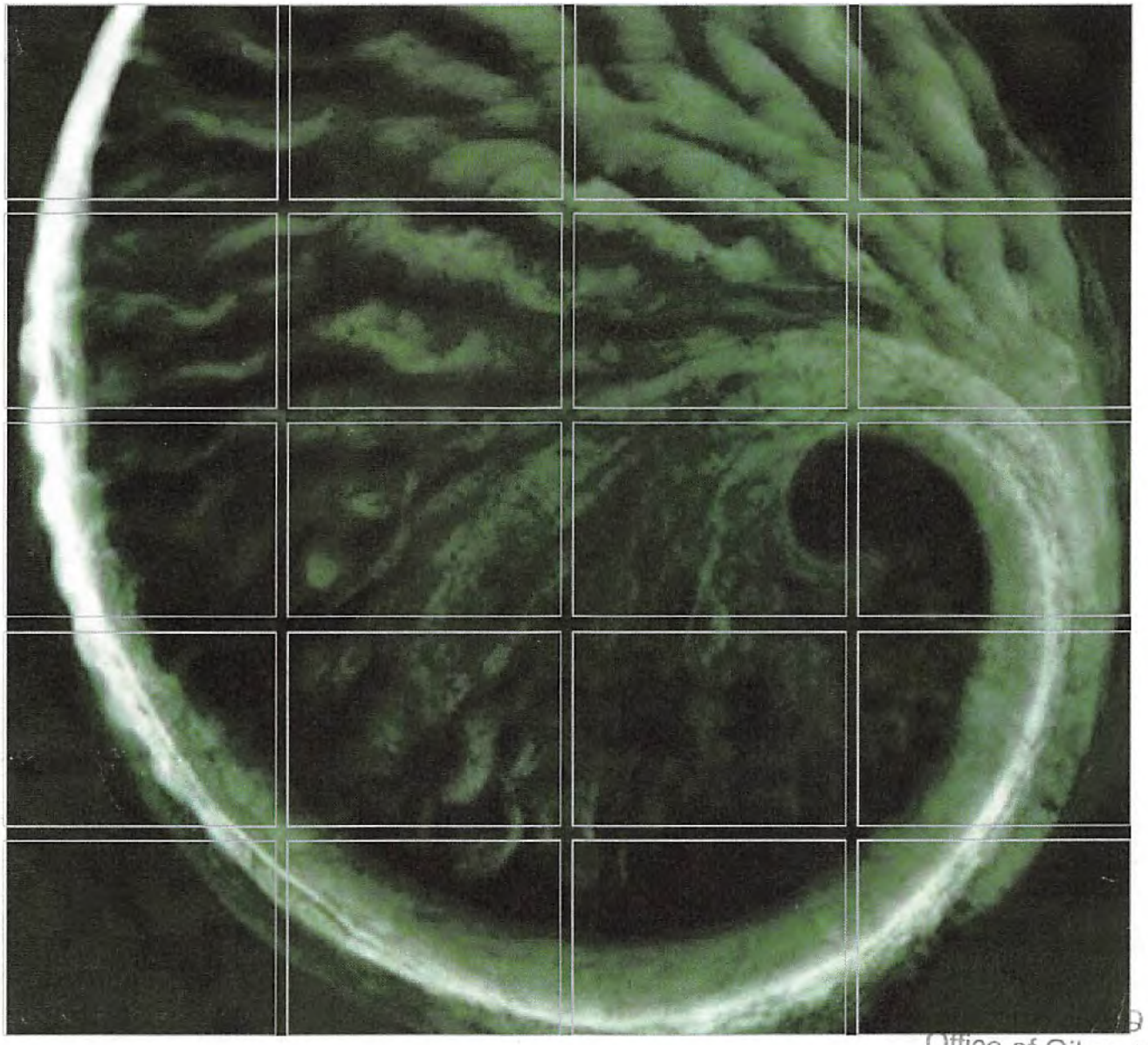


Prepared For:

EQT

UIC Permit Renewal Application

Twin Branch Injection Well

June 2016

Environmental Resources Management
204 Chase Drive
Hurricane, WV 25526
www.erm.com

ERM

1710 Pennsylvania
Avenue
Charleston WV 25302
www.eqt.com

TEL: (304) 348-7661

Chad Carmichael
Senior Environmental
Coordinator

June 29, 2016

Mr. James Martin, Chief
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street, SE
Charleston, West Virginia, 25304

RE: UIC Well Renewal Application
EQT Production Company
Twin Branch UIC

Dear Chief Martin:

Enclosed are one (1) original hard copy and two (2) complete PDFs included on CD-ROM of a UIC Permit Renewal Application for the Twin Branch UIC located near Davy, McDowell County, West Virginia. The Twin Branch facility currently operates under UIC permit ID number UIC2D0471511.

Please contact me for payment of the application fee by credit card.

If you have any questions concerning this permit application, please contact me at (304) 348-7661 or by email at ccarmichael@eqt.com.

Sincerely,

Chad Carmichael
EQT Corporation

Enclosures

CHECKLIST FOR FILING A UIC PERMIT APPLICATION

Please utilize this checklist to ensure you have prepared, completed, and enclosed all required documentation and payment to ensure a timely review of your submittal.

Operator	EQT Production		
Existing UIC Permit ID Number	UIC2D0471511	UIC Well API Number	4704701511

Office of Oil and Gas Office Use Only	
Permit Reviewer	
Date Received	
Administratively Complete Date	
Approved Date	
Permit Issued	

Please check the fees and payment included.

Fees		Payment Type	
UIC Permit Fee: $500	✓	Check	
Groundwater Protection Plan (GPP) Fee: $50.00	✓	Electronic	
		Other	✓

Please check the items completed and enclosed.

- ✓ Checklist
- ✓ UIC-1
  - ✓ Section 1 – Facility Information
  - ✓ Section 2 – Operator Information
  - ✓ Section 3 – Application Information
  - ✓ Section 4 – Applicant/Activity Request and Type
  - ✓ Section 5 – Brief description of the Nature of the Business
  - ✓ CERTIFICATION
- ✓ Section 6 – Construction
  - ✓ Appendix A Injection Well Form
  - ✓ Appendix B Storage Tank Inventory
- ✓ Section 7 – Area of Review
  - ✓ Appendix C Wells Within the Area of Review

- [x] Appendix D Public Service District Affidavit
- [x] Appendix E Water Sources
- [x] Appendix F Area Permit Wells
- [x] Section 8 – Geological Data on Injection and Confining Zones
- [x] Section 9 – Operating Requirements / Data
  - [x] Appendix G Wells Serviced by Injection Well
- [x] Section 10 – Monitoring
- [x] Section 11 – Groundwater Protection Plan (GPP)
  - [x] Appendix H Groundwater Protection Plan (GPP)
- [x] Section 12 – Plugging and Abandonment
- [x] Section 13 – Additional Bonding
- [x] Section 14 – Financial Responsibility
  - [x] Appendix I Financial Responsibility
- [x] Section 15 – Site Security Plan
  - [x] Appendix J Site Security for Commercial Wells
- [x] Section 16 – Additional Information
  - [x] Appendix K Other Permit Approvals

NOTE: For all 2D wells an additional bond in the amount of $5,000 is required.

Reviewed by (Print Name): Mike Gavin (VP Production Operations)

Reviewed by (Sign): M. Gavin

Date Reviewed: 4/11/18

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ATTACHMENTS

EXECUTIVE SUMMARY

EQT Production Company (EQT) is presently permitted to operate a Class 2D underground injection well near the town of Davy, in McDowell County, West Virginia under the Underground Injection Control (UIC) Permit number UIC2D0471511, dated August 30, 2011. The existing permit grants EQT the authority to operate the UIC for a period of 5 years from issuance date and requires renewal by August 30, 2016.

EQT submits this application for permit renewal to extend the authority to operate the Twin Branch UIC Facility until 2021. This application reviews the applicable groundwater, geological, and environmental conditions of current operations and is based upon the West Virginia Department of Environmental Protection (WVDEP) guidance document for UIC permit applications. Applicable permitting fees, which include a $500.00 UIC permit application fee and a $50.00 Groundwater Protection Plan (GPP) fee, are included in with this document submission.

The Twin Branch Injection facility, permitted under UIC Permit UIC2D0471511, is responsible for injecting brine from natural gas production operations into the confining layer of the Berea Sandstone. This facility is comprised of one (1) injection well, four (4) aboveground storage tanks (ASTs), and one (1) tank truck loading area for the delivery of brine.

1.0 *FACILITY INFORMATION*

The Twin Branch Injection Well is located near Davy, in McDowell County, West Virginia. The site is located on Old Twin Branch Loop Road between the Towns of Hensley and Davy. More precisely, the site is located at the Global Positioning System (GPS) coordinates of 37° 28' 51.6" N, 81° 40' 1.2"E near the Tug Fork River. The site consists of one (1) underground injection well (API No. 4704701511), four (4) tanks and one (1) tank truck loading area. The facility is presently permitted under UIC Permit No. UIC2D0471511. Contact information for the environmental contact and operator information are in the Underground Injection Control (UIC) Permit Application form included as Appendix A of this submittal. The general site location is displayed in **Figure 1**.

The site can be reached by taking the following directions:

Take West Virginia State Route 97 South into Pineville. In Pineville, take a left onto River Drive Avenue and continue for 0.3 miles before taking a right onto Pinnacle Avenue (West Virginia State Route 16). After 5.1 miles, take a right onto Indian Creek Road and travel another 5.3 miles towards the Town of Fanrock. Take a left onto Brier Creek Road and travel for 7.9 miles until you reach the Town of Davy. After crossing the train tracks- and bridge, turn right onto Worthington Road. Continue for 1.3 miles and take a right at the fork onto Old Twin Branch Loop. Drive about 0.3 miles and the access road will be on the right.

2.0 *OPERATOR INFORMATION*

Operator information is provided in the Underground Injection Control Permit Application Forms, included as **Attachment A** of this submittal.

3.0 *APPLICATION INFORMATION*

Application information is provided in the Underground Injection Control Permit Application Forms, included as **Attachment A** of this submittal.

4.0 *APPLICANT/ACTIVITY REQUEST AND TYPE*

Applicant/Activity Request and Type is provided in the Underground Injection Control Permit Application Forms, included as **Attachment A** of this submittal.

5.0 *BRIEF DESCRIPTION OF NATURE OF BUSINESS*

The Twin Branch Injection Well is a subsurface injection well owned and operated by EQT that injects brine accumulated from nearby natural gas production facilities into the Berea Sandstone formation. EQT injects corrosion and scale inhibitors into the injected brine as a part of normal operations. The brine and chemical additives are stored on-site in four (4) aboveground storage tanks prior to injection. The Twin Branch facility operates one (1) tank truck loading area to receive brine fluids from tanker trucks.

This description is also provided in the Underground Injection Control Permit Application Forms, included as **Attachment A** of this submittal.

6.0 CONSTRUCTION

The Twin Branch Injection Well is a pre-existing site originally permitted in 2001 located at the GPS coordinates 37° 28′ 51.6″ N, 81° 40′ 1.2″E in McDowell County, West Virginia. **Figure 1** details an aerial overview of the injection well site and surrounding area. **Attachment B** includes a detailed well schematic. Information about well characteristics is provided in **Appendix B**.

6.1 FACILITY LAYOUT

The injection well facility is housed around a metal chain link fence and houses one (1) injection well, four (4) fiberglass tanks (T1, T2, T3, T4), and one (1) tank truck loading area.). Tanks (T1 and T2) are single walled tanks with capacities of 6,510 gallons each. Tanks T3 and T4 are 168 gallon single walled tanks that contain the corrosion and scaling inhibitor additives for the injection of brine. Full details on the storage tanks inventory are provided in **Appendix B**.

6.2 TESTS INVOLVED WITH DRILLING

Geophysical and cementation logs for the Twin Branch Injection Well were interpreted in accordance with the WVDEP guidance document for UIC permit applications. Results for the gamma ray, caliper, induction, density porosity, neutron porosity, resistivity, audio, and temperature logs are summarized in **Table 1**. Based on the porosity and resistivity values for the Berea sandstone in the injection well, the average water saturation (SW) across the interval (3438 feet to 3458 feet) of maximum porosity (16 to 20%) is calculated to range from 75% to 80% salt water saturated.

Based on the gamma ray/cement bond log the top and base of the Berea are located at 3,408 and 3,468 respectively. Casing collars within the well are located at 3,375′, 3,420′, and 3,464′. The well is perforated as follows: 3,412′ to 3,468′ there are 16 holes; 3,449′ to 3,458′ there are 36 holes; and 3,464′ to 3,468′ there are 16 holes. The cement bond within the well was interpreted as follows: an excellent bond from 1,874′ to 3,882′, and the amplitude of the cement bond log indicates a good bond with casing and cement from 3,882′ to the total depth of the well at 3,492′. The cement bond log also indicates the porous zone within the Berea from 3,440′ to 3,460′. Copies of geophysical logs, gamma ray/cement bond logs, and a schematic including details on the cementation for the well and for the well are included in **Attachment B**.

7.0 *AREA OF REVIEW*

In accordance with WVDEP UIC permitting guidance, groundwater wells in an Underground Sources of Drinking Water (USDWs) within a quarter-mile of the site were sampled for environmental contaminants. This quarter-mile area is defined as the Area of Review (AOR). The McDowell Public Health Department was contacted numerous times to request records for groundwater wells contained within the AOR; however, no records were provided for review. Due to the lack of information available from the McDowell Public Health Department, historical data from the previous permit application was evaluated to determine the presence of wells within the AOR.

7.1 *HISTORICAL GROUNDWATER FINDINGS*

As a part of the original permit application and each permit renewal effort for UIC Permit No. UIC2D0471511, nine (9) sites were identified by Smith Land Surveying, Inc. (SLS) as possibly housing Underground Sources of Drinking Water (USDWs). These sites are illustrated in **Figure 2**. Each of the sites visited are residences within a quarter mile of the injection well. For the purposes of this application, residences within a quarter mile radius of the injection well are identified as being in the Area of Review. Of the sites visited previously, three (3) sites (Sites 2, 7, 8) were identified as having USDWs. Sometime between 2006 and 2011, the USDW for Site 8 was abandoned, and thus there is no testing available for this site in this report or from the 2011 permit application.

7.2 *2016 AREA OF REIVEW STUDY AND EVALUATION*

For the purposes of this permit renewal, EQT contacted homeowners within a quarter mile of the site injection well to indicate that ERM would be visiting as cited in the Courtesy Request Notifications sent to homeowners in **Attachment D**. During the site visit and sampling effort, two (2) sites were identified as having USDWs by both ERM and EQT. The McDowell County Public Health Department was also contacted for information on the presence of USDWs within the AOR, but was unable to supply relevant information. Additional effort was made by the Public Health Department to get in contact with the Town of Davy PSD, but they were unsuccessful in getting any applicable records within the AOR. In absence of this information, EQT and ERM relied upon the information submitted in previous permit applications and information gained from discussions with residences in the area to determine that all wells within the quarter mile AOR were considered. Despite multiple attempts to obtain documentation from the McDowell County Health Commission, they were unable or unwilling to provide the requested documentation to be provided in **Appendix D**.

The two sites identified are consistent with the findings of the 2011 survey completed by SLS. For the purposes of this discussion, they will be referred as USDW Source RSW-1, RSW-2. Following is a summary of ERM's findings. The locations of each of these sites are referenced in **Figure 3**. Applicable sampling results are present in **Attachment** C of this submittal.

7.2.1 *USDW Source RSW-1 Findings (2016)*

USDW Source RSW-1 is located at Site 2, **illustrated in Figure 3**, and in accordance with the nomenclature of previous permit application submissions. The well is an active well used primarily as potable water for the property homeowner. The USDW is derived from a freshwater spring "Mountain Water," located on the nearby mountain that is piped to their property.

The results from this test are listed in **Appendix** E and **Attachment C**. Pollutants in concentrations greater than the minimum detection limit include: Calcium, Xylenes, Toluene, Chloride, Sulfate, Total Dissolved Solids (TDS), and Total Organic Carbon (TOC). In order to qualify the concentrations of contaminants which exceeded the minimum detection limits, the analytical results were compared to **Table 2 – United States Surface Water Quality Drinking Standards for Residential Use**. There is no case in which contaminants detected for RSW-1 exceed the primary or secondary standards listed.

7.2.2 *USDW Source RSW-2 Findings (2016)*

USDW Source RSW-2 is located at Site 7 in **Figure 3**. The well is an USDW used primarily as an outdoor water source used for items such washing vehicles. While the homeowner is connected to the Town of Davy PSD for potable water, the water is used as a backup water source in the event the town supplied waterline goes down. The site is located in a residential area located on the opposite side of the Tug Fork River. The contaminants Aluminum, Barium, Calcium, Iron, Manganese, dissolved Methane, Chloride, Sulfide, TDS, and TOC had concentration limits which exceeded the minimum detection limit. Like RSW-1, the sample RSW-2 had no concentrations that exceeded the primary or secondary drinking water standards in Table 8. The concentrations detected for this site are also available in **Appendix E** and **Attachment C.**

Groundwater wells in the state of West Virginia are known to commonly contain measurable levels of dissolved methane. The United States Geological Survey (USGS), in cooperation with the WVDEP and other state agencies, sampled 170 groundwater wells across the state from 1997 to 2005 in a report titled "Methane in West Virginia Ground Water". The results of this investigation revealed that there were measureable dissolved methane concentrations in 131 of 170 wells. The report details that methane concentrations greater than 28 mg/L were deemed actionable and owners/users of the well should contact the local health commissions to determine what

actions should be taken. Wells with dissolved methane contents between 10 mg/L and 28 mg/L were deemed to be of concern, but not necessarily actionable. Wells with dissolved methane content of less than 10 mg/L require no action, aside from periodic monitoring.

The dissolved methane measure in RSW-2 is noted as 3.7 mg/L, which is well below the recommended actionable levels. Upon review of the sampling data available from USGS, it was determined that the Twin Branch Facility operates in an area of Southern West Virginia where the occurrence of dissolved methane within groundwater wells is a frequent occurrence, especially given that Site 7 exists within a valley along the Tug River. It is also important to note that the measured amount of dissolved methane in RSW-2 is significantly higher than the levels measured in the injection fluid, which were 0.47 mg/L.

7.3 *CONCLUSIONS AND SAMPLING ASSESSMENT*

In effort to qualify the findings from the Water Quality Assessments conducted within the AOR, the concentration values for pollutants were compared with the general requirements for surface water drinking standards in the United States. Both primary and secondary water quality standards were assessed in order to ensure that the water quality analyses are assessed in accordance with the standards acceptable for human consumption as deemed by the Environmental Protection Agency (EPA).

For chemical contaminants regulated as a part of the US Drinking Water Act, none of these chemicals exceed the Maximum Contaminant Levels (MCLs) listed in Table 1.

The dissolved methane content measured in sample RSW-2 is deemed consistent with available data for dissolved methane in groundwater wells in West Virginia. No conclusion can be made from potential sources of methane, but it can be concluded that the measured dissolved methane levels are low enough as to not warrant action.

8.0 GEOLOGIC DATA ON THE INJECTION AND CONFINING ZONE

8.1 GEOGRAPHY AND REGIONAL GEOLOGY

The EQT Twin Branch Injection Well lies within in the Davy, WV USGS 7.5' Quadrangle at the confluence of the Tug River and Twin Branch (**Figure 1**). The Site is located in the unglaciated portion of the Appalachian Plateau physiographic province, which generally consists of relatively flat lying, gently folded Upper Paleozoic sedimentary rocks. The geology underlying the site consists of Pennsylvanian age rocks of the Pottsville Group, specifically the New River Formation, characterized predominately by sandstone with some shale, siltstones, and coal (Cardwell 1986).

8.2 TARGET ZONE GEOLOGY

The target injection zone for the well is the Berea Sandstone (Berea). The Berea is a fine to medium grained quartz sandstone representative of a prograding delta complex deposited during the Early Mississippian Period, within McDowell County the Berea is representative of sheet sand deposits from near shore and coastal environments.

The porosity of the Berea in McDowell County ranges from 5 to 20 percent, with and average porosity of 8 percent. According to the Atlas of Major Appalachian Gas Plays indicates the average permeability for the Big Sandy Field in the surrounding area is 0.013 millidarcies. The average thickness of the Berea in the vicinity of the injection well has been calculated to be 52 feet **Attachment F**. The geophysical log for the well indicates the Berea to have thickness of approximately 60 feet Figure 5. An isopach map showing the thickness of the Berea within the Davy Quadrangle is included as **Figure 6**.

The Berea is unproductive for oil and gas in northern McDowell and Southern Wyoming Counties due to high water saturation, making it a target zone for produced fluid injection.

8.2.1 *Structural Analysis*

The Berea Sandstone in the area of the Twin Branch facility is characterized by a northwest to southeast strike with a slight southwest dip, as displayed in **Figure 7**. The Pocahontas Land Lease appears to be on the axis of an anticlinal structure. Injected fluids are expected to migrate laterally throughout the formation and over time flow down-dip in a southwesterly direction. A volumetric calculation for injection lateral flow from the well bore is included in **Figure 8.**

8.3 CONFINING UNITS

The Berea is overlain by the Sunbury Shale and underlain by unnamed Upper Huron shale, both being black shales with little to no porosity. The Sunbury and Upper Huron shale is sufficiently impermeable to act as a seal thus preventing fluid migration exiting the Berea Sandstone. The geophysical properties of these units are illustrated on the lithologic log for the Twin Branch Injection Well **Figure 5.**

The average thickness of the Sunbury Shale in the vicinity of the EQT Twin Branch Injection Well is approximately 20 feet. Approximately 500 of feet of silty shale overlays the Sunbury Shale in this area and provides an additional seal above the Berea. Based on the geophysical logs for the wells in the vicinity of the EQT Twin Branch Injection Well, the unnamed Upper Huron shale below the Berea is approximately 100 feet thick and provides an adequate seal below the Berea.

In order to illustrate sufficient lateral containment of the confining units an effort was made show that the Sunbury and Upper Huron shales uniformly confined the Berea within the area surrounding the injection well. Selected wells: 47-047-0287, 47-047-01106, 47-047-0983, 47-047-0944, 47-047-00244, and 47-047-00212 are plotted on **Figure 9** and correspond to the annotated geophysical logs included in **Attachment F**. The geophysical logs show uniformity of the Berea being confined by the Sunbury and Upper Huron shales within the surrounding area of the injection well.

8.4 Log Interpretation

The driller log shows a TD of 3575' and the Berea to be 50' thick with a depth of 3400' to 3450'. These depths are believed to already be corrected to ground level from the kelly bushing (KB) height. KB height was assumed to be 10'.

The Schlumberger Logs **(Figure 5)** measured from the KB shows a TD of 3585'. When corrected to ground level from KB the TD is 3575'. Utilizing the Gamma Ray from this log the Berea starts at 3408' and end at 3468'. As the Schlumberger Log is more accurate than the Driller's Log the Gamma Ray will be used to identify the upper and lower limit of the Berea formation. Depths for TD, perforations, and formations were adjusted below to consider a 10' KB adjustment to surface.

Parameter	Measurement from KB	Measurement from Ground
TD	3585'	3575'
Berea	3408' to 3468'	3398' to 3458'
Perforations	3412'- 3468'	3402' – 3458'

9.0 *OPERATING REQUIREMENTS/DATA*

The Twin Branch injection well is injecting brine in the Berea Sandstone geological formation between 3,370 and 3,420 feet below the surface. Based upon the injection of brine fluids from oil and natural gas operations, the Twin Branch Injection Site qualifies as a Class 2D wellsite.

EQT adds corrosion inhibitors and scale inhibitors to the injected brine to prevent the deterioration and clogging of the well casing and perforation in the injection zone. Safety Data Sheets (SDS) of the additives utilized in the injection process are included as **Attachment E**. The tubing annulus is filled with freshwater and a corrosion inhibitor. The current corrosion inhibitor is Alpha 3207 and supplied by Aqua Clear. Alpha 3207 also acts as a biocide. The current mixing rate is 10 gal per 60 bbl fresh water. This SDS is also included in Attachment E. The 5 1/2" casing annulus has no injected fluid and would contain only air. All remaining casing annulus are cemented to surface.

The list of wells serviced by this site is available in **Appendix G**.

Operating conditions include a maximum injection rate of 47.7 bbl/hour, maximum injection volume of 1,145 bbl/day, maximum injection pressure of 847 psig, and a bottom-hole pressure of 1,550 psig. This information is provided as **Appendix A**. **Appendix A** also details a number of relative characteristics including information on the casing and tubing program, information on the water strata depths, virgin reservoir pressure, and estimated reservoir fracture pressure.

In the event mechanical integrity should fail injection will cease immediately. Produced fluids will be hauled to a commercial disposal well. The WVDEP will be contacted immediately through the emergency spill line number, 1-800-642-3074. Written submission will be provided within five days. The written submission will contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and time, and if the non compliance has been corrected. The written notice will also provide anticipated time it is expected to continue, and the steps taken to be taken to reduce, eliminate, and prevent reoccurence of the noncompliance.

10.0 MONITORING

EQT maintains a manifesting system which covers injection pressures, annulus pressure, flowrate, cumulative volume, fluid sources, quantity, transportation type, and fluid disposal dates for the EQT Twin Branch Injection Well. EQT monitors injection and annulus pressures with a 31 day chart recorder. Fluid volumes are monitored with a barrel counter. These readings are taken daily and recorded on the sample WR-40 form.

Fluid sources, transportation type, date, volume of load, and other information required by the OOG Class II Manifest are recorded on the attached blank haul ticket. The sample WR-40 and blank haul ticket are included in the next two pages. In the event of non-compliance the WVDEP OOG will be contacted immediately at the Emergency Spill Line # 1-800-642-3074.

EQT will perform a well MIT every five years. In the event of a loss of mechanical integrity the well integrity will be restored within 90 days of failure and then a successful MIT completed prior to resuming injection. The MIT will consist of first loading the tubing annulus with fresh water and corrosion inhibitor. Then pressure will be applied to the tubing annulus using a nitrogen bottle to 150% of the maximum allowable injection pressure and recorded for 30 minutes with a chart recorder. Once the test is complete all pressure will be bled off the tubing annulus.

EQT will perform a injection line MIT every five years, after loss of integrity, or installation of new equipment and/or piping on the injection line. The MIT will consist of shutting in the tubing valve and bleeding pressure off the injection line between the pump and tubing to ensure the tubing valve's integrity. Then the facility pump will pressure the injection line to 150% of the maximum injection pressure. This pressure will be recorded for 30 minutes with a chart recorder. Once the test is complete the pressure will be bled off the injection line prior to opening the tubing valve.

EQT found no well within the area of review that penetrates the injection zone and lacks cement across the injection zone. Furthermore no wells were found within the AOR. Therefore no monitoring is proposed.

FORM WR-40

(Revised 3-93)

STATE OF WEST VIRGINIA

DIVISION OF ENVIRONMENTAL PROTECTION

REPORT FOR WASTE DISPOSAL WELLS

Date: 01/10/18

Well No.: WV 506168

API Permit No.: 047 - 047- 01511

State County Permit

previous months total --> 0

Operator Name: EQT Production Company

Month: December 2017

********** MAXIMUM PERMITTED INJECTION PRESSURE 847 PSIG **********

0.04 X bbl.

Day	Operating Hours	Annulus Pressures		Maximum Daily Injection Pressure	Shut In Pressure	Volume in Bbls. and/or MCF		Rate in Gallons Per Minute	
		Tubing	Other			Daily	Accumulated	Average	Max.
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									

I hereby certify that the information on this report is true and correct.

By: _____

Title: _____

Bill of Lading
For Non-Hazardous Liquids

EQT Production Company
625 Liberty Avenue, Suite 1700, Pittsburgh, PA 15222

BOL Number
789801

SOURCE INFO

Source Name	Address		
City	**State**	**Zip**	**County**

Check Type of Source:

Freshwater:

- ☐ Municipal Withdrawal
- ☐ Surface Withdrawal
- ☐ Freshwater Pit
- ☐ Groundwater Supply Well

Impaired Water:

- ☐ Flowback — Pad Name _____ Well Number _____
- ☐ Production — Pad Name _____ Well Number _____
- ☐ Drilling — Pad Name _____ Well Number _____
- ☐ Secondary Containment — Pad Name _____ **Circle Containment Type: Production Drilling Completions**
- ☐ Recycling Facility — Name _____

Driver Notes:

Volume Removed (total volume in gallons)	**Source Date**	**Source Time(s)**
Source Facility Printed Name	**Source Facility Signature**	

HAULER/TRANSFER COMPANY INFO

Company Name	Address			Truck #
City	**State**	**Zip**	**Phone**	**Trailer #**

Volume Hauled or Transferred (total volume in gallons)	Vehicle License Plate #
Driver Printed Name	**Driver Signature**

RECEIVER INFO

Receiving Facility or Pad Name	Address		
City	**State**	**Zip**	**Phone**

Check Type of Receiver:

- ☐ **Recycling Facility** **Permit #** _____
- ☐ **Disposal Facility** **Permit #** _____
- ☐ **EQT Well Site** **Well #** ____ _____ **Circle One: Freshwater Only Pit/AST Impaired Pit/AST Tank**

Volume Received (total water volume in gallons)	Date & Time(s)
Receiving Facility Printed Name	**Receiving Facility Signature**

WHITE – EQT; GOLD – Hauler; PINK – Receiver; CANARY YELLOW – Book Copy

Forms must be filled out completely and submitted to EQT on a weekly basis.

11.0 GROUNDWATER PROTECTION PLAN (GPP)

Appendix H details the components of the Groundwater Protection Plan (GPP).

12.0 PLUGGING AND ABANDONMENT

EQT has no plans to plug or abandon the Twin Branch Injection Well over the course of the next five years. In the event the need to plug the Twin Branch Injection Well would arise a proposed plugging procedure is attached on the next page.

PLUGGING PROGNOSIS

506168
Pocahontas Land Corp.
API# 47-047-01511
District, Browns Creek
McDowell County, WV

BY: R Green
DATE: 01/18/18

CURRENT STATUS:
TD @ 3554'
Elevation @ 1165'

16" casing @ 23' (CTS)
11 3/4" casing @ 360' (CTS)
8 5/8" casing @ 1020' (CTS)
5 1/2" casing @ 3554' (Cemented with 510.3 cu.ft)
2 3/8" tubing set on 2 3/8"X 5 ½" packer @ 3277'
Perforations @ 3412'to 3468' (16 holes)
" @ 3449'to 3458' (36 holes)
" @ **3464' to 3468' (16 holes)**

Fresh Water @ 85', 111', 250'
Saltwater@ None Reported
Oil Show @ None Reported
Gas shows @ None Reported
Coal @ 115', 200', 350'.480', 1000'

1. Notify inspector Brian Ferguson @ 304-550-6265, 24 hrs. prior to commencing operations.
2. Release packer and TOOH packer and 2 3/8" tubing.
3. TIH to 3400', spot 30 bbl. of 6% gelled water followed by a 300' C1A cement plug. 3400' to 3100'.WOC 8 hrs. Tag TOC. Add additional C1A cement if necessary.
4. TOOH to 2500' set a 200' C1A cement plug 2500' to 2300'.
5. Free point 5 ½" casing cut casing @ free point. (EST @1800') TOOH 5 ½" casing.
6. Set a 100' C1A cement plug 50' in/out of casing cut. Perforate all freshwater, saltwater, coal, oil and gas shows below cut. Do not omit any plugs.
7. TOOH to 1600' set a 100' C1A cement plug 1600' to 1500'.(Safety plug).
8. TOOH to 1250' set a 300' C1A cement plug 1250' to 950' (Elevation, & 8 5/8" casing seat).
9. TOOH to 500' set a 500' C1A cement plug 500' to surface. (11 3/4" casing seat, coal, freshwater).
10. Erect monument with API#, date plugged, & company name.
11. Reclaim location and road to WV-DEP specifications.

13.0 ADDITIONAL BONDING

A performance bond is required for Class 2D injection wells that dispose of contaminants, pollutants, or other effluents. EQT is submitting proof of a five thousand dollar ($5,000) performance bond to the State of West Virginia, in addition to the applicable permitting and GPP fees in order to satisfy these requirements.

14.0 FINANCIAL RESPONSIBILITY

Appendix I includes the appropriate documentation necessary in order to verify that EQT will maintain financial responsibility and fiduciary resources to close, plug, and abandon the Twin Branch Underground Injection Well in a manner prescribed by the Chief of the Office of Oil and Gas at the WVDEP.

15.0 SITE SECURITY PLAN

The security of the Twin Branch UIC facility is deemed sufficient to restrict or prohibit illegal dumping, unauthorized access, and to deter vandalism of the facility. The entire facility is enclosed by a metal chain link fence, which includes barbed wire across the top of the fence to deter unauthorized access. When EQT personnel are not on-site, the fence gate is locked via padlock. EQT well operators visit the site daily and conduct checks to ensure no tampering has occurred before commencing transferring or injection operations.

The pumps utilized for injection of the brine fluid are housed within a cinderblock pump house with a sliding metal door. The pump house is secured with a padlock when not in use by EQT personnel.

16.0 ADDITIONAL INFORMATION

UIC-1
(4/25)

WEST VIRGINIA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS
601 57th Street, SE
Charleston, WV 25304
(304) 926-0450
www.dep.wv.gov/oil-and-gas

UNDERGROUND INJECTION CONTROL (UIC) PERMIT APPLICATION

UIC PERMIT ID # UIC2D0471511 API # 4704701511 WELL # 506168

Section I. Facility Information

Facility Name: Twin Branch

Address:

City: Twin Branch State: WV Zip: 24889

County: McDowell

Location description:

The Twin Branch UIC Facility is located off of Old Twin Branch Loop Road, McDowell County,Twin Branch, WV. The facility operates in close proximity to the Tug River.

Location of well(s) or approximate center of field/project in UTM NAD 83 (meters):

Northing: 4148474 Easting: 440805

Environmental Contact Information:

Name: Chad Carmichael Title: Senior Environmental Coordinator

Phone: (304) 348-7661 Email: ccarmichael@eqt.com

Section 2. Operator Information

Operator Name: EQT Production

Operator ID: 306686

Address: 1710 Pennsylvania Ave.

City: Charleston State: WV Zip: 25304

County: Kanawha

Received
JUN 30 2016
Office of Oil and Gas
WV Dept. of Environmental Protection

Contact Name: Chad Carmichael Contact Title: Senior Environmental Coordinator

Contact Phone: (304) 348-7661 Contact Email: ccarmichael@eqt.com

Section 3. Applicant Information

Ownership Status: ■ PRIVATE ☐ PUBLIC ☐ FEDERAL ☐ STATE
☐ OTHER (explain):

SIC code: ■ 1311 (2D, 2H, 2R) ☐ 1479 (3S) ☐ OTHER (explain):

Section 4. Applicant / Activity Request and Type:

A. Apply for a new UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
B. Reissue existing UIC Permit: ■ 2D ☐ 2H ☐ 2R ☐ 3S
C. Modify existing UIC Permit: ☐ 2D ☐ 2H ☐ 2R ☐ 3S
(Submit only documentation pertaining to the modification request)
2D COMMERCIAL FACILITY: ☐ YES ☐ NO

Section 5. Briefly describe the nature of business and the activities to be conducted:

The Twin Branch Injection Well is a subsurface injection well owned and operated by EQT that injects brine accumulated from nearby natural gas production facilities into the Berea Sandstone formation. EQT injects corrosion and scale inhibitors into the injected brine as a part of normal operations. The brine and chemical additives are stored on-site in four (4) fiberglass storage tanks prior to injection. The Twin Branch facility operates one (1) tank truck loading area to receive brine fluids from tanker trucks.

RECEIVED
Office of Oil and Gas

MAY 10 2018

WV Department of
Environmental Protection

CERTIFICATION

All permit applications must be signed by a responsible corporate officer for a corporation, by a general partner for a partnership, by the proprietor of a sole proprietorship, or by a principal executive or ranking elected official for a public agency, or a [1]duly authorized representative in accordance with 47CSR13-13.11.b.

A. Name and title of person applying for permit:

Print Name: Michael Gagnini

Print Title: VP Production OPS

B. Signature and Date.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Signature:

Date: 5/7/18

[1] A person is a duly authorized representative if:

The authorization is made in writing by a person described in subdivision 47CSR13-13.11.a.

The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of the plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility.

The written authorization is submitted to the Director.

