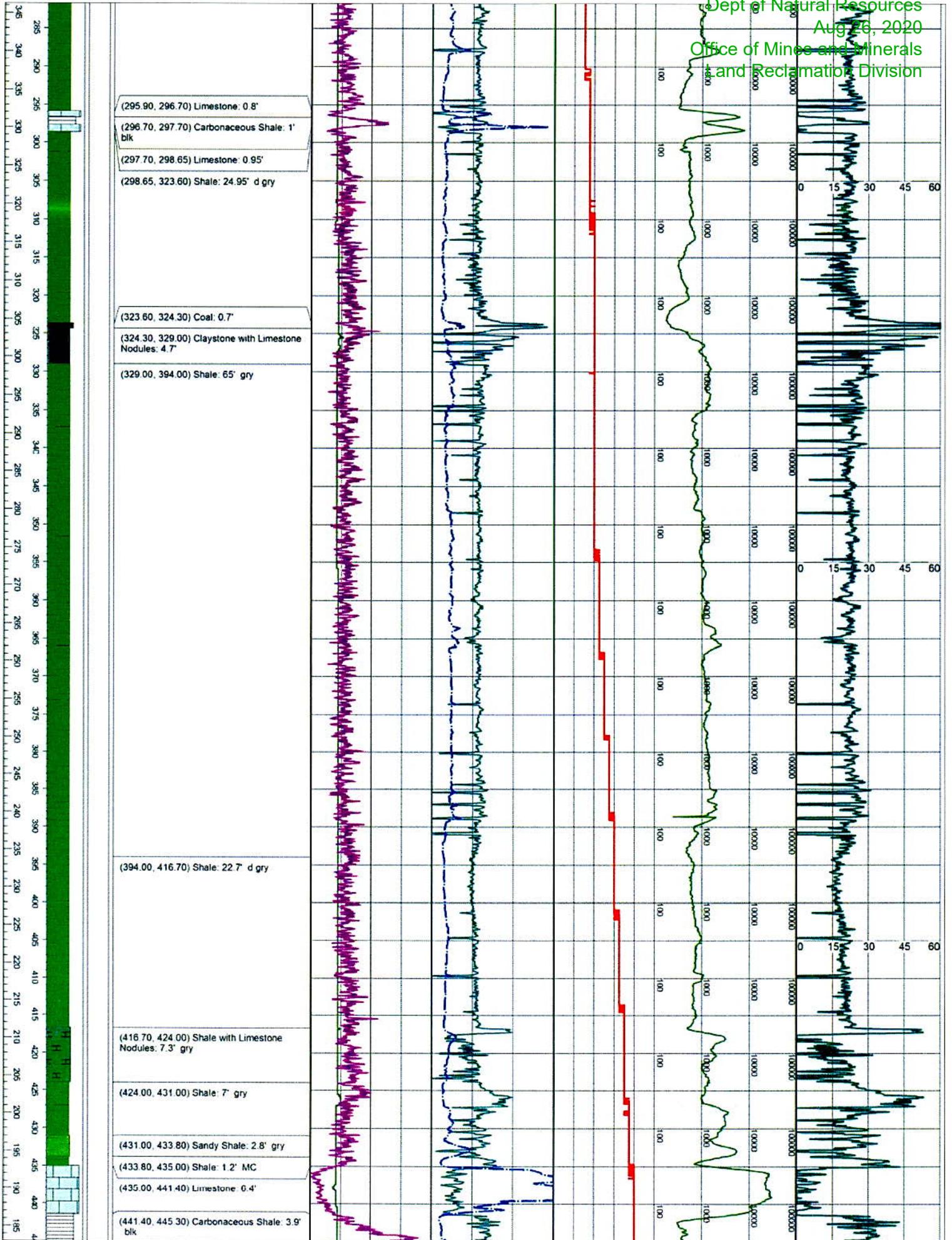
Drilled By: Hawkey & Kline
 Cuttings Logged By: Driller, JTP
 Core Logged By: JT Padgett
 Geophysical Log Operator: Cardno
 Completion Date: 9/24/2013

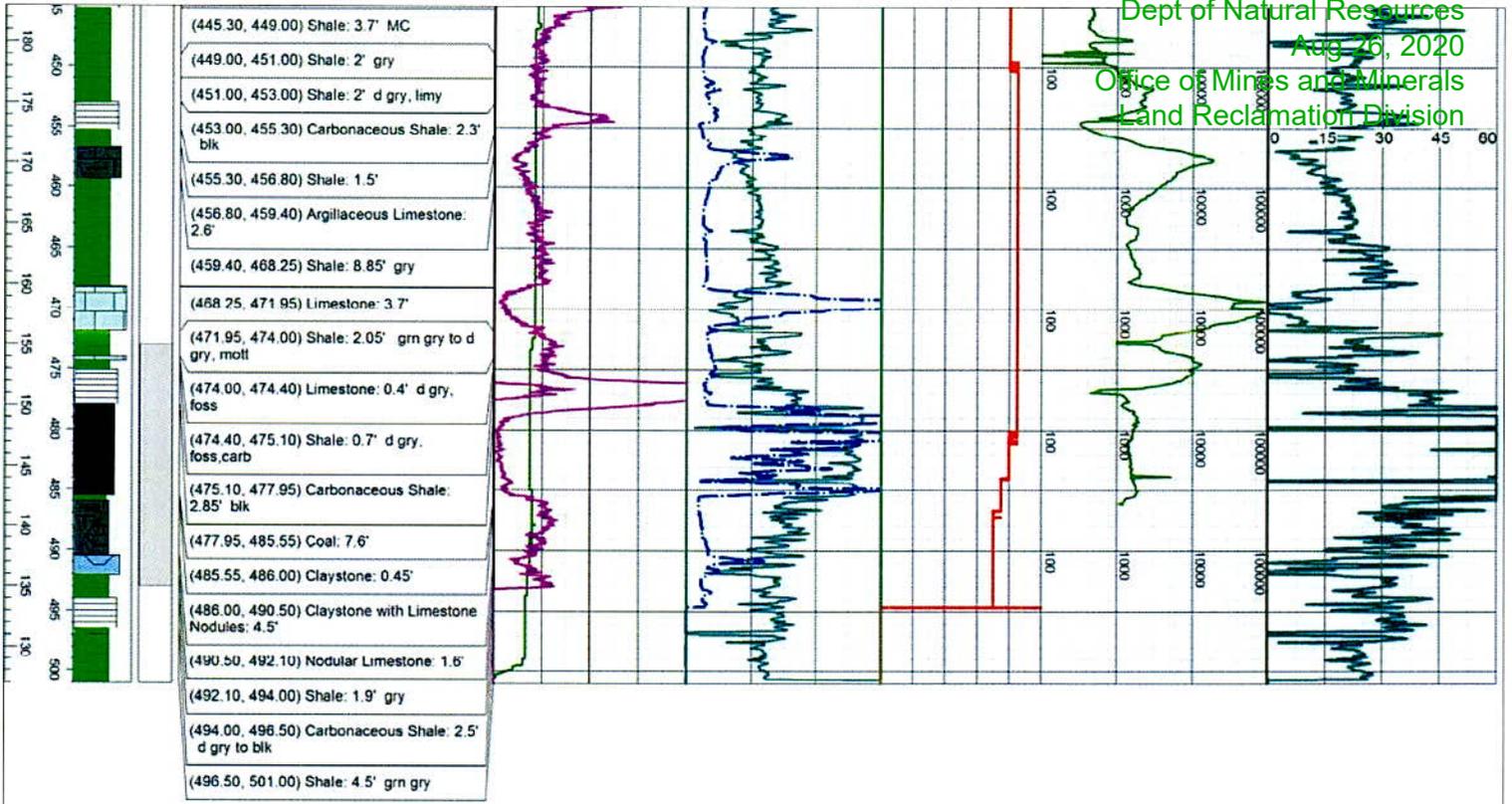
Notes:

Elevation Depth (feet)	Casing/Coored Int	Lithology	Natural Gamma	Density	Temp	Est. UCS (psi)	Porosity
			0 — 500 Caliper 4 — 8	3.0 — 1.0 Resistivity 0 — 100	-1 — 1	100 — 100,000	0 — 60











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08-03-32-03

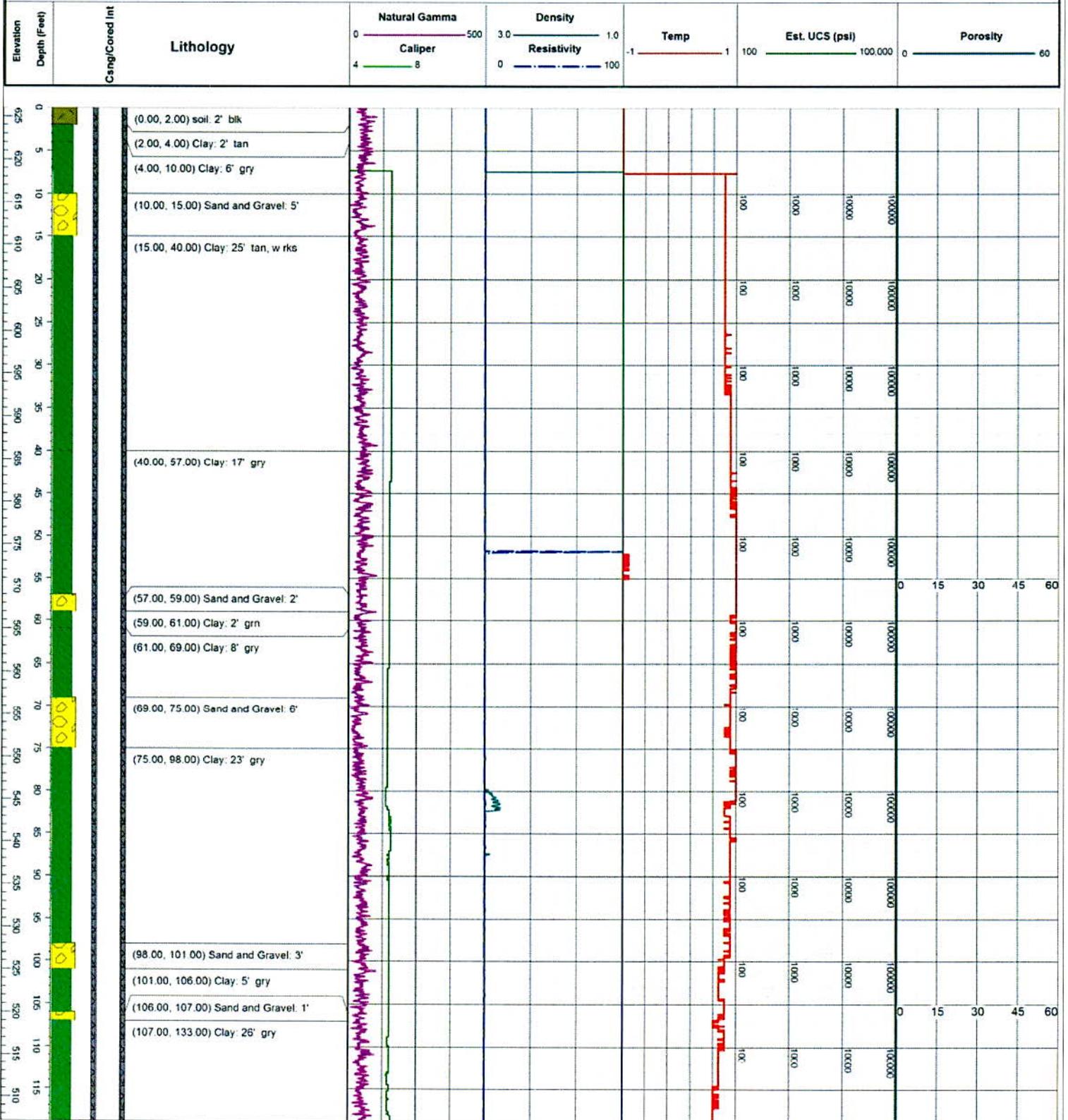
Lithology Log

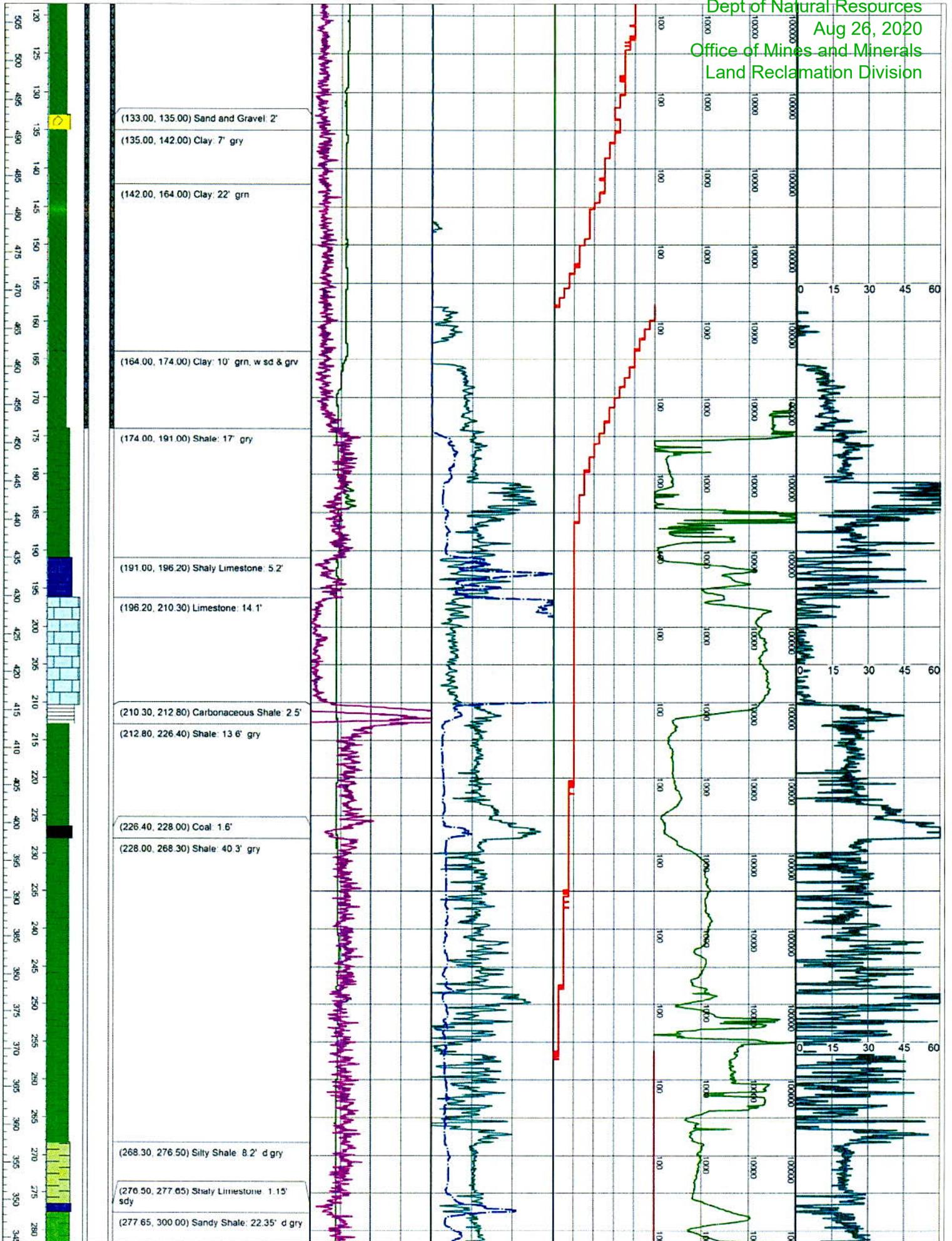
Easting: 2500880
 Northing: 884295
 Township: 8N
 Range: 3W
 Section: 32
 County: Montgomery