Figure 1

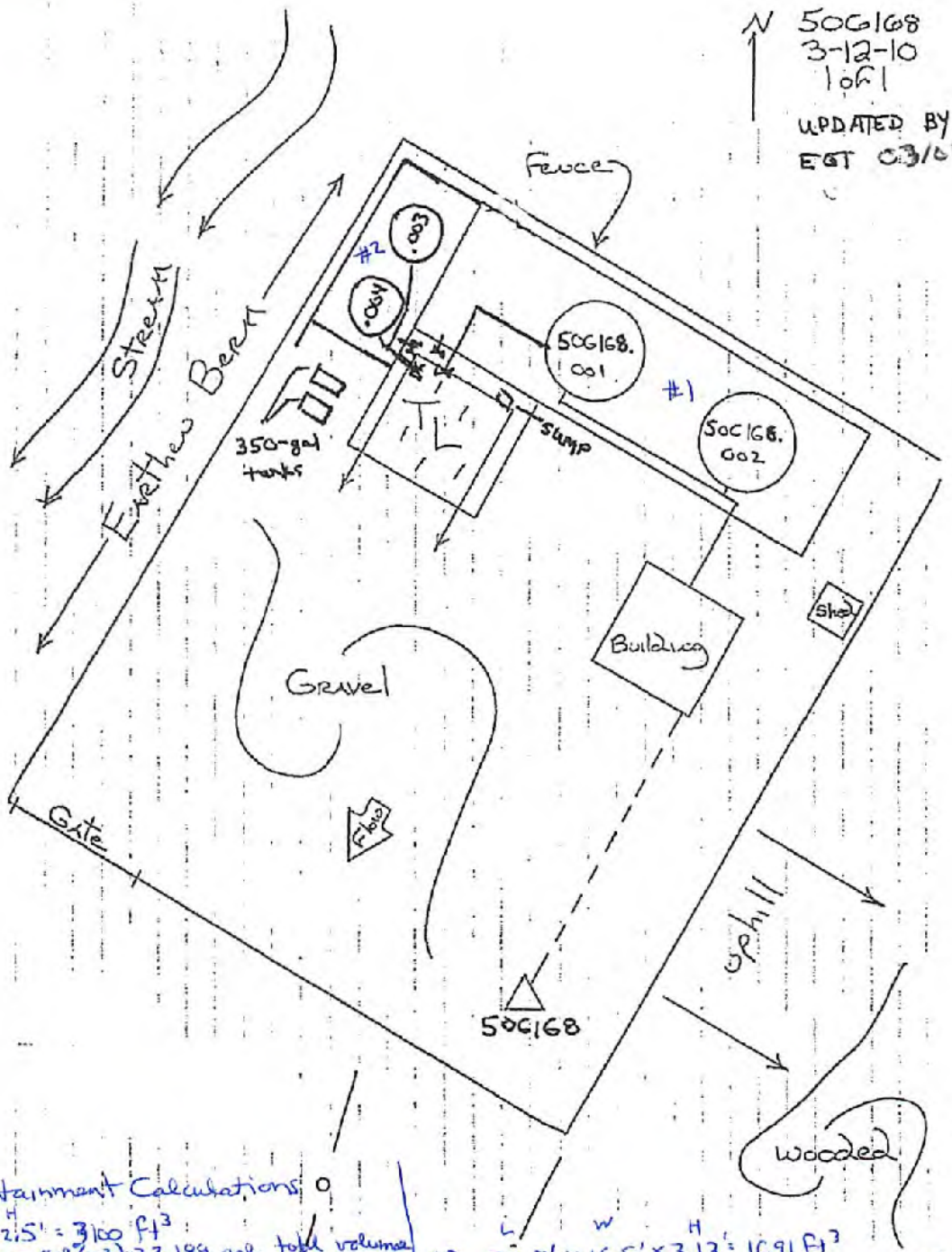
Twin Branch Site Location Map

Figure 2

2011 Area of Review Survey

Well #:506168

Site sketch:



RECEIVED
Office of Oil and Gas

MAY 23 2018

WV Department of
Environmental Protection

Secondary Containment Calculations:

#1 $50' \times 24.8' \times 2.5' = 3100\ ft^3$ (L × W × H)

$3100\ ft^3 (7.48\ gal/ft^3) = 23,188\ gal$ total volume

tank displacement volume: (# of tanks)$(\pi \times \frac{D^2}{4})(H)$

$= 1\left(\pi \frac{(12)^2}{4}\right)(2.5) = 283\ ft^3 (7.48\ gal/ft^3) = 2,115\ gal$

Net volume = total volume − tank displacement

$= 23,188 - 2,115 = 21,073\ gal$ (162%)

#2 $32.8' \times 16.5' \times 3.13' = 1691\ ft^3$ (L × W × H)

$1691\ ft^3 (7.48\ gal/ft^3) = 12,651\ gal$ total volume

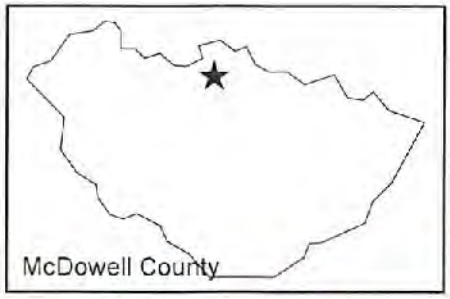
tank displacement volume:

$(1)\left(\pi \frac{(10)^2}{4}\right)(2.79)^* = 219\ ft^3 (7.48\ gal/ft^3) = 1,640\ gal$

*tanks rest on 4" beams so H for displacement is less than height of containment

Net volume = total volume − tank displacement

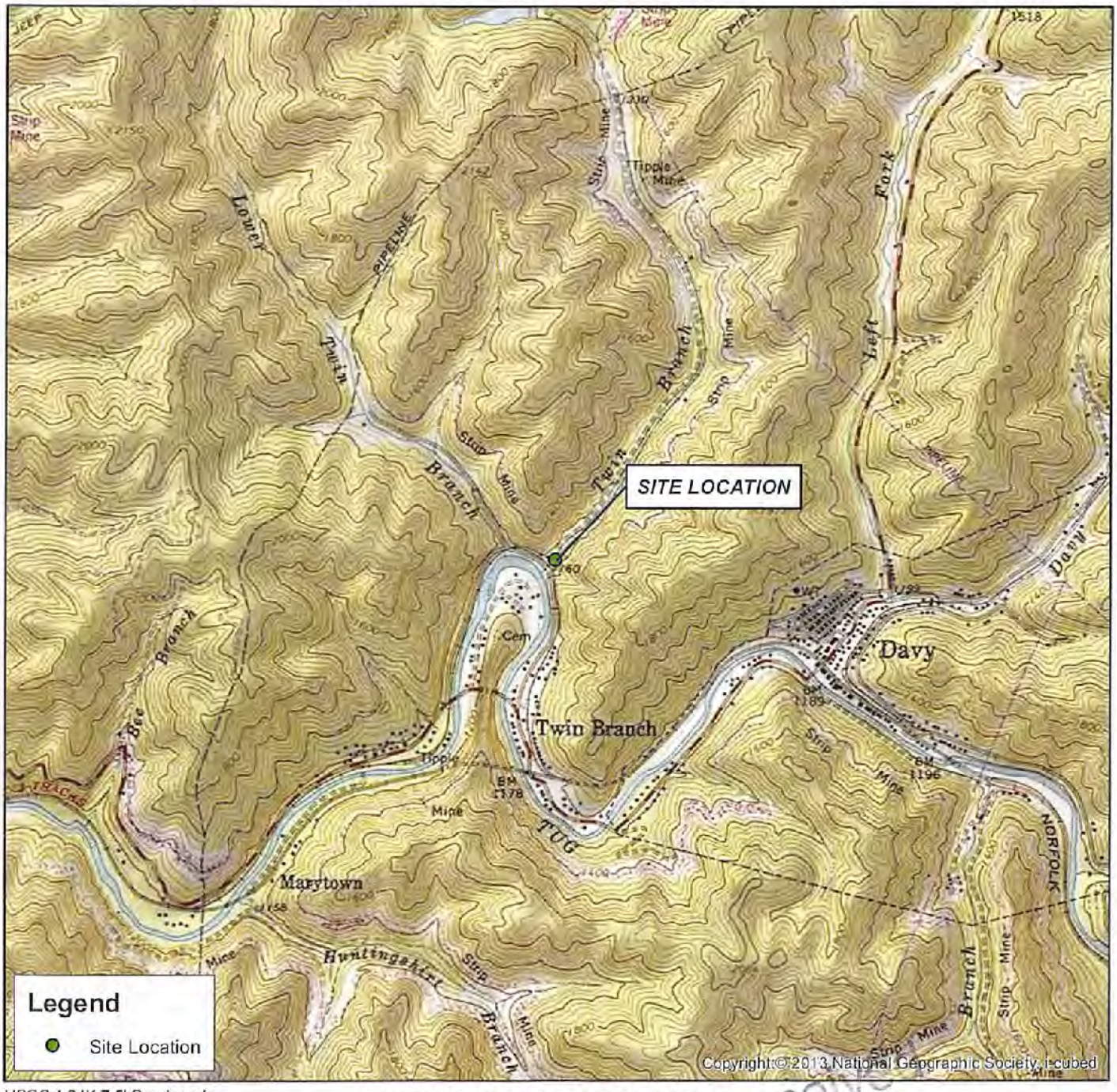
$= 12,651 - 1,640 = 11,011\ gal$ (125%)



0 1,000 2,000 4,000 Feet

N

LAT. 37.48099 LON. -81.66701
MCDOWELL COUNTY
WEST VIRGINIA



USGS 1:24K 7.5' Quadrangle:
Davy, WV

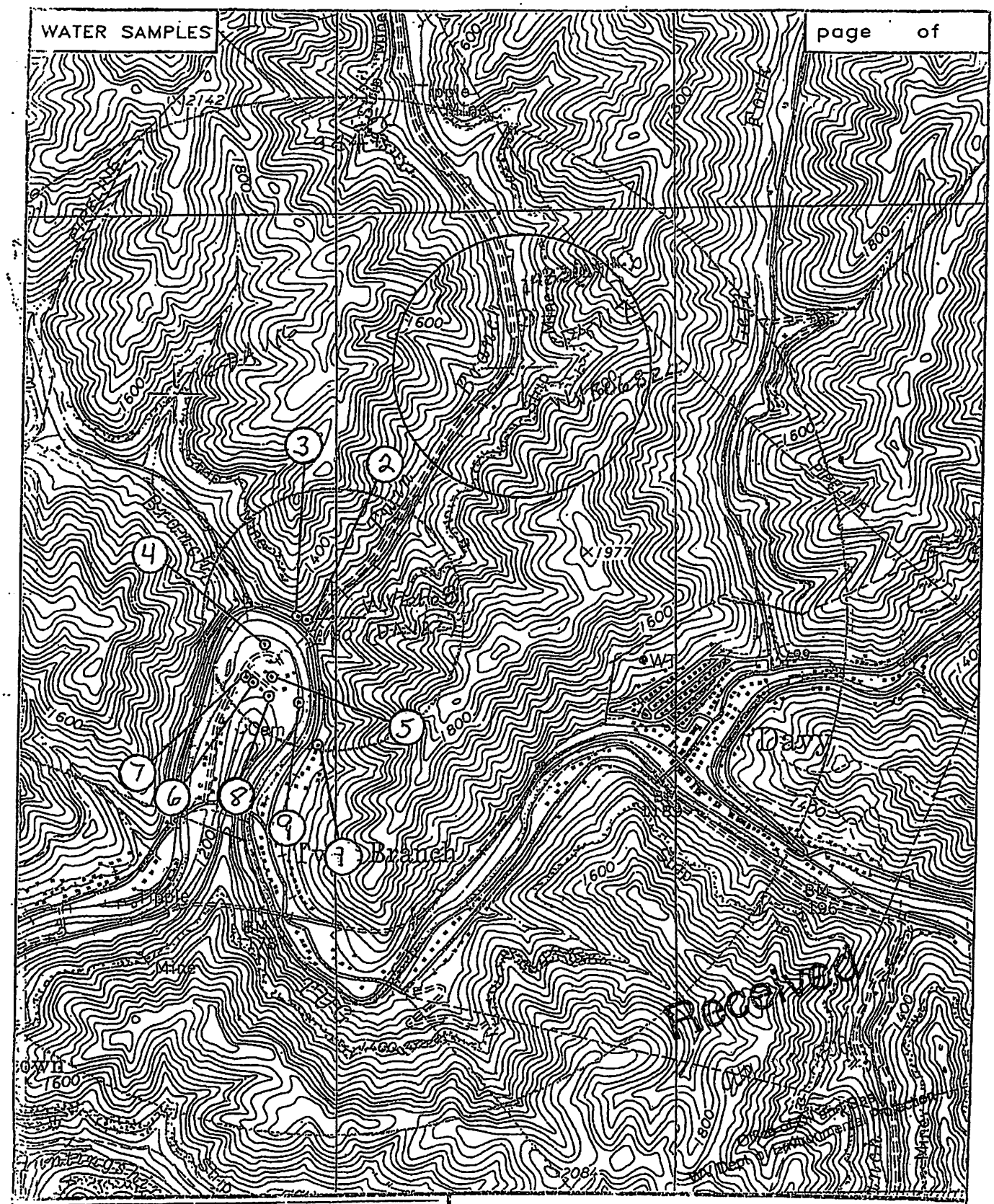
SITE LOCATION MAP

ERM	**EQT PRODUCTION COMPANY** Twin Branch Underground Injection Well Twin Branch McDowell County, West Virginia	GIS Review: MC CHK'D: MC 0350417
Drawn By: SRV-6/8/16	**Environmental Resources Management**	FIGURE 1

J:\GIS\Projects\EQT\...Branch_SiteLocation_Location Map.mxd - 6/8/2016 SRV

WATER SAMPLES

page of



SLS

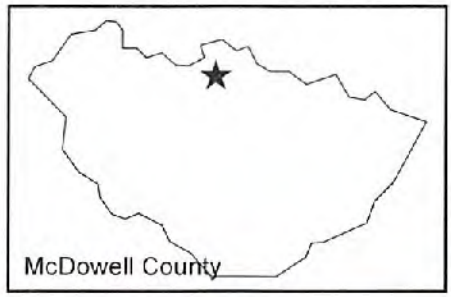
SMITH LAND SURVEYING
P.O.BOX 150 GLENVILLE, WV. 26351

TOPO SECTION OF Davy

FILE NO. 4552 DATE 1-31-06 SCALE 1/4 mile radius

Figure 3

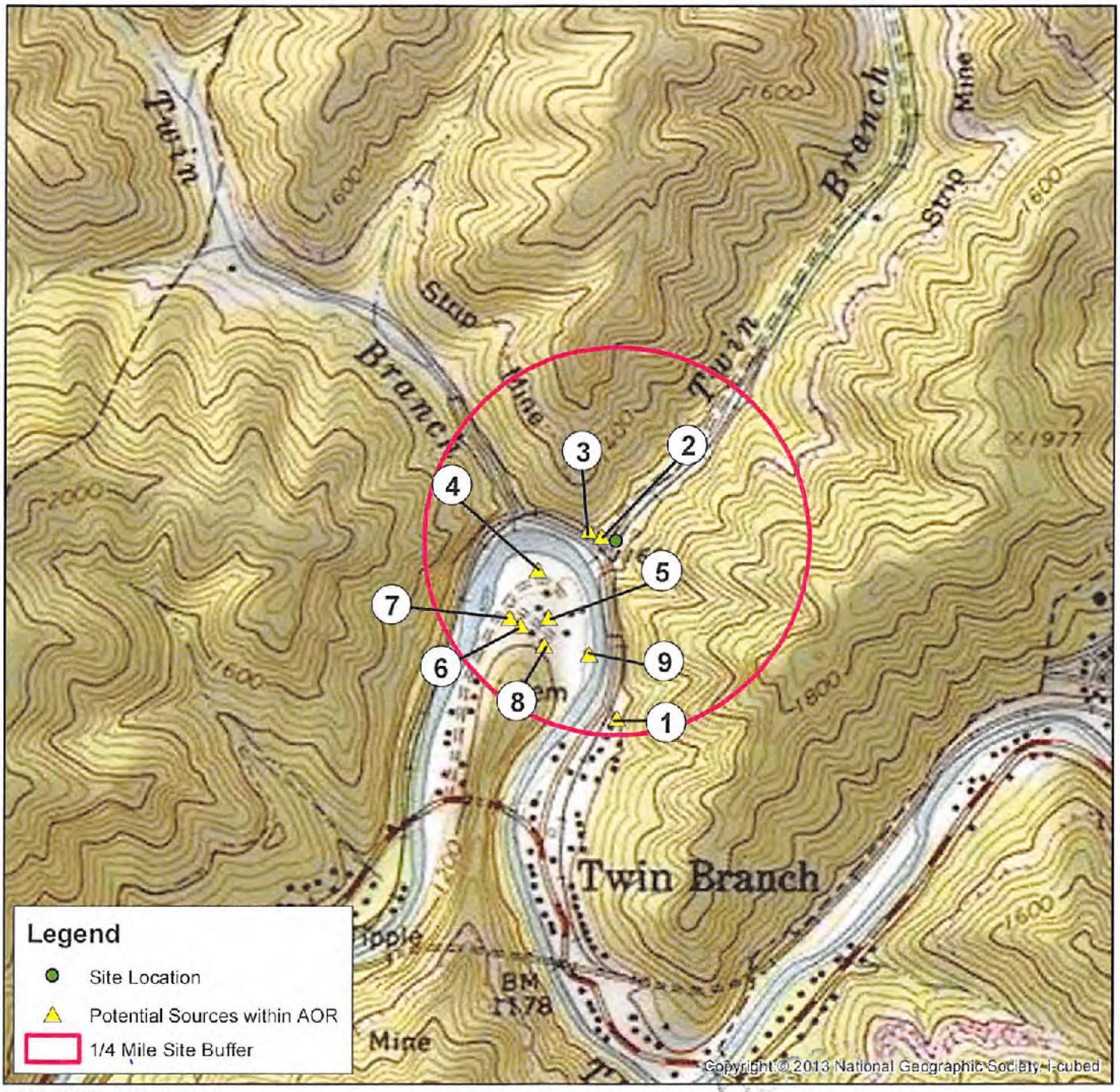
2016 Area of Review Survey



0 500 1,000 2,000 Feet

N

LAT. 37.48099 LON. -81.66701
MCDOWELL COUNTY
WEST VIRGINIA



USGS 1:24K 7.5' Quadrangle:
Davy, WV

2016 AREA OF REVIEW SURVEY

ERM

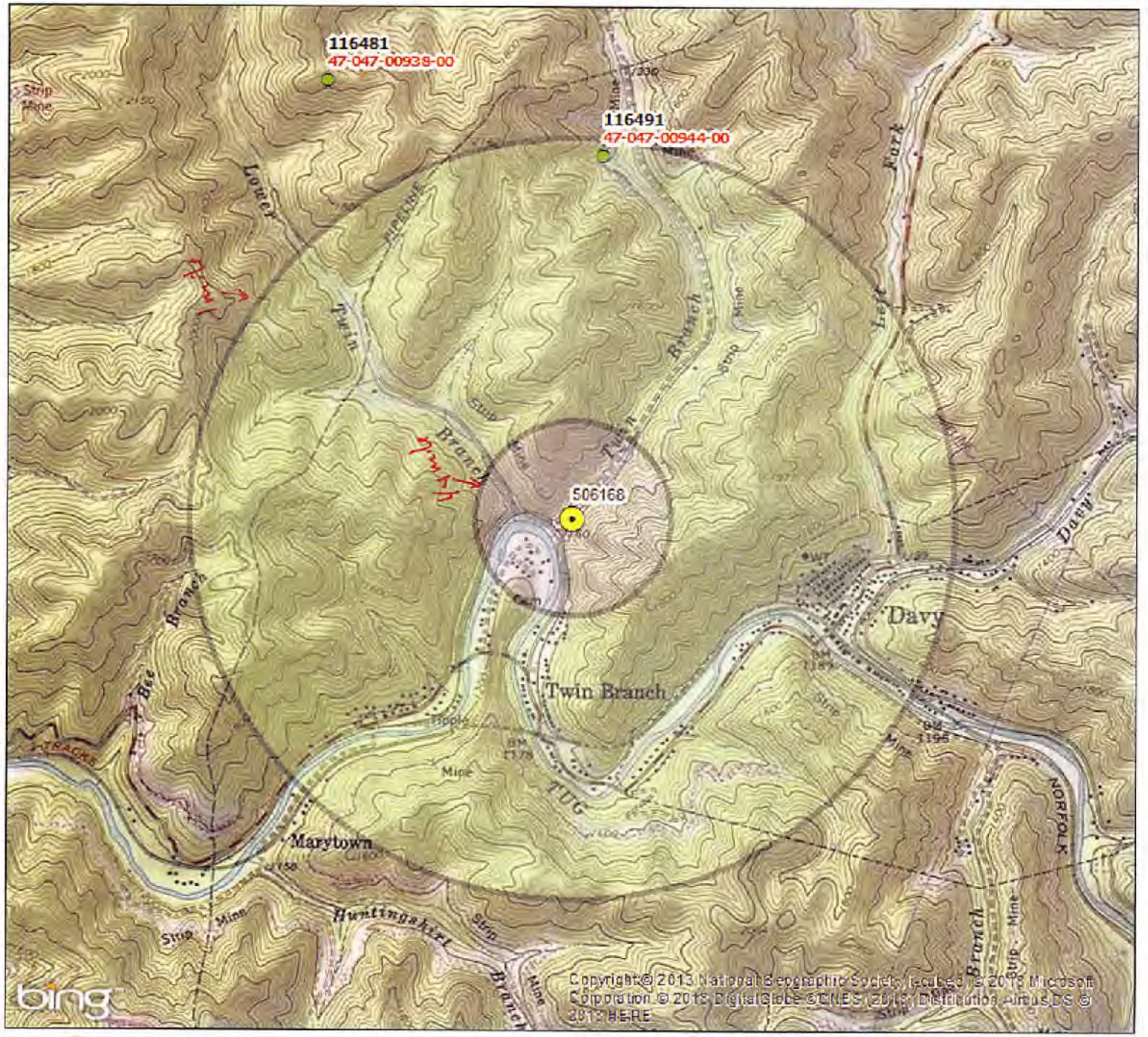
EQT PRODUCTION COMPANY
Twin Branch Underground Injection Well
Twin Branch
McDowell County, West Virginia

GIS Review: MC
CHK'D: MC
0350417

Drawn By:
SRV-6/8/16

Environmental Resources Management

FIGURE 3



EQT

EQT Plaza
625 Liberty Avenue
Suite 1700
Pittsburgh, PA 15222

506168

Permit Map

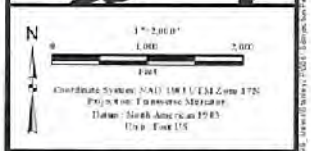
Legend

- Active Vertical
- Active Horizontal
- Inactive
- Storage Wells
- 3rd Party Wells
- P&A Wells
- Sold Wells
- 506168

RADIUS

- 1,350'
- 5,280'

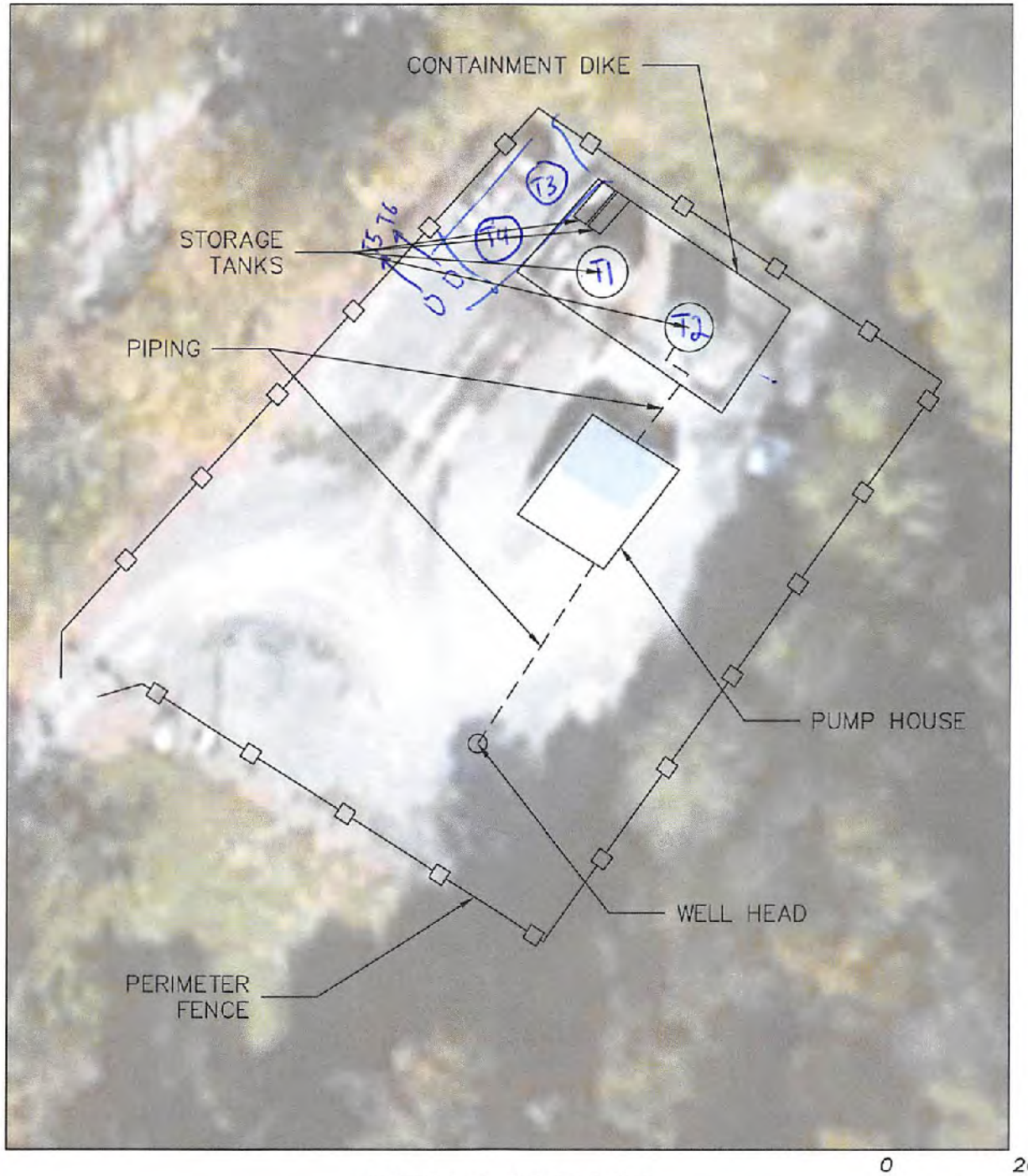
USA Topo Maps




WVDEP Office of Oil&Gas Well Locations
Map Layers
Lower Twin Branch
Twin Branch
Left Fork Davy Branch
Davy Branch
Bee Branch
Long Branch
Huntington Branch
Short Branch
Attribute Search
Result Table
Location Search
Legend
About

Figure 4

Twin Branch Injection Well Site Map



SITE LAYOUT

0 2000

SCALE (IN FEET)

REVISIONS ARE TO BE MADE ON THE CADD FILE ONLY

ERM.	EQT	CADD Review RB
		CHK'D RB
	MCDOWELL COUNTY, WV	0350417
Drawn By JEY 6/8/16	Environmental Resources Management	FIGURE 4

Figure 5

Annotated Geophysical Log for Twin Branch Injection Well

COMPANY: EQUITABLE PRODUCTION CO.

WELL: POCAHONTAS LAND # 506168

FIELD: BRENTON DISTRICT

COUNTY: McDOWELL STATE: WV

COUNTY: McDOWELL
Field: BRENTON DISTRICT
Location: LAT. 37 : 28' : 52.3"
Well: POCAHONTAS LAND # 506168
Company: EQUITABLE PRODUCTION CO.

Schlumberger

LITHO DENSITY / NEUTRON
ARRAY INDUCTION IMAGER
AUDIO / TEMPERATURE

LOCATION

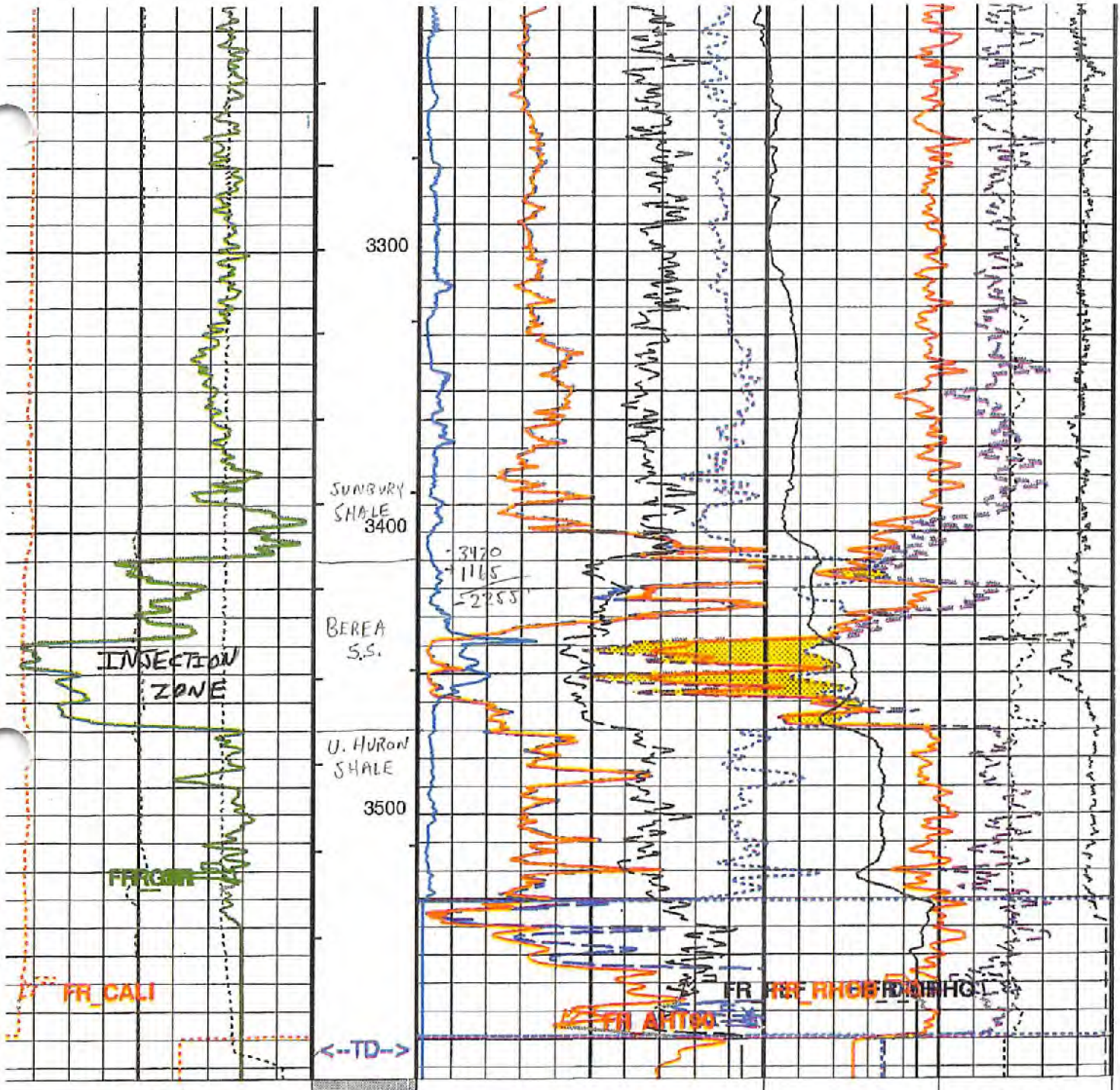
LAT. 37 : 28' : 52.3"
LON. 81 : 40' : 00.6"

Elev.: K.B. 1175 ft
G.L. 1165 ft
D.F. 1174 ft

Permanent Datum: GROUND LEVEL — Elev.: 1165 ft
Log Measured From: KELLY BUSHING — 10.0 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No. 47-4701511		DISTRICT BROWNS CREEK	QUADRANGL DAVY 7.5'

Logging Date			18-Oct-2001					
Run Number			ONE					
Depth Driller			3575 ft					
Schlumberger Depth			3585 ft					
Bottom Log Interval			3577 ft					
Top Log Interval			0 ft					
Casing Driller Size @ Depth			7.000 in @ 1013 ft			@		
Casing Schlumberger			1022 ft					
Bit Size			7.625 in					
Type Fluid In Hole			AIR					
MUD	Density	Viscosity	0 lbm/gal					
	Fluid Loss	PH						
	Source Of Sample		N/A					
RM @ Measured Temperature			@			@		
RMF @ Measured Temperature			@			@		
RMC @ Measured Temperature			@			@		
Source RMF	RMC		N/A	N/A				
RM @ MRT	RMF @ MRT		@ 97	@ 97		@		@
Maximum Recorded Temperatures			97 degF					
Circulation Stopped	Time							
Logger On Bottom	Time		18-Oct-2001	SEE LOG				
Unit Number	Location		8503	BELLE,WV				
Recorded By			S. SALIM					
Witnessed By			MR. RICK McLEAD					



Caliper (CALI) (IN) 6 16

Gamma Ray (GR) (GAPI) 200

Tension (TENS) (LBF) 0

GR > 200 From LHT1 to GR1

MT Differential Gas Temperature (TDELTAT) (DC/K) 1

Cable Drag From STIA to STIT

Tool/Tot. Drag From D3T to STIA

AIT-H 60 Inch Investigation (AHT60) 0 (OHMM) 100

AIT-H 90 Inch Investigation (AHT90) 0 (OHMM) 100

Bulk Density Correction (DRHO) -0.2 (G/C3) 0.3

Density Porosity (DPHI) 0.3 (V/V) -0.1

Epithermal Neutron Porosity (ENPH) 0.3 (V/V) -0.1

PhotoElectric Factor (PEF) 0 (---) 10

Figure 6

Isopach Map of the Berea Sandstone

Figure 8

Lateral Flow Calculation for Twin Branch Injection Well

EQT	Document Type	Engineering Work Sheet		
	Project: Twin Branch	Doc. No.	Rev. No.	Sheet No. of
	Subject: Salt Water Fill up	Prepared By: Jeff Mast		Date: 5/8/11
	System	Checked By		Date

$V = 7758\ \phi\ h\ A\ (1-Sw)$

V = volume (bbl)
h = formation thickness, Ft
Sw = orginal water saturation
A = area (ac)

$$A = \frac{V}{7758(\phi)(H)(1-Sw)}$$

$$A = \frac{1,151,981\ BBL}{7758(0.077)(3468-3409)(1-0.642)}$$

$A = 91.3$ ac

Assume radial flow

$A = \pi r^2 = 91.3(43560\ ft^2/ac)$

$r = 1125.4$ ft flow radius

Table 1

Drilling Test Results

Gamma Ray	Caliper	Density	Density Porosity	Neutron Porosity	Resistivity	Audio	Temperature
Feet	Inches	G/C^3	%	%	Milli-Ohms	MV	Degrees F
Top of Sunbury Shale	From	From	From	From	From	From	From
3390'	3390'	3390'	3390'	3390'	3390'	3390'	3390'
Base of Sunbury Shale/ Top of Berea SS	to	to	to	to	to	to	to
3408'	3408'	3408'	3408'	3408'	3408'	3408'	3408'
Measurement	7.8 to 8.0	2.65 to 2.75	12 to 14	0 to 2	30 to 70	~10	~85.25
Top of Berea SS	3408'	3408'	3408'	3408'	3408'	3408'	3408'
	to	to	to	to	to	to	to
Base of Berea SS	3468'	3468'	3468'	3468'	3468'	3468'	3468'
Measurement	7.8	2.35 to 2.75	4 to 8	0 to 20	5-to 100	~12.5 to 50	85.6 to 86.5

Table 2

United States Surface Water Quality Drinking Standards for Residential Use

Primary Drinking Water Standards			
Contaminant	MCLG	MCL	Units
Arsenic	0	0.01	mg/L
Barium	2	2	mg/L
Toluene	1	1	mg/L
Xylenes	10	10	mg/L
Bacteria (Total Coliform)	0	5%	Count/100 mL
Secondary Drinking Water Standards			
Contaminant	MCL		Units
Aluminum	0.05 to 0.2		mg/L
Chloride	250		mg/L
Iron	0.3		mg/L
Manganese	0.05		mg/L
pH	6.5 – 8.5		mg/L
Sulfate	250		SU
Total Dissolved Solids (TDS)	500		mg/L

Appendix A

Injection Well Form

APPENDIX A
Injection Well Form

1) GEOLOGIC TARGET FORMATION: Berea SS

Depth: 3398 Feet (top) 3458 Feet (bottom)

2) Estimated Depth of Completed Well, (or actual depth of existing well): 3575 Feet

3) Approximate water strata depths: Fresh 85,111,250 Feet Salt N/A Feet

4) Approximate coal seam depths: 115,200,350,480,1000

5) Is coal being mined in the area? Yes ☑ No ☐

6) Virgin reservoir pressure in target formation 859 psig Source Offset Well: 47-047-00944

7) Estimated reservoir fracture pressure 2551 psig (BHFP)

8) MAXIMUM PROPOSED INJECTION OPERATIONS:

Injection rate (bbl/hour)	47.7
Injection volume (bbl/day)	1,145
Injection pressure (psig)	~~847 psig~~ 823 psig
Bottom hole pressure (psig)	1550 psig

9) DETAILED IDENTIFICATION OF MATERIALS TO BE INJECTED, INCLUDING ADDITIVES:

The fluids injected include Brine, Corrosion Inhibitors, and Scale Inhibitors. The Material, Data Safety, Sheets are provided in attached documentation.

Temperature of injected fluid: (°F) Atmospheric

10) FILTERS (IF ANY)

None

11) SPECIFICATIONS FOR CATHODIC PROTECTION AND OTHER CORROSION CONTROL

Injection tubing is Seal Tite. Internally lined and tubing - CSG annulus is loaded with an inhibited fluid to mitigate corrosion issues.

APPENDIX A (cont.)

12. Casing and Tubing Program

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	16"	New			23'	23'	CTS
Fresh Water	11 3/4"	New	F-25	42	360'	360'	CTS
Coal	8 5/8"	New	F-25	24	1020'	1020'	CTS
Intermediate 1							
Intermediate 2							
Production	5.5"	New	J-55	15.5	3554'	3554'	510
Tubing	2 3/8"	New	J-55	4.7	3277.5'	3277.5'	
Liners							

TYPE	Wellbore Diameter	Casing Size	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./sk)	Cement to Surface ? (Y or N)
Conductor		16"		1,640	C1A		Y
Fresh Water		11 3/4"	0.3"	1,980	C1A		Y
Coal		8 5/8"	0.264"	2,950	C1A		Y
Intermediate 1							
Intermediate 2							
Production	7 7/8"	5 1/2"	.275"	4,810	C1A	1.89	N
Tubing		2 3/8"	0.19	7,700	N/A	N/A	N/A
Liners							

PACKERS	Packer #1	Packer #2	Packer #3	Packer #4
Kind:	1XS Mechanical Packer			
Sizes:	5 1/2" x 2 3/8"			
Depths Set:	3,277.5' - 3,283.3'			

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47- 047 - 01511 County McDowell District Browns Creek
Quad Davy 7.5' Pad Name NA Field/Pool Name
Farm name Pocahontas Land Corportation Well Number 506168
Operator (as registered with the OOG) EQT Production Company
Address 1 Hillcrest Drive East City Charleston State WV Zip 25311

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing N/A Easting N/A
Landing Point of Curve Northing N/A Easting N/A
Bottom Hole Northing N/A Easting N/A

Elevation (ft) 1165' GL Type of Well □New ■ Existing Type of Report □Interim ■Final

Permit Type □ Deviated □ Horizontal □ Horizontal 6A ■ Vertical Depth Type □ Deep ■ Shallow

Type of Operation □ Convert □ Deepen ■ Drill □ Plug Back □ Redrilling □ Rework □ Stimulate

Well Type ■ Brine Disposal □ CBM □ Gas □ Oil □ Secondary Recovery □ Solution Mining □ Storage □ Other

Type of Completion ■ Single □ Multiple Fluids Produced □ Brine □Gas □ NGL □ Oil □ Other
Drilled with □ Cable ■ Rotary

Drilling Media Surface hole ■ Air □ Mud □Fresh Water Intermediate hole ■ Air □ Mud □ Fresh Water □ Brine
Production hole ■ Air □ Mud □ Fresh Water □ Brine
Mud Type(s) and Additive(s)
NA

Date permit issued Date drilling commenced 10/8/2001 Date drilling ceased
Date completion activities began Date completion activities ceased 11/7/2001
Verbal plugging (Y/N) Date permission granted Granted by

RECEIVED
Office of Oil and Gas
MAY 23 2018

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 85', 111', 250' Open mine(s) (Y/N) depths NA
Salt water depth(s) ft Not encountered Void(s) encountered (Y/N) depths NA
Coal depth(s) ft 115', 200', 350', 480', 1000' Cavern(s) encountered (Y/N) depths NA
Is coal being mined in area (Y/N) N

WV Department of
Environmental Protectic

Reviewed by:

API 47- 047 - 01511 Farm name Pocahontas Land Corportation Well number 506168

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor		16"	23'	New		NA	Y
Surface		11 3/4"	360'	New	F-25		Y
Coal		8 5/8"	1020'	New	F-25		Y
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	7 7/8"	5 1/2"	3554'	New	J-55		N
Tubing		2 3/8"	3277.5'	New	J-55		
Packer type and depth set		1xS Mechanical Packer, 5 1/2" x 2 3/8", Set at 3,277.5'					

Comment Details Tubing is PVC lined

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ^{3}/sks)	Volume (ft ^{3})	Cement Top (MD)	WOC (hrs)
Conductor	C1A					0	
Surface	C1A				205	0	
Coal	C1A				333	0	
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production	C1A				510	1874	
Tubing							

Drillers TD (ft) 3575 Loggers TD (ft) 3585 (3575 adjsuted for KB)

Deepest formation penetrated Shale (Upper Huron) Plug back to (ft) NA

Plug back procedure NA

Kick off depth (ft) NA

Check all wireline logs run ■ caliper ■ density □ deviated/directional ■ induction ■ neutron ■ resistivity ■ gamma ray ■ temperature ■ sonic

Well cored □ Yes ■ No Conventional Sidewall Were cuttings collected □ Yes ■ No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING Unknown

WAS WELL COMPLETED AS SHOT HOLE □ Yes ■ No DETAILS

WAS WELL COMPLETED OPEN HOLE? □ Yes ■ No DETAILS

WERE TRACERS USED □ Yes ■ No TYPE OF TRACER(S) USED

API 47- 047 - 01511 Farm name Pocahontas Land Corportation Well number 506168

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1		3402'	3458'	108	Berea

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
1	10/25/20	20	847	941	736	40,000	702	0

Please insert additional pages as applicable.

API 47- 047 - 01511 Farm name Pocahontas Land Corportation Well number 506168

PRODUCING FORMATION(S)	DEPTHS		
Berea	3398-3458 TVD	3398-3458 MD	

Please insert additional pages as applicable.

GAS TEST ☐ Build up ☐ Drawdown ☐ Open Flow OIL TEST ☐ Flow ☐ Pump

SHUT-IN PRESSURE Surface _____ psi Bottom Hole _____ psi DURATION OF TEST _____ hrs

OPEN FLOW Gas _____ mcfpd Oil 0 bpd NGL 0 bpd Water _____ bpd GAS MEASURED BY ☐ Estimated ☐ Orifice ☐ Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H_2S, ETC)
	0		0		See attached drillers log

Please insert additional pages as applicable.

Drilling Contractor Gasco Drilling Inc
Address 530 Ratcliff Dr City Cedar Bluff State VA Zip 24609

Logging Company Schlumerger
Address 1325 S. Dairy City Houston State TX Zip 77077

Cementing Company BJ Services
Address 11211 FM 2920 Rd. City Tomball State TX Zip _____

Stimulating Company BJ Services
Address 11211 FM 2920 Rd. City Tomball State TX Zip 77375
Please insert additional pages as applicable.

Completed by Jeff Mast Telephone 304-543-6988
Signature _____ Title Engineer III Date 5/3/2018

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

Gasco Drilling Inc.

Cedar Bluff, Va 24609
(540)964-2696

Rig No. 5

Driller's Log

Operator's Well Name & Number:

506168

API No. 47-4701511

AFE No. _____

County: Wyoming

District: Clear Fork

State: West Virginia

Gasco Drilling

(Drilling Contractor)

FORMATION

TOP (DEPTH)	BASE (DEPTH)	FORMATION (STRATA)
0	23	CUPER BURTON
23	115	SANDSTONE
115	117	COAL
117	200	SANDYSHALE
200	202	COAL
202	350	STREAKED SANDSTONE
350	351	COAL
351	420	SANDY SHALE
480	481	COAL
480	1000	SALT SAND
1000	1002	COAL
1002	1090	STREAKED SANDSTONE
1090	1270	RAVEN CLIFF
1270	1360	SANDY SHALE
1360	1410	UPPER MAXTON
1410	1620	STREAKED SANDSTONE
1620	1660	MIDDLE MAXTON
1660	1800	SANDY SHALE
1800	2000	STREAKED SANDSTONE
2000	2100	LOWER MAXTON
2100	2200	LITTLE LIME
2200	2235	RED ROCK
2235	2650	BIG LIME
2650	2910	SANDY SHALE
2910	2940	UPPER WEIR
2940	2970	SANDY SHALE
2970	3000	LOWER WEIR
3000	3400	SANDY SHALE
3400	3450	BEREA
3450	3575	SANDY SHALE T.D.

RECORD

DESCRIPTION (HARD, SOFT, COLOR, ETC.)	REMARKS (OIL, FRESH/SALT WATER, GAS)
	85 WATER 1" STREAM
	111 " " 2" STREAM
	250 6" STREAM
	↓
RAN 81 JOINTS of 5½ 15.5# pipe 3549 SET AT 3554 cement with B. J. 270 SKs of 50-50-3 Blend pump 9.5 BARREL of H.C.L. ACID 15% Plug down AT P.M 10-18-01	

RECEIVED
Office of Oil & Gas

JUL 25 2011

WV Department of
Environmental Protection

RECEIVED
Office of Oil and Gas

MAY 23 2018

WV Department of
Environmental Protection

PLUGGING RECORD

DATE WELL PLUGGED: _____

PLUGGING CONTRACTOR:

_____

PIPE LEFT IN HOLE:

Size:	Footage:

CEMENT/GEL PLUGS SET AS FOLLOWS:

From:	To:	Sacks/Type:	

REMARKS

Set 21' on well #1
Set 23.3 on well #2
of 16" Conduct

RECEIVED
Office of Oil & Gas

JUL 25 2011

WV Department of
Environmental Protection

~~RECEIVED~~
Office of Oil and Gas

MAY 23 2018

WV Department of
Environmental Protection

TALLY OF PIPE

SIZE	WEIGHT	GRADE	THREAD
11 3/4			off

(1) Feet	In	(2) Feet	In	Feet	In	Feet	In
43	85			43	05		
44	20			44	30		
44	—			44	35		
132	05			32	75		
				44	10		
				44	15		
				44	10		
				44	40		
				43	85		
				44	35		
				43	—		
				44	—		
				521	50		
				352			
				SET			
				in			
				well			

TALLY OF PIPE

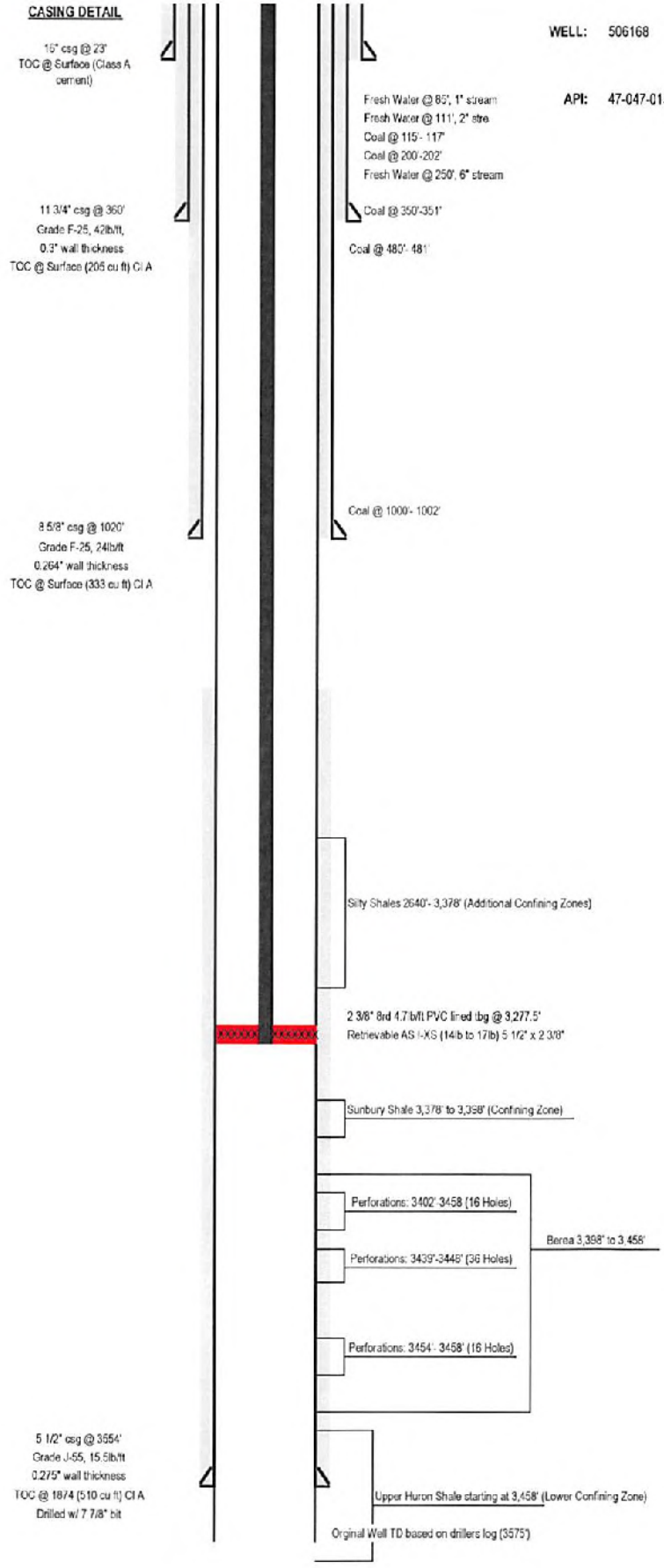
SIZE	WEIGHT	GRADE	THREAD

Feet	In	Feet	In	Feet	In	Feet	In

RECEIVED
Office of Oil & Gas
JUL 2011
WV Department of
Environmental Protection

RECEIVED
Office of Oil and Gas
MAY 23 2018
WV Department of
Environmental Protection

EQT
Where energy meets innovation.



Appendix B

Storage Tank Information

APPENDIX B
Storage Tank Inventory

AST #	Tank ID	Tank Location (Lat/Long)		Installation Date	Tank Age (Months)	Construction Material (Steel, plastic, etc.)	Capacity (gallons)	Type of Fluid Stored	Volume of Fluid Stored (gallons)	Tank Type Single/Double Wall
		Northing	Easting							
024-00001276	T1	37.481572	81.666482	2017	~ 8	Steel	13,020	Brine	6,510	Single
024-00001263	T2	37.481572	81.666482	2003	~ 180	Fiberglass	13,020	Brine	6,510	Single
024-00001351	T3	37.48167	81.66666	2017	~ 8	Steel	8820	Oil/Brine Mix	4,410	Single
024-00001350	T4	37.48163	81.66665	2017	~ 8	Steel	8820	Oil/Brine Mix	4,410	Single
NA	T5	37.48163	81.66665	2017	~ 8	Steel	168	Corrosion Inhibitor	168	Single
NA	T6	37.48163	81.66665	2017	~ 8	Steel	168	Scaling Inhibitor	168	Single

Appendix C

Wells within Area of Review

Appendix C

Wells within Area of Review

EQT found no producing wells, plugged wells, injection wells, abandoned wells, dry holes, or pre 1929 wells within the area of review

Appendix D

Public Service District Affadavit

The McDowell County Health Commission and the Davy's Public Service District were unable to provide documentation of publically recorded drinking water sources. The efforts made to obtain this documentation are discussed in Section 7 of this submittal.

Appendix E

Water Sources

USDWs within the Area of Review

Geological Formation	Well Type	Well Status (Active, Abandoned, Shut-in, Plugged)	Northing (UTM NAD 83 Meters)	Easting (UTM NAD 83 Meters)	Penetrate Injection Zone (Y or N)	Penetrate Confining Zone (Y or N)	Total Vertical Depth	Surface Elevation
N/A	Spring	Active	4148383.494	440978.016	N	N	N/A	1131 ft.
Pocahontas	Well	Active	4148290.041	440800.483	N	N	~ 80 ft.	1798 ft.
Pocahontas	Well	Abandoned	4148248.004	440861.018	N	N	~ 84 ft.	1820 ft.

Make as many copies as necessary and include page numbers as appropriate.

USDWs within the Area of Review

API #	Well Type	Well Status (Active, Abandoned, Shut-in, Plugged)	Northing (UTM NAD 83 Meters)	Easting (UTM NAD 83 Meters)	Penetrate Injection Zone (Y or N)	Penetrate Confining Zone (Y or N)	Total Vertical Depth	Surface Elevation
N/A	Spring	Active	4148383.494	440978.016	N	N	N/A	1131 ft.
N/A	Well	Active	4148290.041	440800.483	N	N	~ 80 ft.	1798 ft.
N/A	Well	Abandoned	4148248.004	440861.018	N	N	~ 84 ft.	1820 ft.

Make as many copies as necessary and include page numbers as appropriate.

APPENDIX E
Water Sources

Operator: EQT Production Year 2016 UIC Permit # UOC2D0471511

		Source # 1	Source # 2	Source #	Source #
Water Source Name		RWS-1	RWS-2		
Northing		4148383.494	4148290.041		
Easting		440978.016	440800.483		
Parameter	Units				
TPH - GRO	mg/L	< 0.046	<0.048		
TPH - DRO	mg/L	< 0.023	<0.023		
TPH - ORO	mg/L	< 0.026	<0.026		
BTEX	mg/L	13.4	<0.062		
Chloride	mg/L	1.0	11		
Sodium	mg/L	19	73		
Total Dissolved Solids (TDS)	mg/L	190	230		
Aluminum	mg/L	0.0069	0.013		
Arsenic	mg/L	< 0.00070	<0.00087		
Barium	mg/L	0.044	0.039		
Iron	mg/L	< 0.010	2.0		
Manganese	mg/L	< 0.00020	0.20		
pH	SU	6.53	6.99		
Calcium	mg/L	24	15		
Sulfate	mg/L	71	0.13		
MBAS	mg/L	< 0.0050	<0.0050		
Dissolved Methane	mg/L	< 0.00034	3.7		
Dissolved Ethane	mg/L	< 0.00023	<0.00023		
Dissolved Butane	mg/L	< 0.00035	<0.00035		
Dissolved Propane	mg/L	< 0.00022	<0.00022		
Bacteria (Total Coliform)	c/100mL	< 10	<10		

Appendix F

Area Permit Wells

The Twin Branch UIC Facility is classified as a Class 2D well and is not required to submit the information associated with Appendix F.

Appendix G

Wells Serviced by Injection Wells

PROPNAME	OPERATED	APINUMBER	ENERTIA_NO	DISTRICT	RESERVOIR	STATUSCODE	PROD_MTHD
GEORGIA PACIFIC CORPORATION #508436	Y	4710902101	508436	BRENTON	BEREA,GORDON	PROD	SB
ROGERS, LON #508826	Y	4502725154	508826	BRENTON	COALBED METHANE	PROD	C
COLE & CRANE #508089	Y	4704501457	508089	BRENTON	BEREA,DEVONIAN SHALE,GORDON	PROD	CPL
ROGERS, LON #508827	Y	4502725173	508827	BRENTON	COALBED METHANE	PROD	C
THOMPSON #508163	Y	4705901420	508163	BRENTON	BEREA,HURON	PROD	C
COLE & CRANE #508052	Y	4704501425	508052	BRENTON	BIG LIME,HURON	PROD	C-SWAB
POCAHONTAS/CHATTEROY #508486	Y	4705901452	508486	BRENTON	LOWER HURON(NATURAL)	PROD	C
ISLAND CREEK COAL "D" #508093	Y	4704501397	508093	BRENTON	BEREA,BIG LIME,GORDON,HURON	PROD	PU
POCAHONTAS/CARNEGIE #508372	Y	4705901447	508372	BRENTON	BEREA,BIG LIME,HURON,WEIR	PROD	C
POCAHONTAS/CARNEGIE #508371	Y	4705901446	508371	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
COLE & CRANE #508090	Y	4704501410	508090	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
ISLAND CREEK COAL "D" #508046	Y	4705901439	508046	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
POCA/CARNEGIE #508109	Y	4705901454	508109	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
ISLAND CREEK #508055	Y	4705901456	508055	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER/COUCH #508457	Y	4710902081	508457	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	MPL
RITTER LUMBER COMPANY #508266	Y	4710902086	508266	BRENTON	BIG LIME,HURON,MAXTON,SHALE	PROD	C-SWAB
RITTER LUMBER COMPANY #508141	Y	4710902077	508141	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	DC
OSWALD, ENID #508185	Y	4704701514	508185	BRENTON	BEREA,BIG LIME,HURON	PROD	C
BIG HUFF #507274	Y	4704501443	507274	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE, WEIR	PROD	C
ROGERS #508500	Y	4704701581	508500	BRENTON	COALBED METHANE	PROD	PU
GEORGIA PACIFIC CORPORATION #508144	Y	4704701505	508144	BRENTON	DEVONIAN SHALE,LOWER HURON,MAXTON	PROD	T
GEORGIA PACIFIC CORPORATION #508468	Y	4710902089	508468	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF,WEIR	PROD	T
OSWALD #507860	Y	4704701513	507860	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
ELK CREEK COAL & LAND COMPANY #508400	Y	4704501458	508400	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
GEORGIA PACIFIC CORPORATION #504538	Y	4704701441	508888	BRENTON	COALBED METHANE	PROD	PU
GEORGIA PACIFIC CORPORATION #508185	Y	4704701507	508186	BRENTON	BEREA,HURON	PROD	C
GEORGIA PACIFIC CORPORATION #508189	Y	4704701510	508189	BRENTON	BEREA,BIG LIME,GORDON,LOWER HURON	PROD	C-SWAB
RITTER LUMBER COMPANY #347	Y	4710001914	507519	BRENTON	BEREA,BIG LIME	PROD	DC
POCAHONTAS/CARNEGIE #508161	Y	4705901441	508161	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,GORDON	PROD	C-SWAB
ELK CREEK #508387	Y	4704501447	508387	BRENTON	BEREA,BIG LIME,GORDON,DEVONIAN SHALE	PROD	C-SWAB
RITTER/COUCH #508438	Y	4710902079	508438	BRENTON	BEREA,BIG LIME,RAVENCLIFF,WEIR	PROD	T
POCAHONTAS/CARNEGIE #508160	Y	4705901440	508160	BRENTON	BEREA,BIG LIME,GORDON,DEVONIAN SHALE	PROD	C-SWAB
GEORGIA PACIFIC CORPORATION #508145	Y	4704701506	508145	BRENTON	BEREA,BIG LIME,HURON	PROD	C
FRANCIS, DAVID TRUST #508116	Y	4704501403	508116	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	C-SWAB
CUB CREEK COAL #508088	Y	4710902059	508088	BRENTON	BEREA,BIG LIME,HURON	PROD	C
MINGO/WYOMING COAL & LAND CO. #508285	Y	4705901456	508285	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
OSWALD #508143	Y	4704701512	508143	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,HURON	PROD	C
MCDONALD #508135	Y	4704501438	508135	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER/COUCH #508456	Y	4710902080	508456	BRENTON	BEREA,BIG LIME,GORDON,MAXTON,RAVENCLIFF	PROD	DC
OSWALD #507861	Y	4704701515	507861	BRENTON	BEREA,BIG LIME,GORDON,DEVONIAN SHALE	PROD	C-SWAB
GEORGIA PACIFIC CORPORATION #508188	Y	4704701509	508188	BRENTON	BEREA,HURON	PROD	C
MCDONALD #508102	Y	4704501450	508102	BRENTON	BEREA,BIG LIME,GORDON,HURON,LOWER SHALE	PROD	C
GEORGIA PACIFIC CORPORATION #508280	Y	4710902103	508269	BRENTON	BEREA,BIG LIME,HURON,MAXTON,SHALE	PROD	DC
RITTER LUMBER COMPANY #508462	Y	4710902047	508462	BRENTON	BEREA,GORDON,PRINCETON,RAVENCLIFF	PROD	SB
RITTER LUMBER COMPANY #508433	Y	4710902078	508433	BRENTON	GORDON,MAXTON,RAVENCLIFF	PROD	T
RITTER LUMBER COMPANY #508201	Y	4710902082	508201	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	SB
GEORGIA PACIFIC CORPORATION #508467	Y	4710902090	508467	BRENTON	BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	SB
GEORGIA PACIFIC CORPORATION #508464	Y	4710902088	508464	BRENTON	BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	SB
GEORGIA PACIFIC CORPORATION #508203	Y	4710902087	508203	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	T
RITTER LUMBER COMPANY #508465	Y	4710902048	508465	BRENTON	BIG LIME,GORD,MAXTON,RAVENCLIFF,WEIR	PROD	MPL
LECKIE/RAMSAY COAL COMPANY #508088	Y	4710902084	508088	BRENTON	BEREA,BIG LIME,MAXTON,PRINCE,RAVEN	PROD	C
RITTER LUMBER COMPANY #508206	Y	4710902089	508206	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	CPL
RITTER LUMBER COMPANY #508190	Y	4710902046	508190	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	T
LECKIE/RAMSAY COAL COMPANY "A" # 8	Y	4710902083	508082	BRENTON	BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	C
RITTER LUMBER COMPANY #508140	Y	4710902074	508140	BRENTON	BIG LIME,GORDON,RAVENCLIFF	PROD	C
RITTER LUMBER COMPANY #307	Y	4710902044	508200	BRENTON	BIG LIME,MAXTON	PROD	SB
PARDEE LAND COMPANY #102	Y	4705501720	508533	BRENTON	BEREA,BIG LIME,HURON,MAXTON	PROD	CPL
SOUTHERN LAND COMPANY #38	Y	4705501722	508328	BRENTON	BEREA,BIG LIME,MAXTON,HURON	PROD	C
PARDEE LAND COMPANY #508346	Y	4704501419	508346	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
ROGERS, LON #504626	Y	4704701481	504626	BRENTON	COALBED METHANE	PROD	PU
EVANS, LIZ #504185	Y	4704701407	504185	BRENTON	COALBED METHANE		
GEORGIA PACIFIC CORPORATION #508501	Y	4704701562	508501	BRENTON	COALBED METHANE	PROD	PU
MINGO WYOMING COAL & LAND CO. #508288	Y	4705901467	508288	BRENTON	BEREA,BIG LIME, DEVONIAN SHALE	PROD	C
POLAN, RUTH #508269	Y	4704701574	508269	BRENTON	BEREA,BIG LIME	PROD	DC
FRANCIS, DAVID TRUST #1106	N	4705901399	509359	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
FRANCIS, DAVID TRUST #1107	N	4705901400	508977	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	FLOWING
FRANCIS, DAVID TRUST #1108	N	4705901401	508077	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
Well #1682 Div.(900) LS# 17459	Y	4704500493	656536	BRENTON	UNKNOWN	PROD	C
USS # 1	Y	4704500494	656541	BRENTON	UNKNOWN	PROD	C
U. S. S. 1698 # 1	Y	4705900499	656596	BRENTON	UNKNOWN	PROD	C
U S S. 1701 # 1	Y	4705900521	656606	BRENTON	UNKNOWN	PROD	C
U S S. 1687 # 1	Y	4704500526	656551	BRENTON	UNKNOWN	PROD	C
Well #1692 Div (900) LS# 17459	Y	4705900471	656571	BRENTON	UNKNOWN	PROD	C
U. S. S. 1693 # 1	Y	4705900479	656576	BRENTON	UNKNOWN	PROD	C
U. S. S. 1697 # 1	Y	4705900494	656591	BRENTON	UNKNOWN	PROD	C
U. S. S. 1705 # 1	Y	4705900547	656621	BRENTON	UNKNOWN	PROD	C
USS #21	Y	4705900549	656631	BRENTON	UNKNOWN	PROD	C
Well #1752 Div.(900) LS# 17459	Y	4705900746	656781	BRENTON	UNKNOWN	PROD	C
U. S. S. 1708 # 1	Y	4705900553	656636	BRENTON	UNKNOWN	PROD	C
U. S. S. 1709 # 1	Y	4705900561	656641	BRENTON	UNKNOWN	PROD	C
U. S. S. 1711 # 1	Y	4705900584	656646	BRENTON	UNKNOWN	PROD	C
Well #1712 Div.(900) LS# 17459	Y	4705900566	656651	BRENTON	UNKNOWN	PROD	C
U. S. S. 1754 # 1	Y	4705900748	656791	BRENTON	UNKNOWN	PROD	FLOWING
Well #1713 Div.(900) LS# 17459	Y	4705900568	656656	BRENTON	UNKNOWN	PROD	C
U S S. 1714 # 1	Y	4705900574	656661	BRENTON	UNKNOWN	PROD	C
Well #1720 Div.(900) LS# 17459	Y	4705900600	656671	BRENTON	UNKNOWN	PROD	C
USS #32	Y	4705900609	656676	BRENTON	UNKNOWN	PROD	C
USS #26	Y	4705900615	656686	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND #1726	Y	4705900618	656691	BRENTON	UNKNOWN	PROD	C
U. S. S. 1727 # 1	Y	4705900644	656696	BRENTON	UNKNOWN	PROD	C
U S S. 1749 # 1	Y	4705900702	656766	BRENTON	UNKNOWN	PROD	C
Well #1733 Div (900) LS# 17459	Y	4705900659	656716	BRENTON	UNKNOWN	PROD	C
U. S S. 1735 # 1	Y	4705900664	656726	BRENTON	BEREA,DEVONIAN SHALE	PROD	C

U. S. S. 1750 # 1	Y	4705900724	556771	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND #1691	Y	4705901279	557451	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND #1692	Y	4705901280	557456	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND #1693	Y	4705901281	557461	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND #1694	Y	4705901311	557466	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND #1695	Y	4705901312	557471	BRENTON	UNKNOWN	PROD	C
FRANCIS, DAVID TRUST #990	N	4705901341	216691	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
FRANCIS, DAVID TRUST #991	N	4705901340	216691	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
ELK CREEK COAL & LAND COMPANY #39	Y	4705901382	508535	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
MINGO WYOMING COAL & LAND CO. #508075	Y	4705901416	508075	BRENTON	BEREA,BIG LIME,HURON	PROD	T
ROGERS, LON #504747	Y	4704701471	504747	BRENTON	COALBED METHANE	PROD	PU
ISLAND CREEK COAL "D" #508061	Y	4704501393	508061	BRENTON	BEREA,BIG LIME,GORDON DEVONIAN SHALE	PROD	C-SWAB
ISLAND CREEK COAL "D" #508059	Y	4704501391	508059	BRENTON	BEREA,BIG LIME,GORDON DEVONIAN SHALE	PROD	C
MINGO WYOMING COAL & LAND CO. #508076	Y	4705901415	508076	BRENTON	BEREA,BIG LIME,GORDON,HURON	PROD	C
MINGO WYOMING COAL & LAND CO. #508077	Y	4705901407	508077	BRENTON	BEREA,HURON	PROD	C
MCKENZIE # 1	Y	4705901417	508074	BRENTON	BEREA,BIG INJUN,BL,GORD,DEVON SHALE	PROD	C
AMHERST LAND COMPANY # 3	Y	4704500242	017310	BRENTON		SI	T
PARDEE LAND COMPANY # 22	Y	4710900318	016290	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
WVC-3824	Y	4704701279	793791	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3585	Y	4704701280	793768	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3586	Y	4704701281	793789	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3587	Y	4704701282	793790	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3589	Y	4704701306	793792	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3590	Y	4704701307	793793	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3591	Y	4704701308	793794	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3594	Y	4704701309	793795	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3822	Y	4704701338	793815	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3695	Y	4704701310	793796	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3688	Y	4704701369	793811	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3863	Y	4704701388	793809	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3688	Y	4704701314	793797	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3882	Y	4704701405	793812	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3692	Y	4704701315	793798	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3698	Y	4704701316	793800	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3697	Y	4704701317	793801	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3693	Y	4704701318	793799	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3821	Y	4704701337	793817	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3845	Y	4704701339	793816	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3857	Y	4704701340	793802	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3860	Y	4704701341	793804	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3858	Y	4704701342	793803	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3859	Y	4704701346	793805	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3930	Y	4704701348	793814	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3861	Y	4704701349	793813	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3937	Y	4704701359	793806	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3938	Y	4704701360	793807	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3939	Y	4704701361	793808	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3952	Y	4704501362	703952	BRENTON	COALBED METHANE	PROD	FLOWING
WVC-3987	Y	4704701368	793810	BRENTON	COALBED METHANE	PROD	FLOWING
ISLAND CREEK COAL #508080	Y	4704501392	508080	BRENTON	BEREA,BIG LIME,DEVON SHALE,GORD,WEIR	PROD	C
MINGO WYOMING COAL & LAND CO. #508153	Y	4705901408	508153	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #350	Y	4710902006	508120	BRENTON	BEREA,BIG LIME,HURON	PROD	DC
ISLAND CREEK COAL "D" #508084	Y	4704501389	508084	BRENTON	BEREA,BIG LIME,HURON	PROD	C
MINGO WYOMING COAL & LAND CO. #508156	Y	4705901409	508156	BRENTON	BEREA,BIG LIME,HURON	PROD	C
ISLAND CREEK COAL "D" #508058	Y	4704501411	508058	BRENTON	BEREA,BIG INJUN,BIG LIME,HURON,WEIR	PROD	C-SWAB
MCKENZIE # 3	Y	4705901414	508531	BRENTON	BEREA,BIG INJUN,BIG LIME,GORDON,HURON	PROD	C-SWAB
RED JACKET COAL COMPANY "A" #14	Y	4705901383	508073	BRENTON	BEREA,BIG INJUN,BL,HURON,MAXTON,WEIR	PROD	C
BAILEY #506087	Y	4710902045	506087	BRENTON	BEREA,BIG LIME,HURON	PROD	C
LOPIN "A" # 2	Y	4704700842	128841	BRENTON	BEREA	PROD	C
LOPIN "A" # 1	Y	4704700841	121451	BRENTON	BEREA	PROD	T
RITTER LUMBER COMPANY #238	Y	4710901081	117631	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T&C
RITTER LUMBER COMPANY #236	Y	4710901080	117611	BRENTON	DEVONIAN SHALE,RAVENCLIFF	PROD	T&C
MCDONALD LAND COMPANY "A" #16X	Y	4704501110	131741	BRENTON	DEVONIAN SHALE	PROD	T
MCDONALD LAND COMPANY "A" #10	Y	4704500948	131721	BRENTON	DEVONIAN SHALE	PROD	T
MCDONALD LAND COMPANY "A" # 4	Y	4704500496	131691	BRENTON	DEVONIAN SHALE	PROD	SB
MCDONALD LAND COMPANY "A" #15	Y	4704501089	131731	BRENTON	DEVONIAN SHALE	PROD	T
MCDONALD LAND COMPANY "A" #19	Y	4704501119	131771	BRENTON	DEVONIAN SHALE	PROD	T
PARDEE LAND COMPANY # 78	Y	4704501137	117531	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	MPL
MCDONALD LAND COMPANY "A" #18	Y	4704501118	131761	BRENTON	DEVONIAN SHALE	PROD	T
MCDONALD LAND COMPANY "A" #17X	Y	4704501116	131751	BRENTON	DEVONIAN SHALE	PROD	T
MCDONALD LAND COMPANY "C" # 1	Y	4704500563	121581	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
OSWALD "A" # 7	Y	4704700935	131621	BRENTON	DEVONIAN SHALE	PROD	T
RAMSEY COAL COMPANY "A" # 5	Y	4710900841	120431	BRENTON	BEREA	PROD	SB
ROGERS, LON #27	Y	4704701043	118071	BRENTON	BEREA	PROD	SB
RED JACKET COAL COMPANY "A" # 8X	Y	4705901119	131631	BRENTON	DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY # 77	Y	4704501135	117521	BRENTON	BIG LIME,DEVONIAN SHALE,WEIR	PROD	T
RED JACKET COAL COMPANY "A" # 1	Y	4705900244	122581	BRENTON	DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #257A	Y	4710901146	120331	BRENTON	BIG LIME,RAVENCLIFF	PROD	SB
RITTER LUMBER COMPANY #234A	Y	4710901070	117331	BRENTON	BIG LIME,RAVENCLIFF	PROD	T
RITTER LUMBER COMPANY #231	Y	4710901076	117271	BRENTON	BIG LIME,DEVONIAN SHALE,RAVENCLIFF	PROD	T
RITTER/CROUCH # 4	Y	4710901077	117581	BRENTON	BEREA,PRINCETON	PROD	C
RITTER LUMBER COMPANY #240	Y	4710901082	117651	BRENTON	BEREA	PROD	C
RITTER LUMBER COMPANY #239	Y	4710901083	117641	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T"
RITTER LUMBER COMPANY #237	Y	4710901079	117621	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T&C
PARDEE LAND COMPANY # 79	Y	4704501138	117541	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
GEORGIA PACIFIC "A" # 4	Y	4502722282	141581	BRENTON	DEVONIAN SHALE	PROD	T
ELK CREEK COAL & LAND COMPANY #24	Y	4705901125	118011	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
GRIFFITH, A. C. # 1	Y	4704701104	134331	BRENTON	BEREA,MAXTON	PROD	C
RITTER LUMBER COMPANY #244	Y	4710901089	117691	BRENTON	DEVONIAN SHALE,GORDON,RAVENCLIFF	PROD	T
ISLAND CREEK COAL "D" # 35	Y	4704501197	142691	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	T&C
RITTER LUMBER COMPANY #243	Y	4710901092	117681	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,GORDON	PROD	SB
ELK CREEK COAL & LAND COMPANY #28	Y	4704501140	118041	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #245	Y	4710901087	117701	BRENTON	DEVONIAN SHALE,GORDON,RAVENCLIFF,WEIR	PROD	SB
RITTER LUMBER COMPANY #247	Y	4710901085	117721	BRENTON	DEVONIAN SHALE,GORDON	PROD	T

RITTER LUMBER COMPANY #248	Y	4710901090	117091	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
ELK CREEK COAL & LAND COMPANY #26	Y	4704501139	116021	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #242	Y	4710901091	117671	BRENTON	BIG LIME,DEVONIAN SHALE,RAVENCLIFF	PROD	C
RITTER LUMBER COMPANY #246	Y	4710901088	117711	BRENTON	BIG LIME,DEVONIAN SHALE,RAVENCLIFF	PROD	SB
PARDEE LAND COMPANY # 60	Y	4704501136	117551	BRENTON	BIG LIME,DEVONIAN SHALE,WEIR	PROD	SB
RITTER LUMBER COMPANY #230	Y	4710901111	118081	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #249	Y	4710901108	118091	BRENTON	BEREA	PROD	C-SWAB
ISLAND CREEK COAL "D" # 51	Y	4705901177	140821	BRENTON	BEREA,DEVONIAN SHALE	P&A	ABDN
BLUE JAY # 5	N	4705500116	143091	BRENTON	MAXTON,WEIR	PROD	FLOWING
BLUE JAY #10	N	4705500134	142931	BRENTON	MAXTON,WEIR	PROD	FLOWING
BLUE JAY #12	N	4705500135	142941	BRENTON	MAXTON,WEIR	PROD	FLOWING
BLUE JAY #15	N	4705500137	142951	BRENTON	BIG LIME,MAXTON	PROD	FLOWING
ELK CREEK COAL & LAND COMPANY #26	Y	4704501198	142201	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL "D" # 52	Y	4704501187	140241	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 57	Y	4704501194	142021	BRENTON	BIG LIME,WEIR	PROD	T
CLINCHFIELD/RITTER-ROGERS # 1	Y	4502721145	113521	BRENTON	BEREA	PROD	MPL
AMHERST LAND COMPANY #15	Y	4704500313	019920	BRENTON	BIG LIME,MAXTON	PROD	T
SUDDITH # 1	Y	4704700952	118501	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 58	Y	4704501198	142721	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
SOUTHERN LAND COMPANY #21	Y	4700501589	142701	BRENTON	BEREA,DEVONIAN SHALE,MAXTON	PROD	DC
SOUTHERN LAND COMPANY #24	Y	4700501570	142711	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
RITTER/CROUCH # 2	Y	4710900616	166151	BRENTON	RAVENCLIFF	PROD	T
ROGERS, LON #31	Y	4704701158	132421	BRENTON	BIG LIME	PROD	C
RITTER/CROUCH UNIT # 3	Y	4710901074	115041	BRENTON	UNKNOWN	PROD	T
ROGERS, LON #30	Y	4502721315	116531	BRENTON	BEREA	PROD	C
ROGERS, LON #28	Y	4502721313	116511	BRENTON	DEVONIAN SHALE	PROD	T
ROGERS, LON #29	Y	4502721314	116521	BRENTON	BEREA	PROD	T
RITTER LUMBER COMPANY # 17V	Y	4502721283	116541	BRENTON	BEREA	PROD	T
RITTER LUMBER COMPANY #227	Y	4710901129	120181	BRENTON	BIG LIME,RAVENCLIFF	PROD	T&C
CLINCHFIELD/LITZ UNIT # 1	Y	4502720446	092821	BRENTON	BEREA	PROD	SB
CLINCHFIELD/ROGERS # 1	Y	4502720811	104701	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	C
SOUTHERN LAND/PARDEE UNIT # 1	Y	4704501115	112271	BRENTON	BIG LIME,WEIR	PROD	SB
ISLAND CREEK COAL "D" # 53	Y	4704501192	141631	BRENTON	UNKNOWN	PROD	T
HAMILL W-11581	Y	4705900824	459301	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "C" # 2	Y	4704501145	133001	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
U.S. TREASURY # 1	Y	4710901670	210001	BRENTON	UNKNOWN	PROD	C
U.S. TREASURY # 4	Y	4710901671	417021	BRENTON	UNKNOWN	PROD	C
HAMILL/GOODYKOONTZ "A" # 1	Y	4705901263	416981	BRENTON	UNKNOWN	PROD	C
HAMILL/GOODYKOONTZ "A" # 2	Y	4705901254	416671	BRENTON	UNKNOWN	PROD	C
COOK W-11769	Y	4710900743	459471	BRENTON	UNKNOWN	PROD	C
HAMILL/GOODYKOONTZ "B" # 1	Y	4705901255	416971	BRENTON	UNKNOWN	PROD	C
HINCHMAN "D" # 1	Y	4704500741	122141	BRENTON	GILBERT-ISLAND C	PROD	T
ISLAND CREEK COAL "D" # 74	Y	4704501250	416961	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 69	Y	4704501247	210091	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY # 3	Y	4704501231	459811	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY # 5	Y	4704501238	459841	BRENTON	UNKNOWN	PROD	C
HAMILL W-11881	Y	4705900845	459801	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY # 4	Y	4704501237	459831	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY # 6	Y	4704501239	459821	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" # 1	Y	4704500381	131711	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #47	Y	4704501242	210271	BRENTON	UNKNOWN	PROD	C
TOLER # 1	Y	4710901541	459771	BRENTON	UNKNOWN	PROD	DC
MCDONALD LAND COMPANY W-10046	Y	4704500852	459171	BRENTON	UNKNOWN	PROD	C
HAMILL W-11799	Y	4705900839	459831	BRENTON	UNKNOWN	PROD	C
TOLER W-10241	Y	4710900542	459401	BRENTON	UNKNOWN	PROD	T
KELLY W-10276	Y	4710900568	459441	BRENTON	UNKNOWN	PROD	C
DAMRON W-10289	Y	4710900577	459421	BRENTON	UNKNOWN	PROD	C
HAMILL W-11800	Y	4705900838	459841	BRENTON	UNKNOWN	PROD	C
DAMRON W-10335	Y	4710900609	459561	BRENTON	UNKNOWN	PROD	C
HILBERT W-10848	Y	4705900777	459251	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-11212	Y	4705900801	459511	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-11322	Y	4705900802	459501	BRENTON	UNKNOWN	PROD	C
HAMILL W-11494	Y	4705900808	459871	BRENTON	BEREA,BIG LIME,HURON	PROD	C
HAMILL W-11580	Y	4705900836	459201	BRENTON	UNKNOWN	PROD	C
HAMILL W-11892	Y	4705900846	459651	BRENTON	UNKNOWN	PROD	C
CARTER LAND COMPANY "A" # 7	Y	4704701248	146821	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	C
HAMILL W-11910	Y	4705900848	459701	BRENTON	UNKNOWN	PROD	C
MINGO WYOMING LAND COMPANY "B" #17	Y	4705901208	199981	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
HAMILL W-11911	Y	4705900850	459271	BRENTON	UNKNOWN	PROD	C
1ST NATIONAL BANK OF BLUEFIELD # 1	Y	4704700486	121751	BRENTON	BEREA	PROD	SB
TOLER W-9648	Y	4710900358	459361	BRENTON	UNKNOWN	PROD	T
TOLER W-9712	Y	4710900371	459431	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-9758	Y	4704500312	459161	BRENTON	UNKNOWN	PROD	C
HATFIELD W-9828	Y	4710900390	459371	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-9873	Y	4704500400	459581	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-9882	Y	4704500414	459591	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-9904	Y	4705900437	459601	BRENTON	UNKNOWN	PROD	C
ADDAIR "A" # 1	Y	4704700304	126201	BRENTON	BEREA	PROD	T
MCDONALD LAND COMPANY W-9911	Y	4705900444	459611	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-9944	Y	4705900507	459621	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,HURON	PROD	C
KELLY # 1	Y	4710901542	459781	BRENTON	UNKNOWN	PROD	SB
MCDONALD LAND COMPANY # 2A	Y	4704501229	459791	BRENTON	UNKNOWN	PROD	C
BRUCE MCDONALD HOLDING "C" # 1	Y	4705901233	416881	BRENTON	UNKNOWN	PROD	C
MCDONALD, BRUCE "D" # 1	Y	4705901234	416891	BRENTON	UNKNOWN	PROD	C
MCDONALD, W. W. # 2	Y	4705901236	416651	BRENTON	UNKNOWN	PROD	C
ADDAIR "B" # 1	Y	4704700331	126211	BRENTON	BEREA	PROD	T
MCDONALD, W. W. # 3	Y	4705901237	416601	BRENTON	UNKNOWN	PROD	C
PARDEE LAND COMPANY # 60	Y	4704500955	078311	BRENTON	BEREA,BIG LIME,MAXTON	PROD	MPL
PARDEE LAND COMPANY # 66	Y	4704501035	085231	BRENTON	BEREA	PROD	C
RITTER LUMBER COMPANY #225	Y	4710900990	109181	BRENTON	GORDON,RAVENCLIFF	PROD	T&C
ADDAIR "C" # 1	Y	4704700346	126221	BRENTON	BEREA	PROD	T
BRIAR TXO # 2	Y	4705901098	116521	BRENTON	BEREA,BIG LIME	PROD	T
BRIAR TXO # 3	Y	4705901099	116531	BRENTON	BIG LIME	PROD	T
ADDAIR "D" # 1	Y	4704700383	126231	BRENTON	BEREA	PROD	T