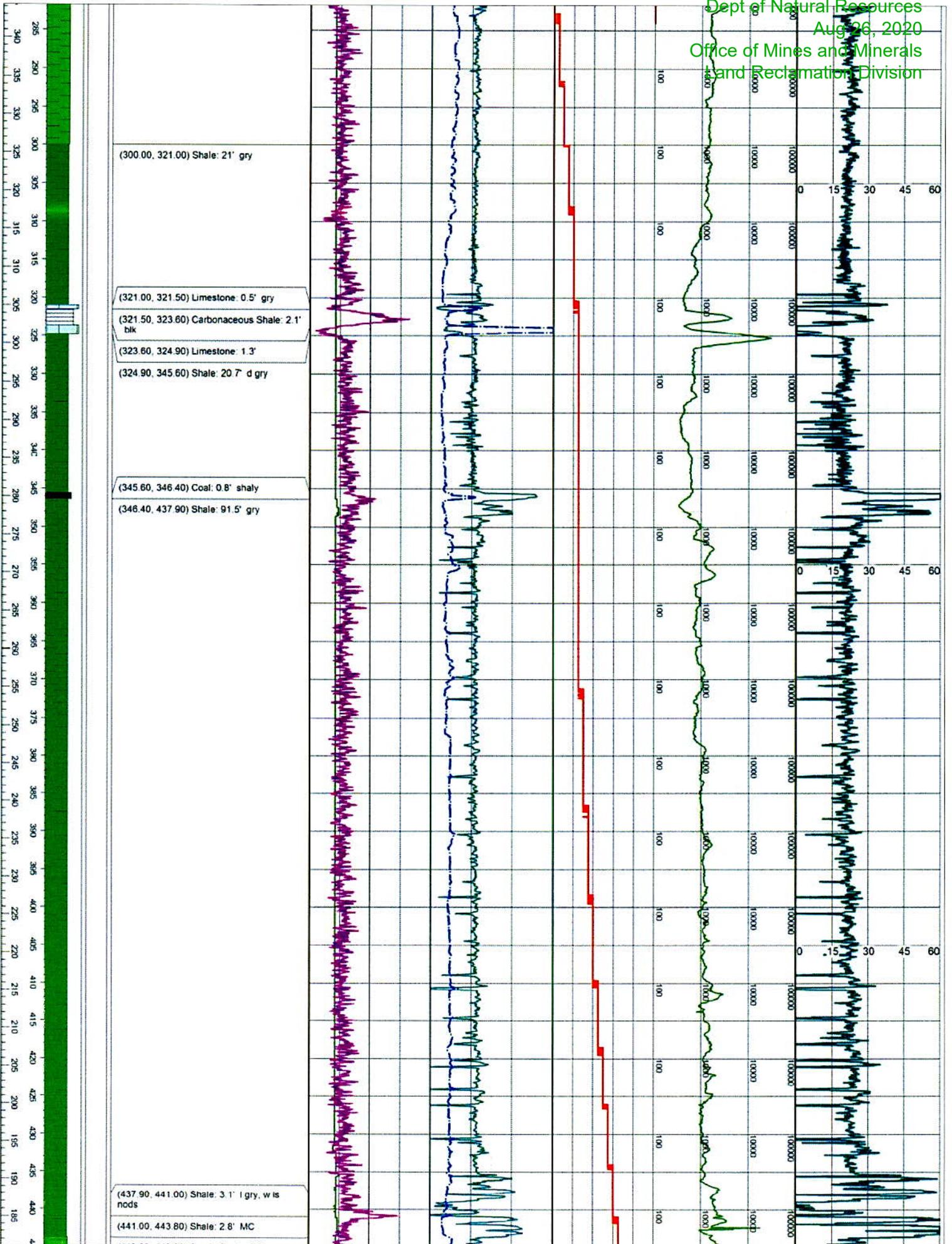
Total Depth (Driller): 533
 Total Depth (Logger): 529.19
 Elevation (GS): 626
 Casing Depth: 174
 Core Interval: 498-518

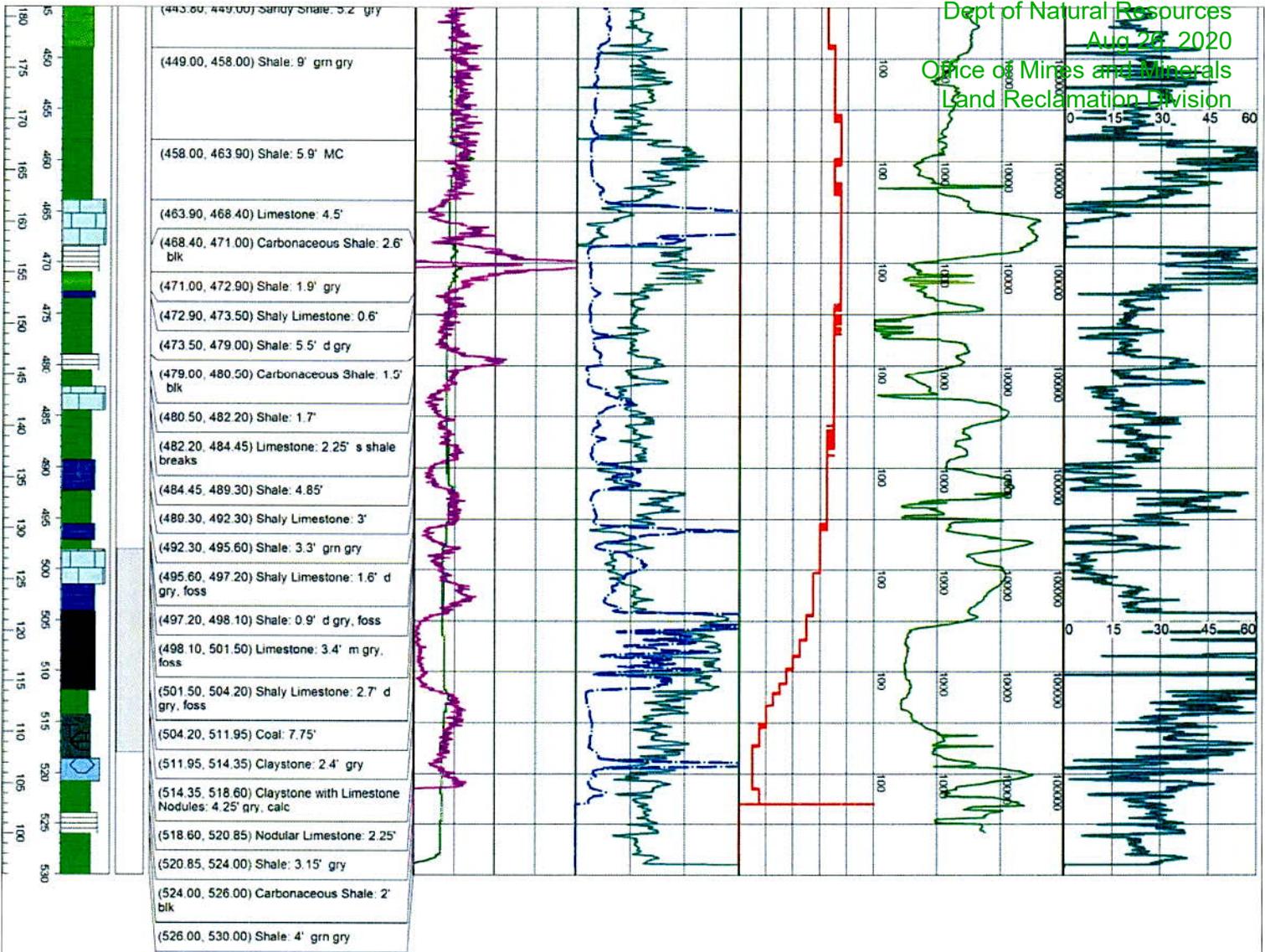
Drilled By: Hawkey & Kline
 Cuttings Logged By: Driller, JTP
 Core Logged By: JT Padgett
 Geophysical Log Operator: Cardno
 Completion Date: 8/20/2013

Notes: Drill depths adjusted to E-log











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08-03-33-02

Lithology Log

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Aug 26, 2020
Office of Mines and Minerals
Land Reclamation Division

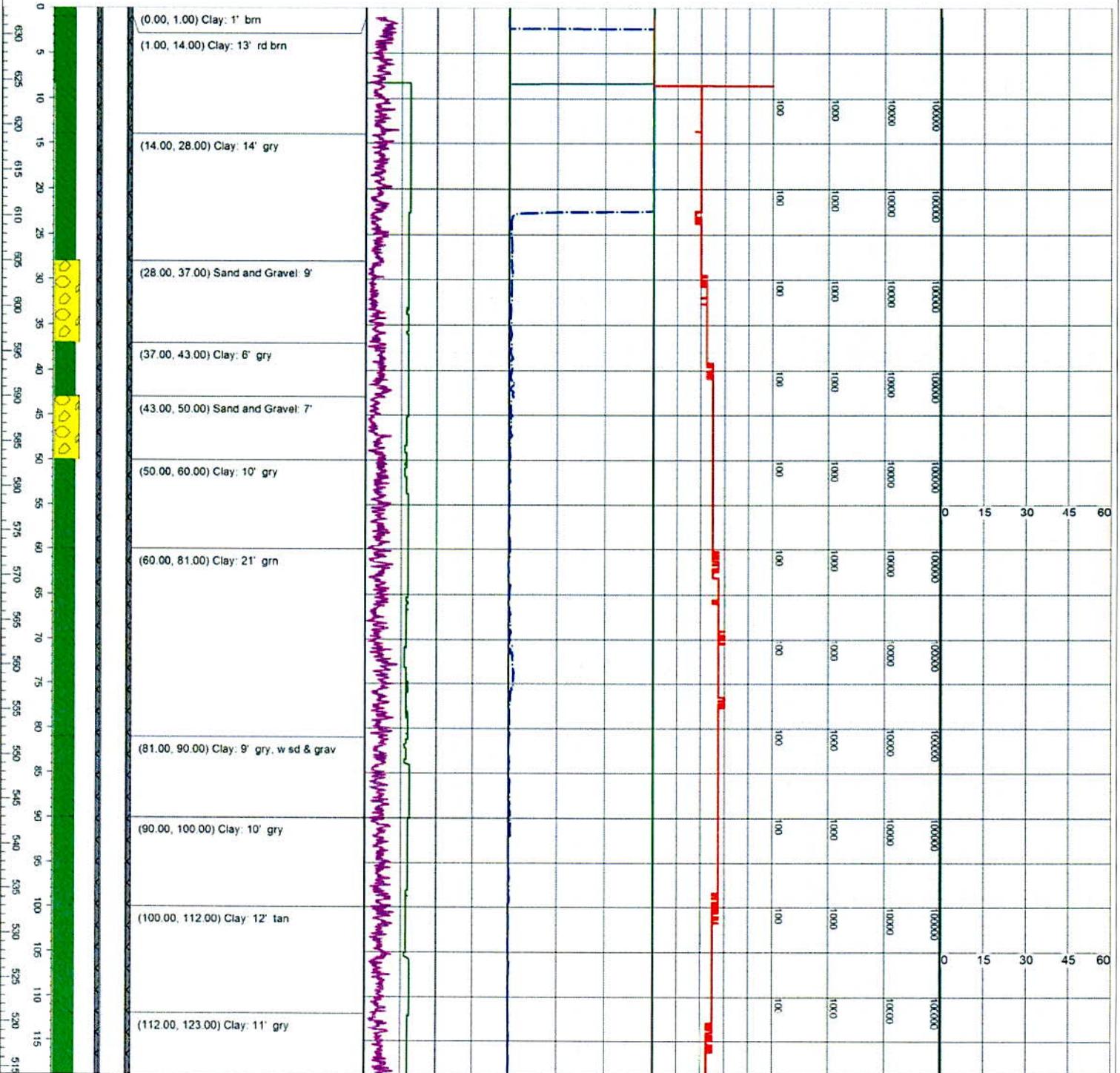
Easting: 2507404
Northing: 885488
Township: 8N
Range: 3W
Section: 33
County: Montgomery

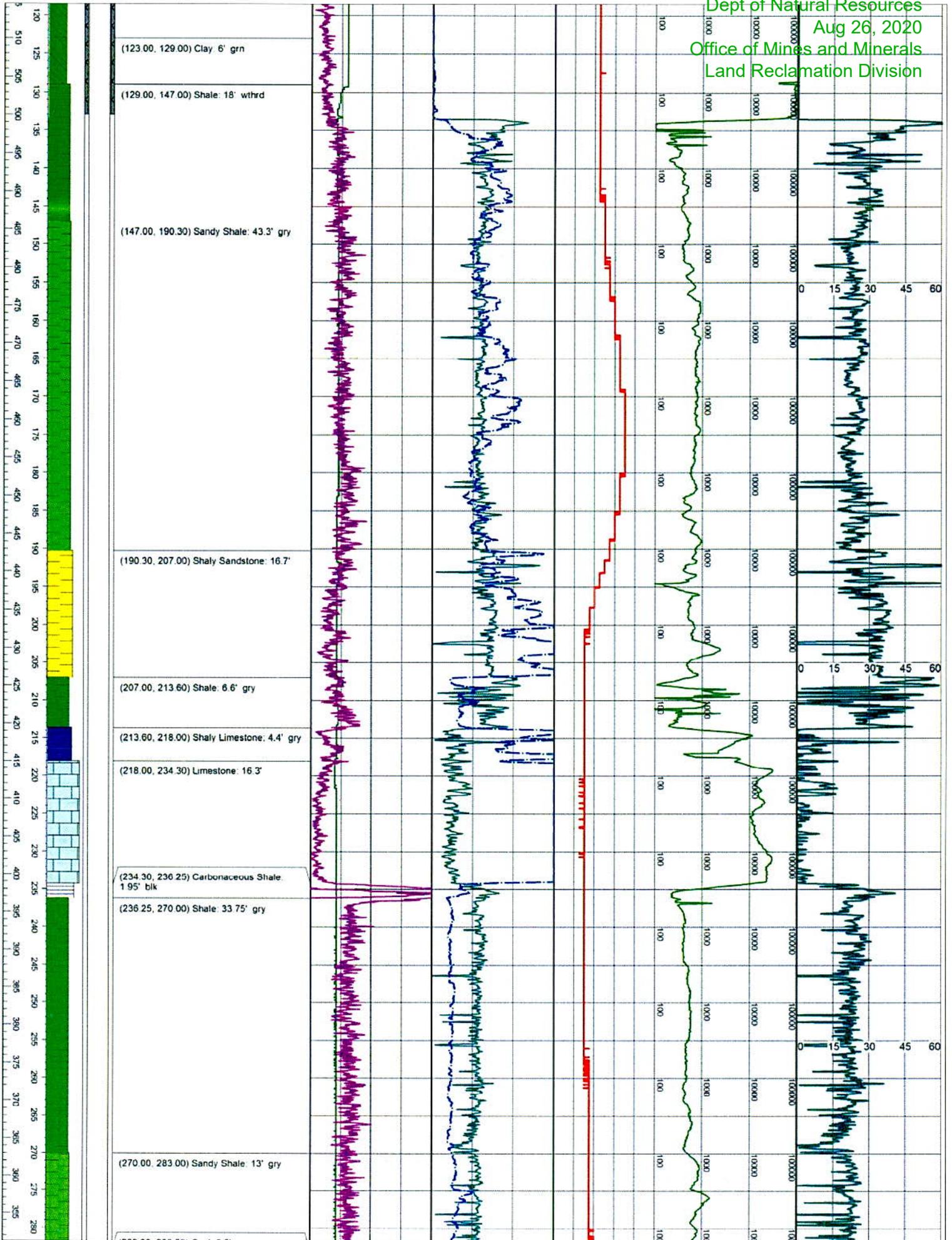
Total Depth (Driller): 551
Total Depth (Logger): 551.62
Elevation (GS): 633
Casing Depth: 133
Core Interval: 518.5 - 551