BRIAR TXO # 4	Y	4705901098	116541	BRENTON	BEREA	PROD	T
RITTER LUMBER COMPANY #266	Y	4710901248	135921	BRENTON	MAXTON	PROD	C
COLE "B" #15	Y	4705901148	134251	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
THACKER LAND COMPANY "A" # 2	Y	4705900352	131601	BRENTON	DEVONIAN SHALE	PROD	C
BAILEY "A" # 1	Y	4710900634	126191	BRENTON	UNKNOWN	PROD	C
BEACH "A" # 1	Y	4704700286	126241	BRENTON	BEREA	PROD	T
HARMAN "B" # 1	Y	4704700377	121351	BRENTON	BEREA	PROD	T
BEACH "B" # 1	Y	4704700332	126251	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL "C" # 3	Y	4704700466	122181	BRENTON	UNKNOWN	PROD	SB
BEACH "C" # 1	Y	4704700333	126261	BRENTON	UNKNOWN	PROD	T
BEACH "D" # 1	Y	4704700359	126271	BRENTON	UNKNOWN	PROD	T
BEACH "E" # 1	Y	4704700433	126281	BRENTON	BEREA	PROD	T
BRICKER "A" # 1	Y	4704700314	125701	BRENTON	UNKNOWN	PROD	T
BRICKER "B" # 1	Y	4704700401	125681	BRENTON	BEREA	PROD	MPL
CARTER LAND COMPANY "A" # 1	Y	4704700264	125761	BRENTON	UNKNOWN	PROD	T
CARTER LAND COMPANY "B" # 1	Y	4704700385	125771	BRENTON	BEREA	PROD	T
HINCHMAN "A" # 1	Y	4704500440	122111	BRENTON	MAXTON	PROD	T
CHEW, MARGRET "A" # 2	Y	4704500792	132121	BRENTON	BIG LIME	PROD	T
COLE "B" # 1	Y	4704500402	131681	BRENTON	DEVONIAN SHALE	PROD	C
COLE "B" # 4	Y	4704500770	125561	BRENTON	UNKNOWN	PROD	C
COLE "C" # 1	Y	4704500814	125571	BRENTON	BIG LIME	PROD	C
HINCHMAN "B" # 1	Y	4704500786	122121	BRENTON	MAXTON	PROD	T
COLE & CRANE CONSOL "B" # 1	Y	4704500785	125611	BRENTON	MAXTON	PROD	T
COLE & CRANE CONSOL "D" # 1	Y	4704500765	125621	BRENTON	BIG LIME	PROD	C
COLE & CRANE CONSOL # 2	Y	4704500379	132041	BRENTON	UNKNOWN	PROD	T
COLE & CRANE TRUST # 4	Y	4704500541	125591	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "D" # 20	Y	4704501121	131261	BRENTON	DEVONIAN SHALE	PROD	C
COLE "D" # 1	Y	4704500857	125581	BRENTON	BIG LIME	PROD	T
HINCHMAN "C" # 1	Y	4704500802	122131	BRENTON	BIG LIME	PROD	T
COMBS "A" # 1	Y	4704700205	125501	BRENTON	BEREA	PROD	T
HOWARD, A. # 1	Y	4704700455	122161	BRENTON	BEREA	PROD	T
COTIGA DEVELOPMENT COMPANY "A" # 1	Y	4705900555	125871	BRENTON	BIG LIME	PROD	C
COTIGA DEVELOPMENT COMPANY "B" # 2	Y	4705900556	125881	BRENTON	BIG LIME	PROD	C
CUB CREEK COAL "A" # 1	Y	4710900604	121671	BRENTON	UNKNOWN	PROD	T
IAFOLLA, A. # 1	Y	4704700373	121361	BRENTON	BEREA	PROD	T
EDWARDS "A" # 1	Y	4704700432	121821	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL "B" # 1	Y	4705900446	122551	BRENTON	UNKNOWN	PROD	T
FERREL, A. # 1	Y	4704500998	121581	BRENTON	BIG LIME	PROD	T
HARMAN "A" # 1	Y	4704700296	122091	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL "D" # 16	Y	4704500173	131241	BRENTON	DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL "D" # 22	Y	4704501127	131301	BRENTON	DEVONIAN SHALE	PROD	T
RED JACKET COAL COMPANY "A" # 2	Y	4705900278	132131	BRENTON	BIG LIME	PROD	C
ISLAND CREEK COAL # 7	Y	4704700523	129231	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "A" # 2	Y	4704500105	122561	BRENTON	UNKNOWN	PROD	T
COLE "B" #20	Y	4704501203	144641	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
KENNEDY "A" # 1	Y	4704700535	121391	BRENTON	BEREA	PROD	SB
STEELE, A. # 1	Y	4704500805	122321	BRENTON	BIG LIME,LOWER HURON	PROD	C
MALONE "A" # 1	Y	4704700316	121471	BRENTON	UNKNOWN	PROD	T
MCCORMICK "A" # 1	Y	4704700188	121551	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #29	Y	4704501232	201321	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #31	Y	4705901189	144651	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	CPL
MCDONALD LAND COMPANY "B" # 1	Y	4704500828	121671	BRENTON	BIG LIME	P&A	ABDN
ISLAND CREEK COAL "D" # 59	Y	4704501201	144251	BRENTON	BIG LIME	PROD	T&C
MINGO OIL & GAS "A" # 1	Y	4705900864	121591	BRENTON	BEREA	PROD	T
STEPP, A. # 1	Y	4705900375	122331	BRENTON	BIG LIME	PROD	SB
MINGO WYOMING LAND COMPANY "A" # 1	Y	4705900168	121601	BRENTON	BEREA	PROD	T
MINGO WYOMING LAND COMPANY "B" # 2	Y	4705900714	121611	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #24	Y	4704501204	145701	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
MOHAWK LAND COMPANY "A" # 1	Y	4704700238	121641	BRENTON	UNKNOWN	PROD	SB
MINGO WYOMING LAND COMPANY "B" #14	Y	4705901186	144281	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
NORFOLK WESTERN RAILWAY "A" # 1	Y	4705900181	122491	BRENTON	UNKNOWN	PROD	C
OSWALD "A" # 1	Y	4704700414	122501	BRENTON	UNKNOWN	PROD	T
THACKER LAND COMPANY "A" # 1	Y	4705900272	122381	BRENTON	BIG LIME	PROD	C
OSWALD "B" # 1	Y	4704700659	122511	BRENTON	BEREA	PROD	T
OSWALD "C" # 1	Y	4704700739	122521	BRENTON	BEREA	PROD	T
BAILEY, MARY LEE # 1	Y	4704700334	126121	BRENTON	BEREA	PROD	C
OSWALD "D" # 1	Y	4704700740	122531	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL # 5	Y	4704700816	129211	BRENTON	UNKNOWN	PROD	T
POLAN "A" # 2	Y	4704700814	126741	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL # 6	Y	4704700817	129221	BRENTON	UNKNOWN	PROD	T
POLAN "A" # 1	Y	4704700720	121281	BRENTON	RAVENCLIFF	PROD	T
RAMSEY COAL COMPANY "A" # 1	Y	4710900828	122571	BRENTON	UNKNOWN	PROD	T
MINGO WYOMING LAND COMPANY "B" #15	Y	4705901187	145211	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
MCDONALD LAND COMPANY "A" #28	Y	4704501224	200531	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
MINGO WYOMING LAND COMPANY "B" #16	Y	4705901188	145221	BRENTON	BEREA	PROD	C
MINGO OIL & GAS "A" # 8	Y	4705901217	200541	BRENTON	UNKNOWN	PROD	CPL
SOUTHERN LAND/PARDEE UNIT # 5	Y	4700501625	147131	BRENTON	UNKNOWN	PROD	CPL
OSWALD "A" #11	Y	4704701226	146281	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY #32	Y	4704501226	200491	BRENTON	LOWER MAXTON	PROD	C
SOUTHERN LAND COMPANY #22	Y	4700501574	142741	BRENTON	BEREA	PROD	T
SOUTHERN LAND/PARDEE UNIT # 3	Y	4700501592	146591	BRENTON	BEREA	PROD	MPL
RITTER LUMBER COMPANY #277	Y	4710901428	142991	BRENTON	BEREA,MAXTON	PROD	T
RITTER LUMBER COMPANY #279	Y	4710901378	144281	BRENTON	MAXTON,RAVENCLIFF	PROD	T&C
CALDWELL & CAMPBELL "A" # 1	Y	4705900718	125741	BRENTON	UNKNOWN	PROD	T
RITTER LUMBER COMPANY #260	Y	4710901387	144271	BRENTON	MAXTON,PRINCETON	PROD	T&C
RITTER LUMBER COMPANY #272	Y	4710901558	136871	BRENTON	BIG LIME,RAVENCLIFF	PROD	T
PARDEE LAND COMPANY # 56	Y	4704500939	050890	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #284	Y	4710901381	144631	BRENTON	BEREA	PROD	MPL
SOUTHERN LAND COMPANY # 7	Y	4700501062	075031	BRENTON	UNKNOWN	PROD	C
SOUTHERN LAND COMPANY # 8	Y	4700501246	083121	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "D" # 60	Y	4704501209	146561	BRENTON	DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #177	Y	4710900534	027760	BRENTON	BEREA,MAXTON	PROD	T
PARDEE LAND COMPANY # 67	Y	4704501205	146601	BRENTON	BEREA,DEVONIAN SHALE	PROD	MPL
LAWSON HEIRS # 1	Y	4704501193	135571	BRENTON	BEREA,DEVONIAN SHALE,WEIR	PROD	T

PARDEE LAND COMPANY # 69	Y	4700501612	146641	BRENTON	BIG LIME	PROD	MPL
RITTER/CROUCH # 5	Y	4710901455	146431	BRENTON	BEREA,RAVENCLIFF	PROD	C
STOKES/RITTER # 7R	Y	4710901458	142131	BRENTON	BEREA,DEVONIAN SHALE	PROD	MPL
STOKES/RITTER # 8	Y	4710901429	142141	BRENTON	BEREA,DEVONIAN SHALE	PROD	CPL
STOKES/RITTER #278	Y	4710901457	142121	BRENTON	BEREA,DEVONIAN SHALE	PROD	DC
COLLINS HEIRS # 1	Y	4704700320	144681	BRENTON	BEREA,BIG LIME	PROD	T
JUSTICE, CLARENCE # 1	Y	4704701263	146781	BRENTON	BEREA,BIG LIME	PROD	C
G.W.C. LAND COMPANY # 1	Y	4705900658	144731	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #25	Y	4704501211	146751	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
G.W.C. LAND COMPANY #23	Y	4704700881	144951	BRENTON	BEREA,BIG LIME	PROD	T
MCDONALD LAND COMPANY "A" #27	Y	4704501227	200891	BRENTON	DEVONIAN SHALE	PROD	C
KROLL HEIRS # 1	Y	4710900848	144691	BRENTON	UNKNOWN	PROD	C
MCDONALD/ALTIZER # 1	Y	4704500795	032760	BRENTON	UNKNOWN	PROD	C
BENNETT HEIRS # 1	Y	4705901181	142971	BRENTON	DEVONIAN SHALE	PROD	C
MCDONALD, S. E. # 1	Y	4704500561	025090	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #23	Y	4704501199	143491	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #273	Y	4710901307	142981	BRENTON	BEREA	PROD	C-SWAB
GRIFFITH, A. C. # 2	Y	4704701190	133991	BRENTON	BEREA,WEIR	PROD	T
MILLER/RITTER # 1	Y	4710900819	033710	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #26	Y	4704501216	147341	BRENTON	BIG LIME	PROD	C
MINGO OIL & GAS "A" # 5	Y	4705901199	147621	BRENTON	BEREA,DEVONIAN SHALE	PROD	MPL
MINGO WYOMING LAND COMPANY "A" # 2	Y	4705901200	147631	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,ORISKANY	PROD	T
POLAN "A" # 6	Y	4704701242	147111	BRENTON	RAVENCLIFF	PROD	T
MORGAN, EDD # 1	Y	4710900262	015240	BRENTON	UNKNOWN	PROD	T
SOUTHERN LAND COMPANY #26	Y	4700501615	146801	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
SOUTHERN LAND/PARDEE UNIT # 4	Y	4700501614	146851	BRENTON	BEREA,DEVONIAN SHALE	PROD	MPL
BRANT "B" # 2	Y	4704700933	116381	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	C
KEATON # 1	Y	4704700970	116391	BRENTON	RAVENCLIFF	PROD	C
BRANT "B" # 1	Y	4704700934	116401	BRENTON	BIG LIME,RAVENCLIFF	PROD	C
COOK # 1	Y	4710901035	116441	BRENTON	RAVENCLIFF	PROD	MPL
PARDEE LAND COMPANY # 1	Y	4704500107	011690	BRENTON	UNKNOWN	PROD	C
EKY ENERGY CORP # 1	Y	4704700977	116451	BRENTON	MAXTON,RAVENCLIFF	PROD	SB
POCAHONTAS TXO # 1	Y	4704700938	116481	BRENTON	BIG LIME,MAXTON	PROD	T
POCAHONTAS TXO # 3	Y	4704700944	116491	BRENTON	BIG LIME,MAXTON	PROD	SB
MUNCY, A # 1	Y	4704700938	116411	BRENTON	BEREA,RAVENCLIFF	PROD	C
COLEMAN, ELIZABETH # 1	Y	4709900288	011350	BRENTON	UNKNOWN	PROD	C
COTIGA DEVELOPMENT COMPANY # 1	Y	4705900069	010910	BRENTON	UNKNOWN	PROD	C
AMHERST LAND COMPANY # 1	Y	4704500092	017290	BRENTON	UNKNOWN	PROD	T
ALTIZER COAL LAND COMPANY # 1	Y	4704500502	024580	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #37	Y	4704500560	025060	BRENTON	UNKNOWN	PROD	T
BAILEY, R. O. # 1	Y	4710900597	032300	BRENTON	UNKNOWN	PROD	C
BROWNING HEIRS # 1	Y	4704500451	023560	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #33	Y	4705901218	200881	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY # 3	Y	4710900024	011180	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #18	Y	4704500318	020020	BRENTON	UNKNOWN	PROD	C
RITTER/STONE UNIT #205	Y	4710900643	035700	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #11	Y	4704500269	019220	BRENTON	UNKNOWN	PROD	T
ROGERS THEATERS INCORPORATED # 1	Y	4710900312	016040	BRENTON	UNKNOWN	PROD	C
SCOTT, LIBBY # 1	Y	4710900480	025370	BRENTON	UNKNOWN	PROD	T
SHIELDS, W. H. # 1	Y	4710900347	017020	BRENTON	UNKNOWN	PROD	C
AMHERST LAND COMPANY #12	Y	4704500290	019230	BRENTON	UNKNOWN	PROD	T
PIERCE SHORT # 1	Y	4710900353	017570	BRENTON	UNKNOWN	PROD	C
SOUTHERN LAND COMPANY # 2	Y	4700500994	044980	BRENTON	UNKNOWN	PROD	C
STOKES, ANNE # 2	Y	4710900417	022290	BRENTON	BEREA,GORDON,LOWER HURON	PROD	C
COLE & CRANE TRUST #17	Y	4704501215	147121	BRENTON	UNKNOWN	PROD	CPL
ISLAND CREEK COAL "O" # 61	Y	4704501210	146571	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #13	Y	4704500291	019240	BRENTON	UNKNOWN	PROD	T
SOUTHERN LAND/PARDEE UNIT # 3D	Y	4700501592	145592	BRENTON	DEVONIAN SHALE	PROD	SB
PARDEE LAND COMPANY # 35	Y	4704500302	019850	BRENTON	UNKNOWN	PROD	C
COLE & CRANE TRUST "A" #18	Y	4704501234	201821	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	DC
MINGO WYOMING LAND COMPANY "B" #18	Y	4705901224	201671	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	MPL
MCDONALD, BRUCE HOLDING "A" # 1	Y	4705901232	416881	BRENTON	UNKNOWN	PROD	C
MCDONALD, BRUCE HOLDING "A" # 3	Y	4704501241	416871	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" # 3	Y	4704500473	130171	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	T
AMHERST LAND COMPANY #14	Y	4704500292	019330	BRENTON	UNKNOWN	PROD	T
MCDONALD, W. W. # 9	Y	4705901242	459911	BRENTON	UNKNOWN	PROD	C
MCDONALD, W. W. # 8	Y	4705901243	410001	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 62	Y	4704501240	202391	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #31	Y	4704501238	203001	BRENTON	UNKNOWN	PROD	T
MCDONALD, W. W. # 5	Y	4705901239	416611	BRENTON	UNKNOWN	PROD	C
AMHERST LAND COMPANY #16	Y	4704500315	019930	BRENTON	UNKNOWN	PROD	T
MCDONALD, W. W. # 7	Y	4705901241	416531	BRENTON	UNKNOWN	PROD	C
MCDONALD, W W # 6	Y	4705901240	416521	BRENTON	UNKNOWN	PROD	C
DAMRON #12	Y	4710901681	417071	BRENTON	UNKNOWN	PROD	C
AMHERST LAND COMPANY #17	Y	4704500317	020010	BRENTON	UNKNOWN	PROD	C
ALTIZER COAL LAND COMPANY # 3	Y	4704500659	026130	BRENTON	UNKNOWN	PROD	C
ALTIZER COAL LAND COMPANY # 5	Y	4704500720	027120	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY # 2	Y	4704500115	017300	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #10	Y	4704500270	018680	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #20	Y	4704500347	020650	BRENTON	UNKNOWN	PROD	C
COTIGA DEVELOPMENT COMPANY # 4	Y	4705900075	011440	BRENTON	UNKNOWN	P&A	ABDN
AMHERST LAND COMPANY #22	Y	4704500350	020670	BRENTON	UNKNOWN	PROD	C
COTIGA DEVELOPMENT COMPANY # 5	Y	4705900079	011790	BRENTON	UNKNOWN	P&A	ABDN
AMHERST LAND COMPANY #23	Y	4704500363	021020	BRENTON	UNKNOWN	PROD	C
CUB CREEK COAL "A" # 2	Y	4710900617	130361	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #24	Y	4704500369	021030	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #25	Y	4704500388	021660	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #27	Y	4704500396	021750	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #33	Y	4704500474	023860	BRENTON	UNKNOWN	PROD	C
CUB CREEK COAL "A" # 4	Y	4710900626	130371	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #35	Y	4704500497	024120	BRENTON	UNKNOWN	PROD	C
AMHERST LAND COMPANY #39	Y	4704500618	026720	BRENTON	UNKNOWN	PROD	C
AMHERST LAND COMPANY #42	Y	4704500658	026100	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #43	Y	4704500755	029360	BRENTON	UNKNOWN	PROD	T

CUB CREEK COAL "A" # 5	Y	4710900527	130381	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #44	Y	4704501213	146791	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY # 5	Y	4704500244	017420	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY # 6	Y	4704500245	017430	BRENTON	UNKNOWN	PROD	T
BAILEY "A" # 2	Y	4710900635	130791	BRENTON	UNKNOWN	PROD	C
CUB CREEK COAL "A" # 6	Y	4710900638	130391	BRENTON	UNKNOWN	PROD	T
BEACH "C" # 2	Y	4704700708	130811	BRENTON	UNKNOWN	PROD	T
BEACH "D" # 2	Y	4704700537	130821	BRENTON	UNKNOWN	PROD	T
BRICKER "A" # 2	Y	4704700351	130731	BRENTON	UNKNOWN	PROD	T
CARTER LAND COMPANY "A" # 2	Y	4704700276	130751	BRENTON	UNKNOWN	PROD	T
CARTER LAND COMPANY "A" # 4	Y	4704700497	130761	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY # 2	Y	4704500195	014980	BRENTON	UNKNOWN	PROD	T
CARTER LAND COMPANY "A" # 5	Y	4704700518	130771	BRENTON	UNKNOWN	PROD	T
COLE "B" # 6	Y	4704500807	129481	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY # 3	Y	4704500217	015760	BRENTON	UNKNOWN	PROD	T
COLE "B" # 7	Y	4704500820	129491	BRENTON	UNKNOWN	PROD	C
COLE & CRANE TRUST # 9	Y	4704500865	130711	BRENTON	UNKNOWN	PROD	C
COLEMAN, ELIZABETH # 2	Y	4709900298	011490	BRENTON	UNKNOWN	PROD	T
COLEMAN, ELIZABETH # 4	Y	4709900325	011660	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY # 4	Y	4704500230	016600	BRENTON	UNKNOWN	PROD	C
COLEMAN, ELIZABETH # 5	Y	4709900339	012070	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY # 5	Y	4704500295	019530	BRENTON	UNKNOWN	PROD	T
G W.C. LAND COMPANY #13	Y	4704700262	144851	BRENTON	UNKNOWN	PROD	SB
G.W.C. LAND COMPANY #15	Y	4704700280	144871	BRENTON	UNKNOWN	PROD	T
G.W C. LAND COMPANY #14	Y	4704700283	144881	BRENTON	UNKNOWN	PROD	T
G.W C. LAND COMPANY #16	Y	4704700286	144881	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY #17	Y	4704700289	144891	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY #18	Y	4705900758	144901	BRENTON	UNKNOWN	PROD	SB
ELK CREEK COAL & LAND COMPANY # 6	Y	4704500381	021670	BRENTON	UNKNOWN	PROD	T
G W.C. LAND COMPANY #19	Y	4705900770	144911	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY # 7	Y	4704500420	022200	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
G.W C. LAND COMPANY #20	Y	4704700319	144921	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY # 9	Y	4704500469	023820	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY #10	Y	4704500568	025260	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
G.W.C LAND COMPANY #21	Y	4704700337	144931	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #15	Y	4704500735	027480	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY #16	Y	4704500819	035270	BRENTON	UNKNOWN	PROD	C
G.W.C. LAND COMPANY #22	Y	4704700592	144941	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY #19	Y	4704500829	036060	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #20	Y	4705900763	039500	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #21	Y	4705900970	078581	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY # 2	Y	4705900683	144741	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY # 3	Y	4704700220	144751	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "A" #57	Y	4704500199	130551	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY # 4	Y	4705900730	144761	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY # 5	Y	4705900731	144771	BRENTON	UNKNOWN	PROD	C
G.W.C. LAND COMPANY # 6	Y	4705900822	144781	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "A" # 3	Y	4704500108	130481	BRENTON	UNKNOWN	PROD	T
G.W C. LAND COMPANY # 7	Y	4704700240	144791	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY # 8	Y	4704700241	144801	BRENTON	UNKNOWN	PROD	T
G.W.C LAND COMPANY # 9	Y	4704700245	144811	BRENTON	UNKNOWN	PROD	C
G.W.C LAND COMPANY #10	Y	4704700251	144821	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "A" #26	Y	4704500147	130531	BRENTON	UNKNOWN	PROD	T
G W.C. LAND COMPANY #11	Y	4704700259	144831	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "A" #42	Y	4704500170	130581	BRENTON	UNKNOWN	PROD	T
G.W.C. LAND COMPANY #12	Y	4704700260	144841	BRENTON	UNKNOWN	PROD	SB
ISLAND CREEK COAL "A" #48	Y	4704500183	130611	BRENTON	UNKNOWN	PROD	PU
ISLAND CREEK COAL "A" #60	Y	4704500201	130661	BRENTON	UNKNOWN	PROD	T
MOHAWK LAND COMPANY "A" # 7	Y	4704700298	130301	BRENTON	UNKNOWN	PROD	SB
ISLAND CREEK COAL "B" # 8	Y	4705900465	129451	BRENTON	UNKNOWN	PROD	C
PARDEE LAND COMPANY # 5	Y	4710900154	014170	BRENTON	BEREA,BIG LIME,LOWER SHALE	PROD	FLOWING
ISLAND CREEK COAL "B" #16	Y	4705900771	129461	BRENTON	UNKNOWN	PROD	C
MOHAWK LAND COMPANY "A" # 8	Y	4704700445	130311	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "B" #17	Y	4705900860	129471	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "B" # 2	Y	4705900445	129441	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "C" # 4	Y	4704700542	129201	BRENTON	UNKNOWN	PROD	T
MOHAWK LAND COMPANY "A" # 0	Y	4704700976	130321	BRENTON	UNKNOWN	PROD	SB
KROLL HEIRS # 2	Y	4710900553	144701	BRENTON	UNKNOWN	PROD	C
KROLL HEIRS # 3	Y	4710900660	144711	BRENTON	UNKNOWN	PROD	T
KROLL HEIRS # 4	Y	4710900739	144721	BRENTON	UNKNOWN	PROD	T
MALONE "A" # 2	Y	4704700470	129541	BRENTON	UNKNOWN	PROD	T
OSWALD "A" # 2	Y	4704700444	129401	BRENTON	UNKNOWN	PROD	T
MALONE "A" # 3	Y	4704700498	129551	BRENTON	UNKNOWN	PROD	T
MALONE "A" # 4	Y	4704700776	129561	BRENTON	UNKNOWN	PROD	T
MCCORMICK "A" # 2	Y	4704700203	130151	BRENTON	UNKNOWN	PROD	SB
MCCORMICK "A" # 3	Y	4704700462	130161	BRENTON	UNKNOWN	PROD	SB
OSWALD "A" # 3	Y	4704700848	129381	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #30	Y	4704501233	201671	BRENTON	BEREA,LOWER SHALE,WEIR	PROD	C
MINGO WYOMING LAND COMPANY "B" # 3	Y	4705900715	130201	BRENTON	UNKNOWN	PROD	T
PARDEE LAND COMPANY # 7	Y	4710900171	014330	BRENTON	BEREA,BIG LIME,LOWER DEVONIAN,WEIR	PROD	FLOWING
MINGO WYOMING LAND COMPANY "B" # 4	Y	4705900716	130211	BRENTON	UNKNOWN	PROD	T
OSWALD "A" # 8	Y	4704700859	129391	BRENTON	UNKNOWN	PROD	T
MINGO WYOMING LAND COMPANY "B" # 5	Y	4705900729	130221	BRENTON	UNKNOWN	PROD	T
PARDEE LAND COMPANY # 2	Y	4710900058	011910	BRENTON	UNKNOWN	PROD	T
MINGO WYOMING LAND COMPANY "B" # 6	Y	4705900733	130231	BRENTON	UNKNOWN	PROD	SB
MINGO WYOMING LAND COMPANY "B" # 7	Y	4705900800	130241	BRENTON	UNKNOWN	PROD	SB
MOHAWK LAND COMPANY "A" # 2	Y	4704700236	130251	BRENTON	UNKNOWN	PROD	SB
MOHAWK LAND COMPANY "A" # 3	Y	4704700239	130261	BRENTON	UNKNOWN	PROD	T
PARDEE LAND COMPANY # 3	Y	4710900108	012760	BRENTON	UNKNOWN	PROD	C
MOHAWK LAND COMPANY "A" # 5	Y	4704700253	130281	BRENTON	UNKNOWN	PROD	SB
MOHAWK LAND COMPANY "A" # 6	Y	4704700256	130291	BRENTON	UNKNOWN	PROD	SB
PARDEE LAND COMPANY # 8	Y	4710900190	014490	BRENTON	UNKNOWN	PROD	T
PARDEE LAND COMPANY # 9	Y	4710900200	014530	BRENTON	BEREA,BIG LIME,GORDON,HURON,MAXTON	PROD	C
PARDEE LAND COMPANY # 38	Y	4704500376	026970	BRENTON	UNKNOWN	PROD	T

PARDEE LAND COMPANY # 50	Y	4710900487	025730	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 10	Y	4710900204	014550	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 51	Y	4704500566	026180	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 11	Y	4710900216	014620	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 39	Y	4704500382	021540	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 12	Y	4710900217	014630	BRENTON BEREA,BIG LIME,LOWER HURON	PROD	C
PARDEE LAND COMPANY # 13	Y	4710900249	014870	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 53	Y	4704500583	026550	BRENTON UNKNOWN	PROD	C
PARDEE LAND COMPANY # 14	Y	4710900254	015150	BRENTON BIG LIME	PROD	T
PARDEE LAND COMPANY # 54	Y	4704500773	031300	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 15	Y	4710900278	015160	BRENTON BEREA,BIG LIME,GORDON,SHALE	PROD	T-SWAB
PARDEE LAND COMPANY # 55	Y	4704500875	063781	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 17	Y	4710900295	015560	BRENTON UNKNOWN	SI	T
PARDEE LAND COMPANY # 40	Y	4704500419	022170	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 18	Y	4710900300	015700	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 20	Y	4710900316	016250	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 61	Y	4704500944	082051	BRENTON UNKNOWN	PROD	MPL
PARDEE LAND COMPANY # 21	Y	4710900317	016260	BRENTON BEREA,WEIR	PROD	FLOWING
PARDEE LAND COMPANY # 41	Y	4704500429	022310	BRENTON UNKNOWN	PROD	C
PARDEE LAND COMPANY # 23	Y	4710900325	016340	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 42	Y	4704500430	022320	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 24	Y	4710900329	016390	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 45	Y	4704500470	023840	BRENTON UNKNOWN	PROD	C
PARDEE LAND COMPANY # 25	Y	4710900338	016620	BRENTON BEREA,BIG LIME,DEVONIAN SHALE,MAXTON	PROD	C
PARDEE LAND COMPANY # 26	Y	4710900341	016630	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 46	Y	4704500480	023900	BRENTON UNKNOWN	PROD	C
PARDEE LAND COMPANY # 27	Y	4710900342	016750	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 48	Y	4710900461	024740	BRENTON UNKNOWN	PROD	C
PARDEE LAND COMPANY # 30	Y	4704500249	017520	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 49	Y	4704500581	025440	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 32	Y	4704500273	018960	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 34	Y	4704500300	019690	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 62	Y	4704500945	082061	BRENTON UNKNOWN	PROD	MPL
RITTER LUMBER COMPANY # 33	Y	4710900127	013570	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 63	Y	4704500946	085161	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 34	Y	4710900128	013580	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 35	Y	4710900132	013690	BRENTON UNKNOWN	PROD	T
PARDEE LAND COMPANY # 64	Y	4704500947	085171	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 36	Y	4710900135	013820	BRENTON UNKNOWN		T
RAMSEY COAL COMPANY "A" # 2	Y	4710900529	129411	BRENTON UNKNOWN	PROD	DC
RITTER LUMBER COMPANY # 37	Y	4710900138	013830	BRENTON UNKNOWN		T
RITTER LUMBER COMPANY # 4	Y	4710900025	011190	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 5	Y	4710900033	011200	BRENTON UNKNOWN		T
RITTER LUMBER COMPANY # 38	Y	4710900137	013860	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 8	Y	4710900042	011690	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 39	Y	4710900142	013890	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 9	Y	4710900046	011700	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 10	Y	4710900049	011710	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 40	Y	4710900146	013900	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 12	Y	4710900054	011880	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 13	Y	4710900055	011890	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 14	Y	4710900058	011900	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 41	Y	4710900147	014100	BRENTON UNKNOWN		T
RITTER LUMBER COMPANY # 15	Y	4710900065	012030	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 42	Y	4710900148	014110	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 18	Y	4710900072	012410	BRENTON UNKNOWN		T
RITTER LUMBER COMPANY # 19	Y	4710900076	012420	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 43	Y	4710900158	014140	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 20	Y	4710900077	012520	BRENTON UNKNOWN		T
RITTER LUMBER COMPANY # 22	Y	4710900088	012760	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY # 24	Y	4710900094	013060	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 25	Y	4710900095	013070	BRENTON UNKNOWN		T
RITTER LUMBER COMPANY # 44	Y	4710900167	014230	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 27	Y	4710900100	013160	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 28	Y	4710900102	013330	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 29	Y	4710900120	013450	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 32	Y	4710900125	013560	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 45	Y	4710900172	014240	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 46	Y	4710900178	014370	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 78	Y	4710900298	015730	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 47	Y	4710900179	014380	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 81	Y	4710900310	016160	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 49	Y	4710900186	014410	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 50	Y	4710900188	014500	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 52	Y	4710900206	014560	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 82	Y	4710900315	016240	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 53	Y	4710900210	014580	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 54	Y	4710900227	014670	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 55	Y	4710900231	014770	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 56	Y	4710900232	014780	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 57	Y	4710900233	014790	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY # 83	Y	4710900319	016300	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 58	Y	4710900236	014830	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 59	Y	4710900237	014840	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 60	Y	4710900241	014850	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 61	Y	4704500194	014860	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 62	Y	4710900246	014930	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 63	Y	4710900257	015180	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 85	Y	4710900321	016350	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 64	Y	4704500198	016220	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY # 65	Y	4710900261	015230	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 66	Y	4710900264	015300	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 67	Y	4710900265	015310	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 85	Y	4710900324	016370	BRENTON UNKNOWN	PROD	T

RITTER LUMBER COMPANY # 68	Y	4710900270	015340	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 70	Y	4710900269	015450	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 71	Y	4710900268	015460	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 72	Y	4710900267	015470	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 67	Y	4710900326	016380	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 73	Y	4710900266	015480	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 75	Y	4710900291	015640	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 89	Y	4704500222	016450	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 76	Y	4704500214	015870	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 77	Y	4704500215	015890	BRENTON UNKNOWN	PROD	C
GEORGIA PACIFIC "A" # 5	Y	4502722283	141591	BRENTON DEVONIAN SHALE,RAVENCLIFF	PROD	CPL
RITTER LUMBER COMPANY # 90	Y	4710900334	016530	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #129	Y	4710900405	021960	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 91	Y	4710900335	016540	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #141	Y	4710900428	023590	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 93	Y	4710900336	016580	BRENTON UNKNOWN	PROD	SB
RITTER LUMBER COMPANY # 94	Y	4710900339	016660	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #130	Y	4710900408	021970	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 95	Y	4710900340	016760	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 96	Y	4710900343	016780	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY # 97	Y	4704500227	016790	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #100	Y	4710900349	017030	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #101	Y	4710900350	017040	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #102	Y	4710900354	017410	BRENTON UNKNOWN	PROD	T
CLINCHFIELD COAL CORPORATION # 8	Y	4502720340	088961	BRENTON BEREA	PROD	SB
RITTER LUMBER COMPANY #131	Y	4710900410	022090	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #106	Y	4704500262	018140	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #107	Y	4704500261	018150	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #108	Y	4710900362	018160	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #110	Y	4710900366	018700	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #111	Y	4710900368	018870	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #133	Y	4710900414	022190	BRENTON UNKNOWN	PROD	C
ELSWICK, ANDERSON # 1	Y	4502721249	117281	BRENTON BEREA,BIG LIME	PROD	T
RITTER LUMBER COMPANY #114	Y	4704500282	019090	BRENTON BEREA,HURON	PROD	T
RITTER LUMBER COMPANY #115	Y	4710900369	019100	BRENTON UNKNOWN	PROD	T
ELSWICK, ANDERSON # 2	Y	4502721250	117291	BRENTON BEREA	PROD	T
RITTER LUMBER COMPANY #116	Y	4710900370	019110	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #117	Y	4710900372	019120	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #118	Y	4710900374	019320	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #119	Y	4704500307	019830	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #135	Y	4710900421	023100	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #120	Y	4710900378	019840	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #121	Y	4710900380	019900	BRENTON UNKNOWN	PROD	T
ROGERS, LON #32	Y	4502721502	119311	BRENTON BEREA	PROD	T
RITTER LUMBER COMPANY #122	Y	4710900382	020170	BRENTON UNKNOWN		T
RITTER LUMBER COMPANY #123	Y	4704500337	020180	BRENTON UNKNOWN	PROD	T
GEORGIA PACIFIC "A" # 3	Y	4502722723	141571	BRENTON DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #139	Y	4710900428	023570	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #125	Y	4710900391	020730	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #126	Y	4710900393	021040	BRENTON UNKNOWN	PROD	T&C
RITTER LUMBER COMPANY #127	Y	4710900398	021550	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #128	Y	4710900403	021700	BRENTON UNKNOWN	PROD	C
JEWELL # 2	Y	4502720937	143761	BRENTON BEREA,BIG LIME	PROD	C
COLE & CRANE TRUST "A" #29	Y	4704501343	214701	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #142	Y	4704500462	023650	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #201	Y	4710900525	034180	BRENTON UNKNOWN	PROD	C
MATNEY HEIRS # 1	Y	4502720918	143751	BRENTON BEREA,BIG LIME	PROD	C
COLE & CRANE CONSOLIDATED "A" # 3	Y	4704501338	214571	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #143	Y	4710900434	023710	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #195	Y	4710900502	032570	BRENTON UNKNOWN	PROD	T
POCAHONTAS MINING COMPANY/ROGERS # 9	N	4502720826	132281	BRENTON BEREA	PROD	FLOWING
RITTER LUMBER COMPANY #144	Y	4710900436	023850	BRENTON UNKNOWN	PROD	T
POCA MINING "A" # 1	N	4502721444	126651	BRENTON BEREA	PROD	FLOWING
RITTER LUMBER COMPANY #145	Y	4710900437	023860	BRENTON UNKNOWN	PROD	C
DAY, A. G HEIRS # 1	Y	4502722848	142771	BRENTON BEREA,BIG LIME	PROD	C
RITTER LUMBER COMPANY #146	Y	4710900450	024090	BRENTON UNKNOWN	PROD	T
CLINCHFIELD COAL CORPORATION # 2	Y	4502719869	025580	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #196	Y	4710900607	033030	BRENTON UNKNOWN	PROD	C
CLINCHFIELD KROLL # 1	Y	4502720330	088151	BRENTON BEREA	PROD	C
RITTER LUMBER COMPANY #148	Y	4710900452	024110	BRENTON UNKNOWN	PROD	T
POCAHONTAS MINING CORPORATION # 2	Y	4502719982	024150	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #152	Y	4710900460	024790	BRENTON UNKNOWN	PROD	T
ROGERS, LON # 1	Y	4502719942	021050	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #156	Y	4710900469	024900	BRENTON UNKNOWN	PROD	T
CLINCHFIELD/ROGERS # 2	Y	4502721127	113021	BRENTON BEREA	PROD	C
RITTER LUMBER COMPANY #157	Y	4710900470	024990	BRENTON UNKNOWN	PROD	C
FRANCIS, DAVID TRUST # 4	N	4705901316	216211	BRENTON UNKNOWN	PROD	FLOWING
RITTER LUMBER COMPANY #159	Y	4710900473	025130	BRENTON UNKNOWN	PROD	T
ROGERS, LON UNIT #35	Y	4502722535	142571	BRENTON BEREA,BIG LIME	PROD	MPL
RITTER LUMBER COMPANY #197	Y	4710900608	033040	BRENTON UNKNOWN	PROD	T
POCAHONTAS MINING CORPORATION # 3	Y	4502719987	025030	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #160	Y	4710900477	025270	BRENTON BIG LIME	PROD	C
CLINCHFIELD COAL CORPORATION # 3	Y	4502719971	025670	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #162	Y	4710900482	025430	BRENTON UNKNOWN	PROD	T
CLINCHFIELD COAL CORPORATION # 4	Y	4502719974	026320	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #163	Y	4710900483	025500	BRENTON UNKNOWN	PROD	T
CLINCHFIELD COAL CORPORATION # 5	Y	4502719975	026570	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #165	Y	4710900486	025620	BRENTON BIG LIME,DEVONIAN SHALE,HURON	PROD	C
CLINCHFIELD COAL CORPORATION # 6	Y	4502719981	029400	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #166	Y	4710900493	025780	BRENTON UNKNOWN	PROD	T
CLINCHFIELD COAL CORPORATION # 7	Y	4502720258	077051	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #198	Y	4710900613	033470	BRENTON UNKNOWN	PROD	T
ROGERS, LON # 2	Y	4502719947	021760	BRENTON UNKNOWN	PROD	SB
RITTER LUMBER COMPANY #168	Y	4710900489	025980	BRENTON UNKNOWN	PROD	T