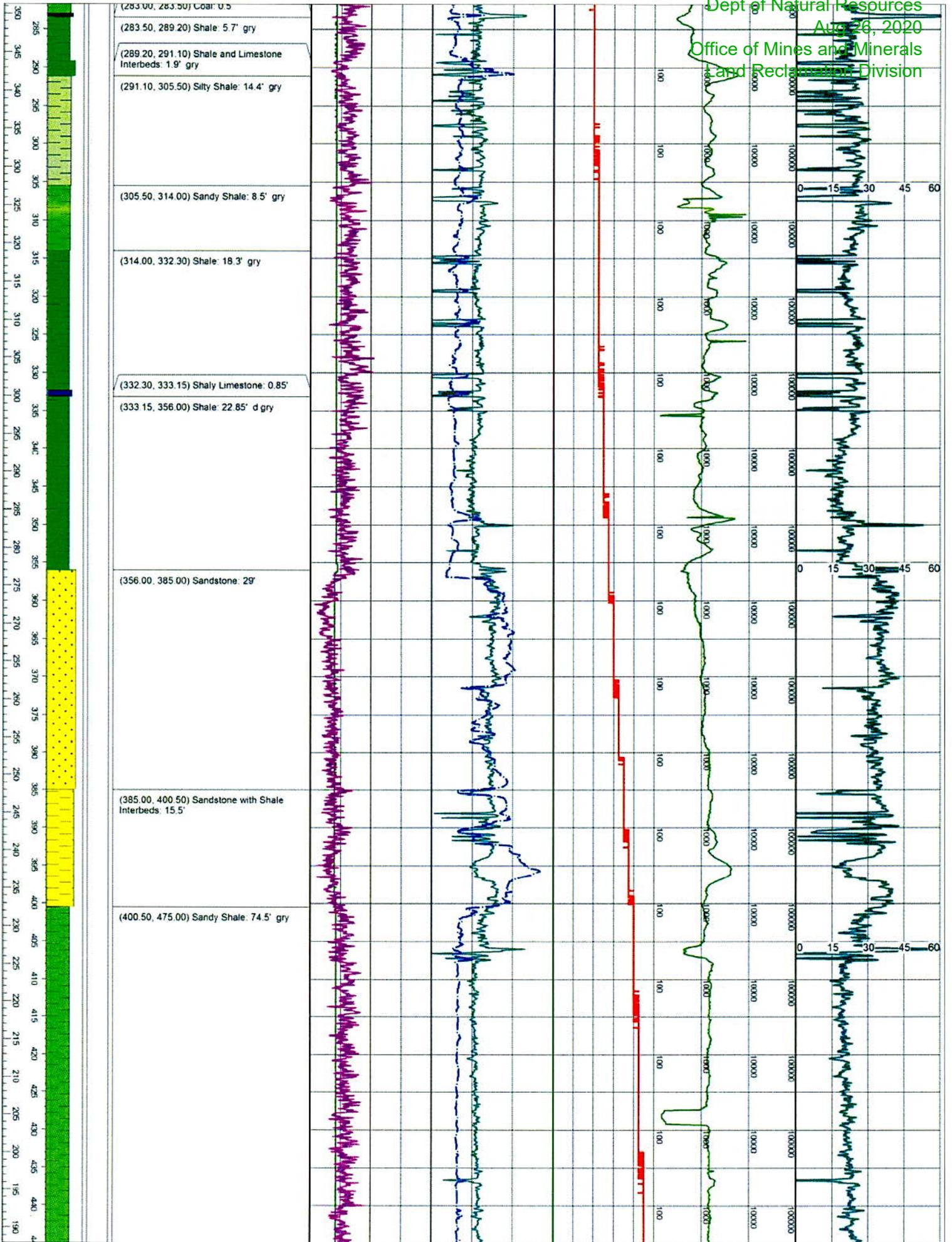
Drilled By: Hawkey & Kline
Cuttings Logged By: Driller, JTP
Core Logged By: JT Padgett
Geophysical Log Operator: Cardno
Completion Date: 12/17/2013

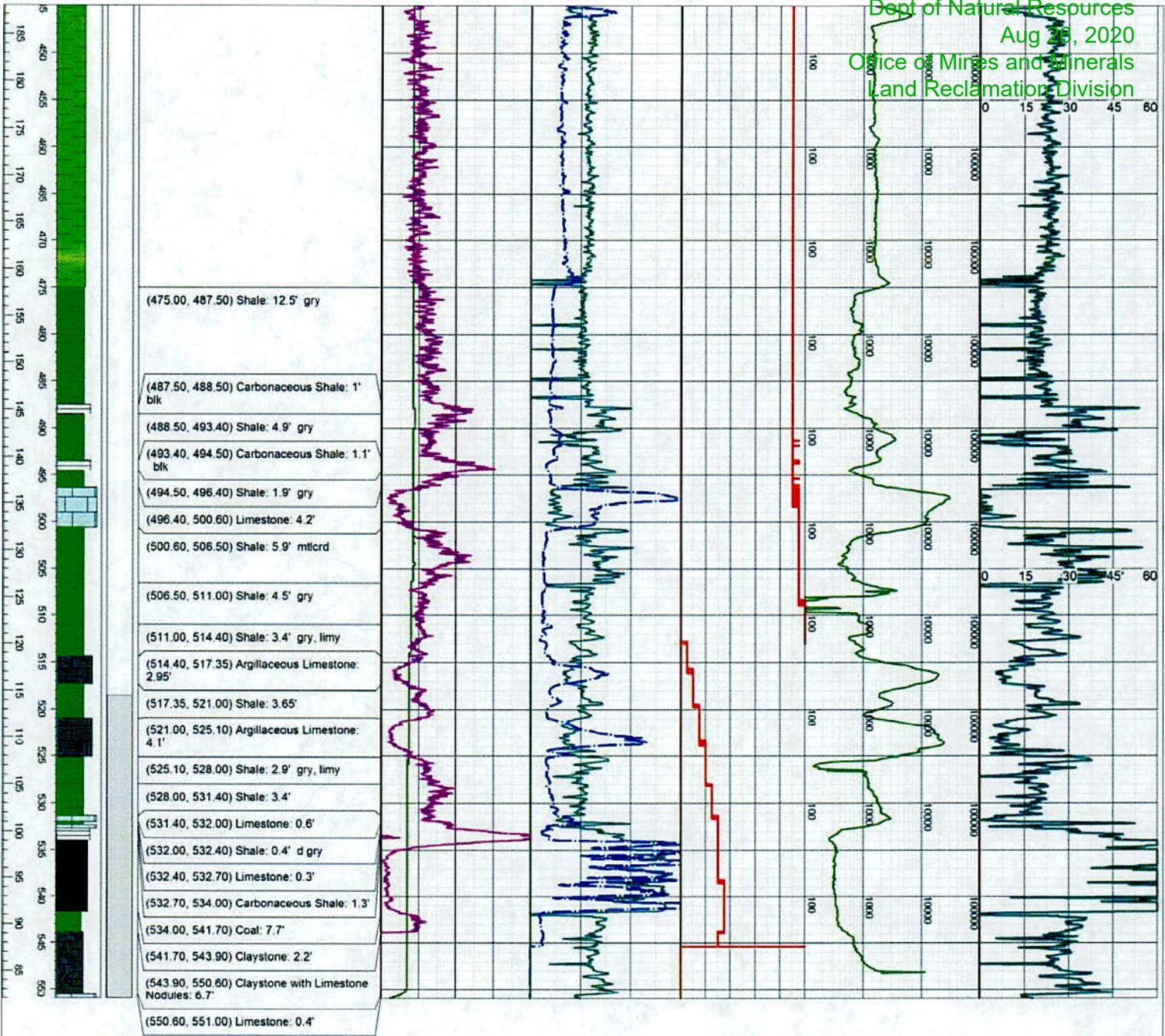
Notes:

Elevation Depth (feet)	Casing/Coored Int	Lithology	Natural Gamma	Density	Temp	Est. UCS (psi)	Porosity
			Caliper	Resistivity			
			0 — 500	3.0 — 1.0	-1 — 1	100 — 100,000	0 — 60
			4 — 8	0 — 100			









ATTACHMENT III.2.A.2
ACID BASE ACCOUNTABILITY

-A-
**“Overburden Sampling and Analytical
Techniques”**

OVERBURDEN SAMPLING AND ANALYTICAL TECHNIQUES

Acid Base Accounting and Leaching Tests

Characterization of the acid or toxic potential of overburden material is generally accomplished by either a technique known as acid/base accounting (*Smith and others, 1982; Sobek and others, 1978*) or leaching tests (*Caruccio and others, 1977, 1981, 1982; Caruccio, 1984; Geidel, 1979*).

Acid/base accounting is utilized nationwide to assess acid or toxic potential and consists of the following three fundamental measurements:

1. Ph of a pulverized sample mixed with distilled water to the consistency of a thin paste.
2. Measurement of total disulfide content (mainly pyrite).
3. Measurement of total neutralization potential.

Paste Ph is a measure of the sample's immediate acidity or alkalinity and reflects current geochemical conditions. Samples with a paste Ph of 4.0 or less are classed as acid/toxic regardless of the pyrite and neutralizer balance (*Smith and Sencendiver, 1982; Sobek and others, 1978*).

Solubility and mobility of many trace elements and metals in water are strongly dependent on Ph. For example, at a Ph 4.0 or lower, elements such as aluminum, copper, manganese, zinc, lead, and chromium can be released into ground or surface waters.

Maximum potential acidity is calculated from the pyrite content of the sample and the four-step chemical reaction of pyrite to acid formation (*Sobek and others, 1978*). This calculated value represents the maximum or worst case condition of acid production. The actual acid production rate and completeness of reaction cannot be estimated using the acid/base technique.

Neutralization potential measures the sum total of carbonates, alkaline earths, and bases available to neutralize acidity and represents the most favorable condition. Calculations of maximum potential acidity and neutralization potential are structured to equate the two measurements to a common basis for comparison. The resulting values, expressed as calcium carbonate equivalent, are compared to compute a net acid-producing or neutralizing potential. Materials exhibiting a net acid production potential of 5 tons/1,000 tons of overburden material or more as calcium carbonate equivalent are classed as toxic or potentially toxic (*Smith and Sencindiver, 1982; Sobek and others, 1978; Sturm and others, 1984*).

The primary advantages of the acid/base accounting method are:

1. Short turn-around time for sample processing.
2. Low cost.
3. Relatively simple analytical procedures.
4. Relatively simple interpretation of results.

The principal disadvantages of acid/base accounting are:

1. The method predicts maximum potential acidity and maximum neutralization capability and implies a 1:1 acid to base reaction. Actual acid production and neutralization release rates cannot be predicted with this technique nor can the completeness of the reaction be assessed.
2. Acid/base accounting assumes all acid production is attributable to iron disulfide minerals (chiefly pyrite) and that no acid is produced by sulfate or organic sulfur forms. Sulfur fractionation studies of some Western overburden material have shown that about half of the total sulfur is present in organic forms and that acidity is being produced that cannot be accounted for by pyrite alone.
3. Measurement of neutralization potential utilizes a hot acid extract to measure carbonates and bases. Recent work in Texas suggests that this extraction procedure may overestimate neutralization potential and that a modified method may be needed.

Application of this acid/base accounting method to overburden handling and placement plans throughout the country has generally been moderately effective in eliminating or reducing adverse water quality impacts. Acid/base accounting is typically considered state-of-the-art for overburden analysis.

Leaching or simulated weathering tests have been advocated by *Caruccio and others (1977, 1981, 1982), Caruccio (1984), and Geidel (1979)* as an alternative overburden analysis method. The procedure is designed to mimic the conditions expected to occur in regraded spoil. Samples are subjected to alternating water leaching and exposure to moist air. Leachate is collected periodically and analyzed for pH, acidity, sulfate, and any other constituents of interest. Supplemental information may also be obtained by petrographic study of pyrite morphology. Caruccio has indicated that fine-grained pyrite with a large surface area is much more reactive and likely to produce acidity than coarse-grained pyritic material (*Caruccio, 1969, 1984; Caruccio and others, 1982*).

Results of leachate analyses are plotted as a function of time resulting in data on rate of reaction and the quantity of acidity or alkalinity produced. Leaching simulations have been applied to eastern and midwestern minesites and are reasonably good predictors of short-term (2 or 3 years) drainage quality.

Caruccio (1984) suggested that acid/base accounting be used as an initial screening test

for overburden samples. Materials containing a large net neutralization potential do not require further analyses. If total pyrite exceeds about 1 percent or if the neutralization potential is small, Caruccio recommends leaching tests to more accurately predict drainage quality.

The main advantages of leaching tests are summarized as follows:

1. Test methods are designed to simulate field conditions.
2. Reaction rates (kinetics) can be evaluated.
3. Leaching of overburden constituents other than acidity and alkalinity can be evaluated.

The primary disadvantages associated with leaching tests are:

1. Test time is lengthy; about two months are required to conduct one analysis.
2. Analysis is expensive.
3. Long-term predictive capability of leaching tests are uncertain.
4. Data interpretation requires more sophisticated review than the acid/base accounting method.



[Tell us what you think.](#)

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Last Updated by Doug Growitz: 02/06/2001 08:04:44

-B-
“Acid Base Accountability”



Appalachian Laboratories, Inc.

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 BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
 FAX 304-253-4157
 E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
 P.O. Box 455
 Hillsboro, IL 62049

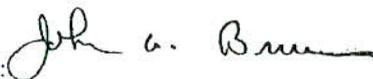
Date Sampled: 2/1/2007
 Date Received: 8/3/2007
 Date Analyzed: 8/6/2007

Hole # 08-03-17-04
 ACID BASE ACCOUNTABILITY
 CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11282	Unit 3 Sample 1	5y/6/1	slight	0.0009	0.0281	23.5000	-0-	23.4719	8.71
11283	Unit 3 Sample 2	5y/6/1	none	0.0100	0.3125	4.5000	-0-	4.1875	8.80
11284	Unit 3 Sample 3	5y/6/1	none	0.0013	0.0406	3.7500	-0-	3.7095	8.59
11285	Unit 3 Sample 4	5y/6/1	slight	0.0130	0.4063	11.2500	-0-	10.8437	8.79
11286	Unit 4 Sample 1	5y/6/1	slight	0.0243	0.7594	7.2500	-0-	6.4906	8.79
11287	Unit 5 Sample 1	5y/5/2	moderate	0.0085	0.2656	15.0376	-0-	14.7720	8.36
11288	Unit 5 Sample 2	5y/5/2	moderate	0.0055	0.1719	17.5439	-0-	17.3720	8.74
11289	Unit 6 Sample 1	5y/5/2	moderate	0.0124	0.3875	22.5564	-0-	22.1689	8.40
11290	Unit 6 Sample 2	2.5y/5/1	moderate	0.0059	0.1844	18.7970	-0-	18.6126	8.77
11291	Unit 6 Sample 3	2.5y/5/1	slight	0.0033	0.1031	15.5000	-0-	15.3969	8.58
11292	Unit 7 Sample 1	5y/4/1	strong	0.1970	6.1563	140.7035	-0-	134.5472	8.04
11293	Unit 8 Sample 1	2.5y/2.5/1	slight	1.3090*	40.9063	21.2500	19.6563	-0-	7.08
11294	Unit 9 Sample 1	2.5y/2.5/1	slight	0.7300*	22.8125	18.2500	4.5625	-0-	6.21
11295	Unit 10 Sample 1	2.5y/7/1	strong	0.1090	3.4063	513.8191	-0-	510.4128	9.08
11296	Unit 11 Sample 1	5y/7/1	strong	0.0003	0.0094	65.3266	-0-	65.3172	9.37
11297	Unit 11 Sample 2	5y/7/1	none	0.0040	0.1250	10.2500	-0-	10.1250	9.02
11298	Unit 11 Sample 3	5y/6/1	none	0.0032	0.1000	6.7500	-0-	6.6500	9.19
11299	Unit 12 Sample 1	5y/6/1	none	0.0063	0.1969	6.7500	-0-	6.5531	9.09
11300	Unit 12 Sample 2	5y/5/2	moderate	0.0140	0.4375	28.8221	-0-	28.3846	8.12

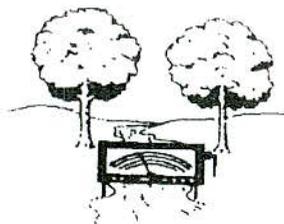
*Calculated from the Pyritic Sulfur Content
 See Attachment

hillsboro acid base, 8-6-07.xls

Respectively Submitted: 

Aug 26, 2020

Office of Mines and Minerals
 Land Reclamation Division



Appalachian Laboratories, Inc.

P.O. BOX 392
 BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
 FAX 304-253-4157
 E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
 P.O. Box 455
 Hillsboro, IL 62049

Date Sampled: 2/1/2007
 Date Received: 8/3/2007
 Date Analyzed: 8/6/2007

Hole # 08-03-17-04
 ACID BASE ACCOUNTABILITY
 CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11301	Unit 12 Sample 3	5y/1/2	slight	0.0302	0.9438	14.0000	-0-	13.0562	8.03
11302	Unit 12 Sample 4	5y/4/2	moderate	0.0387	1.2094	18.7970	-0-	17.5876	8.02
11303	Unit 12 Sample 5	5y/5/2	slight	0.0655	2.0469	23.0000	-0-	20.9531	8.04
11304	Unit 12 Sample 6	5y/5/2	slight	0.0056	0.1750	14.2500	-0-	14.0750	8.60
11305	Unit 13 Sample 1	5y/5/2	slight	0.0027	0.0844	13.7500	-0-	13.6656	8.86
11306	Unit 14 Sample 1	5y/5/2	slight	0.0050	0.1563	16.5000	-0-	16.3437	9.17
11307	Unit 15 Sample 1	5y/5/2	slight	0.0006	0.0188	16.7500	-0-	16.7312	8.96
11308	Unit 16 Sample 1	2.5y/7/1	strong	0.0014	0.0438	683.4171	-0-	683.3733	8.89
11309	Unit 17 Sample 1	5y/5/1	slight	0.4670	14.5938	14.0000	0.5938	-0-	8.54
11310	Unit 18 Sample 1	5y/6/1	slight	0.1430	4.4688	16.7500	-0-	12.2812	8.48
11311	Unit 18 Sample 2	5y/6/1	slight	0.2180	6.8125	12.7500	-0-	5.9375	8.77
11312	Unit 18 Sample 3	2.5y/5/2	moderate	0.4240	13.2500	27.5689	-0-	14.3189	8.37
11313	Unit 18 Sample 4	2.5y/5/2	moderate	0.0959	2.9969	16.2907	-0-	13.2938	8.92
11314	Unit 19 Sample 1	2.5/	none	0.7320*	22.8700	12.7500	10.1250	-0-	5.79
11315	Unit 20 Sample 1	5y/6/1	none	0.1840	5.7500	2.2500	3.5000	-0-	6.92
11316	Unit 21 Sample 1	5y/7/1	none	0.0024	0.0750	8.2500	-0-	8.1750	8.64
11317	Unit 22 Sample 1	5y/6/1	slight	0.0027	0.0844	16.5000	-0-	16.4156	9.02
11318	Unit 22 Sample 2	5y/6/1	slight	0.0019	0.0594	0.5000	-0-	0.4406	9.08
11319	Unit 23 Sample 1	5y/5/2	slight	0.4300	13.5313	14.0000	-0-	0.4687	8.11

*Calculated from the Pyritic Sulfur Content
 See Attachment
 hillsboro acid base,8-6-07.xls

Respectively Submitted: *John A. Brown*



Appalachian Laboratories, Inc.

P.O. BOX 392
BECKLEY, WEST VIRGINIA 25802

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Received Electronically
Dept of Natural Resources
Aug 26, 2020
Office of Mines and Minerals
Land Reclamation Division

Client: Hillsboro Energy, LLC
P.O. Box 455
Hillsboro, IL 62049

Date Sampled: 2/1/2007
Date Received: 8/3/2007
Date Analyzed: 8/6/2007

Hole # 08-03-17-04

ACID BASE ACCOUNTABILITY CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11320	Unit 23 Sample 2	5y/5/2	slight	0.0038	0.1188	15.0000	-0-	14.8812	8.90
11321	Unit 24 Sample 1	5y/5/2	slight	0.3910	12.2188	14.7500	-0-	2.5312	8.09
11322	Unit 24 Sample 2	5y/5/2	slight	0.2770	8.6563	13.7500	-0-	5.0937	8.64
11323	Unit 24 Sample 3	5y/5/2	moderate	0.0030	0.0938	21.3033	-0-	21.2095	8.99
11324	Unit 24 Sample 4	5y/5/2	moderate	0.0020	0.0625	27.5689	-0-	27.5064	9.03
11325	Unit 24 Sample 5	5y/5/2	moderate	0.0078	0.2438	35.0877	-0-	34.8439	9.08
11326	Unit 24 Sample 6	5y/5/2	slight	0.0014	0.0438	14.7500	-0-	14.7062	9.03
11327	Unit 24 Sample 7	5y/5/2	slight	0.0014	0.0438	17.0000	-0-	16.9562	8.97
11328	Unit 24 Sample 8	5y/5/2	slight	0.0071	0.2219	18.5000	-0-	18.2781	9.02
11329	Unit 24 Sample 9	5y/5/2	slight	0.0086	0.2688	16.0000	-0-	15.7312	9.05
11330	Unit 24 Sample 10	5y/5/2	slight	0.0006	0.0188	21.7500	-0-	21.7312	8.78
11331	Unit 24 Sample 11	5y/5/2	slight	0.0182	0.5688	17.0000	-0-	16.4312	9.03
11332	Unit 24 Sample 12	5y/5/2	moderate	0.0012	0.0375	28.8221	-0-	28.7846	9.02
11333	Unit 24 Sample 13	5y/5/2	slight	0.0027	0.0844	35.7500	-0-	35.6656	9.13
11334	Unit 25 Sample 1	5y/5/2	slight	0.0016	0.0500	18.5000	-0-	18.4500	9.10
11335	Unit 25 Sample 2	5y/5/2	slight	0.0029	0.0906	17.0000	-0-	16.9094	8.98
11336	Unit 25 Sample 3	5y/5/2	none	0.0067	0.2094	9.2500	-0-	9.0406	9.11
11337	Unit 26 Sample 1	5y/6/1	strong	0.0678	2.1188	149.4975	-0-	147.3787	8.94
11338	Unit 27 Sample 1	5y/7/1	slight	0.0268	0.8375	19.5000	-0-	18.6625	9.25

*Calculated from the Pyritic Sulfur Content
See Attachment

hillsboro acid base, 8-6-07.xls

Respectively Submitted:

Aug 26, 2020

Office of Mines and Minerals
 and Reclamation Division



Appalachian Laboratories, Inc.

P.O. BOX 392
 BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
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Client: Hillsboro Energy, LLC
 P.O. Box 455
 Hillsboro, IL 62049

Date Sampled: 2/1/2007
 Date Received: 8/3/2007
 Date Analyzed: 8/6/2007

Hole # 08-03-17-04

ACID BASE ACCOUNTABILITY CAC03 Equiv. (Tons/1000 Tons of Material)

Lab No.	SAMPLE ID	Color	Fizz	% Sulfur	Max. From % Sulfur	Amount Present	Max. Needed pH 7	Excess	Paste pH
11339	Unit 28 Sample 1	5y/7/1	slight	0.0180	0.5625	25.7500	-0-	25.1875	9.41
11340	Unit 29 Sample 1	10yr/5/4	none	0.0012	0.0375	4.7500	-0-	4.7125	8.26
11341	Unit 29 Sample 2	2.5y/7/1	none	0.0023	0.0719	14.2500	-0-	14.1781	9.13
11342	Unit 30 Sample 1	2.5y/8/1	strong	0.0019	0.0594	866.8342	-0-	866.7748	9.28
11343	Unit 31 Sample 1	2.5y/5/4	none	0.0018	0.0563	11.2500	-0-	11.1937	9.30
11344	Unit 32 Sample 1	2.5y/3/1	none	0.2080	6.5000	1.7500	4.7500	-0-	7.43
11345	Unit 33 Sample 1	5y/6/1	strong	0.0410	1.2813	124.3719	-0-	123.0906	9.17
11346	Unit 34 Sample 1	2.5y/7/1	none	0.0012	0.0375	13.5000	-0-	13.4625	8.46
11347	Unit 35 Sample 1	10yr/2/1	moderate	2.2300*	69.6875	63.9098	5.7777	-0-	7.41
11348	Unit 36 Sample 1	2.5y/7/1	moderate	1.4750*	46.0938	22.5564	23.5374	-0-	8.85
11349	Unit 37 Sample 1	2.5y/8/1	strong	0.1340	4.1875	597.9899	-0-	593.8024	9.24
11350	Unit 38 Sample 1	5Gy/7/1	slight	1.3500*	42.1875	58.0000	-0-	15.8125	9.06
11351	Unit 39 Sample 1	2.5y/8/1	strong	0.0086	0.2688	816.5829	-0-	816.3141	8.63
11352	Unit 40 Sample 1	2.5/5/1	strong	2.2670*	70.8438	236.1809	-0-	165.3371	7.81
11353	Unit 41 Sample 1	2.5y/7/1	strong	0.0114	0.3563	817.8392	-0-	817.4829	7.69
11354	Unit 42 Sample 1	2.5y/7/1	strong	0.0195	0.6094	741.2060	-0-	740.5966	7.97
11355	Unit 43 Sample 1	10yr/2/1	none	1.2720*	39.7500	10.0000	29.7500	-0-	6.47
11356	Unit 44 Sample 1	REMOVED							
11357	Unit 45 Sample 1	2.5/7/1	none	0.5343*	16.6969	-1.0000	17.6969	-0-	6.65

*Calculated from the Pyritic Sulfur Content
 See Attachment
 hillsboro acid base, 8 6 07.xls

Respectively Submitted: *John G. Brown*

-C-

“Sample for Chemical Analysis”

-D-
“Acid Base Accountability Data”

Acid Base Accountability Data (Hole # 08-03-17-04)
 Deer Run Mine
 Montgomery County, IL

Unit	Sample	Feet	Weighted Feet (Feet / Total Feet)	CaCO ₃ Equivalent (T/1000 T CaCO ₃ Equiv)	Weighted CaCO ₃ Equivalent (CaCO ₃ Equiv * Wghtd Ft)
3	1	5.3750	0.0175	23.4719	0.4108
3	2	5.3750	0.0175	4.1875	0.0733
3	3	5.3750	0.0175	3.7095	0.0649
3	4	5.3750	0.0175	10.8437	0.1898
4	1	8.0000	0.0261	6.4906	0.1691
5	1	5.0000	0.0163	14.7720	0.2405
5	2	5.0000	0.0163	17.3720	0.2828
6	1	5.2700	0.0172	22.1689	0.3804
6	2	5.2700	0.0172	18.6126	0.3194
6	3	5.2700	0.0172	15.3969	0.2642
7	1	3.6000	0.0117	134.5472	1.5773
8	1	3.5500	0.0116	(19.6563)	(0.2272)
9	1	0.4000	0.0013	(4.5625)	(0.0059)
10	1	3.6500	0.0119	510.4128	6.0665
11	1	5.3300	0.0174	65.3172	1.1337
11	2	5.3300	0.0174	10.1250	0.1757
11	3	5.3300	0.0174	6.6500	0.1154
12	1	5.0667	0.0165	6.5531	0.1081
12	2	5.0667	0.0165	28.3846	0.4683
12	3	5.0667	0.0165	13.0562	0.2154
12	4	5.0667	0.0165	17.5876	0.2902
12	5	5.0667	0.0165	20.9531	0.3457
12	6	5.0667	0.0165	14.0750	0.2322
13	1	4.3000	0.0140	13.6656	0.1913
14	1	3.6000	0.0117	16.3437	0.1916
15	1	3.1500	0.0103	16.7312	0.1716
16	1	2.0500	0.0067	683.3733	4.5618
17	1	7.5000	0.0244	(0.5938)	(0.0145)
18	1	4.3750	0.0142	12.2812	0.1750
18	2	4.3750	0.0142	5.9375	0.0846
18	3	4.3750	0.0142	14.3189	0.2040
18	4	4.3750	0.0142	13.2938	0.1894
19	1	1.1000	0.0036	(10.1250)	(0.0363)
20	1	2.0000	0.0065	(3.5000)	(0.0228)
21	1	5.4000	0.0176	8.1750	0.1437
22	1	5.5000	0.0179	16.4156	0.2940

Unit	Sample	Feet	Weighted Feet (Feet / Total Feet)	CaCO ₃ Equivalent (T/1000 T CaCO ₃ Equiv)	Weighted CaCO ₃ Equivalent (CaCO ₃ Equiv * Wghtd Ft)
22	2	5.5000	0.0179	0.4406	0.0079
23	1	4.5000	0.0147	0.4687	0.0069
23	2	4.5000	0.0147	14.8812	0.2181
24	1	4.6920	0.0153	2.5312	0.0387
24	2	4.6920	0.0153	5.0937	0.0778
24	3	4.6920	0.0153	21.2095	0.3241
24	4	4.6920	0.0153	27.5064	0.4203
24	5	4.6920	0.0153	34.8439	0.5324
24	6	4.6920	0.0153	14.7062	0.2247
24	7	4.6920	0.0153	16.9562	0.2591
24	8	4.6920	0.0153	18.2781	0.2793
24	9	4.6920	0.0153	15.7312	0.2404
24	10	4.6920	0.0153	21.7312	0.3320
24	11	4.6920	0.0153	16.4312	0.2510
24	12	4.6920	0.0153	28.7846	0.4398
24	13	4.6920	0.0153	35.6656	0.5449
25	1	7.9500	0.0259	18.4500	0.4776
25	2	7.9500	0.0259	9.0406	0.2340
26	1	0.9500	0.0031	147.3787	0.4559
27	1	4.2500	0.0138	18.6625	0.2583
28	1	1.9500	0.0063	25.1875	0.1599
29	1	5.0000	0.0163	4.7125	0.0767
29	2	5.0000	0.0163	14.1781	0.2308
30	1	5.4500	0.0177	866.7748	15.3826
31	1	2.2500	0.0073	11.1937	0.0820
32	1	2.3000	0.0075	(4.7500)	(0.0356)
33	1	2.6500	0.0086	123.0906	1.0622
34	1	3.1000	0.0101	13.4625	0.1359
35	1	1.2000	0.0039	(5.7777)	(0.0226)
36	1	1.8000	0.0059	(23.5374)	(0.1380)
37	1	2.7000	0.0088	593.8024	5.2207
38	1	3.5000	0.0114	15.8125	0.1802
39	1	1.1000	0.0036	816.3141	2.9240
40	1	1.4000	0.0046	165.3371	0.7537
41	1	0.9000	0.0029	817.4829	2.3958
42	1	1.9000	0.0062	740.5966	4.5821
43	1	3.3000	0.0107	(29.7500)	(0.3197)
Total Feet = 307.0962				Weighted Average =	57.3180

Attachment III.2.A.3
Sulfur Forms Result Sheet



Appalachian Laboratories, Inc.

P.O. BOX 392
 BECKLEY, WEST VIRGINIA 25802

PHONE 304-253-8677
 FAX 304-253-4157
 E-mail: applabs@charter.net

Client: Hillsboro Energy, LLC
 P.O. Box 455
 Hillsboro, W 62049

Date Sampled: 2/1/2007
 Date Received: 8/3/2007
 Date Analyzed: 8/6/2007

Hole# 08-03-17-04

%
SULFUR FORMS

Lab No.	I.D. No.	% Pyritic Sulfur	% Organic Sulfur	% Sulfate Sulfur	% Total Sulfur
11293	Unit 8 Sample 1	1.3090	0.1810	<0.0001	1.4900
11294	Unit 9 Sample 1	0.7300	1.0300	<0.0001	1.7600
11314	Unit 19 Sample 1	0.7320	0.9180	<0.0001	1.6500
11347	Unit 35 Sample 1	2.2300	0.8900	<0.0001	3.1200
11348	Unit 36 Sample 1	1.4750	0.1050	<0.0001	1.5800
11350	Unit 38 Sample 1	1.3500	0.1000	<0.0001	1.4500
11352	Unit 40 Sample 1	2.2670	0.2130	<0.0001	2.4800
11355	Unit 43 Sample 1	1.2720	0.2980	0.3500	1.9200
11357	Unit 45 Sample	0.5343	0.0427	0.0510	0.6280

*Calculated from the Pyritic Sulfur Content
 See Attachment
 Hillsboro SULFUR, 8-6-07.xls

Respectively Submitted:



Testing Laboratory
COAL ANALYSIS, INSPECTION AND SAMPLING

P.O. BOX 1985 • BECKLEY, WEST VIRGINIA 25802 • TELEPHONE (304) 252-2539

COMPANY: Hillsboro Energy LLC
ADDRESS: 925 S. Main Street
Hillsboro, IL 62049
DESCRIPTION: 1.70 Float Composite

SAMPLE ID:
Core Sample Montgomery Co.
Hole#: 08-03-17-04
T/C (ft): 443.90
B/C (ft): 451.60
Total: 7.70

LABORATORY NUMBER: 332,274
DATE RECEIVED: 6-Feb-07
DATE ANALYZED: 1-Mar-07

Herrin #6 coal

Sulfur Forms

% Total Sulfur	4.30
% Pyritic Sulfur	2.14
% Sulfate Sulfur	0.19
% Organic Sulfur	1.97

Fusing Temperature of Ash (Degrees Fah.)

Initial Deformation Point
Softening Temperature, Spherical
Softening Temperature, Hemispherical
Fluid Temperature

Reducing

1936
2000
2129
2288

Oxidizing

2287
2371
2459
2497

PRECISION TESTING LABORATORY, INC.