ROGERS, LON #3	Y	4502719950	022010	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #171	Y	4710900512	026430	BRENTON UNKNOWN	PROD	T
ROGERS, LON #4	Y	4502719953	022400	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #172	Y	4710900510	026520	BRENTON UNKNOWN	PROD	T
ROGERS, LON #5	Y	4502719954	022410	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #173	Y	4710900514	026580	BRENTON UNKNOWN	PROD	C
DAMRON # 9	Y	4710901664	210611	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #174	Y	4710900519	026640	BRENTON UNKNOWN	PROD	SB
ROGERS, LON #6	Y	4502719955	022960	BRENTON UNKNOWN	P&A	ABDN
RITTER LUMBER COMPANY #178	Y	4710900535	029380	BRENTON UNKNOWN	PROD	T
ROGERS, LON #7	Y	4502719957	023630	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #199	Y	4710900620	033990	BRENTON UNKNOWN	PROD	C
ROGERS, LON #8	Y	4502719958	023790	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #181	Y	4710900545	029810	BRENTON UNKNOWN	PROD	SB
ROGERS, LON #9	Y	4502719959	023800	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #186	Y	4710900564	031050	BRENTON UNKNOWN	PROD	C
ROGERS, LON #11	Y	4502719965	024870	BRENTON COALBED METHANE	PROD	T
RITTER LUMBER COMPANY #187	Y	4710900569	031200	BRENTON UNKNOWN	PROD	T
ROGERS, LON #12	Y	4502719966	025310	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #200	Y	4710900624	034170	BRENTON UNKNOWN	PROD	T
FRANCIS, DAVID TRUST # 5	N	4705901317	216221	BRENTON UNKNOWN	PROD	FLOWING
RITTER LUMBER COMPANY #188	Y	4710900571	031210	BRENTON UNKNOWN	PROD	C
ROGERS, LON #14	Y	4502719976	026940	BRENTON UNKNOWN	PROD	SB
RITTER LUMBER COMPANY #191	Y	4710900584	031720	BRENTON UNKNOWN	PROD	C
ROGERS, LON #16	Y	4502719984	031590	BRENTON UNKNOWN	PROD	T
RITTER LUMBER COMPANY #192	Y	4710900588	031830	BRENTON UNKNOWN	PROD	C
ROGERS, LON #17	Y	4502719987	032010	BRENTON UNKNOWN	PROD	SB
RITTER LUMBER COMPANY #193	Y	4710900592	032260	BRENTON UNKNOWN	PROD	C
ROGERS, LON #20	Y	4502720111	050540	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #194	Y	4710900601	032490	BRENTON UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #34	Y	4704501335	214601	BRENTON UNKNOWN	PROD	C
AMHERST LAND COMPANY #48	Y	4704501253	210351	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #202	Y	4710900631	034800	BRENTON UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #36	Y	4705901308	214881	BRENTON UNKNOWN	PROD	T-SWAB
ISLAND CREEK COAL "D" # 84	Y	4704501269	210691	BRENTON UNKNOWN	PROD	C
ROGERS, LON #43	Y	4502724517	216011	BRENTON BEREA,BIG LIME,MAXTON	PROD	C
ISLAND CREEK COAL #85	Y	4704501273	216081	BRENTON BIG LIME,DEVONIAN SHALE	PROD	C
MCDONALD LAND COMPANY "A" #52	Y	4704501345	214531	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #203	Y	4710900633	035200	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #313	Y	4710901821	214341	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #204	Y	4710900640	035460	BRENTON UNKNOWN	PROD	SB
RITTER LAND COMPANY #318	Y	4710901810	214561	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #207	Y	4710900642	035980	BRENTON UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 90	Y	4704501306	214981	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #209	Y	4710900646	036410	BRENTON UNKNOWN	PROD	C
NEELY # 1	N	4705500133	142961	BRENTON UNKNOWN	PROD	FLOWING
RITTER LUMBER COMPANY #210	Y	4710900645	038420	BRENTON UNKNOWN	PROD	T
GRIFFITH, A. C. # 3	Y	4704701412	215831	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #211	Y	4710900647	038430	BRENTON UNKNOWN	PROD	CPL
HAMILL "B" # 2	Y	4705901331	215161	BRENTON UNKNOWN	PROD	C-SWAB
RITTER LUMBER COMPANY #324	Y	4710901838	215971	BRENTON BEREA,BIG LIME,GORD,RAVENCLIFF,WEIR	PROD	C-SWAB
CHEW, MARGRET "A" # 4	Y	4704501258	210591	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #212	Y	4710900858	038850	BRENTON UNKNOWN	PROD	C
HAMILL/GOODYKOONTZ "A" # 8	Y	4705901329	215751	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #213	Y	4710900876	042400	BRENTON UNKNOWN	PROD	CPL
HAMILL/GOODYKOONTZ "A" # 9	Y	4705901330	215761	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #214	Y	4710900878	042820	BRENTON UNKNOWN	PROD	C
ISLAND CREEK COAL COMPANY "D" #103	Y	4704501348	214681	BRENTON DEVONIAN SHALE	PROD	C-SWAB
RITTER LUMBER COMPANY #215	Y	4710900719	050440	BRENTON UNKNOWN	PROD	T
ISLAND CREEK COAL "D" #104	Y	4704501349	214971	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #216	Y	4710900720	050450	BRENTON UNKNOWN	PROD	T
ISLAND CREEK COAL "D" #105	Y	4704501350	214851	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #217	Y	4710900723	050460	BRENTON UNKNOWN	PROD	T
ISLAND CREEK COAL "D" #106	Y	4704501351	215101	BRENTON UNKNOWN	PROD	C-SWAB
ROGERS, LON #44	Y	4704701437	216071	BRENTON BEREA,BIG LIME	PROD	C
ISLAND CREEK COAL "D" #107	Y	4704501352	215401	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #218	Y	4710900726	050470	BRENTON UNKNOWN	PROD	C
ROGERS, LON #39	Y	4704701401	216361	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #219	Y	4710900727	050480	BRENTON UNKNOWN	PROD	C
ROGERS, LON #41	Y	4704701405	215411	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #291	Y	4710901575	147751	BRENTON UNKNOWN	PROD	T
MCCORMICK "A" # 5	Y	4704701400	215201	BRENTON UNKNOWN	PROD	C-SWAB
RITTER LUMBER COMPANY #289	Y	4710901488	148241	BRENTON UNKNOWN	PROD	C
GEORGIA PACIFIC "A" # 8	Y	4704701298	210821	BRENTON UNKNOWN	PROD	C-SWAB
RITTER LUMBER COMPANY #330	Y	4710901654	216091	BRENTON BEREA,BIG LIME,RAVENCLIFF,WEIR	PROD	C
RITTER LUMBER COMPANY #319	Y	4710901811	216151	BRENTON UNKNOWN	PROD	C
SOUTHERN LAND COMPANY # 9	Y	4705501260	083131	BRENTON UNKNOWN	PROD	SB
RITTER LUMBER COMPANY #326	Y	4710901826	215331	BRENTON UNKNOWN	PROD	T
STOKES, ANNE #3	Y	4710900435	023770	BRENTON BEREA,DEVONIAN SHALE	PROD	DC
RITTER LUMBER COMPANY #332	Y	4710901827	215181	BRENTON UNKNOWN	PROD	T
STOKES, ANNE #4	Y	4710900459	024760	BRENTON BEREA,DEVONIAN SHALE	PROD	APL
RITTER LUMBER COMPANY #334	Y	4710901828	215341	BRENTON UNKNOWN	PROD	T
CALDWELL & CAMPBELL "A" # 2	Y	4705900717	130741	BRENTON UNKNOWN	PROD	T
HAMILL W-12004	Y	4705900856	459311	BRENTON UNKNOWN	PROD	T-SWAB
ISLAND CREEK COAL "D" # 17	Y	4704500163	131251	BRENTON DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #335	Y	4710901841	215111	BRENTON UNKNOWN	PROD	SB
ISLAND CREEK COAL "D" # 18	Y	4705900095	131261	BRENTON DEVONIAN SHALE	PROD	SB
RITTER LUMBER COMPANY #338	Y	4710901842	215661	BRENTON UNKNOWN	PROD	SB
RITTER LUMBER COMPANY #331	Y	4710901853	216181	BRENTON BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	C
RITTER LUMBER COMPANY #337	Y	4710901838	215321	BRENTON UNKNOWN	PROD	SB
ISLAND CREEK COAL "D" # 33R	Y	4704501230	134211	BRENTON BIG LIME,DEVONIAN SHALE	PROD	CPL
ISLAND CREEK COAL "D" # 70	Y	4704501248	210381	BRENTON UNKNOWN	PROD	C
RITTER LUMBER COMPANY #283	Y	4710901638	144621	BRENTON BIG LIME,DEVONIAN SHALE	PROD	C
THACKER LAND COMPANY "A" #10	Y	4705901284	213091	BRENTON UNKNOWN	PROD	C

GRIFFITH, A. C # 4	Y	4704701413	216931	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
COLE & CRANE TRUST "A" #26	Y	4704501309	213771	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "C" # 8	Y	4704701422	216331	BRENTON	BEREA,BIG LIME	PROD	C
ISLAND CREEK COAL "D" # 71	Y	4704501249	210371	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #326	Y	4710901837	215911	BRENTON	BIG LIME,GORDON,RAVENCLIFF,WEIR	PROD	C
AMHERST LAND COMPANY #45	Y	4704501254	210261	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL #86	Y	4704501274	215081	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
HAMILL/GOODYKOONTZ "A" # 3	Y	4705901261	210431	BRENTON	UNKNOWN	PROD	C-SWAB
HAWLEY COAL #21	N	4705500154	144991	BRENTON	WEIR	PROD	FLOWING
ISLAND CREEK COAL "D" #110	Y	4704501357	216101	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
ELK CREEK COAL & LAND COMPANY #44	Y	4704501368	216751	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 73	Y	4704501251	214431	BRENTON	UNKNOWN	PROD	C
BLUE JAY # 7	N	4705500151	145001	BRENTON	BIG LIME,MAXTON	PROD	FLOWING
FOREMAN/ROGERS UNIT # 1	Y	4704701409	216141	BRENTON	BEREA,BIG LIME	PROD	C
BRICKER "A" # 4	Y	4704701450	216791	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 75	Y	4704501252	210571	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 91	Y	4704501279	210761	BRENTON	UNKNOWN	PROD	C
ROGERS/MCCORMICK UNIT # 1	Y	4704701436	216291	BRENTON	BEREA,BIG LIME,MAXTON	PROD	C
ROGERS, LON #22	Y	4704700816	087801	BRENTON	BIG LIME	PROD	T
ISLAND CREEK COAL "D" #109	Y	4704501382	216171	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	PU
AVIS # 2	Y	4704501098	116371	BRENTON	BIG LIME	PROD	C
RITTER LUMBER COMPANY #314	Y	4710901862	217211	BRENTON	BEREA,BIG LIME,RAVENCLIFF,WEIR	PROD	C-SWAB
POCAHONTAS LAND "D" # 3	N	4704701074	119681	BRENTON	BEREA,BIG LIME	PROD	FLOWING
ISLAND CREEK COAL "D" #111	Y	4704501358	216161	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
COMBS "B" # 1	Y	4704700342	125511	BRENTON	BEREA	PROD	T
POCAHONTAS/CHATTAROY # 1	Y	4705901359	216621	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 10	Y	4704500191	131271	BRENTON	DEVONIAN SHALE	PROD	C
HAMILL/GOODYKOONTZ "A" #10	Y	4705901352	216231	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
MALONE "B" # 2	Y	4704700826	128571	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL "D" #108	Y	4704501356	216301	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
MALONE "B" # 1	Y	4704700302	121481	BRENTON	BEREA	PROD	T
THACKER LAND COMPANY "A" # 9	Y	4705901269	216261	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
MCCORMICK, NELSON "B" # 1	N	4704700499	122671	BRENTON	BEREA	PROD	FLOWING
RITTER LUMBER COMPANY #339	Y	4710901900	216361	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
SIBLEY COAL & COKE "A" # 4	Y	4704700290	128771	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY #43	Y	4705901364	216821	BRENTON	BEREA,BIG LIME	PROD	C-SWAB
PANTHER STATE "A" #11	N	4704701040	132601	BRENTON	BEREA,BIG LIME,WEIR	PROD	FLOWING
ELK CREEK COAL & LAND COMPANY #45	Y	4704501369	216991	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
POCAHONTAS/HOWARD UNIT # 1	N	4704700468	123611	BRENTON	BEREA,MAXTON	PROD	FLOWING
HINCHMAN UNIT "A" # 2	Y	4704501355	216341	BRENTON	BEREA,BIG LIME,DEVON SHALE,GORDON	PROD	C
POCAHONTAS/BRICKER # 1	N	4704700496	123601	BRENTON	BEREA,BIG LIME	PROD	FLOWING
GEORGIA PACIFIC "A" # 9	Y	4704701449	216961	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
OLGA LAND COMPANY # 1	N	4704700394	123821	BRENTON	BEREA	PROD	FLOWING
MCCORMICK/ROGERS UNIT # 1	Y	4704701465	216381	BRENTON	BEREA,BIG LIME	PROD	T
GARLAND #21	N	4704700476	122721	BRENTON	BEREA	PROD	FLOWING
RITTER LUMBER COMPANY #341	Y	4710901899	216431	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
BLUE JAY #16	N	4705500165	147681	BRENTON	MAXTON,POCONO	PROD	FLOWING
LOPLIN/ROGERS UNIT # 1	Y	4704701454	216421	BRENTON	BEREA,RAVENCLIFF	PROD	T
PANTHER STATE UNIT "A" #15	N	4704701041	132611	BRENTON	BEREA,BIG LIME,WEIR	PROD	FLOWING
RITTER LUMBER COMPANY #340	Y	4710901926	216441	BRENTON	BEREA,BIG LIME,MAXTON	PROD	C
BLUE JAY #11	N	4705500162	145781	BRENTON	BIG LIME	PROD	FLOWING
WVC-4750	Y	4704701468	508842	BRENTON	COALBED METHANE	PROD	PU
GILBERT & PLUMLEY "A" #24	N	4710901379	146471	BRENTON	BEREA,BIG LIME	PROD	FLOWING
WVC-3816	Y	4704701440	216541	BRENTON	COALBED METHANE	PROD	PU
ROGERS, LON #33	Y	4704701161	137761	BRENTON	BEREA,BIG LIME	PROD	SB
RITTER LUMBER COMPANY #348	Y	4710901912	216951	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	DC
SIBLEY COAL & COKE "A" #12	Y	4704701150	138651	BRENTON	BEREA,BIG LIME	PROD	T
ISLAND CREEK COAL "C" # 9	Y	4704701453	216471	BRENTON	BEREA,GORDON,RAVENCLIFF	PROD	T
AVIS # 1	Y	4704501093	116381	BRENTON	BIG LIME	PROD	C
WVC-3819	Y	4704701434	503819	BRENTON	COALBED METHANE	PROD	PU
ISLAND CREEK COAL "D" # 59T	Y	4704501208	146551	BRENTON	SALT SAND	PROD	T
ELK CREEK COAL & LAND COMPANY #41	Y	4704501363	216731	BRENTON	BEREA,BIG LIME,DEVON SHALE,SUNBURY	PROD	C
HAWLEY COAL #13	N	4705500128	142681	BRENTON	MAXTON,WEIR	PROD	FLOWING
LITZ # 1	Y	4704701451	216661	BRENTON	BEREA,BIG LIME	PROD	C
HAWLEY COAL #15	N	4705500130	142691	BRENTON	BIG LIME,MAXTON	PROD	FLOWING
MINGO OIL & GAS "A" # 9	Y	4705901337	216531	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
HAWLEY COAL #16	N	4705500131	142901	BRENTON	BIG LIME,MAXTON	PROD	FLOWING
WVC-4746	Y	4704701466	504746	BRENTON	COALBED METHANE	PROD	PU
HAWLEY COAL #17	N	4705500132	142911	BRENTON	WEIR	PROD	FLOWING
KIRBY LAND # 2	N	4705500145	143161	BRENTON	BIG LIME	PROD	FLOWING
ELK CREEK COAL & LAND COMPANY #42	Y	4704501367	216721	BRENTON	BEREA,BIG LIME,DEVON SHALE,SUNBURY	PROD	C-SWAB
POCAHONTAS LAND # 1	N	4705500139	142921	BRENTON	MAXTON,WEIR	PROD	FLOWING
WVC-4745	Y	4704701465	504745	BRENTON	COALBED METHANE	PROD	PU
POCAHONTAS LAND # 2	N	4705500140	143081	BRENTON	MAXTON,WEIR	PROD	FLOWING
BIG HUFF # 2	Y	4704501372	216811	BRENTON	BIG LIME,DEVON SHALE,GORDON,WEIR	PROD	C
ROGERS, LON #34	Y	4704701159	137381	BRENTON	BEREA	PROD	C
MINGO OIL & GAS "A" #10	Y	4705901338	216741	BRENTON	BEREA,BIG LIME,DEVON SHALE,GORD,WEIR	PROD	C
F & G ENTERPRISES # 1	Y	4704501090	116461	BRENTON	BEREA,BIG LIME	P&A	ABDN
RED JACKET COAL COMPANY "A" #11	Y	4705901274	211601	BRENTON	UNKNOWN	PROD	C-SWAB
GEORGIA PACIFIC "A" # 7	Y	4704701457	216971	BRENTON	BEREA,BIG LIME,GORDON,HURON	PROD	C
BRIAR TXO # 1	Y	4705901097	116511	BRENTON	BIG LIME	PROD	C
RED JACKET COAL COMPANY "A" #12	Y	4705901278	210971	BRENTON	UNKNOWN	PROD	C
CALDWELL & CAMPBELL "A" # 3	Y	4705901372	217001	BRENTON	BEREA,BIG LIME,GORDON,HURON,RAVENCL	PROD	C-SWAB
RITTER/CROUCH # 1	Y	4710900615	033580	BRENTON	UNKNOWN	PROD	C
WILLIAMS, GLEN # 1	Y	4710900311	018170	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #55	Y	4704501366	217011	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
FORMAN, ISREAL # 1	Y	4704700200	031330	BRENTON	UNKNOWN	PROD	C
ROGERS, LON #18	Y	4704700204	031940	BRENTON	UNKNOWN	PROD	T
GEORGIA PACIFIC "A" # 8	Y	4704701458	216681	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
HAWLEY COAL #24	N	4708100987	147691	BRENTON	UNKNOWN	PROD	FLOWING
RITTER LUMBER COMPANY #271	Y	4710901624	210841	BRENTON	UNKNOWN	PROD	T&C
MCKENZIE # 2	Y	4705901374	508868	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	C
ELK CREEK COAL & LAND COMPANY #13	Y	4704500703	026760	BRENTON	UNKNOWN	PROD	T-SWAB
MINGO WYOMING "B" #19	Y	4705901375	508489	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C

POCAHONTAS LAND "D" #40	N	4704701277	202741	BRENTON	UNKNOWN	PROD	FLOWING
HINCHMAN "B" # 2	Y	4704501330	214061	BRENTON	UNKNOWN	PROD	T
RITTER LUMBER COMPANY #349	Y	4710901946	217191	BRENTON	BEREA,MAXTON,RAVENCLIFF	PROD	C
HINCHMAN/BIG HUFF # 1	Y	4704501329	214371	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 99	Y	4704501323	214021	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #58	Y	4704501373	217131	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	C
AMHERST LAND COMPANY #46	Y	4704501255	211031	BRENTON	UNKNOWN	PROD	C
CREW, MARGRET "A" # 3	Y	4704501257	210601	BRENTON	UNKNOWN	PROD	C
FOSTER FOUNDATION # 1	Y	4705901381	508898	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
COLE & CRANE TRUST "A" #19	Y	4704501259	211011	BRENTON	UNKNOWN	PROD	T
COLE & CRANE TRUST "A" #20	Y	4704501260	210961	BRENTON	UNKNOWN	PROD	C
MINGO OIL & GAS "A" #12	Y	4705901376	217141	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #301	Y	4710901728	211921	BRENTON	UNKNOWN	PROD	T
RITTER LUMBER COMPANY #348	Y	4710901945	217181	BRENTON	BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	C
COLE & CRANE TRUST "A" #21	Y	4704501268	211951	BRENTON	UNKNOWN	PROD	C
COLE & CRANE TRUST "B" #22	Y	4704501283	210981	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #40	Y	4704501370	217151	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
HAMILL/GOODYKOONTZ "A" # 7	Y	4705901262	210711	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 72	Y	4704501261	212091	BRENTON	UNKNOWN	PROD	C
POCAHONTAS/CARNEGIE # 2	Y	4705901386	217231	BRENTON	BIG LIME,DEVONIAN SHALE,GORDON	PROD	C
ISLAND CREEK COAL "D" # 75	Y	4704501278	210771	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 60	Y	4704501270	211211	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #37	Y	4705901353	217221	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
ISLAND CREEK COAL "D" # 87	Y	4704501276	210781	BRENTON	UNKNOWN	PROD	PU
RITTER LUMBER COMPANY #303	Y	4710901727	211181	BRENTON	UNKNOWN	PROD	T&C
PARDEE LAND COMPANY #105	Y	4704501385	217201	BRENTON	UPPER MAXTON	PROD	C
ISLAND CREEK COAL "D" # 94	Y	4704501289	212231	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #38	Y	4705901354	217351	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
LAWSON HEIRS # 2	Y	4704501282	210831	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #15	Y	4704501287	211931	BRENTON	UNKNOWN	PROD	C
CUB CREEK COAL "A" # 7	Y	4710901981	505488	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
MCDONALD, W. W. "A" #37	Y	4704501262	210901	BRENTON	UNKNOWN	PROD	C
MCDONALD, W. W. "A" #40R	Y	4704501264	210801	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #345	Y	4710901913	508877	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
MCDONALD, W. W. "A" #42	Y	4704501266	210931	BRENTON	UNKNOWN	PROD	C
MCDONALD, W. W. "A" #43	Y	4704501267	211091	BRENTON	UNKNOWN	PROD	C
POCAHONTAS/CARNEGIE # 1	Y	4705901384	508867	BRENTON	BEREA,BIG LIME,GORDON,HURON	PROD	C
SOUTHERN LAND COMPANY #23	Y	4700501681	210541	BRENTON	UNKNOWN	PROD	CPL
MCDONALD LAND COMPANY "A" #51	Y	4704501320	213981	BRENTON	UNKNOWN	PROD	C
SOUTHERN LAND COMPANY #32	Y	4700501683	210851	BRENTON	UNKNOWN	PROD	CPL
PARDEE LAND COMPANY # 93	Y	4704501280	213441	BRENTON	UNKNOWN	PROD	SB
SOUTHERN LAND COMPANY #33	Y	4700501684	211171	BRENTON	UNKNOWN	PROD	C
THACKER LAND COMPANY "A" # 7	Y	4705901273	210811	BRENTON	UNKNOWN	PROD	C
COLE & CRANE TRUST "B" #26	Y	4704501286	212191	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 93	Y	4705901287	213321	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 95	Y	4704501297	212541	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 96	Y	4704501290	212131	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #33	Y	4704501258	212561	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #38	Y	4704501272	212941	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #39	Y	4704501263	212151	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #48	Y	4704501293	213041	BRENTON	UNKNOWN	PROD	SB-SWAB
MINGO WYOMING LAND COMPANY "A" # 3	Y	4705901283	212441	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #292	Y	4710901764	212141	BRENTON	UNKNOWN	PROD	T
RITTER LUMBER COMPANY #302	Y	4710901761	213071	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 97	Y	4704501321	213991	BRENTON	UNKNOWN	PROD	C
PARDEE LAND COMPANY #100	Y	4700501701	214011	BRENTON	UNKNOWN	PROD	C
MCCORMICK "A" # 4	Y	4704701376	213461	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #34	Y	4704501311	213431	BRENTON	UNKNOWN	PROD	C
PARDEE LAND COMPANY # 95	Y	4704501317	213581	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK MINING "A" # 1	Y	4704500339	122201	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "D" # 92	Y	4704501277	213371	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #41	Y	4704501265	213301	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY "A" #48	Y	4704501304	212631	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND "A" # 4	N	4704700317	213281	BRENTON	UNKNOWN	PROD	FLOWING
RITTER LAND COMPANY #282	Y	4710901763	213341	BRENTON	UNKNOWN	PROD	MPL
RITTER LUMBER COMPANY #306	Y	4710901769	212531	BRENTON	UNKNOWN	PROD	C
THACKER LAND COMPANY "A" # 8	Y	4705901268	212601	BRENTON	UNKNOWN	PROD	C
PARDEE LAND COMPANY # 94	Y	4710901804	213681	BRENTON	UNKNOWN	PROD	SB
COLE & CRANE TRUST "A" #28	Y	4704501303	212681	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #49	Y	4704501318	213921	BRENTON	UNKNOWN	PROD	C
PARDEE LAND COMPANY # 96	Y	4700501700	214171	BRENTON	UNKNOWN	PROD	T&C
PARDEE LAND COMPANY # 98	Y	4704501342	214541	BRENTON	UNKNOWN	PROD	C
CUB CREEK COAL "A" # 3	Y	4710900618	130361	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "D" # 88	Y	4704501322	214661	BRENTON	UNKNOWN	PROD	C
RED JACKET COAL COMPANY "A" #13	Y	4705901298	213471	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY #14	Y	4704500705	026820	BRENTON	UNKNOWN	PROD	T-SWAB
RITTER LUMBER COMPANY #304	Y	4710901769	213491	BRENTON	UNKNOWN	PROD	T
THACKER LAND COMPANY "A" #11	Y	4705901295	214691	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #310	Y	4710901816	214311	BRENTON	UNKNOWN	PROD	T
RITTER LUMBER COMPANY #311	Y	4710901797	213531	BRENTON	UNKNOWN	PROD	MPL
ELK CREEK COAL & LAND COMPANY #18	Y	4705900751	035720	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #312	Y	4710901809	213631	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY W-9848	Y	4704500368	459181	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #317	Y	4710901822	214421	BRENTON	UNKNOWN	PROD	C-SWAB
RITTER LUMBER COMPANY #309	Y	4710901815	214871	BRENTON	UNKNOWN	PROD	C
SOUTHERN LAND COMPANY #34	Y	4700501691	213731	BRENTON	UNKNOWN	PROD	C
COLE & CRANE TRUST "A" #30	Y	4704501337	214711	BRENTON	UNKNOWN	PROD	C
SOUTHERN LAND COMPANY #36	Y	4700501693	213901	BRENTON	UNKNOWN	PROD	C
POCAHONTAS LAND "D" #27	N	4704701275	201691	BRENTON	UNKNOWN	PROD	FLOWING
LESTER # 1	Y	4710901624	214731	BRENTON	UNKNOWN	PROD	C
ALTIZER COAL LAND COMPANY # 4	Y	4704500718	026970	BRENTON	UNKNOWN	PROD	C
MCDONALD LAND COMPANY "A" #54	Y	4704501347	215081	BRENTON	UNKNOWN	PROD	C
AMHERST LAND COMPANY # 4	Y	4704500243	017320	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL COMPANY "D" #101	Y	4704501326	214441	BRENTON	BEREA,DEVONIAN SHALE,GORDON	PROD	C

AMHERST LAND COMPANY #19	Y	4704500331	020150	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY # 1	Y	4704500171	014420	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY #31	Y	4704500417	022140	BRENTON	UNKNOWN	PROD	T
AMHERST LAND COMPANY # 9	Y	4704500264	018110	BRENTON	UNKNOWN	PROD	C
ISLAND CREEK COAL "A" #45	Y	4704500174	130501	BRENTON	UNKNOWN	PROD	T
COLE & CRANE TRUST # 8	Y	4704500788	130701	BRENTON	UNKNOWN		C
COLE & CRANE TRUST #11	Y	4704500927	130721	BRENTON	UNKNOWN	PROD	C
ELK CREEK COAL & LAND COMPANY # 8	Y	4704500439	023130	BRENTON	UNKNOWN	PROD	T
COLEMAN, ELIZABETH # 3	Y	4709900310	011720	BRENTON	UNKNOWN	P&A	ABDN
MCDONALD LAND COMPANY "A" #53	Y	4704501346	214721	BRENTON	UNKNOWN	PROD	SB
ISLAND CREEK COAL "A" #54	Y	4704500190	130631	BRENTON	UNKNOWN	PROD	T
MOHAWK LAND COMPANY "A" # 4	Y	4704700252	130271	BRENTON	UNKNOWN	PROD	SB
FRANCIS, DAVID TRUST # 2	N	4705901221	201181	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
BIG MAC # 1	Y	4704501106	116431	BRENTON	BIG LIME	PROD	C
PARDEE LAND COMPANY # 4	Y	4710900138	013870	BRENTON	BEREA,BIG LIME,LOWER HURON,RAVENCLIFF	PROD	T
MCDONALD LAND COMPANY "F" # 1	Y	4704501103	116471	BRENTON	BIG LIME	PROD	C
PARDEE LAND COMPANY # 18	Y	4710900252	015420	BRENTON	UNKNOWN	PROD	T
RITTER LUMBER COMPANY #323	Y	4710901840	215791	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY #338	Y	4710901843	216001	BRENTON	UNKNOWN	PROD	SB
RITTER LUMBER COMPANY # 26	Y	4710900099	013080	BRENTON	UNKNOWN	PROD	T
MCDONALD LAND COMPANY # 2	Y	4704501128	116851	BRENTON	BEREA	PROD	C
RITTER LUMBER COMPANY # 69	Y	4710900279	015370	BRENTON	UNKNOWN	PROD	T
CLINCHFIELD COAL CORPORATION # 9	Y	4502721040	111481	BRENTON	BEREA	PROD	C
RITTER LUMBER COMPANY # 79	Y	4710900302	015740	BRENTON	UNKNOWN	PROD	DC
RITTER LUMBER COMPANY # 92	Y	4704500224	016550	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY # 99	Y	4710900345	016090	BRENTON	BEREA,HURON	PROD	C
RITTER LUMBER COMPANY #112	Y	4704500272	016880	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #151	Y	4710900458	024730	BRENTON	UNKNOWN		T
RITTER LUMBER COMPANY #176	Y	4710900528	027460	BRENTON	UNKNOWN	PROD	C
RITTER LUMBER COMPANY # 18	Y	4502720797	104732	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
ROGERS, LON #18	Y	4704700550	050520	BRENTON	UNKNOWN	PROD	C
ROGERS, LON #24	Y	4502720444	092661	BRENTON	BEREA,BIG LIME	PROD	MPL
ROGERS, LON #19	Y	4704700554	050530	BRENTON	UNKNOWN	PROD	SB
SIBLEY COAL & COKE "A" # 1	Y	4704700265	121291	BRENTON	UNKNOWN	PROD	T
SIBLEY COAL & COKE "A" # 2	Y	4704700279	128781	BRENTON	UNKNOWN	PROD	C
SIBLEY COAL & COKE "A" # 3	Y	4704700289	128791	BRENTON	UNKNOWN	PROD	T
ROGERS, LON #23	Y	4502720662	097171	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
SIBLEY COAL & COKE "A" # 5	Y	4704700305	128781	BRENTON	UNKNOWN	PROD	T
SIBLEY COAL & COKE "A" # 6	Y	4704700388	128791	BRENTON	UNKNOWN	PROD	T
ELK CREEK COAL & LAND COMPANY #22	Y	4705000983	092401	BRENTON	UNKNOWN	PROD	C
SIBLEY COAL & COKE "A" # 7	Y	4704700439	128801	BRENTON	UNKNOWN	PROD	T
SIBLEY COAL & COKE "A" # 8	Y	4704700630	128811	BRENTON	UNKNOWN	PROD	T
SIBLEY COAL & COKE "A" # 9	Y	4704700631	128821	BRENTON	UNKNOWN	PROD	T
ISLAND CREEK COAL "D" # 21	Y	4705901121	131291	BRENTON	UNKNOWN	PROD	C
BRIAR TXO # 5	Y	4705901100	116551	BRENTON	DEVONIAN SHALE	PROD	T
ELK CREEK COAL & LAND COMPANY #23	Y	4705601035	098331	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
BRIAR TXO # 6	Y	4705901101	116581	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
PARDEE LAND COMPANY # 57	Y	4710900836	088741	BRENTON	BEREA	PROD	T
PARDEE LAND COMPANY # 58	Y	4704501040	088751	BRENTON	BEREA,WEIR	PROD	T
PARDEE LAND COMPANY # 68	Y	4704501076	090931	BRENTON	BEREA,WEIR	PROD	C
PARDEE LAND COMPANY # 69	Y	4710900845	091241	BRENTON	BEREA	PROD	C
PARDEE LAND COMPANY # 70	Y	4710900846	091251	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY # 71	Y	4710900891	084301	BRENTON	DEVONIAN SHALE	PROD	T
PARDEE LAND COMPANY # 67D	Y	4704501085	095041	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
PARDEE LAND COMPANY # 72	Y	4710900902	095151	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY # 73	Y	4704501412	098311	BRENTON	BEREA,MAXTON	PROD	C
RITTER LUMBER COMPANY #221	Y	4710900852	091671	BRENTON	BEREA	PROD	CPL
PARDEE LAND COMPANY # 76	Y	4704501126	112921	BRENTON	WEIR	PROD	MPL
PARDEE LAND COMPANY # 75	Y	4704501124	116921	BRENTON	BEREA,BIG LIME	PROD	T
RITTER LUMBER COMPANY #224	Y	4710900908	097181	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #223B	Y	4710900929	101171	BRENTON	UNKNOWN	PROD	T&C
RITTER LUMBER COMPANY #222	Y	4710901009	104741	BRENTON	BIG LIME,GORDON	PROD	T
RITTER LUMBER COMPANY #226	Y	4710900997	109641	BRENTON	GORDON,RAVENCLIFF	PROD	T&C
RITTER LUMBER COMPANY #232	Y	4710901058	117001	BRENTON	RAVENCLIFF,WEIR	PROD	CPL
RITTER LUMBER COMPANY #233	Y	4710901060	117061	BRENTON	BIG LIME,RAVENCLIFF	PROD	SB
RITTER LUMBER COMPANY #252	Y	4710901130	120281	BRENTON	BIG LIME,DEVONIAN SHALE,RAVENCLIFF	PROD	T&C
RITTER LUMBER COMPANY #228	Y	4710901084	117191	BRENTON	BEREA,BIG LIME,PRINCETON	PROD	T
RITTER LUMBER COMPANY #229	Y	4710901073	117351	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	T
RITTER LUMBER COMPANY #235	Y	4710901078	117501	BRENTON	DEVONIAN SHALE,GORDON,MAXTON,RAVENCLIFF	PROD	T
SOUTHERN LAND COMPANY #14	Y	4700501467	110561	BRENTON	WEIR	PROD	C
SOUTHERN LAND COMPANY #15	Y	4700501468	110571	BRENTON	BIG LIME,WEIR	PROD	SB
SOUTHERN LAND COMPANY #16	Y	4700501477	115311	BRENTON	BIG LIME,WEIR	PROD	CPL
ROGERS, LON #21	Y	4704700830	088971	BRENTON	BEREA,BIG LIME	PROD	T
ROGERS, LON #25	Y	4704700882	094931	BRENTON	BEREA,COALBED METHANE,DEVONIAN SHALE	PROD	C
ROGERS, LON #26	Y	4704700905	098821	BRENTON	BEREA,BIG LIME	PROD	T
RITTER LUMBER COMPANY #253	Y	4710901142	120291	BRENTON	BEREA	PROD	CPL
RITTER LUMBER COMPANY #254	Y	4710901143	120301	BRENTON	BEREA,BIG LIME	PROD	C
SIBLEY COAL & COKE "A" #13	Y	4704701151	136681	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #255	Y	4710901131	120311	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #258	Y	4710901132	120341	BRENTON	RAVENCLIFF	PROD	C
HAWLEY COAL # 7	N	4705500120	137161	BRENTON	BIG LIME,WEIR	PROD	FLOWING
SOUTHERN LAND COMPANY #18	Y	4700501550	120031	BRENTON	BEREA,BIG INJUN,DEVONIAN SHALE	PROD	CPL
MOHAWK LAND COMPANY "A" #11	Y	4704701112	133821	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
COLE & CRANE TRUST #15	Y	4704501183	137871	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
SOUTHERN LAND COMPANY #19	Y	4700501551	137501	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
SOUTHERN LAND COMPANY #20	Y	4700501560	140131	BRENTON	BEREA,DEVONIAN SHALE,INJUN	PROD	MPL
COLE "B" #17	Y	4704501182	137551	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY # 74	Y	4704501172	112911	BRENTON	BEREA,DEVONIAN SHALE	PROD	CPL
SIBLEY COAL & COKE "A" #11	Y	4704701128	135171	BRENTON	BEREA,BIG LIME	PROD	T
COLE "B" #16	Y	4704501173	135891	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY # 85	Y	4704501181	137391	BRENTON	BEREA,BIG LIME,LITTLE LIME	PROD	MPL
1ST NATIONAL BANK OF BLUEFIELD # 2	Y	4704701125	135051	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,RAVENCLIFF	PROD	SB
POLAN "A" # 4	Y	4704701148	134521	BRENTON	BEREA,RAVENCLIFF	PROD	T-SWAB
OSWALD # 8	Y	4704701130	130881	BRENTON	BEREA,WEIR	PROD	C