Steven H. Lilly, Laboratory Manager



Attachment III.2.B.1 - Surface Owners Water Well Surveys

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well ID	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
16-25-100-005	7150 South Illinois Route 127	Hillsboro	Betty	McFarlin	7150 Illinois Route 127	P.O. Box 67	Hillsboro	Illinois	62049	X	X					
16-25-100-007	400 Rountree Street	Hillsboro	Roger	McFarlin	400 Rountree Street		Hillsboro	Illinois	62049							
16-25-200-001	7291 Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
16-25-300-005	7140 Illinois Route 127	Hillsboro	Bruce	Finley	7140 Illinois Route 127		Hillsboro	Illinois	62049	X	X					
16-25-300-009	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049							
16-25-300-010	7012 Illinois Route 127	Hillsboro	Arlen & Allen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
16-25-300-017	10110 Holloway Trail	Hillsboro	Scott	Strausgaugh	130 Bendor Circle		Hillsboro	Illinois	62049			Well 204	-	-	31	
16-25-400-001	123 North Broad	Hillsboro	New River Royalty, LLC	Wisdom Trust	208 Public Square	4th Floor	Benton	Illinois	62812							
16-25-400-004	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	X		Well 203	-	36	34	
16-25-400-006	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-25-400-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
16-25-400-008	7th Avenue & Buckeye Trail	Hillsboro	Connie	Garrett	828 CR 3840		Bridgeport	Texas	76426							
16-36-100-002	11106 North 7th Avenue	Hillsboro	John & Patricia	Robinson	11106 North 7th Avenue		Hillsboro	Illinois	62049	X		Well VV	no	48	20	Used for garden.
16-36-100-004	11148 North 7th Avenue	Hillsboro	Edward & Susan	Boyd	422 West Fairground Avenue		Hillsboro	Illinois	62049			Well 210	no	36	48	Well not used.
16-36-100-008	6252 Illinois Route 127	Hillsboro	Mary	Rikli	6252 Illinois Route 127		Hillsboro	Illinois	62049	X		Wells SS1, SS2, SS3	no	8	26, 48, 29	Three wells present. One diameter provided. Depths from ISWS database. Used for stock & garden.
16-36-100-009	North 7th Avenue	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-100-010	11180 North 7th Avenue	Hillsboro	Rhonda	Huber	11180 North 7th Avenue		Hillsboro	Illinois	62049	X						
16-36-200-001	11228 North 7th Avenue	Hillsboro	David & Carol	Schluckebier	11228 North 7th Avenue		Hillsboro	Illinois	62049	X						
16-36-200-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-200-003	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-200-004	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-300-002	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049			Well 214	-	-	27	
16-36-300-006	11201 North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069							
16-36-400-001	6252 Illinois Route 127	Hillsboro	Daniel	Chappelear	5358 Waveland Road		Hillsboro	Illinois	62049							
16-36-400-002	Buckeye Trail	Hillsboro	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
16-36-400-005	North 6th Avenue	Hillsboro	Forrest	Delong	P.O. Box 334		Hillsboro	Illinois	62049	X						
16-36-400-006	North 6th Avenue	Hillsboro	Kenneth & Betty	Weiss	312 West Third North Street		Mt. Olive	Illinois	62069							
17-27-100-002	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702							
17-27-100-003	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702							
17-27-100-004	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702							
17-27-100-502	Coffeen Road	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-100-503	Illinois Route 185	Hillsboro	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-100-504	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-200-005	Coffeen Road	Hillsboro	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-27-200-006	7225 Coffeen Road	Hillsboro	New River Royalty, LLC	F. Huber	208 Public Square	4th Floor	Benton	Illinois	62812	X		Well 202	-	-	32	
17-27-200-007	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Raetta Realty	One Natural Resources Way		Springfield	Illinois	62702							
17-27-200-008			Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702							
17-27-200-009	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-200-010	Coffeen Road	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-200-507	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-300-001	Illinois Route 185	Coffeen	Illinois Department of Natural Resources		One Natural Resources Way		Springfield	Illinois	62702							
17-27-300-005	15020 Illinois Route 185	Hillsboro	Elzie	Garrett	1715 Summit Street		Hillsboro	Illinois	62049	X						
17-27-300-006	Illinois Route 185	Hillsboro	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-27-300-010	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110	X						
17-27-300-011	15116 Illinois Route 185	Hillsboro	New River Royalty, LLC	C. Branch	208 Public Square	4th Floor	Benton	Illinois	62812	X		Well 9	no	36	30	Used for garden.
17-27-300-012	15056 Illinois Route 185	Hillsboro	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017		X					
17-27-300-013	52 McDavid Cemetery Lane	Coffeen	Celene	Harrelson	P.O. Box 293		Coffeen	Illinois	62017							
17-27-300-014	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049	X		Well MM	yes	-	20	Used for drinking, bathing, & stock.
17-27-300-015	Illinois Route 185	Hillsboro	Randall & Rose	Huber	1201 University		Hillsboro	Illinois	62049							
17-27-300-016	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110							
17-27-300-501	Illinois Route 185	Coffeen	Illinois Department of Natural Resources	c/o Gary Laurent	822 Powder Avenue		Donnellson	Illinois	62019							
17-27-400-001	15039 Illinois Route 185	Hillsboro	Kenneth & Karen	Blankenship	15039 Illinois Route 185		Hillsboro	Illinois	62049							
17-27-400-003	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-400-004	Illinois Route 185	Hillsboro	Brian	Huber	6653 Majestic Way		Carpentersville	Illinois	60110	X						
17-27-400-005	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-27-400-007	Illinois Route 185	Hillsboro	Matthew	Elam	1465 Country Club Way		Smithboro	Illinois	62284							
17-28-100-004	East 14th Road	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049			Well 201	-	-	40	
17-28-100-005	14232 Illinois Route 185	Hillsboro	New River Royalty, LLC	J. Hamilton	208 Public Square	4th Floor	Benton	Illinois	62812	X		Well 3	no	48	1.7	
17-28-100-006	14107 Illinois Route 185	Hillsboro	New River Royalty, LLC	George Elam	208 Public Square	4th Floor	Benton	Illinois	62812	X						
17-28-100-007	Illinois Route 185	Hillsboro	New River Royalty, LLC	H. Jurgena	208 Public Square	4th Floor	Benton	Illinois	62812			Well 2	yes	6, 36	30	6" dia. (first 10') 36" (casing last 20'). Used for drinking, bathing, & garden.
17-28-200-001	East 14th Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							

Attachment III.2.B.1 - Surface Owners Water Well Surveys

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well ID	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
17-28-200-002	East 14th Road	Hillsboro	David & Stephen	Spinner	715 East Union Avenue		Litchfield	Illinois	62056			Well NN	no	60	50	Used for garden.
17-28-200-003	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-28-200-005	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-28-300-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-28-400-002	14401 Illinois Route 185	Hillsboro	New River Royalty, LLC	R. Hughes	208 Public Square	4th Floor	Benton	Illinois	62812	X		Well 7	no	81	33.5	Used for drinking, bathing, stock, & garden.
17-28-400-003	14329 Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812	X						
17-29-100-001	North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-29-100-002	North 7th Avenue	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-29-200-001	13314 Illinois Route 185	Hillsboro	New River Royalty, LLC	L. Bowen	208 Public Square	4th Floor	Benton	Illinois	62812	X		Well 1	yes	30	10	Used for drinking, bathing, & garden.
17-29-200-003	Illinois Route 185	Hillsboro	Wright Trust	c/o First National Bank	P.O. Box 40		Vandalia	Illinois	62471							
17-29-200-004	Illinois Route 185	Hillsboro	Earl	Seltzer	904 Smith Lane	P.O. Box 502	Hillsboro	Illinois	62049							
17-29-300-001	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-29-300-002	13013 North 7th Avenue	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049	X		Wells LL1, LL2, LL3	yes	36	26	Three wells. One dia/depth provided. Used for drinking, bathing, stock, & garden.
17-29-400-004	7170 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-29-400-006	7179 East 14th Road	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-30-100-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
17-30-200-001	North 7th Avenue	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
17-30-300-001	7108 Buckeye Trail	Hillsboro	Richard	Elam	7108 Buckeye Trail		Hillsboro	Illinois	62049	X		Well XX	yes	48	20	Used for drinking & bathing.
17-30-400-001	Buckeye Trail	Hillsboro	Joseph	Boas	11091 Brushy Trail		Irving	Illinois	62051							
17-30-400-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049			Well 205	-	-	15	
17-30-400-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049			Well 206	-	-	35	
17-31-100-001	7199 Buckeye Trail	Hillsboro	Larry	Schraut	7199 Buckeye Trail		Hillsboro	Illinois	62049							
17-31-100-003	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049	X						
17-31-100-004	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049							
17-31-200-001	12248 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049			Wells 207 & 208	-	-	49 & 50	
17-31-200-002	12188 North 7th Avenue	Hillsboro	Gerald	Young	12188 North 7th Avenue		Hillsboro	Illinois	62049							
17-31-300-001	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
17-31-300-002	Buckeye Trail	Coffeen	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
17-31-300-003	12057 North 6th Avenue	Hillsboro	Jerry & Wanda	Mercer	12057 North 6th Avenue		Hillsboro	Illinois	62049	X		Wells 215A & 215B	yes	36 & 30	34 & 60	Two wells. Used for drinking, bathing, & garden.
17-31-300-004	6061 - 6063 Buckeye Trail	Hillsboro	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049	X	X	Well OO	no	48	30	Used for garden.
17-31-300-005	12179 North 6th Avenue	Hillsboro	Brian Weston	c/o Litchfield Community Savings	P.O. Box 445		Litchfield	Illinois	62056	X						
17-31-400-001	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049							
17-31-400-007	6063 Buckeye Trail	Coffeen	Richard & Margaret	Harms	6063 Buckeye Trail		Hillsboro	Illinois	62049							
17-31-400-008	North 6th Avenue	Coffeen	Benjamin	Kenny	5250 East 18th Road		Coffeen	Illinois	62017							
17-31-400-010	North 6th Avenue	Coffeen	Nicholas	Kenny	1402 Kweit Lane		Greenville	Illinois	62246							
17-31-400-011	92 McQuern Lane	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049	X		Well JJ	yes	-	-	Used for drinking & stock.
17-32-100-002	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
17-32-100-003	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
17-32-100-004	13030 North 7th Avenue	Hillsboro	New River Royalty, LLC	John Clark	208 Public Square	4th Floor	Benton	Illinois	62812	X		Wells 8A & 8B	yes	6	50 & 52	Two wells, both 6" diameter. Used for drinking, bathing, stock, & garden.
17-32-100-006	13130 North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049							
17-32-100-007	North 7th Avenue	Hillsboro	Brad & Dawn	Young	13130 North 7th Avenue		Hillsboro	Illinois	62049			Well 209	-	-	50	
17-32-200-001	6265 East 14th Road	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
17-32-200-002	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049	X		Well 211	-	-	64	
17-32-300-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-32-300-005	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-32-400-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049	X						
17-32-400-002	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-32-400-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-33-100-002	East 14th Road	Hillsboro	Earl Seltzer Enterprises		P.O. Box 502		Hillsboro	Illinois	62049							
17-33-200-001	Illinois Route 185	Hillsboro	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-33-300-001	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-33-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-300-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-300-005	North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
17-33-300-006	14061 North 6th Avenue	Coffeen	Wade Edwards	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X						
17-33-400-001	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-400-003	Rural Lake Area	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-33-400-004	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
17-33-400-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							

Attachment III.2.B.1 - Surface Owners Water Well Surveys

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well ID	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
17-33-400-006	5263 East 14th Road	Coffeen	William, Cleola, & Cheryl	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
17-34-100-004	72 McDavid Cemetery Lane	Coffeen	McDavid Point Cemetery		R.R. 1		Hillsboro	Illinois	62049							
17-34-100-005	95 McDavid Cemetery Lane	Coffeen	Kenneth & Linda	Null	95 McDavid Cemetery Lane		Hillsboro	Illinois	62049	X						
17-34-100-006	15212 Illinois Route 185	Hillsboro	Ralph	Ray	15212 Illinois Route 185		Hillsboro	Illinois	62049	X						
17-34-200-001	15172 Illinois Route 185	Hillsboro	Shawn & Hope	Titsworth	15172 Illinois Route 185		Hillsboro	Illinois	62049	X						
17-34-200-007	Coffeen Road	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-34-200-008	Coffeen Road	Hillsboro	New River Royalty, LLC	R. Huber	208 Public Square	4th Floor	Benton	Illinois	62812							
17-34-200-009	15448 Illinois Route 185	Hillsboro	Kenneth & Brenda	Timpe	15323 Irving Road		Irving	Illinois	62051			Well PP	no	-	-	Used for stock & garden.
17-34-200-011	Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
17-34-200-012	1322 CIPS Trail	Coffeen	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-34-200-015	1255 CIPS Trail	Coffeen	William	Kershaw	1255 CIPS Trail		Coffeen	Illinois	62017	X						
17-34-200-019	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
17-34-200-020	1335 CIPS Trail	Coffeen	Danny	Lilley	1335 CIPS Trail		Coffeen	Illinois	62017	X		Well RR	no	80	35	Used for drinking, stock, & garden.
17-34-200-021	Illinois Route 185	Hillsboro	New River Royalty, LLC		208 Public Square	4th Floor	Benton	Illinois	62812							
17-34-300-001	Border North Coffeen Lake	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
17-34-300-007	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017							
17-34-300-008	15177 North 6th Avenue	Coffeen	Kathy	Turner	15177 North 6th Avenue		Coffeen	Illinois	62017	X		Well QQ	no	48	-	Well not used.
17-34-300-009	CIPS Trail	Coffeen	Robert	Ray	6550 Oleatha		St. Louis	Missouri	63139			Well 212	no	-	32	
17-34-451-008	1057 CIPS Trail	Coffeen	Wade & Natalie	Fuller	1057 CIPS Trail		Coffeen	Illinois	62017							
17-34-451-009	15201 North 6th Avenue	Coffeen	Schylar & Amanda	Fuller	15201 North 6th Avenue		Coffeen	Illinois	62017	X						
20-01-100-008	5338 Illinois Route 127	Hillsboro	Gerald	Zumwalt	5338 Illinois Route 127		Hillsboro	Illinois	62049	X		Well C	yes	60	15	Used for drinking, bathing, stock, & garden.
20-01-100-009	13314 Illinois Route 185	Hillsboro	Arlen	Kasten	13314 Illinois Route 185		Hillsboro	Illinois	62049							
20-01-100-011	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650							
20-01-200-003	11202 North 6th Avenue	Hillsboro	Mary June	Koontz	11202 North 6th Avenue		Hillsboro	Illinois	62049	X						
20-01-200-005	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049	X						
20-01-200-006	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
20-01-200-008	North 6th Avenue	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650							
20-01-200-009	11204 North 6th Avenue	Hillsboro	William & Ruth	Schroeder	11204 North 6th Avenue		Hillsboro	Illinois	62049	X		Well F	yes	36	42	Used for drinking, bathing, & garden.
20-01-300-008	Illinois Route 127	Hillsboro	David & Luann	Chappelear	10110 Holloway Trail		Hillsboro	Illinois	62049							
20-01-300-009	Illinois Route 127	Hillsboro	Rodney	Bergmann	4 Deer Hollow		Litchfield	Illinois	62056			Well ZZ & Converted Oil Well 23	yes	-	200 & 110	Used for drinking & stock. Converted oil well plugged back to 110' left open as fresh water well use unknown
20-01-300-011	169 Funk Lane	Hillsboro	Thomas & Mary	Murray	169 Funk Lane		Hillsboro	Illinois	62049	X		Well A	no	-	30	Used for garden.
20-01-300-015	5126 Illinois Route 127	Hillsboro	Ronald	Hunshe	12610 Niggli Road		Highland	Illinois	62249			Well L	no	-	-	Well not used.
20-01-400-010	253 Rock Lane	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049							
20-01-400-012	Rock Lane	Hillsboro	Dolores	Yarbrough	1105 Devonshire Drive		Champaign	Illinois	61821							
20-01-400-013	Funk Lane	Hillsboro	Karen Funk	c/o Farmers State Bank & Trust	200 West State		Jacksonville	Illinois	62650							
20-01-400-014	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
20-01-400-015	Funk Lane	Hillsboro	Thomas	Boehler	379 South Starr Street		Waggoner	Illinois	62572			Wells D1 & D2	yes	8	65 & 235	Two wells. One dia provided. 235 ft well not used. 65 ft well used for drinking & bathing.
20-01-400-018	266 Rock Lane	Hillsboro	Jean	Snyder	266 Rock Lane		Hillsboro	Illinois	62049	X		Well B	yes	8	75	Used for drinking, bathing, stock, & garden.
20-01-400-019	259 Rock Lane	Hillsboro	Todd & Alicia	Kelly	8312 North State Route 159		Dorsey	Illinois	62021							
20-01-400-020	190 Page Lane	Hillsboro	Charles	Page	190 Page Lane		Hillsboro	Illinois	62049							
20-01-400-021	172 Page Lane	Hillsboro	Brian & Edina	Page	P.O. Box 341		Morrisonville	Illinois	62546							
20-01-400-022	204 Page Lane	Hillsboro	Charles & Daniel	Page	204 Page Lane		Hillsboro	Illinois	62049			Well 233	no	36	45	Used for garden.
20-12-100-008	Illinois Route 127	Hillsboro	Dennie & Dee	Goedecke	338 Bens Drive		Chatham	Illinois	62629							
20-12-100-011	Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-100-013	4292 Illinois Route 127	Hillsboro	Roy & Cherlann	Rapien	4292 Illinois Route 127		Hillsboro	Illinois	62049	X		Converted Oil Well 78		8	118	plugged back to 118' left open as fresh water well
20-12-200-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049	X		Wells 237 & 238	no	36	54 & 29	Two wells. One diameter provided. Used for garden.
20-12-200-003	204 Funk Lane	Hillsboro	Charles & Daniel	Page	204 Funk Lane		Hillsboro	Illinois	62049							
20-12-200-006	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049	X						
20-12-300-001	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-300-005	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-300-011	3570 Illinois Route 127	Hillsboro	Corey	Beatty	502 Pine Street		Hillsboro	Illinois	62049							
20-12-300-012	Illinois Route 127	Hillsboro	Rande & Diane	Gibbs	10866 Lake Road		Highland	Illinois	62249							
20-12-300-013	4121 Illinois Route 127	Hillsboro	P & B Trust		4121 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-400-001	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049							
20-12-400-002	181 Adams Lane	Hillsboro	Ronald	Cooper	181 Adams Lane		Hillsboro	Illinois	62049							
20-12-400-003	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049							
20-12-400-005	4003 Buckeye Trail	Hillsboro	Earl	Law	4003 Buckeye Trail		Hillsboro	Illinois	62049			Wells 244 & E	no	48	90 & 28	Two wells. One dia provided. ISGS log (244) indicates dry hole. Well E used for stock & garden.
20-12-400-006	140 Adams Lane	Hillsboro	Stacey Carroll	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X		Well 239	-	-	52	
20-12-400-007	142 Adams Lane	Hillsboro	Gary	Sneed	142 Adams Lane		Hillsboro	Illinois	62049	X		Well CC	yes	36	65	Used for drinking, bathing, stock, & garden.
20-13-100-007	3538 Illinois Route 127	Hillsboro	Charles & Nancy	McDowell	3538 Illinois Route 127		Hillsboro	Illinois	62049							

Attachment III.2.B.1 - Surface Owners Water Well Surveys

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well ID	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
20-13-100-009	3141 Illinois Route 127	Hillsboro	Samual Elizondo	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262							
20-13-100-010	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471			Well 253	-	-	60	
20-13-200-002	Illinois Route 127	Hillsboro	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471							
20-13-200-003	Bear Creek Lane	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450							
20-13-200-005	3127 Illinois Route 127	Hillsboro	Wanda	Bee	3127 Illinois Route 127		Hillsboro	Illinois	62049							
20-13-300-004	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471							
20-13-400-001	Bear Creek Lane	Donnellson	Barbara	Wright	P.O. Box 40		Vandalia	Illinois	62471							
21-03-100-002	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017			Well H	no	36	35	Well not used.
21-03-100-003	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017							
21-03-100-004	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017							
21-03-100-005	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017							
21-03-100-007	North 6th Avenue	Coffeen	Terry & Brenda	Young	73 Young Lane		Coffeen	Illinois	62017			Well I	yes	36	13	Used for drinking & stock.
21-03-100-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017	X						
21-03-100-009	15034 North 6th Avenue	Coffeen	Robert & Clara	Dale	15034 Noth 6th Avenue		Coffeen	Illinois	62017	X		Well G	no	36	35	Used for garden.
21-03-100-012	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017							
21-03-100-013	15112 North 6th Avenue	Coffeen	Brooks	Moreland	15112 North 6th Avenue		Coffeen	Illinois	62017	X						
21-03-100-014	15138 North 6th Avenue	Coffeen	Kevin & Gena	Lewey	15138 North 6th Avenue		Coffeen	Illinois	62017	X		Well YY	yes	36	70	Used for drinking, bathing, stock, & garden.
21-03-100-015	15152 North 6th Avenue	Coffeen	Doris	Graham	15152 North 6th Avenue		Coffeen	Illinois	62017							
21-03-100-016	15170 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	X		Well J	yes	-	-	Used for drinking, bathing, stock, & garden.
21-03-100-017	15194 North 6th Avenue	Coffeen	Randy	White	3362 South Spring Street		Springfield	Illinois	62703	X		Well K	yes	-	-	Used for drinking, bathing, stock, & garden.
21-03-300-001	CIPS Trail	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002			Wells 221 & 222	-	30 & 6,36	29 & 48	Two wells. 30" dia for well 221. 6" dia (first 10'), 36" (last 38') for well 222.
21-03-300-002	151 Fox Lane	Coffeen	Drury	Emerson	151 Fox Lane		Coffeen	Illinois	62017	X		Well 230	-	-	40	
21-04-100-001	North 6th Avenue	Coffeen	Illinois Power Company	c/o Ameren Services	P.O. Box 66149		St. Louis	Missouri	63166							
21-04-100-002	5264 East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017							
21-04-100-007	14198 North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-04-100-008	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			Wells M,N,O,P	yes	varies	20 ft to 174 ft	Used for drinking, bathing, & garden.
21-04-100-010	North 6th Avenue	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017	X		Well 218	no	36	42	Used for drinking & bathing.
21-04-200-001	13253 North 6th Avenue	Coffeen	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049			Well 219	-	-	161	
21-04-200-004	Lake Boundary	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-04-200-005	14330 North 6th Avenue	Coffeen	New River Royalty, LLC	C. Mathenia	208 Public Square	4th Floor	Benton	Illinois	62812	X		Well 12	yes	36	30	Used for drinking, bathing, & garden.
21-04-200-007	14358 North 6th Avenue	Coffeen	Bob & Alice	Reynolds	14358 North 6th Avenue		Coffeen	Illinois	62017	X		Well 220	-	-	54	
21-04-200-008	15010 North 6th Avenue	Coffeen	Mary	Shelbourne	15010 North 6th Avenue		Coffeen	Illinois	62017							
21-04-300-003	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097							
21-04-300-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-04-300-005	6265 East 14th Road	Hillsboro	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
21-04-300-006	East 14th Road	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097			Well 229	-	-	20	
21-04-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-04-400-002	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-04-400-003	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			Well Q	no	-	-	Well not used.
21-04-400-004	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-05-100-003	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-100-004	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-100-005	13214 Flat Avenue	Hillsboro	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014							
21-05-100-006	North 6th Avenue	Coffeen	Brian, Dacia, & Dean	Brown	12167 North Road		Hillsboro	Illinois	62049							
21-05-200-001	13253 North 6th Avenue	Hillsboro	Donald & Brenda	Edwards	13253 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-200-002	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255							
21-05-200-004	East 14th Road	Coffeen	Dennis	Dressler	656 Lily Road		Lenzburg	Illinois	62255							
21-05-200-005	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017	X		Wells T1 & T2	no	60	18	Two wells. Same dia/depth. Used for garden.
21-05-300-001	Flat Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-05-300-003	North 5th Lane	Hillsboro	Bank & Trust		P.O. Box 410		Litchfield	Illinois	62056							
21-05-300-007	Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014							
21-05-300-008	13214 Flat Avenue	Hillsboro	Phyllis	Simonton	13214 Flat Avenue		Coffeen	Illinois	62017	X		Well S	yes	-	-	Used for drinking, bathing, & garden.
21-05-400-001	13214 Flat Avenue	Coffeen	Mark	Huber	9121 Briarfield Lane		Bunker Hill	Illinois	62014	X						
21-05-400-006	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-05-400-008	East 14th Road	Coffeen	Dean	Huber	5264 East 14th Road		Coffeen	Illinois	62017							
21-05-400-009	5073 East 14th Avenue	Coffeen	Bruce	Guckian	5073 East 14th Road		Coffeen	Illinois	62017	X						
21-05-400-011	North 5th Lane	Hillsboro	Jason Huston	c/o Countrywide Tax Service	P.O. Box 10211		Van Nuys	California	91410	X						
21-06-100-003	11400 North 6th Avenue	Hillsboro	Douglas & Brenda	Johnson	11400 North 6th Avenue		Hillsboro	Illinois	62049			Well V	no	36	20	Used for garden.
21-06-100-004	12056 North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049	X		Wells 216 & 217	yes	6,36 & 30	81 & 36	Two wells. 6" dia (first 10'), 36" (last 71') for well 216. Used for drinking, bathing, stock, & garden.

Attachment III.2.B.1 - Surface Owners Water Well Surveys

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well ID	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
21-06-100-005	12198 North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049	X		Wells W1 & W2	no	48	18	Two wells. One dia/depth provided. Used for stock & garden.
21-06-100-006	North 6th Avenue	Hillsboro	Roberta	Meyer	12198 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-200-007	North 6th Avenue	Coffeen	New River Royalty, LLC	G. Edwards	208 Public Square	4th Floor	Benton	Illinois	62812			Well 11	no	36	15	
21-06-200-008	North 6th Avenue	Hillsboro	Austin	Meyer	449 Bobwhite Road		Pocahontas	Illinois	62275							
21-06-200-009	North 6th Avenue	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049			Well DD	-	-	-	Presumed not used. Abandoned farmstead.
21-06-300-002	253 Rock Lane	Hillsboro	Norman	Compton	253 Rock Lane		Hillsboro	Illinois	62049							
21-06-300-007	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-300-008	188 Rock Lane	Hillsboro	Patrick & Lora	Eck	188 Rock Lane		Hillsboro	Illinois	62049	X		Well 228	no	36	72	Used for stock & garden.
21-06-300-009	Buckeye Trail	Hillsboro	Patrick	Jarnagin	4441 Buckeye Trail		Hillsboro	Illinois	62049							
21-06-300-010	4441 Buckeye Trail	Hillsboro	Carrie	Baron	4441 Buckeye Trail		Hillsboro	Illinois	62049	X		Wells 234A & 234B	yes	36	65	Two wells. Same dia/depth. Used for drinking, bathing, & stock.
21-06-400-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-400-002	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-06-400-003	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-07-100-002	4255 Buckeye Trail	Hillsboro	Andrew Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049	X						
21-07-100-007	Buckeye Trail	Hillsboro	Travis & Aimee	Klump	17135 Illinois Route 185		Coffeen	Illinois	62017							
21-07-100-008	Buckeye Trail	Hillsboro	Justin & Brandi	Reynolds	1510 South Main Street		Hillsboro	Illinois	62049			Well 236	-	-	40	
21-07-100-009	Buckeye Trail	Hillsboro	Tracy	Dressler	305 Washington Street		Donnellson	Illinois	62019							
21-07-100-010	Buckeye Trail	Hillsboro	Klump & Atterberry	c/o Phillip Klump	807 Keller Avenue		Hillsboro	Illinois	62049							
21-07-100-011	Buckeye Trail	Hillsboro	Terri	Mackey	253 Rock Lane		Hillsboro	Illinois	62049							
21-07-200-002	Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-07-300-003	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049	X		Wells Y1 & Y2	no	-	-	Used for stock & garden.
21-07-300-007	4201 Buckeye Trail	Hillsboro	John & Edna	Balla	4201 Buckeye Trail		Hillsboro	Illinois	62049			Well 240	-	-	63	
21-07-300-012	4121 Buckeye Trail	Hillsboro	Michelle Stritzel	c/o National Bank	P.O. Box 310		Hillsboro	Illinois	62049	X						
21-07-300-014	Buckeye Trail	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450			Well 245	-	-	50	
21-07-300-015	Buckeye Trail	Hillsboro	Donna	Stritzel	13 Johnson Street		Hillsboro	Illinois	62049			Well 242	-	-	170	
21-07-400-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-07-400-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-07-400-004	4441 Buckeye Trail	Hillsboro	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-07-400-005	Buckeye Trail	Hillsboro	Kenneth & Lonna	Durbin	16130 East 7th Avenue		Butler	Illinois	62015							
21-08-100-001	4441 Buckeye Trail	Hillsboro	Randolph & Susan	Schneider	12056 North 6th Avenue		Hillsboro	Illinois	62049							
21-08-100-002	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-100-003	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-100-004	North 5th Lane	Hillsboro	Joyce Brothers	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-200-001	North 5th Lane	Hillsboro	Eldon & Gerald Joyce	c/o Bank & Trust Company	401 North Madison	P.O. Box 410	Litchfield	Illinois	62056							
21-08-200-002	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-08-200-003	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-08-200-004	East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-08-300-001	North 4th Avenue	Donnellson	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017			Well U	no	60	18	Used for garden.
21-08-300-002	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-08-300-003	5263 East 14th Road	Coffeen	Dean	Huber	5263 East 14th Road		Coffeen	Illinois	62017							
21-08-300-004	North 4th Avenue	Donnellson	Robert	Elmore	10724 Burlington Lane		Marion	Illinois	62959							
21-08-400-001	13295 North 4th Avenue	Donnellson	Roger	Reeves	605 Hickory		Hillsboro	Illinois	62049			Well Z	no	48	50	Used for stock & garden.
21-08-400-002	4177 East 14th Road	Hillsboro	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-09-100-001	Mentors Lane	Coffeen	Brian	Suhre	8233 Brickyard Hill Road		Worden	Illinois	62097							
21-09-100-002	Mentors Lane	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822							
21-09-100-003	14171 Mentors Lane	Coffeen	Stella	Kasten	6265 East 14th Road		Hillsboro	Illinois	62049							
21-09-200-005	14280 Mentors Lane	Coffeen	William & Cleola	Brackett	14280 Mentors Lane		Coffeen	Illinois	62017							
21-09-200-006	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			Well R	no	-	-	Well not used.
21-09-200-008	14243 Mentors Lane	Coffeen	Rose	Beard	14243 Mentors Lane		Coffeen	Illinois	62017	X						
21-09-200-010	Mentors Lane	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-09-200-011	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017			Well 235	-	-	64	
21-09-200-012	Mentors Lane	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-09-300-001	4178 East 14th Road	Coffeen	Nancy	Blackburn	899 County Road 800 East		Champaign	Illinois	61822			Well AA	no	48	26	
21-09-300-003	North 4th Avenue	Coffeen	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-09-300-004	14171 North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-09-400-001	5204 East 14th Road	Coffeen	William & Cleola	Brackett	5204 East 14th Road		Coffeen	Illinois	62017							
21-09-400-002	Border Coffeen Lake	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-09-400-004	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019	X		Well 246	no	36	41	Used for stock & garden.
21-09-400-005	14223 North 4th Avenue	Donnellson	Nathan & Christy	Hemken	14223 North 4th Avenue		Donnellson	Illinois	62019							
21-09-400-006	14261 North 4th Avenue	Donnellson	Collin	Wasson	14261 North 4th Avenue		Donnellson	Illinois	62019							

Attachment III.2.B.1 - Surface Owners Water Well Surveys

Parcel	Site Address	City	First Name	Last name	Mailing Address	Address 2	City	State	Zip Code	Inhabited Residence	Inhabited Mobile Home	Water Well ID	Primary Water Use	Well Dia (in)	Well Depth (ft)	Well Notes
21-09-400-009	14261 North 4th Avenue	Donnellson	Collin	Wasson	14261 North 4th Avenue		Donnellson	Illinois	62019							
21-09-400-012	14305 North 4th Avenue		Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019							
21-09-400-013	15001 North 4th Avenue	Coffeen	Michael & Candace	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019							
21-09-400-014	North 4th Avenue	Coffeen	Joel	Thacker	14305 North 4th Avenue		Donnellson	Illinois	62019	X		Well X	yes	48	35	Used for drinking, bathing, stock, & garden.
21-10-100-002	Border Coffeen Lake	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002			Well 243	-	-	50	
21-10-300-003	North 4th Avenue	Coffeen	Traylor Cemetery	c/o Dorothy White	325 CIPS Trail		Coffeen	Illinois	62017							
21-10-300-004	15001 North 4th Avenue	Coffeen	Michael	Ellington	15001 North 4th Avenue		Donnellson	Illinois	62019	X		Well BB	yes	42	40	Used for drinking, bathing, & garden.
21-10-300-005	15025 North 4th Avenue	Coffeen	William & Deborah	Withers	15025 North 4th Avenue		Coffeen	Illinois	62017	X		Wells 247 & 248	yes	0 & 3	0 & 20	Two wells. Used for drinking.
21-15-100-001	15020 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019			Well 251	-	-	70	
21-15-200-001	Border Coffeen Lake	Coffeen	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-16-100-001	14092 North 4th Avenue	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080							
21-16-200-003	Walnut Grove Road	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019							
21-16-200-005	14392 North 4th Avenue	Coffeen	Joseph & Nancy	Blasko	14392 North 4th Avenue		Donnellson	Illinois	62019	X						
21-16-200-007	North 4th Avenue	Coffeen	Monroe	Reynolds	14304 North 4th Avenue		Donnellson	Illinois	62019	X						
21-16-200-008	North 4 Avenue	Coffeen	Robert	Coleman	1407 East Cloverfield		Greenville	Illinois	62246							
21-16-200-009	14300 North 4th Avenue	Coffeen	Linda	Mathena	14300 North 4th Avenue		Donnellson	Illinois	62019	X		Well 250	no	36	30	Used for drinking & garden.
21-16-300-001	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-16-300-002	3095 Walnut Grove Road	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-16-400-003	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019							
21-16-400-005	Walnut Grove Road	Donnellson	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-16-400-007	Border Coffeen Lake	Donnellson	Vistra Energy		601 Travis Street	Suite 1400	Houston	Texas	77002							
21-16-400-009	3176 Walnut Grove Road	Donnellson	Don & Alta	Betoche	3176 Walnut Grove Road		Donnellson	Illinois	62019	X		Well 256	no	30	26	Used for garden.
21-17-100-001	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-100-003	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019							
21-17-200-002	Arrow Trail	Donnellson	Mary Beth Wolf	c/o Sue Lehr	P.O. Box 161		Ramsey	Illinois	62080							
21-17-200-003	Arrow Trail	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-17-200-004	3289 Arrow Trail	Donnellson	Micheal & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019			Well GG	no	48	30	Used for drinking, stock, & garden.
21-17-400-002	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-400-003	Arrow Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-400-004	14383 East 14th Road	Irving	David	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-17-400-005	North 4th Avenue	Donnellson	Michael & Paula	Shelton	14089 Ticky Point Trail		Donnellson	Illinois	62019							
21-18-100-004			Tammy Huffman	c/o Corelogic	1 Corelogic Drive		Westlake	Texas	76262	X						
21-18-100-005	North 4th Avenue	Hillsboro	Larry	Casarta	2618 Morganfair Lane		Katy	Texas	77450			Well 249	-	-	29	
21-18-200-006	3178 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019							
21-18-200-009	North 4th Avenue	Donnellson	David, Carol, & Nicholas	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-18-200-010	North 4th Avenue	Hillsboro	Ben	Kenny	13001 North 6th Avenue		Hillsboro	Illinois	62049							
21-18-200-011	Buckeye Trail	Donnellson	David & Carol	Schluckebier	14099 Mt. Moriah Avenue		Donnellson	Illinois	62019							
21-18-200-012	3358 Buckeye Trail	Donnellson	Craig	Foster	3358 Buckeye Trail		Donnellson	Illinois	62019	X		Well II	yes	36	18	Used for drinking, bathing, stock, & garden.
21-18-300-001	12316 North 3rd Avenue	Donnellson	Scott	Schluckebier	12316 North 3rd Avenue		Donnellson	Illinois	62019							
21-18-300-003	12227 North 3rd Avenue	Donnellson	Mildred	Balla	12227 North 3rd Avenue		Donnellson	Illinois	62019							
21-18-400-005	3177 Buckeye Trail	Donnellson	Harriet	Gibson	3178 Buckeye Trail		Donnellson	Illinois	62019	X		Wells 254A & 254B	no	30 & 10	25 & 30	Two wells. Used for garden.