POLAN "A" # 5	Y	4704701149	134631	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	T
MCDONALD LAND COMPANY "A" #22	Y	4704501177	136821	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
HARMAN "B" # 2	Y	4704701143	136081	BRENTON	BEREA,PRINCETON	PROD	T
MINGO WYOMING LAND COMPANY "B" # 8	Y	4705001152	134611	BRENTON	BEREA,BIG LIME	PROD	SB
HAWLEY COAL # 4	N	4705500109	137151	BRENTON	WEIR	PROD	FLOWING
RITTER LUMBER COMPANY #267	Y	4710901249	135931	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	T
HAWLEY COAL # 9	N	4705500121	137451	BRENTON	WEIR	PROD	FLOWING
HAWLEY COAL #10	N	4705500122	137461	BRENTON	MAXTON,WEIR	PROD	FLOWING
DOMINION & LEWIS #140781	N	4704701165	140781	BRENTON	DEVONIAN SHALE	PROD	FLOWING
ISLAND CREEK COAL "D" # 37	Y	4704501175	135821	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 36	Y	4704501174	135811	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
MCDONALD LAND COMPANY "A" #21	Y	4704501168	140491	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL "D" # 32	Y	4704501176	134051	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,INJUN	PROD	C
MINGO OIL & GAS "A" # 2	Y	4705901166	140581	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 39	Y	4704501180	137181	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL "D" # 23	Y	4705901149	133981	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 29	Y	4704501156	133781	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL "D" # 34	Y	4704501165	134061	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 38	Y	4704501178	135831	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
MINGO WYOMING LAND COMPANY "B" #11	Y	4705901170	140691	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
ISLAND CREEK COAL "D" # 47	Y	4704501188	140151	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	T
ISLAND CREEK COAL "D" # 43	Y	4704501184	140071	BRENTON	DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" #45	Y	4705901164	140581	BRENTON	BIG LIME	PROD	C
MINGO WYOMING LAND COMPANY "B" #12	Y	4705901171	140701	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
RITTER LUMBER COMPANY #268	Y	4710901217	135681	BRENTON	BEREA,DEVONIAN SHALE	PROD	SB
RITTER LUMBER COMPANY #264	Y	4710901218	135671	BRENTON	BIG LIME,MAXTON	PROD	SB
RITTER LUMBER COMPANY #241	Y	4710901210	117561	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #276	Y	4710901244	136911	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
MINGO WYOMING LAND COMPANY "B" #13	Y	4705901174	141451	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
RITTER LUMBER COMPANY #275	Y	4710901243	138901	BRENTON	BEREA,BIG LIME,GORDON,WEIR	PROD	T
RITTER LUMBER COMPANY #270	Y	4710901237	138861	BRENTON	BIG LIME,DEVONIAN SHALE,PRINCETON	PROD	T-SWAB
MINGO OIL & GAS "A" # 3	Y	4705901167	140501	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
COLE "B" #13	Y	4704501161	134241	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
MINGO WYOMING LAND COMPANY "B" # 9	Y	4705901153	134821	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	SB
RITTER LUMBER COMPANY #265	Y	4710901205	134451	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,RAVENCLIFF	PROD	SB
ISLAND CREEK COAL "D" # 50	Y	4705901168	140611	BRENTON	DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 55	Y	4705901169	140631	BRENTON	BIG LIME	PROD	C
ISLAND CREEK COAL "D" # 54	Y	4705901172	141141	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 31	Y	4704501191	141161	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL # 1	Y	4704501190	140341	BRENTON	DEVONIAN SHALE	PROD	C
RAMSEY COAL COMPANY "A" # 7	Y	4710901273	140551	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	MPL
RAMSEY COAL COMPANY "A" # 6	Y	4710901272	140541	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #263	Y	4710901160	134461	BRENTON	BIG LIME	PROD	T&C
RITTER LUMBER COMPANY #251	Y	4710901153	120271	BRENTON	BIG LIME,GORDON	PROD	T&C
RITTER LUMBER COMPANY #262	Y	4710901158	130931	BRENTON	BEREA,DEVONIAN SHALE,RAVENCLIFF	PROD	T&C
RITTER LUMBER COMPANY #261	Y	4710901157	130921	BRENTON	BEREA,RAVENCLIFF	PROD	T
RITTER LUMBER COMPANY #259	Y	4710901161	130901	BRENTON	BORDEN,DEVONIAN SHALE,RAVENCLIFF	PROD	SB
PARDEE LAND COMPANY # 84	Y	4710901171	132091	BRENTON	BEREA,BIG LIME	PROD	C
GEORGIA PACIFIC "B" # 1	Y	4705901143	133631	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
COLE "B" #12	Y	4704501150	133451	BRENTON	DEVONIAN SHALE	PROD	C
GEORGIA PACIFIC "B" # 2	Y	4705901144	133651	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
COLE "B" #14	Y	4704501151	133461	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
COLE "B" #10	Y	4704501149	133201	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 27	Y	4704501154	133761	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
MOHAWK LAND COMPANY "A" #10	Y	4704701111	133611	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	SB
FERRELL # 2	Y	4704501152	133551	BRENTON	BIG LIME	PROD	T
BRICKER "A" # 3	Y	4704701068	130871	BRENTON	BEREA,BIG LIME	PROD	T
OSWALD "A" # 9	Y	4704701119	134071	BRENTON	BEREA,BIG LIME,WEIR	PROD	SB
PARDEE LAND COMPANY # 83	Y	4704501157	132081	BRENTON	BEREA,BIG LIME	PROD	T
SIBLEY COAL & COKE "A" #10	Y	4704701120	130881	BRENTON	BIG LIME	PROD	T
RED JACKET COAL COMPANY "A" #10	Y	4705901146	133641	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
THACKER LAND COMPANY "A" # 6	Y	4705901147	133951	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 25	Y	4705901150	134261	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
COLE & CRANE TRUST #14	Y	4704501168	134511	BRENTON	BIG LIME	PROD	C
ISLAND CREEK COAL "D" # 26	Y	4704501158	133751	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
OSWALD "A" #10	Y	4704701138	134081	BRENTON	BEREA,BIG LIME	PROD	C
JEWELL, A. B. UNIT #28	N	4502721489	133281	BRENTON	BEREA	PROD	FLOWING
EDWARDS & HARDING UNIT #35	N	4502721453	133491	BRENTON	BEREA	PROD	FLOWING
EDWARDS & HARDING UNIT #32	N	4502721516	133481	BRENTON	BEREA	PROD	FLOWING
POCAHONTAS LAND UNIT "J" # 5	N	4704701099	134141	BRENTON	BEREA	PROD	FLOWING
HAWLEY COAL # 5	N	4705500107	134121	BRENTON	LOWER WEIR	PROD	FLOWING
HAWLEY COAL # 3	N	4705500108	134111	BRENTON	MAXTON	PROD	FLOWING
EDWARDS & HARDING UNIT #31	N	4502721561	133251	BRENTON	BEREA	PROD	FLOWING
COLE "B" #11	Y	4704501160	133441	BRENTON	DEVONIAN SHALE	PROD	C
EDWARDS & HARDING UNIT #38	N	4502721542	133241	BRENTON	BEREA	PROD	FLOWING
DOMINION & LEWIS #134651	N	4704701110	134651	BRENTON	RAVENCLIFF	PROD	FLOWING
CARTER LAND COMPANY/OXY. "A" #1R	N	4704701100	135431	BRENTON	BEREA,BIG LIME,WEIR	PROD	FLOWING
POCAHONTAS LAND UNIT "J" # 6	N	4704701124	135951	BRENTON	BEREA	PROD	FLOWING
RITTER LUMBER COMPANY #260D	Y	4710901141	120261	BRENTON	BEREA	PROD	MPL
MCDONALD LAND COMPANY "A" #20A	Y	4704501167	134501	BRENTON	DEVONIAN SHALE	PROD	C-SWAB
DOMINION & LEWIS #1271	N	4704701109	136791	BRENTON	RAVENCLIFF	PROD	FLOWING
DOMINION & LEWIS #136801	N	4704701137	136801	BRENTON	RAVENCLIFF	PROD	FLOWING
EDWARDS & HARDING UNIT #34	N	4502721411	121261	BRENTON	BEREA	PROD	FLOWING
ISLAND CREEK COAL "D" # 30	Y	4705901145	133971	BRENTON	DEVONIAN SHALE	P&A	ABDN
ISLAND CREEK COAL COMPANY "D" # 3	Y	4704500164	131111	BRENTON	DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL "D" # 9	Y	4704500114	131171	BRENTON	DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 10	Y	4704500124	131181	BRENTON	DEVONIAN SHALE	PROD	T
MCDONALD LAND COMPANY "A" # 6	Y	4704500579	131701	BRENTON	DEVONIAN SHALE	PROD	SB
ISLAND CREEK COAL "D" # 15	Y	4704500219	131231	BRENTON	DEVONIAN SHALE	PROD	C
COLE & CRANE CONSOL # 1	Y	4704500341	125601	BRENTON	DEVONIAN SHALE	PROD	T
COLE & CRANE TRUST # 3	Y	4704500540	132021	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL "D" # 13	Y	4704500205	131211	BRENTON	DEVONIAN SHALE	PROD	C
CHEW, MARGRET "A" # 1	Y	4704500742	125641	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL COMPANY "D" # 4	Y	4704500175	131121	BRENTON	DEVONIAN SHALE	PROD	T

GEORGIA PACIFIC "A" # 1	Y	4502720424	126181	BRENTON	DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL COMPANY "D" # 8	Y	4704500121	131161	BRENTON	DEVONIAN SHALE	PROD	C
BAILEY "A" # 3	Y	4710900842	130801	BRENTON	BEREA	PROD	SB
ISLAND CREEK COAL "D" # 14	Y	4704501123	131221	BRENTON	DEVONIAN SHALE	PROD	T
CHAFIN LAND COMPANY "A" 1	Y	4704500293	125581	BRENTON	DEVONIAN SHALE	PROD	T
CHEMICAL BANK & TRACT "A" # 1	Y	4704700838	125631	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL COMPANY "D" # 1	Y	4705900550	122191	BRENTON	DEVONIAN SHALE	PROD	C
CHEMICAL BANK & TRACT "A" # 4	Y	4704700854	129521	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL "D" # 12	Y	4704500212	131201	BRENTON	DEVONIAN SHALE	PROD	C
CHEMICAL BANK & TRACT "A" # 2	Y	4704700837	129501	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL COMPANY "D" # 5	Y	4704500142	131131	BRENTON	DEVONIAN SHALE	PROD	T
CHEMICAL BANK & TRACT "A" # 3	Y	4704700853	129511	BRENTON	BEREA	PROD	T
ISLAND CREEK COAL COMPANY "D" # 2	Y	4705901123	131101	BRENTON	DEVONIAN SHALE	PROD	C
COLE "B" # 9	Y	4704501120	131991	BRENTON	DEVONIAN SHALE	PROD	C
COLE & CRANE CONSOL "B" # 2	Y	4704501101	132051	BRENTON	BIG LIME	PROD	C
ISLAND CREEK COAL "D" # 11	Y	4704500118	131191	BRENTON	DEVONIAN SHALE	PROD	T
COLE & CRANE TRUST # 2	Y	4704500457	132011	BRENTON	DEVONIAN SHALE	PROD	T
ISLAND CREEK COAL COMPANY "D" # 6	Y	4704500146	131141	BRENTON	DEVONIAN SHALE	PROD	T
COLE & CRANE TRUST #10X	Y	4704501125	132001	BRENTON	DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL COMPANY "D" # 7	Y	4704500133	131151	BRENTON	DEVONIAN SHALE	PROD	C
COLE & CRANE TRUST # 7	Y	4704500790	132031	BRENTON	DEVONIAN SHALE	PROD	C
CRYSTAL BLOCK "A" # 1	Y	4704500416	121661	BRENTON	DEVONIAN SHALE	PROD	C
BARKER W-7242	Y	4704500987	460541	BRENTON	UNKNOWN	PROD	C
HAWLEY COAL #23	N	4708100168	473761	BRENTON	UNKNOWN	PROD	FLOWING
RITTER LUMBER COMPANY #343	Y	4710901888	507530	BRENTON	BEREA,BIG LIME,HURON	PROD	T&C-SWAB
ISLAND CREEK COAL "D" #506062	Y	4704501412	506062	BRENTON	BEREA,BIG INJUN,BIG LIME,GORDON,HURON	PROD	C
FOSTER FOUNDATION #506068	Y	4705901430	506068	BRENTON	BEREA,BIG LIME,CLEVELAND,LOWR HURON	PROD	C
BIG HUFF #507607	Y	4704501417	507607	BRENTON	BEREA,BIG LIME,HURON,WEIR	PROD	C
RITTER LUMBER COMPANY #344	Y	4710901964	506536	BRENTON	BEREA,GORDON,HURON	PROD	C
MINGO OIL & GAS #506085	Y	4705901431	506085	BRENTON	BEREA,BIG LIME,HURON	PROD	C
COLE & CRANE #506133	Y	4704501414	506133	BRENTON	BEREA,BIG LIME,HURON	PROD	C
PARDEE LAND COMPANY #104	Y	4704501384	507358	BRENTON	BEREA,HURON	PROD	C
FOSTER FOUNDATION #506169	Y	4705901418	506169	BRENTON	BEREA,BIG LIME,CLEVELAND,HURON	PROD	C
G.W.C. LAND COMPANY #25	Y	4704701520	506532	BRENTON	BEREA,BIG LIME	PROD	C
ISLAND CREEK COAL "D" #506063	Y	4704501416	506063	BRENTON	BEREA,BIG LIME,HURON	PROD	SB
MCDONALD #506117	Y	4704501404	506117	BRENTON	BEREA,BIG LIME,HURON	PROD	C
PARDEE LAND COMPANY #103	Y	4704501371	506332	BRENTON	BEREA,HURON,MIDDLE MAXTON	PROD	C
GEORGIA PACIFIC CORPORATION #506187	Y	4704701509	506187	BRENTON	BEREA,BIG LIME,HURON	PROD	C
FRANCIS, DAVID TRUST #507497	Y	4704501405	507497	BRENTON	BEREA,BIG LIME	PROD	C
ROGERS, LON #21	Y	4704700830C	508825	BRENTON	COALBED METHANE	PROD	PU
ROGERS, LON #26	Y	4704700882C	508841	BRENTON	COALBED METHANE	PROD	PU
ROGERS, LON #33	Y	4704701161C	508487	BRENTON	COALBED METHANE	PROD	PU
BIG HUFF # 1	Y	4704501336	215741	BRENTON	UNKNOWN	PROD	C
MINGO WYOMING COAL & LAND CO. #506471	Y	4705901483	506471	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ELK CREEK COAL & LAND COMPANY #506396	Y	4704501446	506396	BRENTON	BEREA,BIG LIME,MAXTON,DEVON SHALE,WEIR	PROD	T
ROGERS, LON #508830	Y	4502725153	508830	BRENTON	COALBED METHANE	PROD	C
ROGERS, LON #508831	Y	4502725176	508831	BRENTON	COALBED METHANE	PROD	PU
AMHERST LAND COMPANY #21	Y	4704500348	020860	BRENTON		TA	T
AMHERST LAND COMPANY #29	Y	4704500410	022050	BRENTON		TA	C
AMHERST LAND COMPANY #32	Y	4704500438	023120	BRENTON		TA	C
AMHERST LAND COMPANY #34	Y	4704500479	023890	BRENTON		PROD	C
AMHERST LAND COMPANY # 7	Y	4704500257	017930	BRENTON		TA	T
COTIGA DEVELOPMENT COMPANY # 2	Y	4705900071	011230	BRENTON		PROD	C
RITTER LUMBER COMPANY # 30	Y	4710900121	013490	BRENTON		TA	T
RITTER LUMBER COMPANY # 48	Y	4710900182	014300	BRENTON		TA	T
NORFOLK WESTERN RAILWAY "A" # 4	Y	4705900226	129371	BRENTON		P&A	ABDN
PARDEE LAND COMPANY #59	Y	4704500950	074871	BRENTON		PROD	C
RITTER LUMBER COMPANY # 7	Y	4710900041	011650	BRENTON		P&A	ABDN
RITTER LUMBER COMPANY # 21	Y	4710900084	012770	BRENTON		P&A	ABDN
RITTER LUMBER COMPANY # 51	Y	4710900205	014510	BRENTON		PROD	T
RITTER LUMBER COMPANY # 98	Y	4704500238	016960	BRENTON		TA	T
RITTER LUMBER COMPANY #103	Y	4704500256	017530	BRENTON		TA	C
RITTER LUMBER COMPANY #105	Y	4710900356	017810	BRENTON		PROD	C
RITTER LUMBER COMPANY #113	Y	4704500279	019050	BRENTON		PROD	C
RITTER LUMBER COMPANY #132	Y	4710900413	022180	BRENTON		TA	T
RITTER LUMBER COMPANY #134	Y	4710900418	022300	BRENTON		PROD	T
RITTER LUMBER COMPANY #137	Y	4710900423	023420	BRENTON		PROD	T
RITTER LUMBER COMPANY #138	Y	4710900424	023530	BRENTON		TA	C
RITTER LUMBER COMPANY #147	Y	4710900451	024100	BRENTON		PROD	C
RITTER LUMBER COMPANY #149	Y	4710900455	024560	BRENTON		P&A	ABDN
RITTER LUMBER COMPANY #164	Y	4710900484	025510	BRENTON		PROD	C
RITTER LUMBER COMPANY #180	Y	4710900547	029800	BRENTON		TA	C
CHRISTIAN, A. # 1	Y	4705900488	126521	BRENTON		P&A	ABDN
CHINN, W. #791	Y	4709900240	414701	BRENTON		P&A	ABDN
COLE BURSKIRK CON "A" # 1	Y	4704500830	125651	BRENTON		TA	C
RITTER LUMBER COMPANY #260	Y	4710901162	130911	BRENTON	DEVONIAN SHALE	PROD	T-SWAB
EDWARDS & HARDING #10	N	4502721208	133031	BRENTON		TA	
EDWARDS & HARDING #16	N	4502721207	133011	BRENTON		TA	
COLE & CRANE TRUST #12	Y	4704501159	133951	BRENTON	DEVONIAN SHALE	PROD	C
THACKER LAND COMPANY "A" # 3	Y	4705900358	131611	BRENTON		PROD	C
PARDEE LAND COMPANY # 82	Y	4704501144	132071	BRENTON	DEVONIAN SHALE	PROD	T
POCAHONTAS/CARNEGIE #506352	Y	4705901475	506352	BRENTON	LOWER HURON	PROD	C
ELK CREEK COAL & LAND COMPANY #506394	Y	4704501455	506394	BRENTON	LOWER DEVONIAN	PROD	C
FRANCIS, DAVID TRUST #1103	N	4705901411	506074	BRENTON	BEREA,DEVONIAN SHALE,WEIR	PROD	FLOWING
FRANCIS, DAVID TRUST #1109	N	4705901402	506923	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
PARDEE LAND COMPANY #506345	Y	4704501426	506345	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY #506348	Y	4704501418	506348	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
POCAHONTAS/CARNEGIE #506382	Y	4705901477	506382	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
GREATER WISE LAND COMPANY #506154	Y	4705901471	506154	BRENTON	BEREA,BIG LIME,LOWER SHALE	PROD	SB
POCAHONTAS/CARNEGIE #507489	Y	4705901387	507489	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
MCDONALD LAND COMPANY #506311	Y	4704501449	506311	BRENTON	BEREA,BIG LIME,MAXTON,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #506379	Y	4705901476	506379	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY #506320	Y	4704501420	506320	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
FRANCIS, DAVID TRUST #1104	N	4705901410	506924	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING

FRANCIS, DAVID TRUST #1105	N	4705901398	509358	BRENTON	UNKNOWN	PROD	FLOWING
POCAHONTAS/CARNEGIE #506385	Y	4705901478	506385	BRENTON	DEVONIAN SHALE	PROD	C
ROGERS, LON #508899	Y	4502725237	508899	BRENTON	COALBED METHANE	PROD	PU
SOUTHERN LAND COMPANY #506339	Y	4700501773	506339	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	MPL
POCAHONTAS/CARNEGIE #506373	Y	4705901448	506373	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
SOUTHERN LAND COMPANY #506338	Y	4700501772	506338	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	MPL
POCAHONTAS/CARNEGIE #506104	Y	4705901474	506104	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
ELK CREEK COAL & LAND COMPANY #506949	Y	4704501470	506949	BRENTON	BEREA,LOWER SHALE	PROD	DC
MCDONALD #508420	Y	4704501449	508420	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
GEORGIA PACIFIC CORPORATION #507777	Y	4710902148	507777	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
ELK CREEK COAL & LAND COMPANY #506399	Y	4704501466	506399	BRENTON	BEREA,DEVONIAN SHALE	PROD	CPL
RITTER LUMBER COMPANY #507059	Y	4710901901	507059	BRENTON	BIG LIME,BEREA	PROD	T
ELK CREEK COAL & LAND COMPANY #506401	Y	4704501467	506401	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T&C
ISLAND CREEK COAL COMPANY #506096	Y	4704501456	506096	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
COLE & CRANE #507650	Y	4704501416	507650	BRENTON	BEREA,GORDON,DEVONIAN SHALE,HURON	PROD	C
KENNEDY #506515	Y	4704701599	506515	BRENTON	COALBED METHANE	PROD	PU
KENNEDY #506509	Y	4704701597	506509	BRENTON	COALBED METHANE	PROD	C
KENNEDY #506499	Y	4704701593	506499	BRENTON	COALBED METHANE	PROD	C
ELK CREEK COAL & LAND COMPANY #506392	Y	4704501469	506392	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	APL
KENNEDY #506504	Y	4704701595	506504	BRENTON	COALBED METHANE	PROD	C
MCDONALD LAND COMPANY #506310	Y	4704501444	506310	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	C
RITTER LUMBER COMPANY #507791	Y	4710902147	507791	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	CPL
COLE & CRANE #506209	Y	4704501477	506209	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #506251	Y	4705901442	506251	BRENTON	BIG LIME,DEVONIAN SHALE	P&A	ABDN
DAMRON #507808	Y	4710902150	507808	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T&C
MOHAWK LAND COMPANY #507980	Y	4704701846	507980	BRENTON	BEREA,GORDON,DEVONIAN SHALE	PROD	C
COLE & CRANE #506211	Y	4704501476	506211	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #507456	Y	4705901511	507456	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #506641	Y	4710902157	506641	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	C
DAMRON #507809	Y	4710902151	507809	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T&C
POLAN "A" # 3	Y	4704701075	143281	BRENTON		PROD	C
COLE & CRANE #506218	Y	4704501479	506218	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #506439	Y	4710902109	506439	BRENTON	BIG LIME,GORDON,RAVENCLIFF	PROD	SB
MOHAWK LAND COMPANY #506003	Y	4704701647	506003	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	CPL
POCAHONTAS/CARNEGIE #507459	Y	4705901512	507459	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #507828	Y	4710902148	507828	BRENTON	BEREA,BIG LIME, DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #506441	Y	4710902105	506441	BRENTON	BIG LIME,GORDON,RAVENCLIFF	PROD	SB
RITTER LUMBER COMPANY #506437	Y	4710902102	506437	BRENTON	BEREA,BIG LIME,GORDON,MAXTON,RAVENCLIFF	PROD	MPL
POCAHONTAS/CARNEGIE #507474	Y	4705901515	507474	BRENTON	LOWER SHALE	PROD	C
RITTER LUMBER COMPANY #507790	Y	4710902166	507790	BRENTON	BEREA,DEVONIAN SHALE	PROD	DC
GEORGIA PACIFIC CORPORATION #506147	Y	4704701666	506147	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #506583	Y	4710902157	506583	BRENTON	BEREA,BIG LIME,MAXTON,WEIR	PROD	APL
RITTER LUMBER COMPANY #506585	Y	4710002155	506585	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	APL
GEORGIA PACIFIC CORPORATION #507869	Y	4704701567	507869	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	DC
GREATER WISE LAND COMPANY #506998	Y	4704701666	506998	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #507468	Y	4705901510	507468	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #506600	Y	4710902156	506600	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	T
RITTER LUMBER COMPANY #507789	Y	4710902169	507789	BRENTON	BEREA,BIG LIME,LOWER SHALE	PROD	DC
GEORGIA PACIFIC CORPORATION #506146	Y	4704701684	506146	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #507463	Y	4705901513	507463	BRENTON	BEREA,DEVONIAN SHALE,GORDON	PROD	C
RITTER LUMBER COMPANY #507776	Y	4710902171	507776	BRENTON	DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #507916	Y	4710902172	507916	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	SB
POCAHONTAS/CARNEGIE #507466	Y	4705901514	507466	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #507787	Y	4710902173	507787	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,MAXTON	PROD	DC
GEORGIA PACIFIC CORPORATION #507848	Y	4704701566	507848	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	SB
RITTER LUMBER COMPANY #507698	Y	4710902193	507698	BRENTON	BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	DC
ISLAND CREEK COAL COMPANY #506270	Y	4704501491	506270	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	C-SWAB
RITTER LUMBER COMPANY #507785	Y	4704501484	507785	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T&C
RITTER LUMBER COMPANY #507805	Y	4710902164	507805	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
GREATER WISE LAND COMPANY #508001	Y	4705901526	508001	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,MAXTON	PROD	CPL
COLE & CRANE #506731	Y	4704501494	506731	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #507784	Y	4704501498	507784	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T&C
RITTER LUMBER COMPANY #507806	Y	4710902174	507806	BRENTON	LOWER SHALE	PROD	APL
RITTER LUMBER COMPANY #507883	Y	4710902178	507883	BRENTON	BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	SB
POCAHONTAS/CARNEGIE #507485	Y	4705901516	507485	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
GREATER WISE LAND COMPANY #508002	Y	4704701567	508002	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	CPL
RITTER LUMBER COMPANY #506434	Y	4710902176	506434	BRENTON	BIG LIME,GORDON,RAVENCLIFF	PROD	SB
RITTER LUMBER COMPANY #507494	Y	4704501497	507494	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #507792	Y	4710902170	507792	BRENTON	BEREA,DEVONIAN SHALE	PROD	APL
POCAHONTAS/CARNEGIE #507473	Y	4705901535	507473	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #507807	Y	4710902179	507807	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,MAXTON,RAV	PROD	PU
HARMAN, JAMES #506815	Y	4704701689	506815	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	T
MCDONALD #508139	Y	4704501428	508139	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,GORDON	PROD	C
GREATER WISE LAND COMPANY #507972	Y	4705901538	507972	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
GREATER WISE LAND COMPANY #507975	Y	4705901524	507975	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
COLE & CRANE #506733	Y	4704501493	506733	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
CARTER LAND COMPANY #507223	Y	4704701690	507223	BRENTON	BEREA,BIG LIME,LOWER SHALE	PROD	DC
RITTER LUMBER COMPANY #506041	Y	4710902180	506041	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	T
GREATER WISE LAND COMPANY #507977	Y	4705901517	507977	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	DC
COLE, ALBERT #506676	Y	4704501526	506676	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
SOUTHERN LAND COMPANY #506326	Y	4700501795	506326	BRENTON	LOWER SHALE	PROD	DC
ROGERS, LON #509263	Y	4502725630	509263	BRENTON	COALBED METHANE	PROD	PU
ROGERS, LON #509270	Y	4502725597	509270	BRENTON	COALBED METHANE	PROD	C
RITTER LUMBER COMPANY #507888	Y	4710902208	507888	BRENTON	BEREA,BIG LIME,GORDON,RAVENCLIFF	PROD	T
SOUTHERN LAND COMPANY #506324	Y	4700501790	506324	BRENTON	BEREA,DEVONIAN SHALE,WEIR	PROD	C-SWAB
POCAHONTAS/CARNEGIE #509466	Y	4705901560	509466	BRENTON	LOWER SHALE	PROD	C-SWAB
SOUTHERN LAND COMPANY #506333	Y	4700501791	506333	BRENTON	BIG LIME,DEVONIAN SHALE,WEIR	PROD	APL
POCAHONTAS/CARNEGIE #508477	Y	4705901555	508477	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL COMPANY #507166	Y	4704501537	507166	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	PU
SOUTHERN LAND COMPANY #506337	Y	4700501792	506337	BRENTON	BEREA,DEVONIAN SHALE	PROD	APL
POCAHONTAS/CARNEGIE #506479	Y	4705901556	506479	BRENTON	BIG LIME,DEVONIAN SHALE,GORDON	PROD	C-SWAB
POCAHONTAS/CARNEGIE #508062	Y	4705901559	508062	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #508475	Y	4705901553	508475	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
F & G ENTERPRISES #507270	Y	4704501539	507270	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C

ISLAND CREEK COAL COMPANY #507112	Y	4704501543	507112	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
CHAFIN LAND COMPANY #507592	Y	4704501495	507592	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #508059	Y	4705901558	508059	BRENTON	BEREA,BIG LIME,GORDON,HURON	PROD	C-SWAB
COLE & CRANE #506879	Y	4704501533	506879	BRENTON	BIG LIME,LOWER SHALE	PROD	C
ISLAND CREEK COAL COMPANY #507100	Y	4704501540	507100	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
COLE & CRANE #506210	Y	4704501538	506210	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
POCAHONTAS/CARNEGIE #508046	Y	4705901557	508046	BRENTON	LOWER SHALE	PROD	C
RITTER LUMBER COMPANY #507886	Y	4710902208	507886	BRENTON	BIG LIME,GORDON,RAVENCLIFF	PROD	T
ELK CREEK COAL COMPANY #507495	Y	4704501547	507495	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	T
AVIS HEIRS #507273	Y	4704501492	507273	BRENTON	BEREA,DEVONIAN SHALE	PROD	DC
ISLAND CREEK COAL COMPANY #507115	Y	4704501515	507115	BRENTON	BIG LIME,LOWER DEVONIAN	PROD	C
COLE, ALBERT #506215	Y	4704501535	506215	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #507885	Y	4710902207	507885	BRENTON	BIG LIME,GORDON,RAVENCLIFF,WEIR	PROD	T
ISLAND CREEK COAL COMPANY #507209	Y	4704501516	507209	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #508473	Y	4705901552	508473	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,GORDON	PROD	C
SOUTHERN LAND COMPANY #508342	Y	4705901774	508342	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	DC
DAMRON #507813	Y	4710902231	507813	BRENTON	BIG LIME,MAXTON,RAVENCLIFF	PROD	DC
MCDONALD LAND COMPANY #507496	Y	4704501548	507496	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #508476	Y	4705901554	508476	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,GORDON	PROD	C-SWAB
RED JACKET COAL COMPANY #508235	Y	4705901670	508235	BRENTON	BEREA,DEVONIAN SHALE,GORDON	PROD	C
ISLAND CREEK COAL COMPANY #506095	Y	4704501517	506095	BRENTON	LOWER SHALE	PROD	C
MCDONALD LAND COMPANY #507276	Y	4704501550	507276	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
RITTER LUMBER COMPANY #506621	Y	4710902272	506621	BRENTON	BIG LIME,MAXTON,RAVENCLIFF	PROD	MPL
RED JACKET COAL COMPANY #508351	Y	4705901572	508351	BRENTON	BEREA,BIG LIME,GORDON,HURON	PROD	C
RITTER, WILLIAM #507684	Y	4710902238	507684	BRENTON	BIG LIME,GORDON,LOWER MAXTON	PROD	T
ISLAND CREEK COAL COMPANY #507126	Y	4704501521	507126	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
PARDEE LAND COMPANY #508347	Y	4704501663	508347	BRENTON	BEREA,DEVONIAN SHALE	PROD	DC
POCAHONTAS/CARNEGIE #508160	Y	4705901579	508160	BRENTON	BIG LIME,HURON	PROD	C
RITTER LUMBER COMPANY #507014	Y	4710902263	507014	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL COMPANY #507127	Y	4704501522	507127	BRENTON	BIG LIME,UPPER SHALE	PROD	C-SWAB
POCAHONTAS/CARNEGIE #508480	Y	4705901560	508480	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
COLE & CRANE #508655	Y	4704501551	508655	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
ISLAND CREEK COAL COMPANY #507143	Y	4704501523	507143	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
RITTER LUMBER COMPANY #507015	Y	4710902264	507015	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #506581	Y	4710902259	506581	BRENTON	BEREA,BIG LIME,MIDDLE MAXTON	PROD	SB
RITTER LUMBER COMPANY #509497	Y	4710902267	509497	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	SB
ISLAND CREEK COAL COMPANY #507201	Y	4704501541	507201	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
COLE & CRANE #506656	Y	4704501534	506656	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
RITTER LUMBER COMPANY #506599	Y	4710902258	506599	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	T
ISLAND CREEK COAL COMPANY #507113	Y	4704501544	507113	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
PARDEE LAND COMPANY #505321	Y	4704501439	506321	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,MAXTON,WEI	PROD	T&C
RITTER LUMBER COMPANY #507803	Y	4710902204	507803	BRENTON	BIG LIME,PRINCETON,RAVENCLIFF	PROD	T&C
RED JACKET COAL COMPANY #507409	Y	4705901669	507409	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
SIBLEY COAL & COKE COMPANY #507216	Y	4704701754	507216	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	MPL
MOHAWK LAND COMPANY #508007	Y	4704701787	508007	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #507460	Y	4705901568	507460	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
SIBLEY COAL & COKE COMPANY #506307	Y	4704701753	506307	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL COMPANY #509503	Y	4704501531	509503	BRENTON	LOWER SHALE	PROD	C
POCAHONTAS/CARNEGIE #507449	Y	4705901566	507449	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
POCAHONTAS/CARNEGIE #507453	Y	4705901567	507453	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
RED JACKET COAL COMPANY #506234	Y	4705901616	506234	BRENTON	BIG LIME,UPPER SHALE	PROD	C-SWAB
ISLAND CREEK COAL COMPANY #507076	Y	4704501518	507076	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
SOUTHERN LAND COMPANY #507320	Y	4705501848	507320	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	DC
MCDONALD LAND COMPANY #507278	Y	4704501552	507278	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	DC
GEORGIA PACIFIC #507665	Y	4704701801	507665	BRENTON	BEREA,DEVONIAN SHALE,GORDON	PROD	C
ISLAND CREEK COAL COMPANY #507130	Y	4704501545	507130	BRENTON	BEREA,HURON	PROD	C
RITTER LUMBER COMPANY #507713	Y	4710902300	507713	BRENTON	BIG LIME,GORDON,RAVENCLIFF,WEIR	PROD	SB
ISLAND CREEK COAL COMPANY #507192	Y	4704501530	507192	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	C-SWAB
HINCHMAN/BIG HUFF #507306	Y	4704501583	507306	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	C-SWAB
AMHERST LAND COMPANY #508196	Y	4704501561	508196	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,MAXTON	PROD	C
ISLAND CREEK COAL COMPANY #507181	Y	4704501529	507181	BRENTON	BEREA,DEVONIAN SHALE	PROD	C-SWAB
MCDONALD LAND COMPANY #507277	Y	4704501584	507277	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C-SWAB
RITTER LUMBER COMPANY #507817	Y	4710902181	507817	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL COMPANY #506684	Y	4705901622	506684	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #509498	Y	4710902295	509498	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	SB
RITTER LUMBER COMPANY #506582	Y	4710902260	506582	BRENTON	BEREA,MAXTON,RAVENCLIFF	PROD	DC
RITTER LUMBER COMPANY #506617	Y	4710902257	506617	BRENTON	RAVENCLIFF	PROD	C
AMHERST COAL COMPANY #506555	Y	4704501573	506555	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
COLE, ALBERT #506683	Y	4704501577	506683	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T-SWAB
PLUM CREEK TIMBER COMPANY #507924	Y	4502725840	507924	BRENTON	BEREA,BIG LIME	PROD	DC
RITTER LUMBER COMPANY #506608	Y	4710902262	506608	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	C
ISLAND CREEK COAL COMPANY #506697	Y	4705901621	506697	BRENTON	BEREA,DEVONIAN SHALE	PROD	T
ELK CREEK COAL COMPANY #506395	Y	4704501671	506395	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	DC
PLUM CREEK TIMBER COMPANY #507922	Y	4502725830	507922	BRENTON	BEREA,BIG LIME	PROD	C
RITTER LUMBER COMPANY #507064	Y	4710902273	507064	BRENTON	BIG LIME,RAVENCLIFF	PROD	C
ISLAND CREEK COAL COMPANY #506688	Y	4705901623	506688	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
RITTER LUMBER COMPANY #506601	Y	4710902261	506601	BRENTON	BEREA,BIG LIME	PROD	C
ELK CREEK COAL COMPANY #508115	Y	4704501672	508115	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	DC
RITTER LUMBER COMPANY #507716	Y	4710902303	507716	BRENTON	BIG LIME,GORDON,MAXTON	PROD	C-SWAB
MCDONALD LAND COMPANY #509557	Y	4704501568	509557	BRENTON	LOWER SHALE	PROD	T
ISLAND CREEK COAL COMPANY "D" #506684	Y	4705901620	506684	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	C
HARVEY #509499	N	4710902322	509499	BRENTON	DEVONIAN SHALE	PROD	T
RITTER LUMBER COMPANY #509504	Y	4710902232	509504	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	SB
RITTER/WALLS #507774	Y	4710902340	507774	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	T
FRANCIS, DAVID TRUST #506939 (K1298)	N	4705901605	506939	BRENTON	BEREA,HURON	PROD	FLOWING
FRANCIS, DAVID TRUST #506940 (K1298)	N	4705901595	506940	BRENTON	BEREA,DEVONIAN SHALE,WEIR	PROD	FLOWING
FRANCIS, DAVID TRUST #506919 (K1299)	N	4705901594	506919	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	FLOWING
FRANCIS, DAVID TRUST #506920 (K1300)	N	4705901593	506920	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
ISLAND CREEK COAL COMPANY #506670	Y	4705901631	506670	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
LAWSON HEIRS #506922 (K1301)	N	4705901592	506922	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
ISLAND CREEK COAL COMPANY #507098	Y	4704501587	507098	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	C
LAWSON HEIRS #506915 (K1302)	N	4705901591	506915	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
ISLAND CREEK COAL COMPANY #506671	Y	4705901632	506671	BRENTON	DEVONIAN SHALE	PROD	C
MCDONALD LAND COMPANY #507303	Y	4704501585	507303	BRENTON	BEREA,DEVONIAN SHALE	PROD	C