Attachment III.2.B.1.A

Water Well Multiple Usage Breakdown
 per Attachment III.2.B.1 Well Notes Describing Uses

Attachment
 III.2.B.1

Page #	Well ID	Drinking	Bathing	Stock	Gardening	Not In Use	Usage Unknown	Posted on Map 4	Within Panel Layout	Within Shadow Boundary	Inside 1/2 Mile Buffer
1	VV				X			X			X
1	210					X		X			X
1	SS1			X	X			X			X
1	SS2			X	X			X			X
1	SS3			X	X			X			X
1	214						X	X			X
1	202						X	X			X
1	9				X			X		X	
1	MM	X	X	X				X		X	
1	201						X	X	6		
1	3						X	x	6		
1	2	X	X		X			X	5		
2	NN				X			X	5		
2	7	X	X	X	X			x	7		
2	1	X	X		X			X	^5-6		
2	LL1	X	X	X	X			X	^7-8		
2	LL2	X	X	X	X			X	8		
2	LL3	X	X	X	X			X	7		
2	XX	X	X					X		X	
2	205						X	X	7		
2	206						X	X	8		
2	207						X	X	8		
2	208						X	X	8		
2	215A	X	X		X			X	11		
2	215B	X	X		X			X	11		
2	OO				X			X	^10-11		
2	JJ	X		X				X	11		
2	8A	X	X	X	X			X	8		
2	8B	X	X	X	X			X	8		
2	209						X	X	8		
2	211						X	X	9		
3	PP			X	X			X		X	

Attachment III.2.B.1.A

Water Well Multiple Usage Breakdown
 per Attachment III.2.B.1 Well Notes Describing Uses

Attachment
 III.2.B.1

Page #	Well ID	Drinking	Bathing	Stock	Gardening	Not In Use	Usage Unknown	Posted on Map 4	Within Panel Layout	Within Shadow Boundary	Inside 1/2 Mile Buffer
3	RR	X		X	X			X		X	
3	QQ					X		X			X
3	212						X	X		X	
3	C	X	X	X	X			X			X
3	F	X	X		X			X			X
3	ZZ	X		X				X			X
converted oil											
3	well 23						X	x			x
3	A				X			X			X
3	L					X		X			X
3	D1	X	X					X		X	
3	D2					X		X		X	
3	B	X	X	X	X			X			X
3	233				X			X		X	
converted oil											
3	well 78						X	X			X
3	237				X			X			X
3	238				X			X		X	
3	244						X	X		X	
3	E			X	X			X		X	
3	239						X	X		X	
3	CC	X	X	X	X			X		X	
4	253						X	X			X
4	H					X		X			X
4	I	X		X				X			X
4	G				X			X			X
4	YY	X	X	X	X			X			X
4	J	X	X	X	X			X			X
4	K	X	X	X	X			X			X
4	221						X	X			X
4	222						X	X			X
4	230						X	X			X

Attachment III.2.B.1.A

Water Well Multiple Usage Breakdown
 per Attachment III.2.B.1 Well Notes Describing Uses

Attachment
 III.2.B.1

Page #	Well ID	Drinking	Bathing	Stock	Gardening	Not In Use	Usage Unknown	Posted on Map 4	Within Panel Layout	Within Shadow Boundary	Inside 1/2 Mile Buffer
4	M	X	X		X			X	13		
4	N	X	X		X			X	13		
4	O	X	X		X			X	12		
4	P	X	X		X			X	12		
4	218	X	X				X	X	11		
4	219						X	X	11		
4	12	X	X		X			X	11		
4	220						X	X	11		
4	229						X	X	13		
4	Q					X		X	14-E		
4	T1				X			X	12		
4	T2				X			X	12		
4	S	X	X		X			X	13		
4	V				X			X	11-E		
4	216	X	X	X	X			X	11		
4	217						X	X	11		
5	W1			X	X			X	11		
5	W2			X	X			X	11		
5	11						X	X	^11-12		
5	DD						X	X	12		
5	228			X	X			X	13		
5	234A	X	X	X				X	16		
5	234B	X	X	X				X	16		
5	236						X	X	15		
5	Y1			X	X			X	16		
5	Y2			X	X			X	^16-17		
5	240						X	X	16		
5	245						X	X	17		
5	242						X	X	17		
5	U				X			X	17		
5	Z			X	X			X	17		
5	R					X		X	^15-16		

Attachment III.2.B.1.A

Water Well Multiple Usage Breakdown
 per Attachment III.2.B.1 Well Notes Describing Uses

Attachment
 III.2.B.1

Page #	Well ID	Drinking	Bathing	Stock	Gardening	Not In Use	Usage Unknown	Posted on Map 4	Within Panel Layout	Within Shadow Boundary	Inside 1/2 Mile Buffer
5	235						X	X	15		
5	AA						X	X	16		
5	246			X	X			X	17		
6	X	X	X	X	X			X	17		
6	243						X	X			X
6	BB	X	X		X			X			X
6	247	X						X			X
6	248	X						X			X
6	251						X	X			X
6	250	X			X			X		X	
6	256				X			X			X
6	GG	X		X	X			X		X	
6	249						X	X		X	
6	II	X	X	X	X			X		X	
6	254A				X			X			X
6	254B				X			X			X

Totals	No. of Wells	Drinking	Bathing	Stock	Gardening	Not In Use	Unknown
	112	41	33	36	59	7	37

ATTACHMENT III.2.B.2
GROUNDWATER QUALITY SUMMARY

Attachment III.2.B.2

Groundwater wells have been sampled on a consistent basis from 2008 as a requirement of Permit 399 and sampling will continue in the future. As a result of these samples, the data has been compiled and averaged by the annual quarter in an attempt to determine seasonal variations in groundwater quality. The following groundwater wells were selected as a representation due to their location in the southern portion of Permit 399, and consequently, closest to the shadow boundary revision application.

Based on the following data, there does not appear to be a strong correlation between groundwater quality and the annual seasons. Monitoring of the permitted groundwater wells will continue.

In this attachment you will find the data (averaged per quarter) for Groundwater Wells 26-S, 27-S, 28-S, 30, and 31; associated graphs depicting the data; and a map showing the well locations.

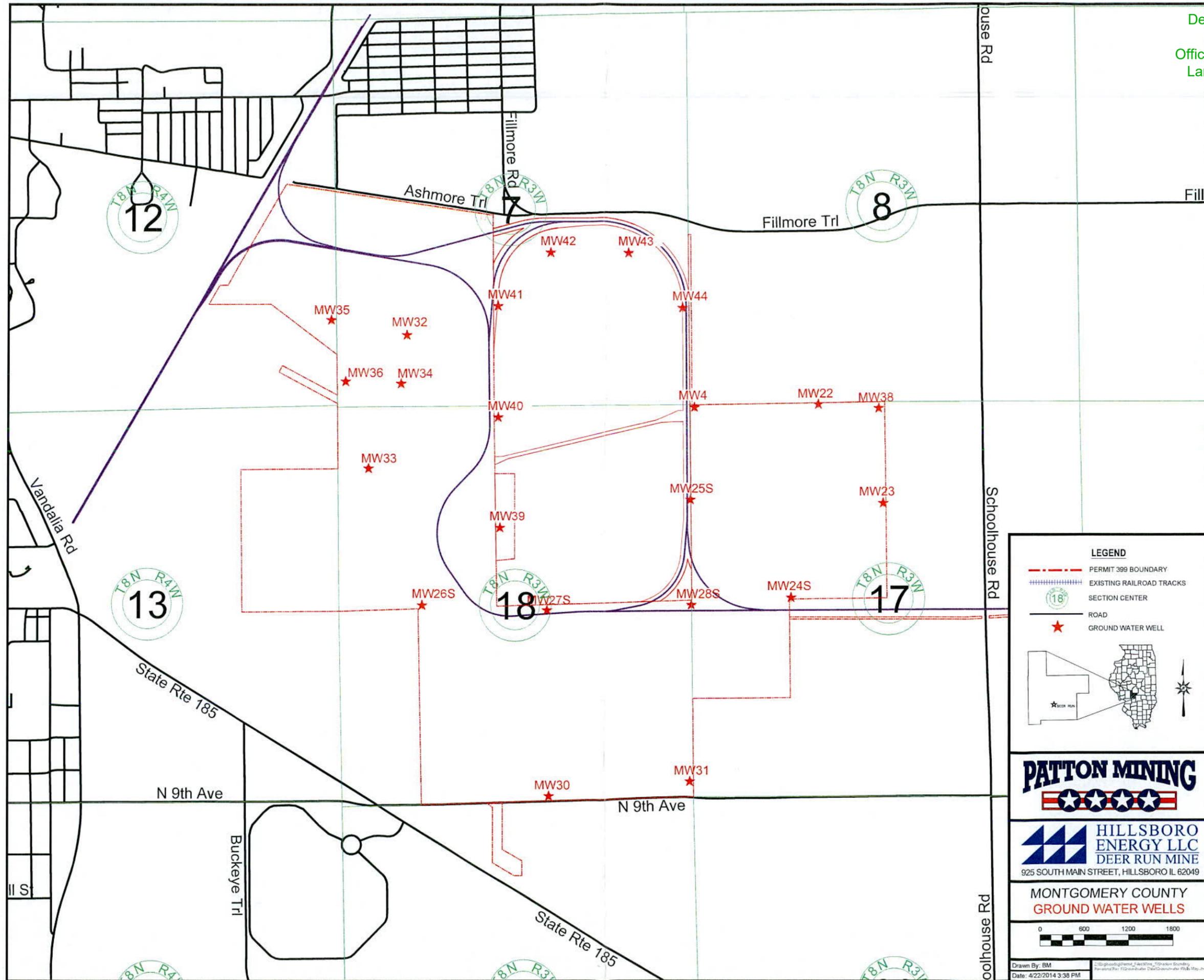
WELL 26-S				
Quarter	1	2	3	4
Acidity, Total (as CaCO ₃)	-429.11	-418.78	-439.60	-506.44
Alkalinity, Total (as CaCO ₃)	404.40	411.78	437.00	475.00
Chloride, Total	35.86	40.00	35.33	40.00
Hardness, as (CaCO ₃)	421.00	573.33	497.00	643.00
Iron, Total	29.43	34.42	117.81	82.21
Lab pH	7.30	7.12	7.26	7.21
Manganese, Total	1.13	1.74	2.93	2.11
Sulfate, Total	112.90	131.22	126.60	184.50
Total Dissolved Solids, Total	615.00	647.78	620.00	796.60

WELL 27-S				
Quarter	1	2	3	4
Acidity, Total (as CaCO ₃)	-277.11	-315.38	-302.40	-289.11
Alkalinity, Total (as CaCO ₃)	276.44	315.00	313.00	290.89
Chloride, Total	36.14	32.80	32.33	38.83
Hardness, as (CaCO ₃)	346.67	375.00	359.40	402.89
Iron, Total	23.57	25.48	48.50	37.67
Lab pH	7.47	7.47	7.42	7.33
Manganese, Total	0.67	1.87	1.35	1.02
Sulfate, Total	99.11	67.13	68.20	118.11
Total Dissolved Solids, Total	470.89	420.75	426.00	502.00

WELL 28-S				
Quarter	1	2	3	4
Acidity, Total (as CaCO3)	-308.89	-370.22	-292.60	-332.89
Alkalinity, Total (as CaCO3)	301.40	361.89	298.60	316.40
Chloride, Total	46.67	51.00	51.25	43.50
Hardness, as (CaCO3)	391.00	572.22	370.30	398.00
Iron, Total	42.34	111.59	81.29	87.37
Lab pH	7.44	7.41	7.38	7.48
Manganese, Total	1.13	2.53	1.73	1.97
Sulfate, Total	110.30	125.33	87.90	65.70
Total Dissolved Solids, Total	559.40	550.89	479.00	429.60

WELL 30				
Quarter	1	2	3	4
Acidity, Total (as CaCO3)	-372.44	-441.00	-416.40	-406.44
Alkalinity, Total (as CaCO3)	382.40	429.22	410.00	394.00
Chloride, Total	88.43	59.80	53.00	123.50
Hardness, as (CaCO3)	303.00	396.22	342.60	340.70
Iron, Total	29.69	45.04	115.53	101.10
Lab pH	7.34	7.26	7.18	7.26
Manganese, Total	0.38	0.72	1.10	0.91
Sulfate, Total	282.30	206.11	194.10	276.00
Total Dissolved Solids, Total	917.80	768.67	787.60	915.20

WELL 31				
Quarter	1	2	3	4
Acidity, Total (as CaCO3)	-316.11	-354.89	-371.80	-342.89
Alkalinity, Total (as CaCO3)	325.60	352.00	368.00	333.60
Chloride, Total	15.86	20.80	21.17	15.67
Hardness, as (CaCO3)	319.00	403.89	411.60	361.70
Iron, Total	29.19	53.27	84.01	88.15
Lab pH	7.43	7.41	7.38	7.40
Manganese, Total	0.63	1.20	1.76	2.07
Sulfate, Total	153.70	160.22	159.50	158.40
Total Dissolved Solids, Total	601.80	589.78	657.40	582.70



LEGEND

- PERMIT 399 BOUNDARY
- EXISTING RAILROAD TRACKS
- SECTION CENTER
- ROAD
- GROUND WATER WELL

PATTON MINING

HILLSBORO ENERGY LLC
DEER RUN MINE
925 SOUTH MAIN STREET, HILLSBORO IL 62049

MONTGOMERY COUNTY
GROUND WATER WELLS

0 600 1200 1800

Drawn By: BM
Date: 4/22/2014 3:38 PM

Received Electronically
Dept of Natural Resources
Aug 26, 2020
Office of Mines and Minerals
Land Reclamation Division

ATTACHMENT III.2.B.3
COAL SEAM WELLS REPORT

June 11, 2012



SUBJECT: Coal Seam Wells
Deer Run Mine
Montgomery County, Illinois

re: H-R 110-0787

Mr. Simon Stepp
Patton Mining, LLC
925 South Main Street
Hillsboro, Illinois 62049

Dear Mr. Stepp:

Three piezometer wells were installed in October/November 2008 within the Deer Run Mine shadow area, and the wells are screened within the Herrin No. 6 coal seam. Details of well installation have been presented in a report prepared by Hurst-Rosche Engineers, Inc. titled, 'Supplemental Hydrogeologic Investigation', dated December 10, 2008.

Groundwater level measurements were recorded on a routine basis following well installations. Enclosed is a table summarizing water level measurements. Reference to this table will indicate the water level within Well 1 stabilized relatively quickly after installation, the water level within Well 2 continued to slowly rise, and the water level within Well 3 apparently stabilized approximately 6 months following installation. Measuring of water levels within the wells was discontinued in August 2009. Current water levels in the wells were recently measured and have been noted on the summary table. It is noted the water level at the Well 1 location has apparently been influenced by recent coal mining activities adjacent to the well and it appears the water level at the Well 2 location has risen to a presumed stabilized level.