LAWSON HEIRS #506914 (K1303)	N	4705901590	506914	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
LAWSON HEIRS #506910 (K1304)	N	4705901589	506910	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
FRANCIS, DAVID TRUST #506888 (K1294)	N	4705901599	506888	BRENTON	UNKNOWN	PROD	FLOWING
FRANCIS, DAVID TRUST #506988 (K1295)	N	4705901598	506986	BRENTON	UNKNOWN	PROD	FLOWING
LAWSON HEIRS #506911 (K1306)	N	4705901587	506911	BRENTON	UNKNOWN	PROD	FLOWING
FRANCIS, DAVID TRUST #506907 (K1287)	N	4705901606	506907	BRENTON	UNKNOWN	PROD	FLOWING
LAWSON HEIRS #506908 (K1305)	N	4705901588	506906	BRENTON	UNKNOWN	PROD	FLOWING
FRANCIS, DAVID TRUST #506908 (K1297)	N	4705901596	506908	BRENTON	UNKNOWN	PROD	FLOWING
FRANCIS, DAVID TRUST #506897 (K1292)	N	4705901601	506897	BRENTON	UNKNOWN		
FRANCIS, DAVID TRUST #506988 (K1293)	N	4705901600	506988	BRENTON	UNKNOWN		
FRANCIS, DAVID TRUST #506071 (K1291)	N	4705901602	506071	BRENTON	UNKNOWN		
FRANCIS, DAVID TRUST #510226 (K1412)	N	4705901855	510226	BRENTON	UNKNOWN	PROD	FLOWING
FRANCIS, DAVID TRUST #506895 (K1289)	N	4705901604	506895	BRENTON	UNKNOWN	PROD	FLOWING
MINGO OIL & GAS #507040	Y	4705901635	507040	BRENTON	BEREA,BIG LIME,DEV. SHALE,GORDON,HURON	PROD	C
RITTER LUMBER COMPANY #507717	Y	4710902302	507717	BRENTON	BIG LIME,GORDON,MAXTON,RAVENCLIFF	PROD	T&C
RITTER LUMBER COMPANY #507716	Y	4710902301	507716	BRENTON	BIG LIME,GORDON,MAXTON,RAVENCLIFF	PROD	C
RITTER LUMBER COMPANY #506611	Y	4710902398	506611	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	C
RITTER LUMBER COMPANY #506612	Y	4710902399	506612	BRENTON	BEREA,BIG LIME,MIDDLE MAXTON	PROD	C
ISLAND CREEK COAL COMPANY #507129	Y	4704501627	507129	BRENTON	BEREA,DEVONIAN SHALE	PROD	C
ISLAND CREEK COAL COMPANY #507195	Y	4704501628	507195	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
ISLAND CREEK COAL COMPANY #507157	Y	4704501637	507157	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
ISLAND CREEK COAL COMPANY #506291	Y	4704501681	506291	BRENTON	BIG INJUN,DEVONIAN SHALE,WEIR	PROD	FLOWING
COLE, ALBERT #506753	Y	4704501640	506753	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	FLOWING
SIBLEY COAL & COKE COMPANY #507236	Y	4704701301	507236	BRENTON	BEREA,DEVONIAN SHALE,GORDON	PROD	FLOWING
COLE, ALBERT #507155	Y	4704501641	507155	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
RITTER LUMBER COMPANY #507026	Y	4710902278	507026	BRENTON	BEREA,BIG LIME,HURON,LOWER SHALE	PROD	FLOWING
ELSWICK, FRANKLIN #538412	N	4502726404	538412	BRENTON	UNKNOWN	PROD	FLOWING
ELSWICK, FRANKLIN #538413	N	4502726205	538413	BRENTON	UNKNOWN	PROD	FLOWING
RITTER LUMBER COMPANY #509552	Y	4710902425	509552	BRENTON	BEREA,MAXTON,RAVENCLIFF,WEIR	PROD	FLOWING
RITTER LUMBER COMPANY #509561	Y	4704501601	509561	BRENTON	BEREA,DEVONIAN SHALE,RAVENCLIFF	PROD	FLOWING
MCDONALD LAND COMPANY #508127	Y	4704501628	508127	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
HAMILGOODYKOONTZ #506408	Y	4705901533	506408	BRENTON	UNKNOWN	PROD	FLOWING
STOKES, ANNE #507518	Y	4710902338	507518	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
ISLAND CREEK COAL COMPANY "D" #506229	Y	4705901637	506229	BRENTON	UNKNOWN	PROD	FLOWING
STOKES, ANNE #507529	Y	4710902338	507529	BRENTON	BEREA,BIG LIME,LOWER HURON	PROD	FLOWING
THACKER LAND COMPANY #506446	Y	4705901686	506446	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,	PROD	FLOWING
RITTER LUMBER COMPANY #506202	Y	4710902071	506202	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	FLOWING
POCAHONTAS CARNEGIE #506384	Y	4705901660	506384	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
STOKES, ANNE #507524	Y	4710902337	507524	BRENTON	BEREA,LOWER DEVONIAN	PROD	FLOWING
ISLAND CREEK COAL COMPANY #506692	Y	4705901688	506692	BRENTON	BEREA,DEVONIAN SHALE,SUNBURY	PROD	FLOWING
CLINCHFIELD COAL COMPANY #507926	Y	4502725958	507926	BRENTON	BIG LIME	PROD	FLOWING
CHAFIN LAND COMPANY #507595	Y	4704501676	507595	BRENTON	BEREA,BIG LIME,LOWER SHALE	PROD	FLOWING
ISLAND CREEK COAL COMPANY #506935	Y	4705901642	506935	BRENTON	BEREA,DEVONIAN SHALE	PROD	FLOWING
MOHAWK LAND COMPANY #507979	Y	4704701860	507979	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,GORDON	PROD	FLOWING
PARDEE LAND COMPANY #507402	Y	4704501554	507402	BRENTON	BEREA,BIG LIME,GORDON,LOWER SHALE	PROD	FLOWING
MOHAWK LAND COMPANY #508028	Y	4704702043	508028	BRENTON	BEREA,BIG LIME,LOWER SHALE	PROD	FLOWING
CARTER LAND COMPANY #509577	Y	4704701995	509577	BRENTON	BEREA,BIG LIME,RAVENCLIFF,WEIR	PROD	FLOWING
OSWALD, ENID #507842	Y	4704701979	507842	BRENTON	BEREA,BIG LIME,GORDON	PROD	FLOWING
AMHERST COAL COMPANY #506197	Y	4704501560	506197	BRENTON	BEREA,BIG LIME,LOWER DEVONIAN,WEIR	PROD	FLOWING
POCAHONTAS/CARNEGIE #508070	Y	4705901689	508070	BRENTON	BEREA,GORDON,LOWER SHALE	PROD	FLOWING
RITTER LUMBER COMPANY #507709	Y	4710902466	507709	BRENTON	BIG LIME,PRINCETON,RAVENCLIFF	PROD	FLOWING
POCAHONTAS/CARNEGIE #508069	Y	4705901695	508069	BRENTON	BEREA,BIG LIME,DEVON SHALE,GORDON,WEIR	PROD	FLOWING
POCAHONTAS/CARNEGIE #508068	Y	4705901697	508068	BRENTON	BEREA,GORDON,LOWER HURON	PROD	FLOWING
CARTER LAND COMPANY #507233	Y	4704701994	507233	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	FLOWING
ISLAND CREEK COAL COMPANY #507109	Y	4704501636	507109	BRENTON	BIG LIME,LOWER HURON	PROD	FLOWING
RED JACKET #506444	Y	4705901585	506444	BRENTON	BIG LIME,DEVONIAN SHALE,LOWER HURON	PROD	FLOWING
CHEW, MARGARET #507275	Y	4704501702	507275	BRENTON	LOWER HURON	PROD	FLOWING
EDWARDS, T. W. #507963	Y	4704701802	507963	BRENTON	BEREA	PROD	FLOWING
SOUTHERN LAND COMPANY #507384	Y	4704501776	507384	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,LWR HURON	PROD	FLOWING
RITTER LUMBER COMPANY #507714	Y	4710902529	507714	BRENTON	BEREA,BIG LIME,GORDON	PROD	FLOWING
RITTER LUMBER COMPANY #506508	Y	4710902293	506508	BRENTON	BEREA,RAVENCLIFF,SUNBURY	PROD	FLOWING
RITTER LUMBER COMPANY #507693	Y	4710902503	507693	BRENTON	LOWER MAXTON,PRINCETON	PROD	FLOWING
RITTER LUMBER COMPANY #506584	Y	4710902464	506584	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	FLOWING
RITTER LUMBER COMPANY #507697	Y	4710902323	507697	BRENTON	BIG LIME,GORDON,RAVENCLIFF	PROD	FLOWING
OSWALD, ENID #507859	Y	4704701980	507859	BRENTON	BEREA,BIG LIME,GORDON,MAXTON	PROD	FLOWING
RITTER LUMBER COMPANY #507701	Y	4710902504	507701	BRENTON	BIG LIME,LOWER MAXTON,RAVENCLIFF	PROD	FLOWING
RITTER LUMBER COMPANY #509554	Y	4710902324	509554	BRENTON	RAVENCLIFF	PROD	FLOWING
CARTER LAND COMPANY #510574	Y	4704702077	510574	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	FLOWING
POCAHONTAS/CHATTEROY #506484	Y	4705901641	506484	BRENTON	BEREA,BIG INJUN,LOWER HURON	PROD	FLOWING
RITTER LUMBER COMPANY #506579	Y	4710902517	506579	BRENTON	BEREA,BIG LIME,MIDDLE MAXTON	PROD	FLOWING
ISLAND CREEK COAL COMPANY #506737	Y	4705901723	506737	BRENTON	LOWER HURON	PROD	FLOWING
RICHARDSON, CHARLES #503089	N	4502726681	503089	BRENTON	UNKNOWN		
OSWALD, ENID #507853	Y	4704702076	507853	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	FLOWING
RITTER LUMBER COMPANY #506597	Y	4710902294	506597	BRENTON	BEREA,RAVENCLIFF	PROD	FLOWING
OSWALD, ENID #507854	Y	4704702075	507854	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
RITTER LUMBER COMPANY #506595	Y	4710902292	506595	BRENTON	BEREA,BIG LIME,RAVENCLIFF	PROD	FLOWING
OSWALD, ENID #507838	Y	4704702086	507838	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,WEIR	PROD	FLOWING
PLUM CREEK RED JACKET #506963	Y	4705901738	506963	BRENTON	BIG LIME,DEVONIAN SHALE	PROD	FLOWING
SOUTHERN LAND COMPANY #507355	Y	4700501992	507355	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
POCAHONTAS/CARNEGIE #506053	Y	4705901743	506053	BRENTON	UNKNOWN	PROD	FLOWING
PLUM CREEK RED JACKET #506964	Y	4705901737	506964	BRENTON	BEREA,BIG INJUN,MAXTON,DEVON SHALE,WEIR	PROD	FLOWING
SOUTHERN LAND COMPANY #507389	Y	4700501970	507389	BRENTON	LOWER HURON	PROD	FLOWING
PLUM CREEK RED JACKET #506965	Y	4705901738	506965	BRENTON	BEREA,BIG INJUN,LOWER DEVONIAN	PROD	FLOWING
PARDEE LAND COMPANY #507327	Y	4704501784	507327	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE,GORDON	PROD	FLOWING
RITTER LUMBER COMPANY #509556	Y	4710902580	509556	BRENTON	BEREA,BIG LIME,MAXTON,RAVENCLIFF	PROD	FLOWING
PLUM CREEK RED JACKET #506966	Y	4705901739	506966	BRENTON	BEREA,BIG LIME,LOWER HURON,WEIR	PROD	FLOWING
CUB CREEK COAL COMPANY #507009	Y	4710902578	507009	BRENTON	BEREA,BIG LIME,DEV SHALE,GORDON,HURON	PROD	FLOWING
HEARTWOOD FOREST LAND #509553	Y	4710902584	509553	BRENTON	BEREA,BIG LIME,LOWER MAXTON	PROD	FLOWING
PARDEE LAND COMPANY #507360	Y	4704501786	507360	BRENTON	BEREA,BIG LIME,GORDON,HURON,WEIR	PROD	FLOWING
HEARTWOOD FOREST LAND #506967	Y	4705901740	506967	BRENTON	BIG INJUN,BIG LIME,LOWER HURON	PROD	FLOWING
PLUM CREEK RED JACKET #506969	Y	4705901742	506969	BRENTON	BIG INJUN,BIG LIME,LOWER HURON		
DIVISION OF NATURAL RESOURCES #507862	Y	4704702107	507862	BRENTON	BEREA,BIG INJ,BIG LIME,GORDON,LWR MAXTON	PROD	FLOWING
HAWLEY COAL COMPANY #510641	N	4705500261	510641	BRENTON	UNKNOWN		
PARDEE LAND COMPANY #506454	Y	4710902593	506454	BRENTON	BEREA,GORDON,LOWER HURON,MAXTON	PROD	FLOWING

PLUM CREEK RED JACKET #506968	Y	4705901741	506968	BRENTON	UNKNOWN		
GREATER WISE INCORPORATED #507971	Y	4705901701	507971	BRENTON	BEREA,BIG LIME,DEV SHALE,GORDON,HURON,	PROD	FLOWING
HEARTWOOD FOREST LAND #507187	Y	4704501782	507187	BRENTON	BEREA,BIG LIME,DEVONIAN SHALE	PROD	FLOWING
HAWLEY COAL COMPANY #510840	N	4705500282	510840	BRENTON	UNKNOWN		
PARDEE LAND COMPANY #507361	Y	4704501787	507361	BRENTON	BEREA,BIG LIME,HURON,DEVONIAN,WEIR	PROD	FLOWING
COLE & CRANE #510522	Y	4704501738	510522	BRENTON	BEREA,BIG LIME,LOWER DEVONIAN,WEIR	PROD	FLOWING
ISLAND CREEK COAL COMPANY #507203	Y	4704501783	507203	BRENTON	BEREA,BIG LIME,LWR HURON,UPR DEVONIAN	PROD	FLOWING
POCAHONTAS/CARNEGIE #510079	Y	4705901644	510079	BRENTON	BIG LIME,LOWER HURON,UPPER DEVONIAN	PROD	FLOWING
MARCUM, TIMOTHY #506296	Y	4704501806	506296	BRENTON	BEREA,INJUN,BIG LIME,HURON,DEVON SHALE		
PLUM CREEK RED JACKET #506985	Y	4705901748	506985	BRENTON	BIG LIME,LOWER HURON,UPPER DEVONIAN		

Appendix H

Groundwater Protection Plan

APPENDIX H

GROUNDWATER PROTECTION PLAN

Facility Name: Twin Branch

County: McDowell

Facility Location:

Postal Service Address:	Box 5-A 17 Twin Branch Road		
Twin Branch, WV 24889			
Latitude :	37.480990	Longitude:	81.667010

Contact Information:

Person:	Chad Carmichael
Phone Number:	(304) 348-7661
E-mail Address:	ccarmichael@eqt.com

Date: 6-30-16

1. A list of all operations that may contaminate the groundwater.

Contamination would be most likely to occur either from a leak, or failure of the underground liquid injection well. Spills on-site would most likely result from either the failure of tanks or liquids unloading operations occurring at the facility. Secondary containment structures are in place at the site in order to prevent a spill. Inspections on-site, and continued maintenance are in place and utilized in order to determine that risk of groundwater contamination from either tanks, or fluid injection is prevented.

2. A description of procedures and facilities used to protect groundwater quality from the list of potential contaminant sources above.

Quarterly inspections are conducted to monitor the facility and ensure it is properly maintained in order to prevent spillage or groundwater contamination.

3. List procedures to be used when designing and adding new equipment or operations.

When new equipment is added to the site, secondary containment calculations and design will be conducted in order to to insure that tanks have appropriate containment. Furthermore, records of injection will be maintained, as well as quarterly inspections will be conducted in order to insure the well is maintained appropriately.

4. Summarize all activities at your facility that are already regulated for groundwater protection.

The facility is presently regulated under the Underground Injection Control (UIC) Program, Spill Prevention, Control, and Countermeasure (SPCC) regulations, and West Virginia Above-ground Storage Tank (AST) Regulations.

5. Discuss any existing groundwater quality data for your facility or an adjacent property.

Groundwater in the area is utilized for residential purposes.

6. Provide a statement that no waste material will be used for deicing or fill material on the property unless allowed by another rule.

No waste material will be used for deicing or fill material at the Twin Branch site.

7. Describe the groundwater protection instruction and training to be provided to the employees. Job procedures shall provide direction on how to prevent groundwater contamination.

EQT maintains a formal written procedure and conducts routine training on groundwater contamination prevention.

8. Include provisions for inspections of all GPP elements and equipment. Inspections must be made quarterly at a minimum.

Quarterly inspections are conducted on-site in order to fulfill GPP requirements. The inspection include evaluations of the secondary containment, tanks located on-site, and the underground liquids injection well. Inspections are recorded and maintained by EQT.

Signature: _____

Date: 6/30/16

Appendix I

Requirement for Financial Responsibility to Plug/Abandon an Injection Well

APPENDIX I

Requirement for Financial Responsibility to Plug/Abandon an Injection Well

To: WV Department of Environmental Protection
Office of Oil and Gas
601 57th Street, SE
Charleston, West Virginia 25304-2345
ATTN: Underground Injection Control Program

From: EQT Production
1 Hillcrest Drive East
Charleston, WV 25311
Attn: Chad Carmichael

Date: 5-7-18

Subject: Underground Injection Control (UIC) Permit Application
2D0471511
Requirement for Financial Responsibility

I, Mike Gavin, verify in accordance with 47CSR13-13.7.g., that I will maintain financial responsibility and resources to close, plug, and abandon underground injection wells(s) in a manner prescribed by the Chief of the Office of Oil and Gas.

Name: Mike Gavin

Signature:

Date: 5/7/18

(4/25)

APPENDIX I

Requirement for Financial Responsibility to Plug/Abandon an Injection Well

VOID

To: WV Department of Environmental Protection
Office of Oil and Gas
601 57th Street, SE
Charleston, West Virginia 25304-2345
ATTN: Underground Injection Control Program

From: EQT Production
550 Eagen Street
Charleston, WV

Date:

Subject: Underground Injection Control (UIC) Permit Application
UIC2D0471511
Requirement for Financial Responsibility

I, HAD ARMICHAEL, verify in accordance with 47CSR13-13.7.g., that I will maintain financial responsibility and resources to close, plug, and abandon underground injection wells(s) in a manner prescribed by the Chief of the Office of Oil and Gas.

Name: HAD ARMICHAEL

Signature:

Date: 6/30/16

Received
JUN 30 2016
Office of Oil and Gas
WV Dept. of Environmental Protection

Appendix J

Site Security for Commercial Facilities

APPENDIX J

Site Security for Commercial Facilities

Provide a detailed description of the method(s) utilized at the facility to restrict or prohibit illegal dumping of unauthorized waste or vandalism at the facility.

1. Complete enclosure of all wells, holding tank/pits and manifold assemblies within a chain link or other suitable fencing; and

2. Require that all gates and other entry points be locked when the facility is unattended; or

3. Providing tamper-proof seals for the master valve on each well (a "lock-out" or chain & padlock system would be more secure; however, these devices could create a potential safety hazard if the well needed to be quickly shut in due to an emergency); and

4. Installing locking caps on all valves and connections on holding tanks, unloading racks, and headers.

The security of the Twin Branch UIC facility is deemed sufficient to restrict or prohibit illegal dumping or unauthorized was and to deter vandalism of the facility. The entire facility is enclosed by a metal chain link fence, which includes barbed wire across the top of the fence to deter unauthorized access. When EQT personnel are not on side, the fence gate is locked via padlock. EQT well operators visit the site daily and conduct checks to ensure no tampering has occurred before commencing transferring or injection operations.
The pumps utilized for injection of the brine fluid are housed within a cinderblock pump house with a sliding metal door. The pump house is secured with a padlock when not in use by EQT personnel.

Appendix K

Permit and Construction Approvals

APPENDIX K

Identify permit or construction approvals received or applied for under the following programs:

Permit/approvals	ID Number
Hazardous Waste Management Program under RCRA	
NPDES Program	
Prevention of Significant Deterioration (PSD)	
Nonattainment Program	
Dredge or Fill	
NPDES/NPDES – Stormwater	
WVDEP – Office of Waste Management (OWM) – Solid Waste Facility	
WVDEP – OWM – RCRA (Hazardous Waste TSD or Transporter)	
WVDEP – OWM – UST	
CERCLA – Superfund	
WV Voluntary Remediation – Brownfields	
FIFRA – Federal Insecticide, Fungicide and Rodenticide Act	
Well Head Protection Program (WHPP)	
Underground Injection Control (UIC)	UIC2D0471511
Toxic Substances Control Act (TSCA)	
Best Management Plans	
Management of Used Oil	
Other Relevant Permits (Specify):	

Attachment B

Twin Branch Well Schematic

& Logs

COMPANY: EQUITABLE PRODUCTION CO.

WELL: POCAHONTAS LAND # 506168

FIELD: BRENTON DISTRICT

COUNTY: McDOWELL STATE: WV

COUNTY: McDOWELL
Field: BRENTON DISTRICT
Location: LAT. 37 : 28' : 52.3"
Well: POCAHONTAS LAND # 506168
Company: EQUITABLE PRODUCTION CO.

Schlumberger

LITHO DENSITY / NEUTRON
ARRAY INDUCTION IMAGER
AUDIO / TEMPERATURE

LOCATION

LAT. 37 : 28' : 52.3"
LON. 81 : 40' : 00.6"

Elev.: K.B. 1175 ft
G.L. 1165 ft
D.F. 1174 ft

Permanent Datum: GROUND LEVEL Elev.: 1165 ft
Log Measured From: KELLY BUSHING 10.0 ft above Perm. Datum
Drilling Measured From: KELLY BUSHING

API Serial No. 47-4701511		DISTRICT BROWNS CREEK	QUADRANGLE DAVY 7.5'

Logging Date			18-Oct-2001						
Run Number			ONE						
Depth Driller			3575 ft						
Schlumberger Depth			3585 ft						
Bottom Log Interval			3577 ft						
Top Log Interval			0 ft						
Casing Driller Size @ Depth			7.000 in	@	1013 ft		@		
Casing Schlumberger			1022 ft						
Bit Size			7.625 in						
Type Fluid In Hole			AIR						
MUD	Density	Viscosity	0 lbm/gal						
	Fluid Loss	PH							
	Source Of Sample		N/A						
RM @ Measured Temperature				@			@		
RMF @ Measured Temperature				@			@		
RMC @ Measured Temperature				@			@		
Source RMF	RMC		N/A	N/A					
RM @ MRT	RMF @ MRT		@ 97		@ 97		@		@
Maximum Recorded Temperatures			97 degF						
Circulation Stopped	Time								
Logger On Bottom	Time		18-Oct-2001		SEE LOG				
Unit Number	Location		8503	BELLE,WV					
Recorded By			S. SALIM						
Witnessed By			MR. RICK McLEAD						

	Run 1	Run 2	Run 3	Run 4
Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth	@		@	
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
MUD Density / Viscosity				
MUD Fluid Loss / PH				
Source Of Sample				
RM @ Measured Temperature	@		@	
RMF @ Measured Temperature	@		@	
RMC @ Measured Temperature	@		@	
Source RMF / RMC				
RM @ MRT / RMF @ MRT	@	@	@	@
Maximum Recorded Temperatures				
Circulation Stopped / Time				
Logger On Bottom / Time				
Unit Number / Location				
Recorded By				
Witnessed By				

DISCLAIMER

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1	OTHER SERVICES2
OS1: LDT	OS1:
OS2: CNT	OS2:
OS3: AITH	OS3:
OS4: TMT	OS4:
OS5: GR	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
TOOL RAN AS PER TOOL SKETCH	
PRIMARY DEPTH CONTROL BY CALIBRATED IDW	
NEUTRON MATRIX SET TO LIMESTONE	
ASSUMING 5.5 IN PRODUCTION CASING	
MATRIX DENSITY NOTED ON LOG	
-	
-	
-	
-	
-	
-	
THANK YOU FOR USING SCHLUMBERGER	
BELLE OFFICE : 304 949 1977	
CREW : JEFF HUDNALL , DON BROWN	

RUN 1			RUN 2		
SERVICE ORDER #:	7937606		SERVICE ORDER #:		
PROGRAM VERSION:	9C2-303		PROGRAM VERSION:		
FLUID LEVEL:			FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

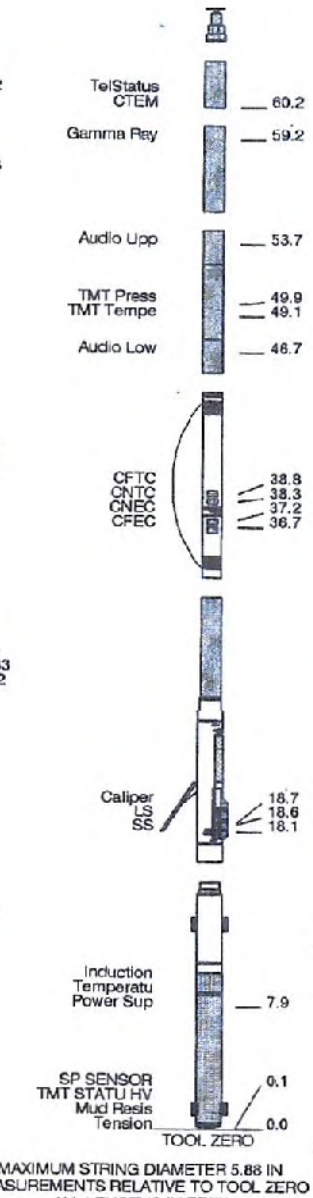
RUN 1 | RUN 2

SURFACE EQUIPMENT

CNB-AB
NCT-B
NCS-VB
GSR-U/Y

WITM (CTS)-A

DOWNHOLE EQUIPMENT



MAXIMUM STRING DIAMETER 5.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Output DLIS Files

DEFAULT	AIT_LDL_CNL_TMT_006LUP	FN:5	PRODUCER	18-Oct-2001 05:26	3594.0 FT	60.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 882.29 F3
Cement Volume = 459.53 F3 (assuming 5.50 IN casing O.D.)
Computed from 3575.0 FT to 1013.0 FT using data channel(s) CALI

OP System Version: 9C2-303

MCM

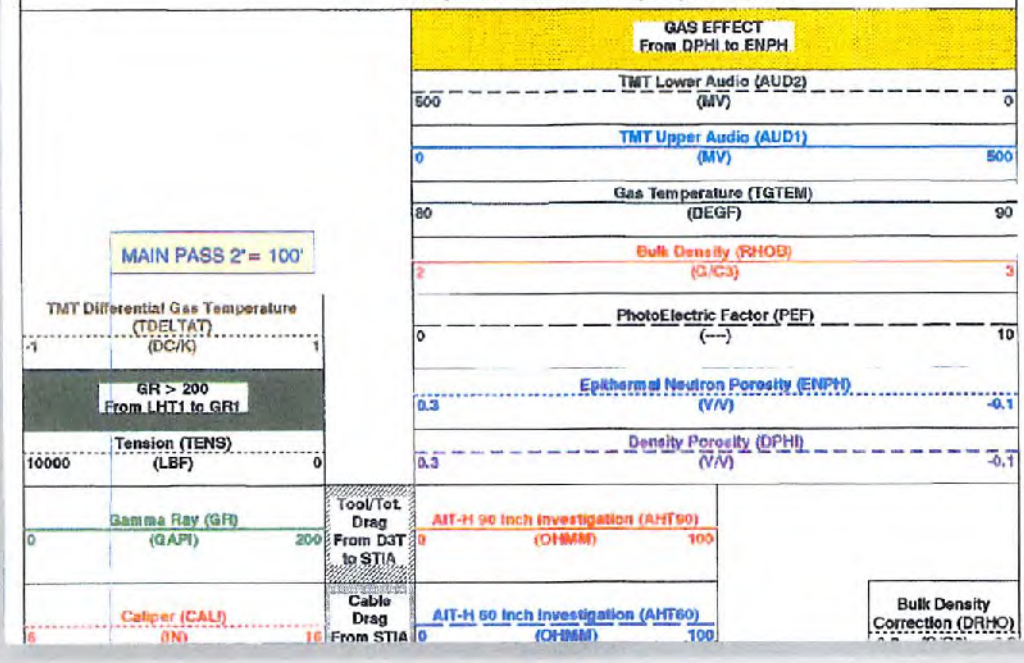
AIT-H	OP92-KP2	LDT-D	OP92-KP2
CNT-G	OP92-KP2	TMT-AA	OP92-KP2
SGT-L	OP92-KP2	TCC-B	OP92-KP2

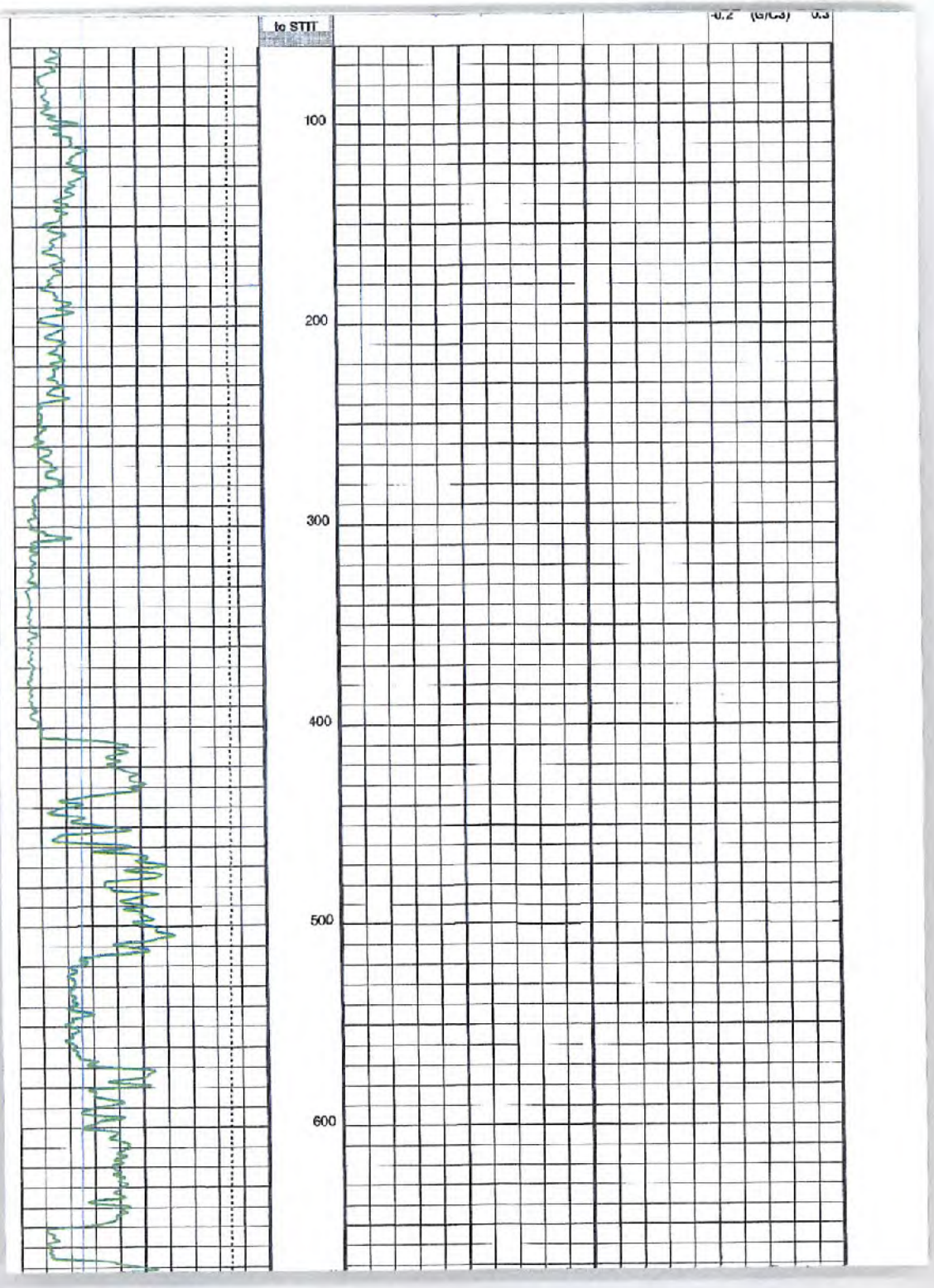
Changed Parameter Summary

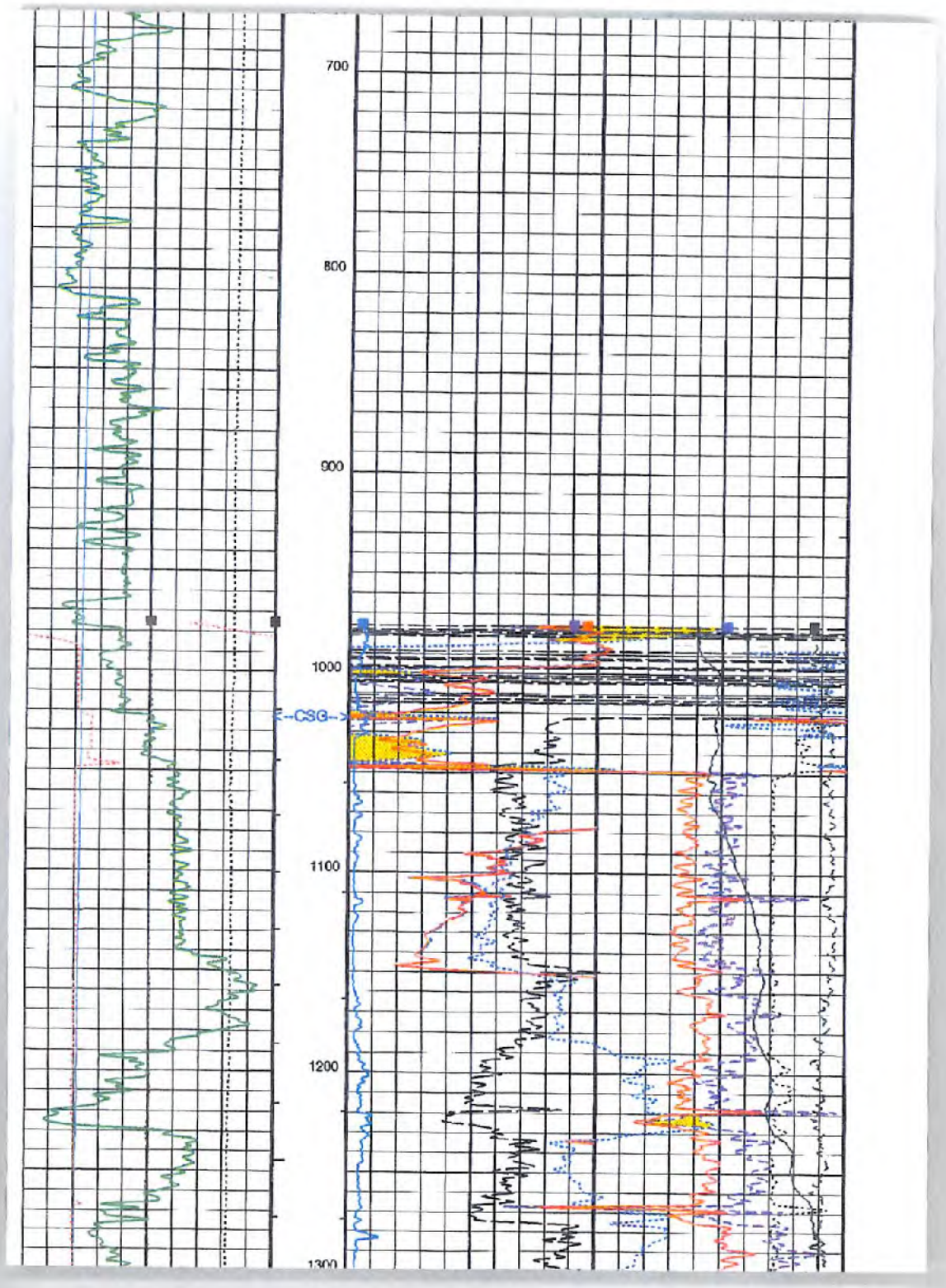
DLIS Name	New Value	Previous Value	Depth & Time
BHT	97 DEGF	85 DEGF	3331.9 05:27:00
BS	7.875 IN	7.625 IN	1567.0 06:14:17
MDEN	2.71 G/C3	2.68 G/C3	2788.4 05:49:30
	2.68 G/C3	2.71 G/C3	2158.0 06:02:24
TD	3585 FT	3575 FT	3456.1 05:33:51
TDL	3585.00 FT	3575.00 FT	3449.0 05:34:04

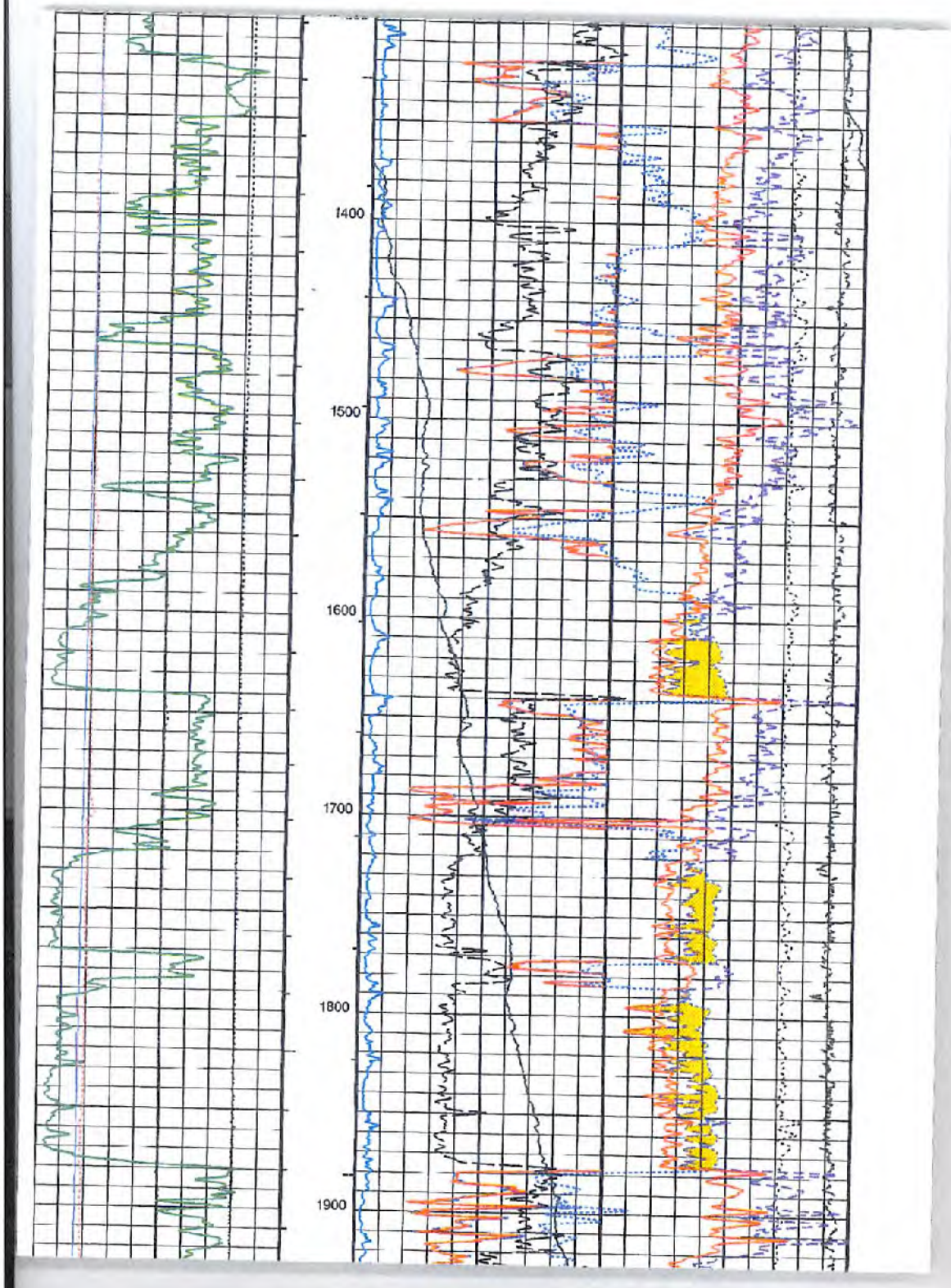
PIP SUMMARY

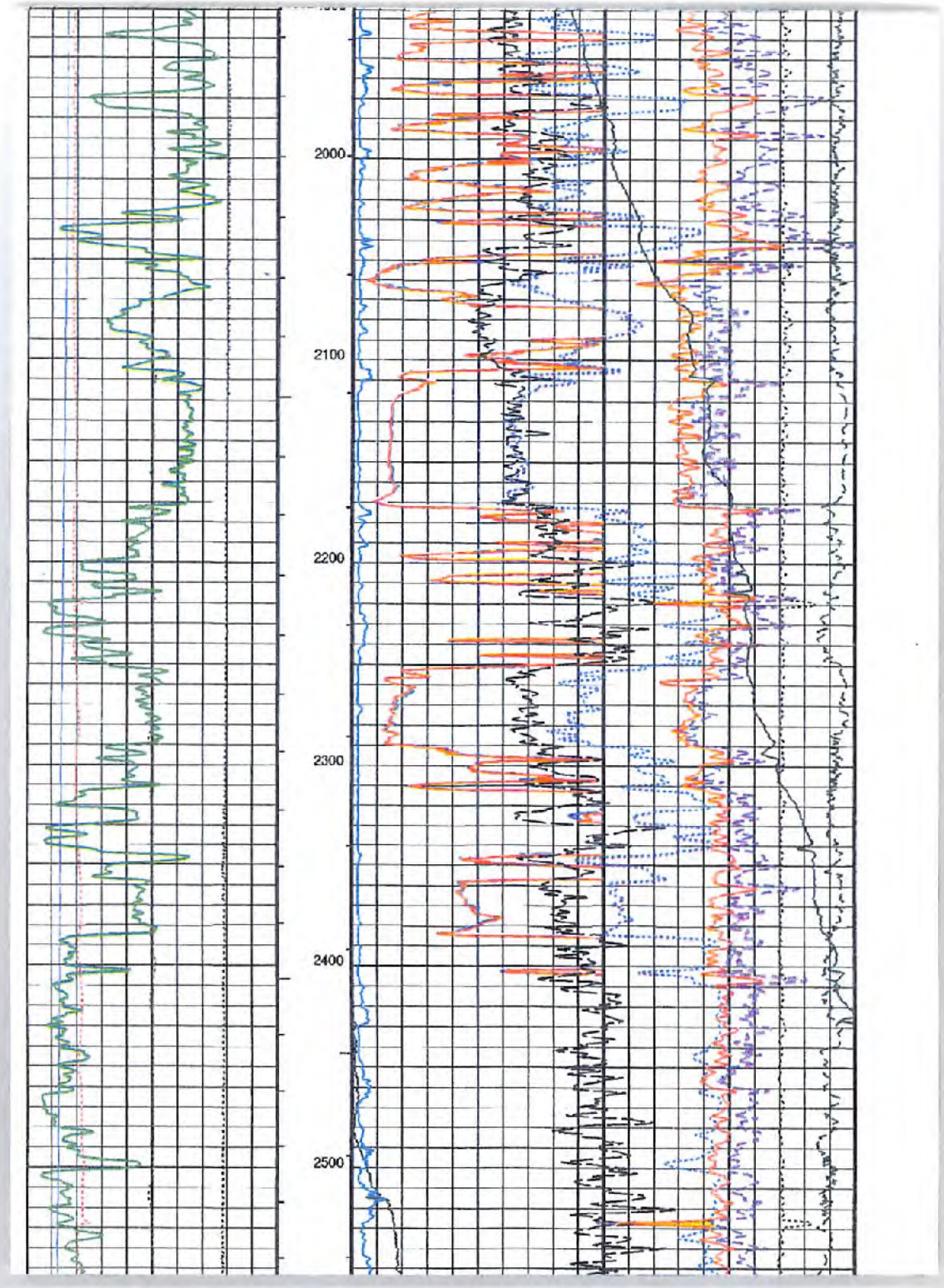
- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