Based on the assimilated data, it appears flow gradient within the No. 6 coal seam is generally west to east, to southeast. Given the delayed response to well re-charge, this information suggests and/or confirms the No. 6 coal seam has very limited potential as a potable water source.

Enclosed are copies of well completion reports and a map identifying well locations.

If you have any questions or require additional information, please contact our office.

Sincerely,

HURST-ROSCHE ENGINEERS, INC.

David H. Kimmle, P.E.

DHK:ad

Enclosures

1400 East Tremont St.
P.O. Box 130
Hillsboro, IL 62049
Telephone 217-532-3959
Facsimile 217-532-3212
E-Mail Hillsboro@hurst-rosche.com
Web Page www.hurst-rosche.com

East St. Louis, Illinois
Marion, Illinois
Springfield, Illinois
Barnhart, Missouri
Neosho, Missouri

DEER RUN MINE
 COAL SEAM GROUNDWATER MEASUREMENTS
 110-0787

DATE	Well No.					
	1 (08-03-17-08)		2 (08-03-19-01)		3 (08-03-28-02)	
	Depth to Water (ft.)	Groundwater Elev. (ft.)	Depth to Water (ft.)	Groundwater Elev. (ft.)	Depth to Water (ft.)	Groundwater Elev. (ft.)
12/12/2008	53.95	580.75	342.28	295.22	240.55	391.15
12/18/2008	54.46	580.24	331.13	306.37	178.52	453.18
12/23/2008	54.55	580.15	320.28	317.22	154.64	477.06
1/2/2009	44.13	590.57	300.76	336.74	119.13	512.57
1/9/2009	47.00	587.70	289.15	348.35	100.55	531.15
1/16/2009	48.85	585.85	278.73	358.77	86.81	544.89
1/22/2009	49.92	584.78	269.70	367.80	77.30	554.40
1/28/2009	50.63	584.07	261.00	376.50	68.15	563.55
2/5/2009	51.32	583.38	251.82	385.68	62.30	569.40
2/24/2009	49.42	585.28	223.13	414.37	60.93	570.77
3/17/2009	26.55	608.15	201.95	435.55	42.71	588.99
5/14/2009	(1)	--	149.09	488.41	37.73	593.97
6/1/2009	27.00	607.70	140.06	497.44	37.69	594.01
7/1/2009	40.98	593.72	126.96	510.54	36.40	595.30
8/5/2009	45.45	589.25	114.93	522.57	37.11	594.59
8/24/2009	46.50	588.20	106.69	530.81	37.29	594.41
6/2/2012	215.85	418.85	51.96	585.54	35.42	596.28

(1) Reading not recorded due to well groundwater depth being impacted by surface water/heavy precipitation.

Well Completion Report

Site Name: Deer Run Mine Well No.: 08-03-17-08 (Coal Seam Well No. 1)
 Drilling Contractor: Hawkey and Kline Coring and Drilling Date Completed: October 7, 2008
 Drilling Method: Mud Rotary Drilling Fluids (type): Water/Bentonite Slurry
 Coordinates: N 900431.3, E 2498009.9

Annular Space Details

8-5/8" diameter steel casing installed in borehole between elevation 632.0 ft. and 496.0 ft. 5-1/2" diameter steel casing installed in borehole between elevation 632.0 ft. and 184.0 ft. Cement seal installed around outside of 8-5/8" diameter steel casing and in between 8-5/8" diameter and 5-1/2" diameter steel casing. Drilling fluid was removed from borehole prior to drilling into coal seam and then boring advanced to elevation 173.7 ft.

Well Construction Materials

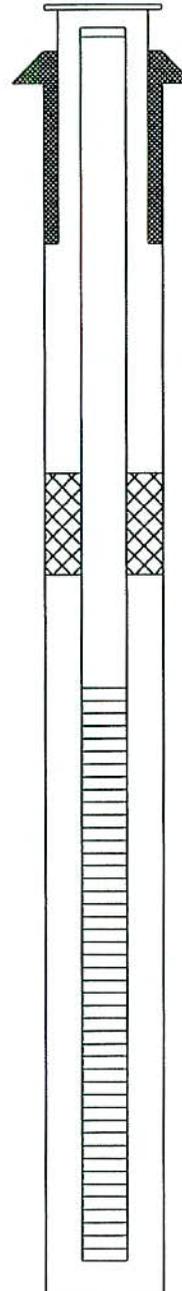
	Stainless Steel Specify Type	3-inch PVC Specify Type	Carbon Steel
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			x

Measurements (ft.)

Riser pipe length	454.0
Screen length	7.0
Screen slot size in	0.01
Protective casing length	--
Depth to water (from riser)	387.0
Elevation of water	247.7
Gallons removed (develop)	64.0
Gallons removed (purge)	--
Other	--

Elevations (ft.)

635.5 Top of Protective Casing
634.7 Top of Riser Pipe
632.0 Ground Surface



184.0 Bottom of Steel Casing

180.7 Top of Screen

7.0 Total Screen Interval

173.7 Bottom of Screen

173.7 Bottom of Borehole

Completed by: D. Jenkins

Well Completion Report

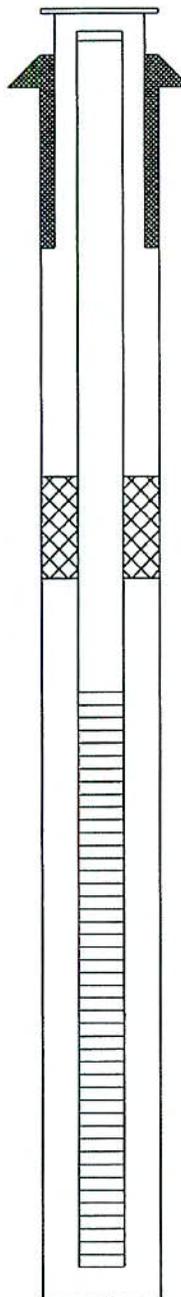
Site Name: Deer Run Mine Well No.: 08-03-28-02 (Coal Seam Well No. 2)
 Drilling Contractor: Hawkey and Kline Coring and Drilling Date Completed: October 24, 2008
 Drilling Method: Mud Rotary Drilling Fluids (type): Water/Bentonine Slurry
 Coordinates: N 889565.0, E 2507291.3

Annular Space Details

8-5/8" diameter steel casing installed in borehole between elevation 634.8 ft. and 489.8 ft. 5-1/2" diameter steel casing installed in borehole between elevation 634.8 ft. and 121.3 ft. Cement seal installed around outside of 8-5/8" diameter steel casing and in between 8-5/8" diameter and 5-1/2" diameter steel casing. Drilling fluid was removed from borehole prior to drilling into coal seam and then boring advanced to elevation 118.3 ft. PVC well installation suggests bottom of borehole is at elevation 117.0 ft.

Elevations (ft.)

638.1 Top of Protective Casing
637.5 Top of Riser Pipe
634.8 Ground Surface



126.8 Top of Screen

121.3 Bottom of Steel Casing

9.8 Total Screen Interval

117.0 Bottom of Screen

118.3 Bottom of Borehole

Well Construction Materials

	Stainless Steel Specify Type	3-inch PVC Specify Type	Carbon Steel
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			X

Measurements (ft.)

Riser pipe length	510.6
Screen length	9.8
Screen slot size in	0.01
Protective casing length	--
Depth to water (from riser)	414.1
Elevation of water	223.4
Gallons removed (develop)	10.0
Gallons removed (purge)	--
Other	--

Completed by: D. Jenkins

Well Completion Report

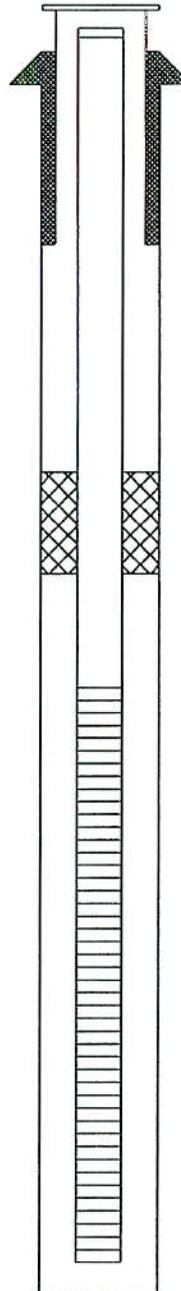
Site Name: Deer Run Mine Well No.: 08-03-19-01 (Coal Well No. 3)
 Drilling Contractor: Hawkey and Kline Coring and Drilling Date Completed: November 12, 2008
 Drilling Method: Mud Rotary Drilling Fluids (type): Water/Bentonine Slurry
 Coordinates: N 895712.3, E 2497058.9

Annular Space Details

8-5/8" diameter steel casing installed in borehole between elevation 630.8 ft. and 486.8 ft. 5-1/2" diameter steel casing installed in borehole between elevation 630.8 ft. and 179.3 ft. Cement seal installed around outside of 8-5/8" diameter steel casing and in between 8-5/8" diameter and 5-1/2" diameter steel casing. Drilling fluid was removed from borehole prior to drilling into coal seam and then boring advanced to elevation 176.3 ft.

Elevations (ft.)

633.9 Top of Protective Casing
631.7 Top of Riser Pipe
630.8 Ground Surface



187.2 Top of Screen

179.3 Bottom of Steel Casing

9.8 Total Screen Interval

177.4 Bottom of Screen

176.3 Bottom of Borehole

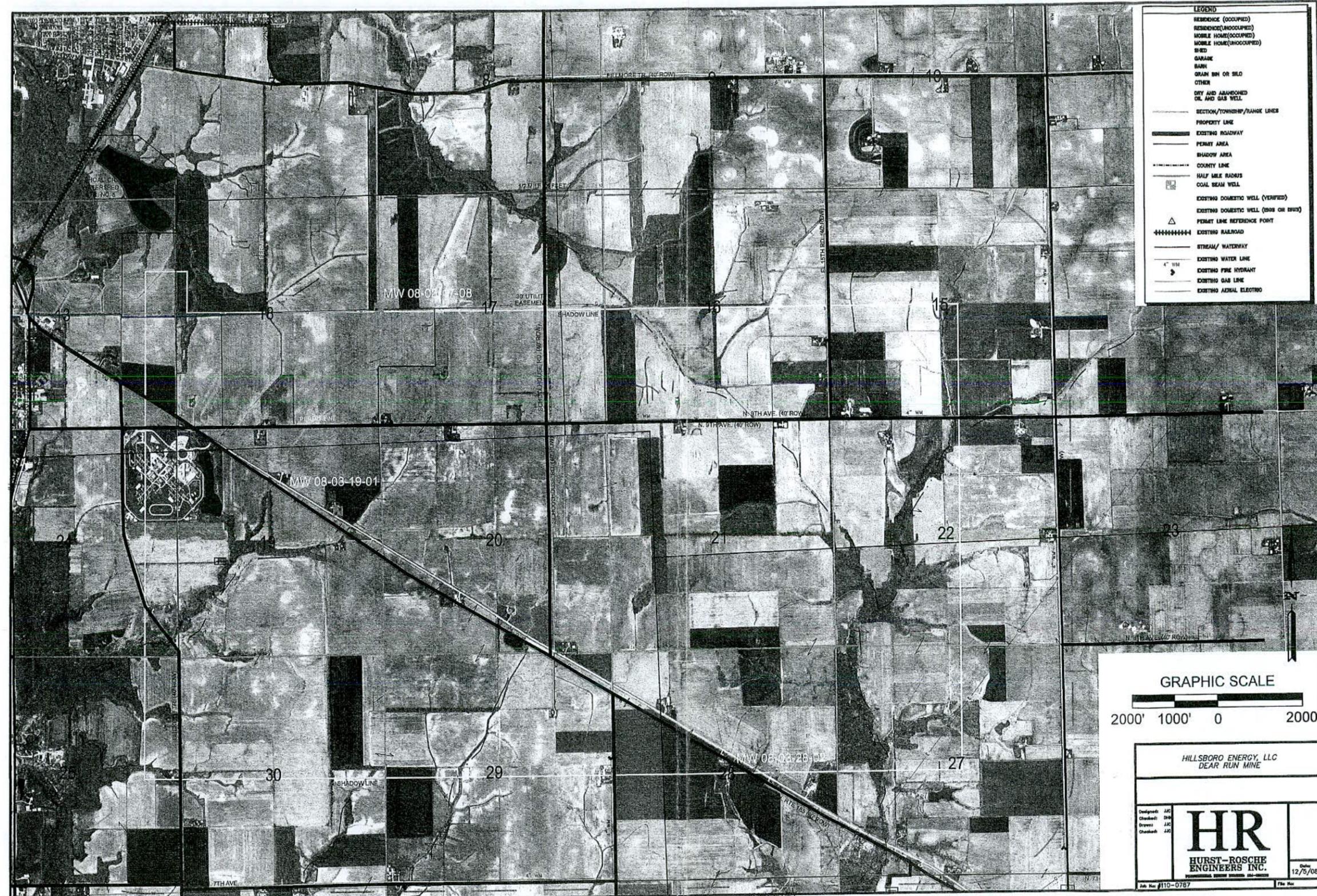
Well Construction Materials

	Stainless Steel Specify Type	3-inch PVC Specify Type	Carbon Steel
Riser coupling joint		Sch 40	
Riser pipe above w.t.		Sch 40	
Riser pipe below w.t.		Sch 40	
Screen		Sch 40	
Coupling joint screen to riser		Sch 40	
Protective casing			x

Measurements (ft.)

Riser pipe length	444.2
Screen length	9.8
Screen slot size in	0.01
Protective casing length	--
Depth to water (from riser)	399.9
Elevation of water	231.8
Gallons removed (develop)	25.0
Gallons removed (purge)	--
Other	--

Completed by: D. Jenkins



ATTACHMENT III.2.C.2
SURFACE WATER QUALITY DATA

Attachment III.2.C.2 – Surface Water Quality Data

Surface water sampling of Shoal Creek Reservoir Structure No. 5 has been sampled on a consistent basis from 2008 as a requirement of Permit 399 and sampling will continue in the future. As a result of these samples, the data has been compiled and averaged by the annual quarter in an attempt to determine seasonal variations in groundwater quality. This body of water is a flood impoundment structure on an intermittent tributary of the Middle Fork of Shoal Creek. It is expected that the water quality of the water in the Shoal Creek Reservoir Structure No. 5 is representative of other water bodies located within the proposed shadow boundary area.

QUARTER AVG	Settleable Solids	Hardness	Ph	Alkalinity, total (as CaCO3)	Acidity, total (as CaCO3)	Solids, total suspended
1	0.099	113.67	7.65	101.40	-75.60	24.00
2	0.099	132.71	8.30	102.29	-78.71	16.57
3	0.099	148.71	7.73	140.13	-115.13	28.00
4	0.099	183.75	8.03	104.33	-85.33	15.67

QUARTER AVG	Chloride (as Cl)	Sulfate, total (as SO4)	Iron, total (as Fe)	Manganese, total (as Mn)	Flow, in conduit or thru treatment plant (MgpD)	Mercury, total (as Hg)
1	75.54	75.80	2.06	0.14	0.46	4.28
2	53.00	59.13	2.35	0.29	0.21	6.28
3	110.19	59.63	2.28	0.36	0.13	3.56
4	209.50	147.50	1.13	0.20	0.38	2.30

Coffeen Lake Sample Results
 Apr-14 thru Mar-15

Parameter	Units	Sample Date					
		4/28/2014	5/21/2014	6/16/2014	7/29/2014	8/12/2014	9/26/2014
Sulfate	mg/L	64	61	61	69	69	79
pH	--	8.45	8.99	8.30	8.35	8.30	8.51
Alkalinity	mg/L	103	104	98	105	104	102
Acidity	mg/L	-97	-93	-92	-98	-98	-95
Total Dissolved Solids	mg/L	228	294	248	248	240	264
Total Suspended Solids	mg/L	19	6	19	<6	<6	<6
Chloride	mg/L	26	22	21	29	25	28
Iron	mg/L	0.345	0.112	0.269	0.121	0.0955	0.087
Manganese	mg/L	0.0338	0.016	0.0453	0.0281	0.0199	0.0154

Parameter	Units	Sample Date					
		10/21/2014	11/20/2014	12/9/2014	1/13/2015	2/3/2015	3/19/2015
Sulfate	mg/L	66	69	75	74	76	84
pH	--	8.33	8.27	7.92	7.84	8.32	8.62
Alkalinity	mg/L	107	109	110	111	109	112
Acidity	mg/L	-101	-99	-101	-104	-99	-106
Total Dissolved Solids	mg/L	314	252	335	360	288	304
Total Suspended Solids	mg/L	<6	<6	<6	<6	<6	<6
Chloride	mg/L	29	28	32	28	32	32
Iron	mg/L	0.198	0.0764	0.163	0.0909	0.111	0.120
Manganese	mg/L	0.0313	0.0177	0.0178	0.0094	0.0154	0.0124