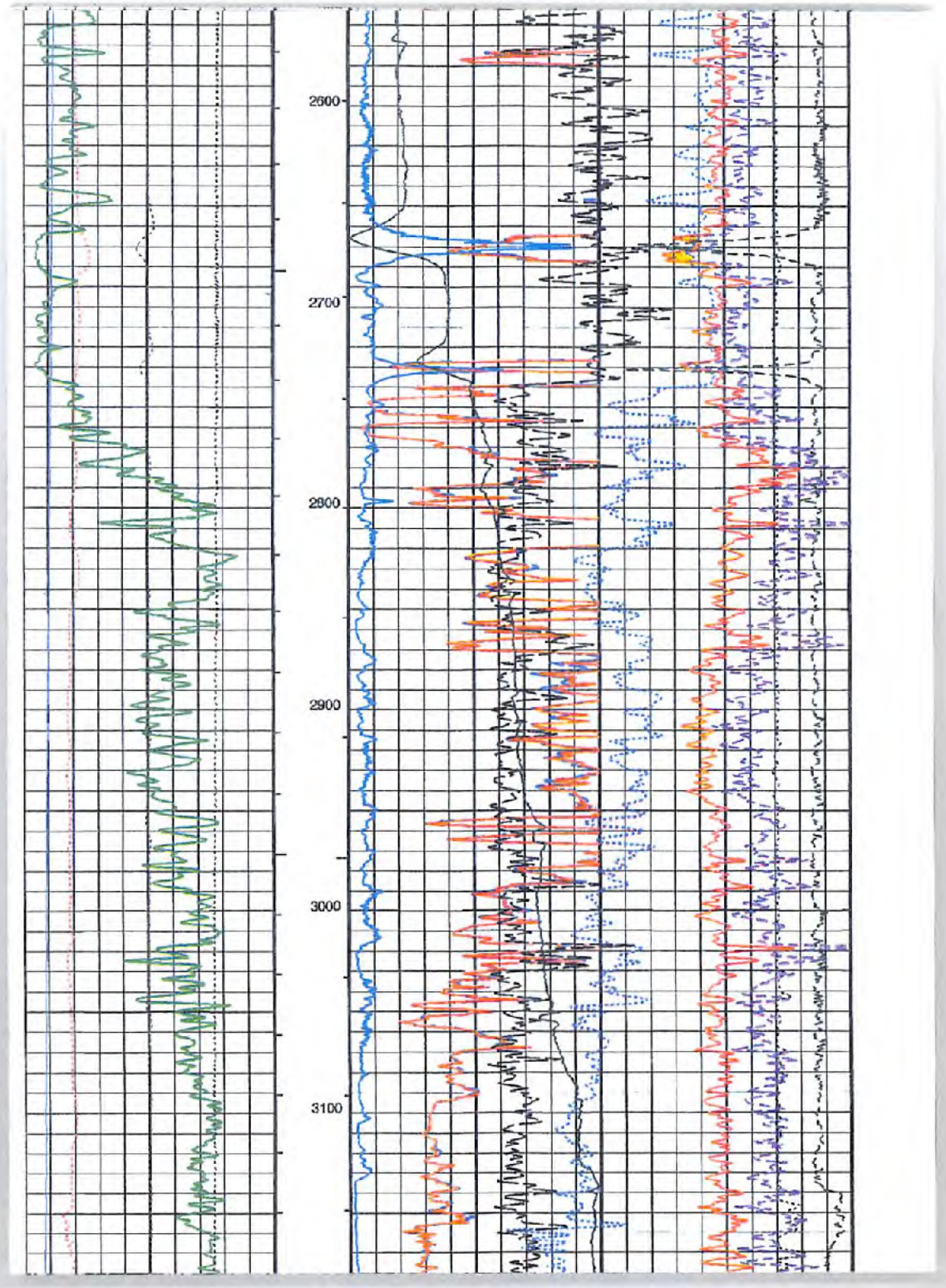


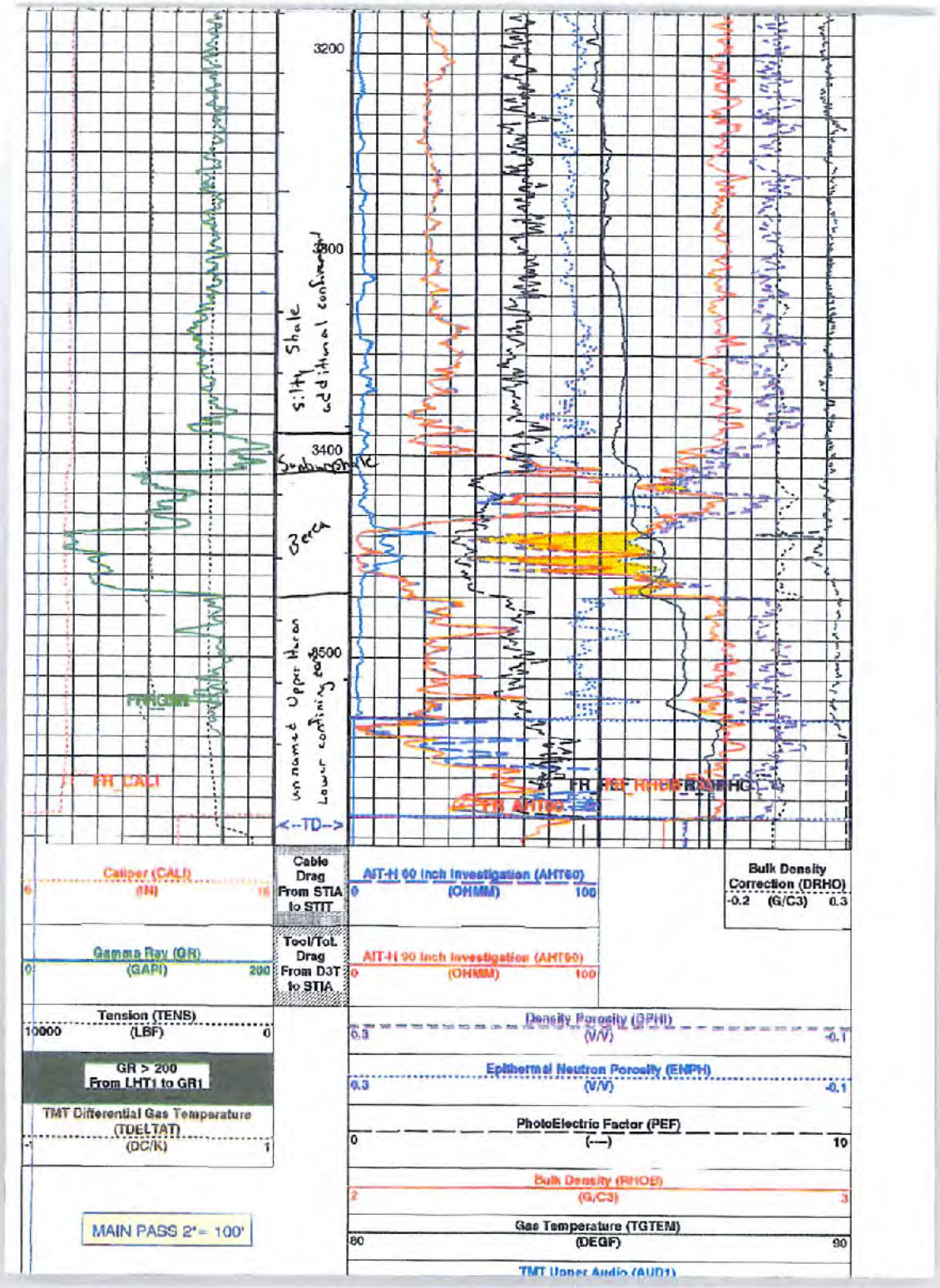












0	(MV)	500
	TMT Lower Audio (AUD2)	
500	(MV)	0

GAS EFFECT
From DPHI to ENPH

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

Parameters

DLIS Name	Description	Value	
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	880	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	108	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (In Borehole)	Eccentered	
AHCSED	Array Induction Casing Shoe Estimated Depth	-50000	FT
AHFRSV	Array Induction Response Set Version for Four ft Resolution	40.70.24.21	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	40.70.24.21	
AHRFV	Array Induction Radial Profiling Code Version Number	700	
AHRPV	Array Induction Radial Parametrization Code Version Number	223	
AHSTA	Array Induction Tool Standoff	0.125	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	40.70.24.21	
BFM	Borehole Fluid Medium	GAS	
BHFL	Borehole Fluid Type	AIR	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	88	DEGF
BS	Bit Size	7.625	IN
DFD	Drilling Fluid Density	0.00	LB/G
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FCD	Future Casing (Outer) Diameter	5.5	IN
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	CALI	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HVCS	Integrated Hole Volume Caliper Selection	CALI	
LBFR	Trigger for MAXIS First Reading Label	STI	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MDEN	Matrix Density	2.68	G/C3
MST	Mud Sample Temperature	-50000.00	DEGF
SHT	Surface Hole Temperature	68	DEGF
STKT	STI Stuck Threshold	3.5	FT
TD	Total Depth	3575	FT
TDD	Total Depth - Driller	3575.00	FT
TDL	Total Depth - Logger	3575.00	FT
TMPTST	TMT Pressure Transducer Selection	10_K	
TMT_ATC	TMT Auto Calibration	ALLOWED	
TTDCI	TMT Temperature Differential Interval	1	FT
WMUD	Mud Weight	0	LB/G

Format: DENSITY_2 Vertical Scale: 2" per 100' Graphics File Created: 18-Oct-2001 05:26

OP System Version: 9C2-303

MCM

AIT-H	OP92-KP2	LDT-D	OP92-KP2
CNT-G	OP92-KP2	TMT-AA	OP92-KP2
SGT-L	OP92-KP2	TCC-B	OP92-KP2

Output DLIS Files

DEFAULT	AIT_LDL_CNL_TMT_006LUP	FN:5	PRODUCER	18-Oct-2001 05:26		

Output DLIS Files

DEFAULT	AIT_LDL_CNL_TMT_006LUP	FN:5	PRODUCER	18-Oct-2001 05:26	3594.0 FT	60.5 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 882.29 F3

Cement Volume = 459.53 F3 (assuming 5.50 IN casing O.D.)

Computed from 3575.0 FT to 4013.0 FT using data channel(s) CALI

Computed from 3575.0 FT to 1013.0 FT using data channel(s): CALI

OP System Version: 9C2-303

MCM

AIT-H	OP92-KP2	LDT-D	OP92-KP2
CNT-G	OP92-KP2	TMT-AA	OP92-KP2
SGT-L	OP92-KP2	TCC-B	OP92-KP2

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
BHT	97 DEGF	85 DEGF	3331.0 05:27:00
BS	7.875 IN	7.625 IN	1567.0 06:14:17
MDEN	2.71 G/C3	2.68 G/C3	2788.4 05:49:30
	2.68 G/C3	2.71 G/C3	2158.0 06:02:24
TD	3585 FT	3575 FT	3456.1 05:33:51
TDL	3585.00 FT	3575.00 FT	3449.0 05:34:04

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 10 F3
- Integrated Hole Volume Major Pip Every 100 F3
- Integrated Cement Volume Minor Pip Every 10 F3
- Integrated Cement Volume Major Pip Every 100 F3

MAIN PASS 5" = 100 '

GAS EFFECT
From DPHI to ENPH

TMT Lower Audio (AUD2)
500 (MV) 0

TMT Upper Audio (AUD1)
0 (MV) 500

Gas Temperature (TGTEM)
80 (DEGF) 90

Bulk Density (RHOB)
2 (G/C3) 3

PhotoElectric Factor (PEF)
0 (---) 10

Epithermal Neutron Porosity (ENPH)
0.3 (V/V) -0.1

Density Porosity (DPHI)
0.3 (V/V) -0.1

TMT Differential Gas Temperature (TDELTAT)
-1 (DC/K) 1

GR > 200
From LHT1 to GR1

Tension (TENS)
10000 (LBF) 0

Gamma Ray (GR)
0 (GAPI) 200

Tool/Tot. Drag From D3T to STIA

AIT-H 90 Inch Investigation (AHT90)
0 (OHMM) 100

Caliper (CALI)
6 (IN) 16

Cable Drag From STIA to STIT

AIT-H 60 Inch Investigation (AHT60)
0 (OHMM) 100

Bulk Density Correction (DRHO)
-0.2 (G/C3) 0.3

100

KEY ENERGY SURVEYS

DUAL RECEIVER
GAMMA RAY / CCL
CEMENT BOND / VDL

CO. EQUITABLE PRODUCTION COMPANY
WELL POCAHONTAS LAND
FIELD BRENTON DISTRICT
CNTY MCDOWELL ST W.VA

COMPANY EQUITABLE PRODUCTION COMPANY
WELL POCAHONTAS LAND # 506168
FIELD BRENTON DISTRICT
COUNTY MCDOWELL STATE W.VA

LOCATION:
PERMIT NO. 47-470-1511

SEC. _____ TWP. _____ RGE. _____

OTHER SERVICES:

PERMANENT DATUM GROUND LEVEL ELEV. 1165
LOG MEASURED FROM K.B. 10 ABOVE PERMANENT DATUM
DRILLING MEASURED FROM K.B.

ELEV.: K.B. 1175
D.F. 1174
G.L. 1165

DATE	10-25-01		
RUN NO.	ONE		
DEPTH DRILLER	3575		
DEPTH LOGGER	3503		
BTM. LOG INTERVAL	3501		
TOP LOG INTERVAL	550		
OPEN HOLE SIZE	6.25		
TYPE FLUID	H20 & ACID		
DENS. : VISC.	N/A		
MAX. REC. TEMP.	N/A		
EST. CEMENT TOP	910		
TIME WELL READY			
TIME LOGGER ON BTM.			
EQUIP. NO.	60131		
LOCATION	DUNBAR		
RECORDED BY	T. BURDETTE		
WITNESSED BY	MR. NAY		

BOREHOLE RECORD / TUBING RECORD

RUN NO.	BIT	FROM	TO	SIZE	WGT.	FROM	TO

CASING RECORD	SIZE	WT/FT	GRADE	TYPE JOINT	TOP	BOTTOM
SURFACE STRING.	7				SURF.	1013
PROT. STRING	5 1/2				SURF.	T.D.
PROD. STRING						
LINER						

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENT AND WE CANNOT AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES, OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO OUR GENERAL TERMS AND CONDITIONS SET OUT IN OUR CURRENT PRICE SCHEDULE.

REMARKS:

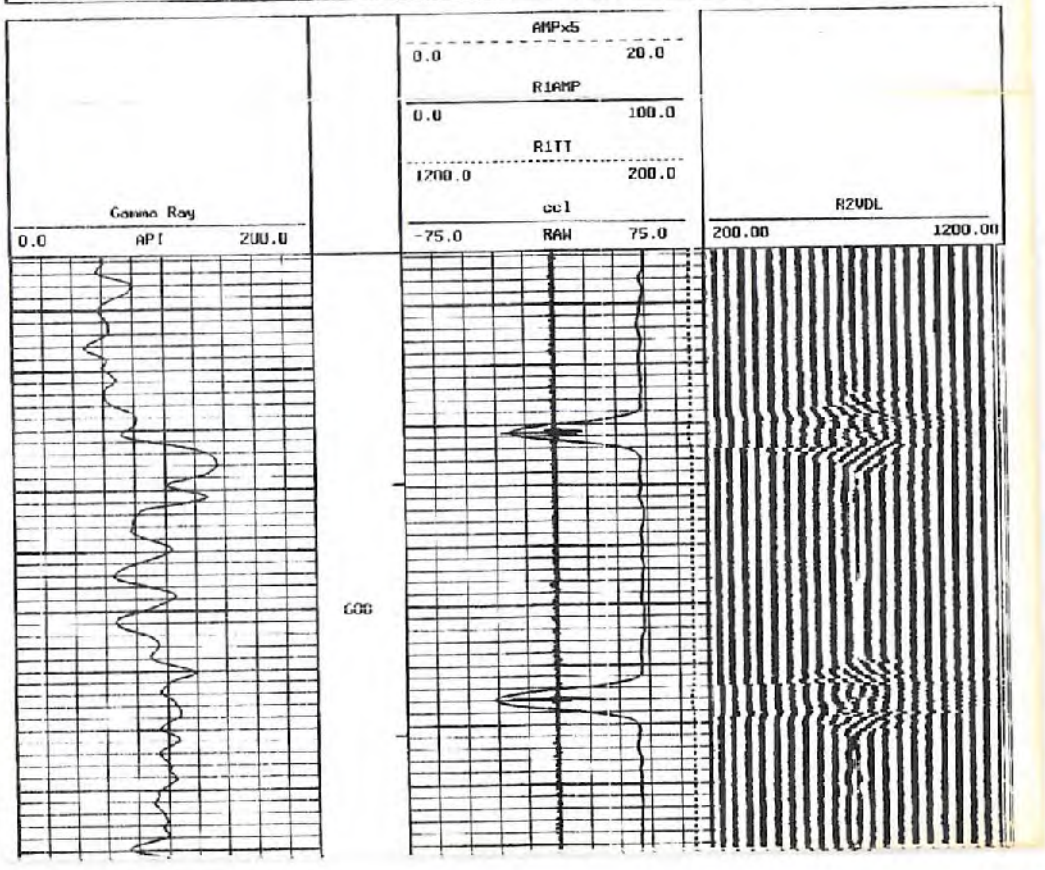
THANK YOU FOR CHOOSING KEY ENERGY

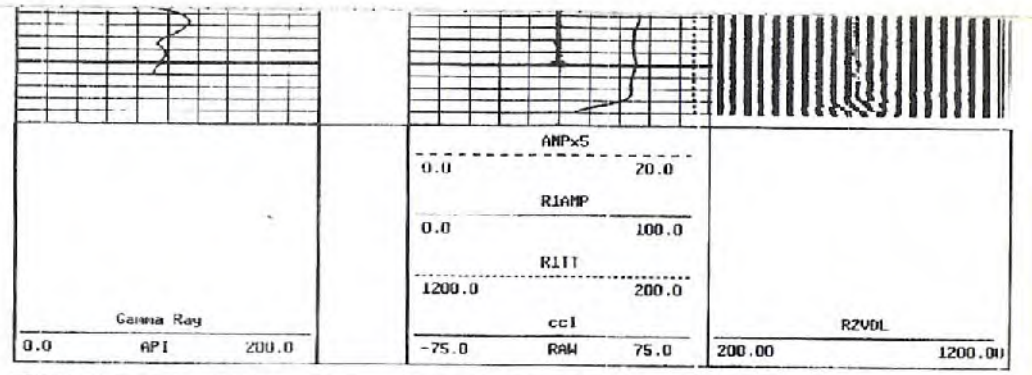
1ST STAGE 3412-3468 108 HOLES HSC.

STOP DEPTH: 541.3 FEET
DIRECTION: UP 1:240
FILE: 11579RT.PTS

CALIBRATION SECTION

FILE DATE: 10-25-2001
TIME: 08:53
PLOT DATE: 10-25-2001
TIME: 11:19 V1.57





START DEPTH: 660.0 FEET
DIRECTION: UP 1:240
FILE: 11579R1.PTS

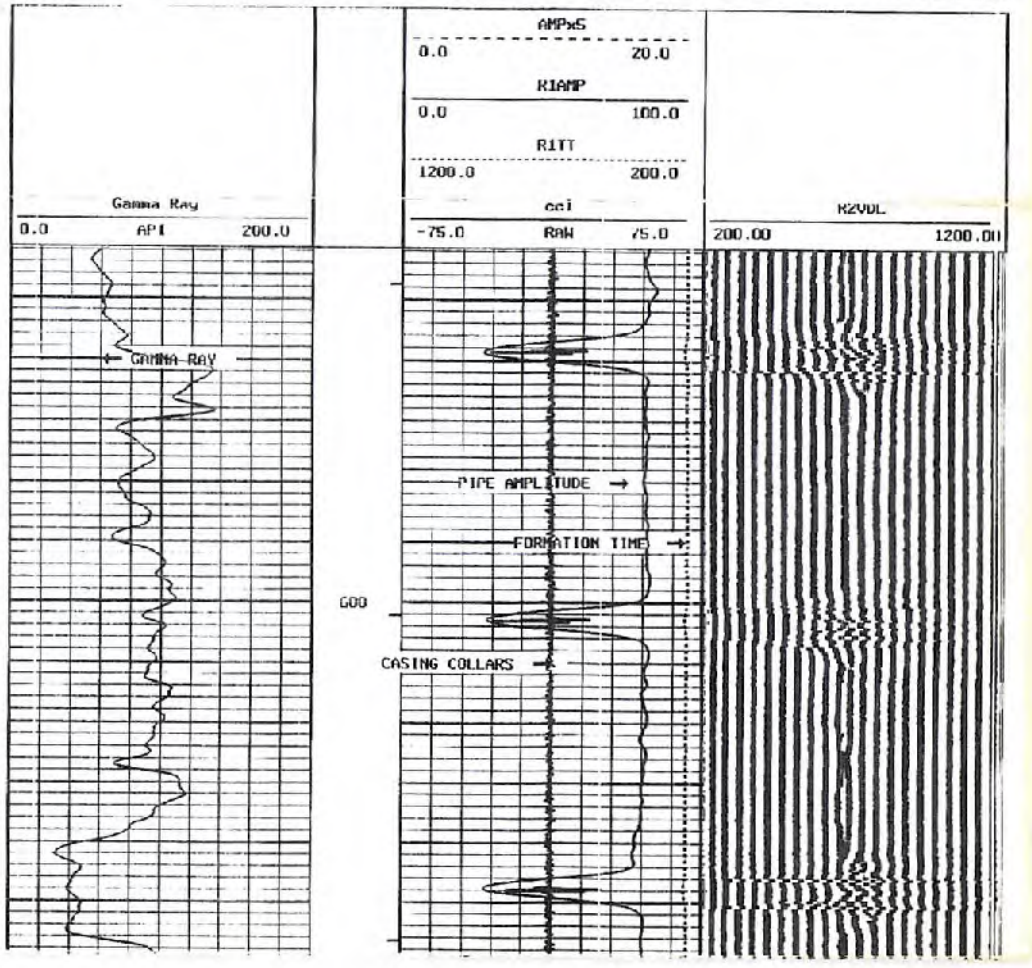
CALIBRATION SECTION

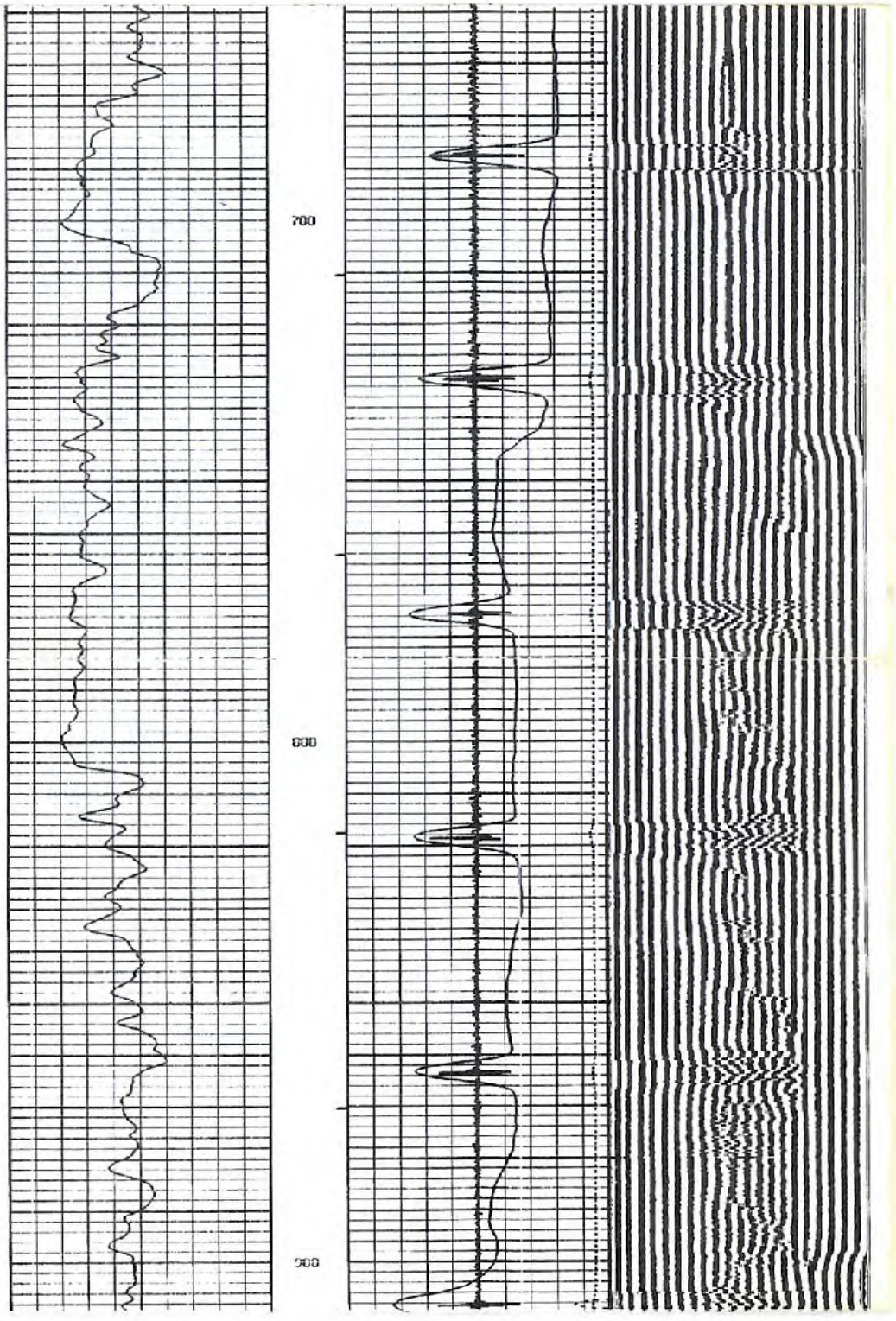
FILE DATE: 10-25-2001
TIME: 08:53
PLOT DATE: 10-25-2001
TIME: 11:18 V1.57

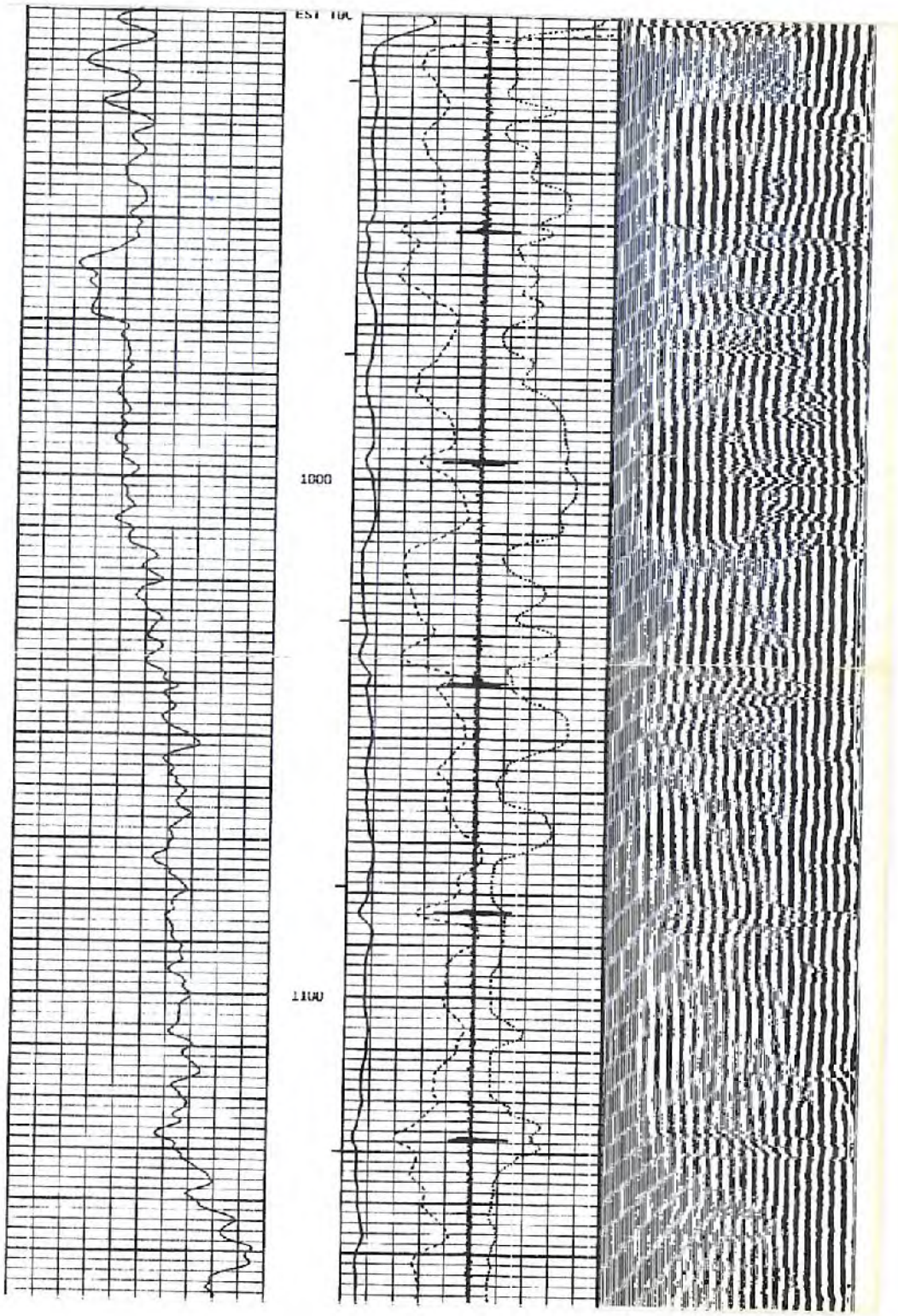
STOP DEPTH: 541.6 FEET
DIRECTION: UP 1:240
FILE: 11579M.PTS

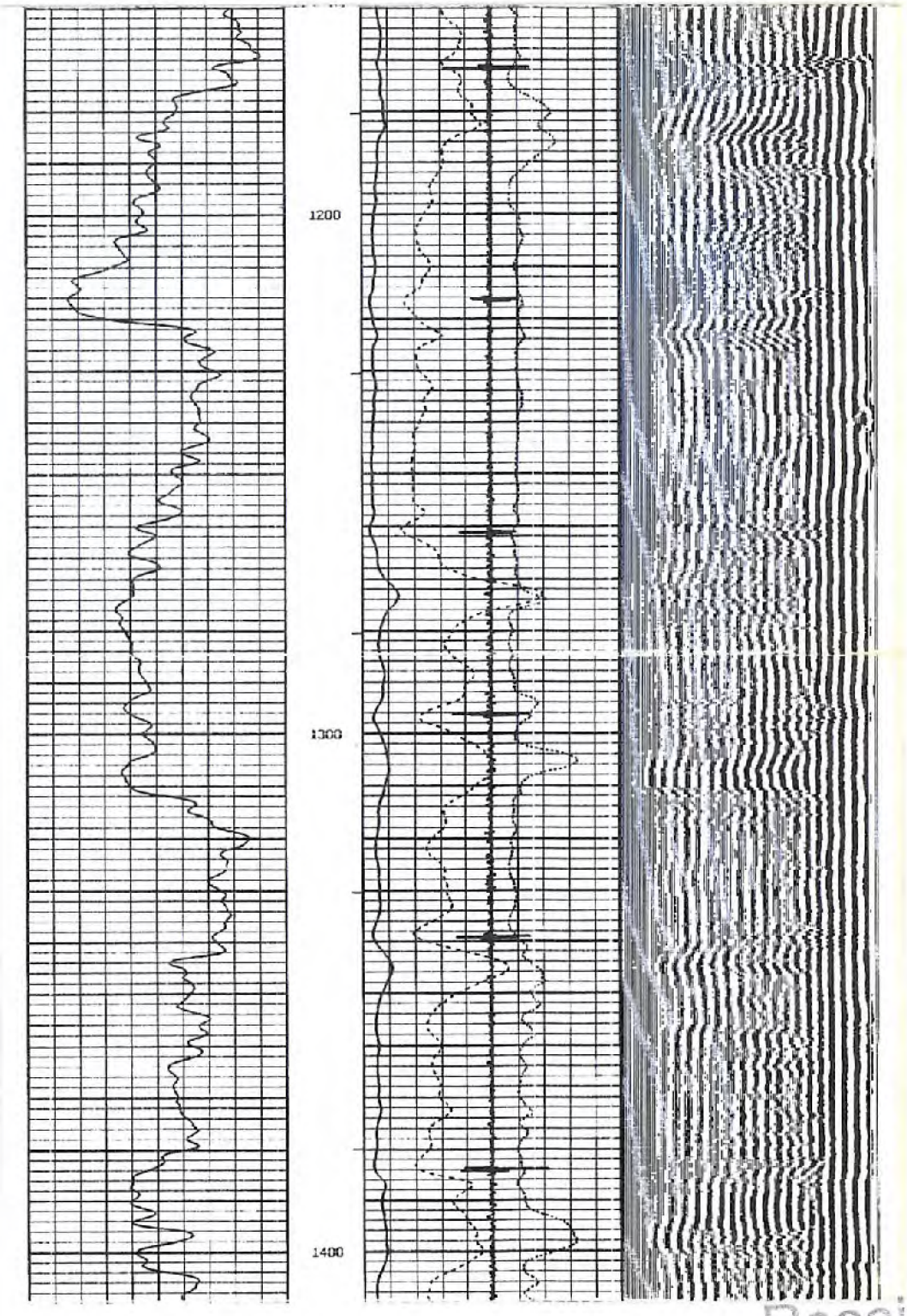
MAIN SECTION

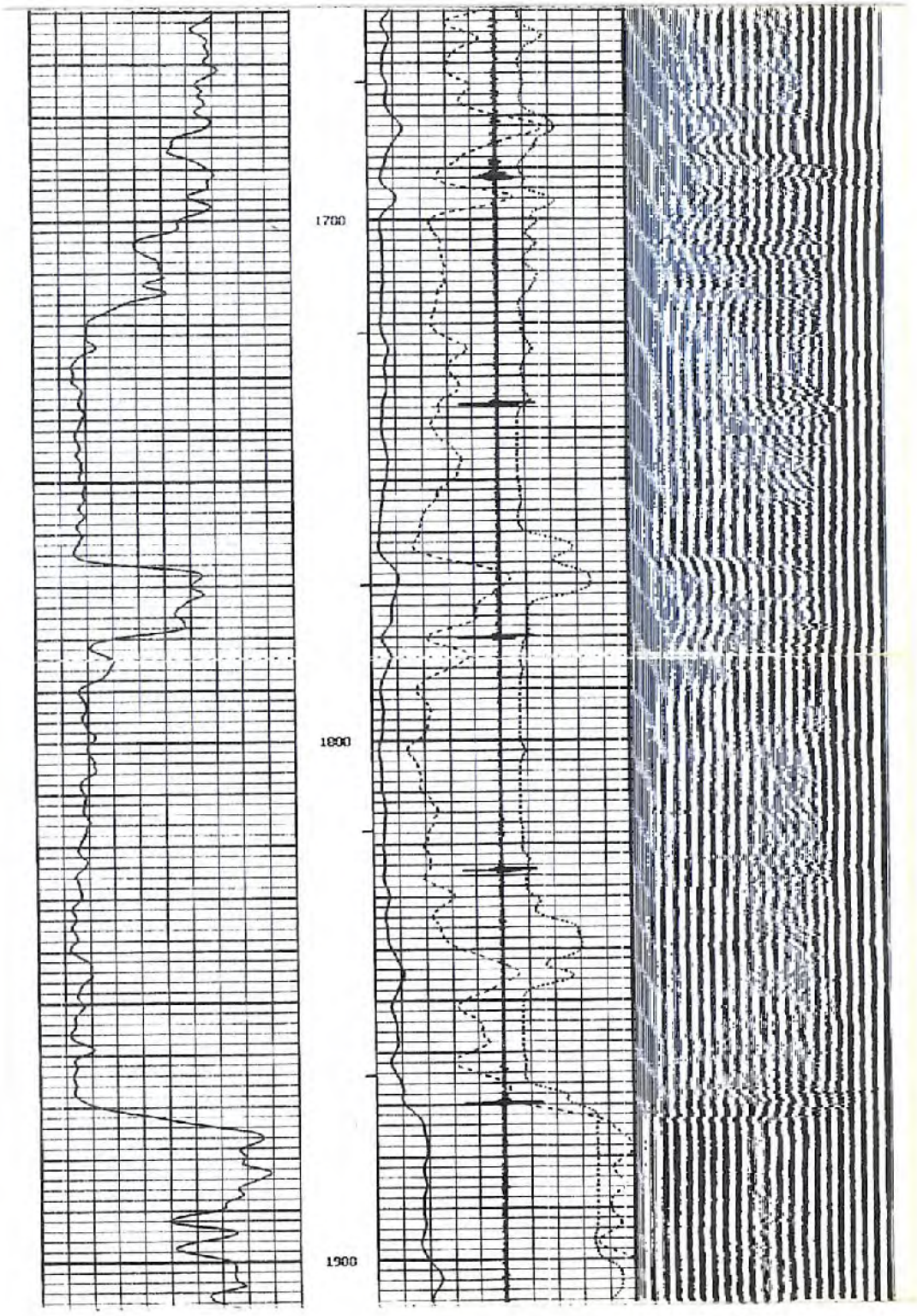
FILE DATE: 10-25-2001
TIME: 10:28
PLOT DATE: 10-25-2001
TIME: 11:25 V1.57

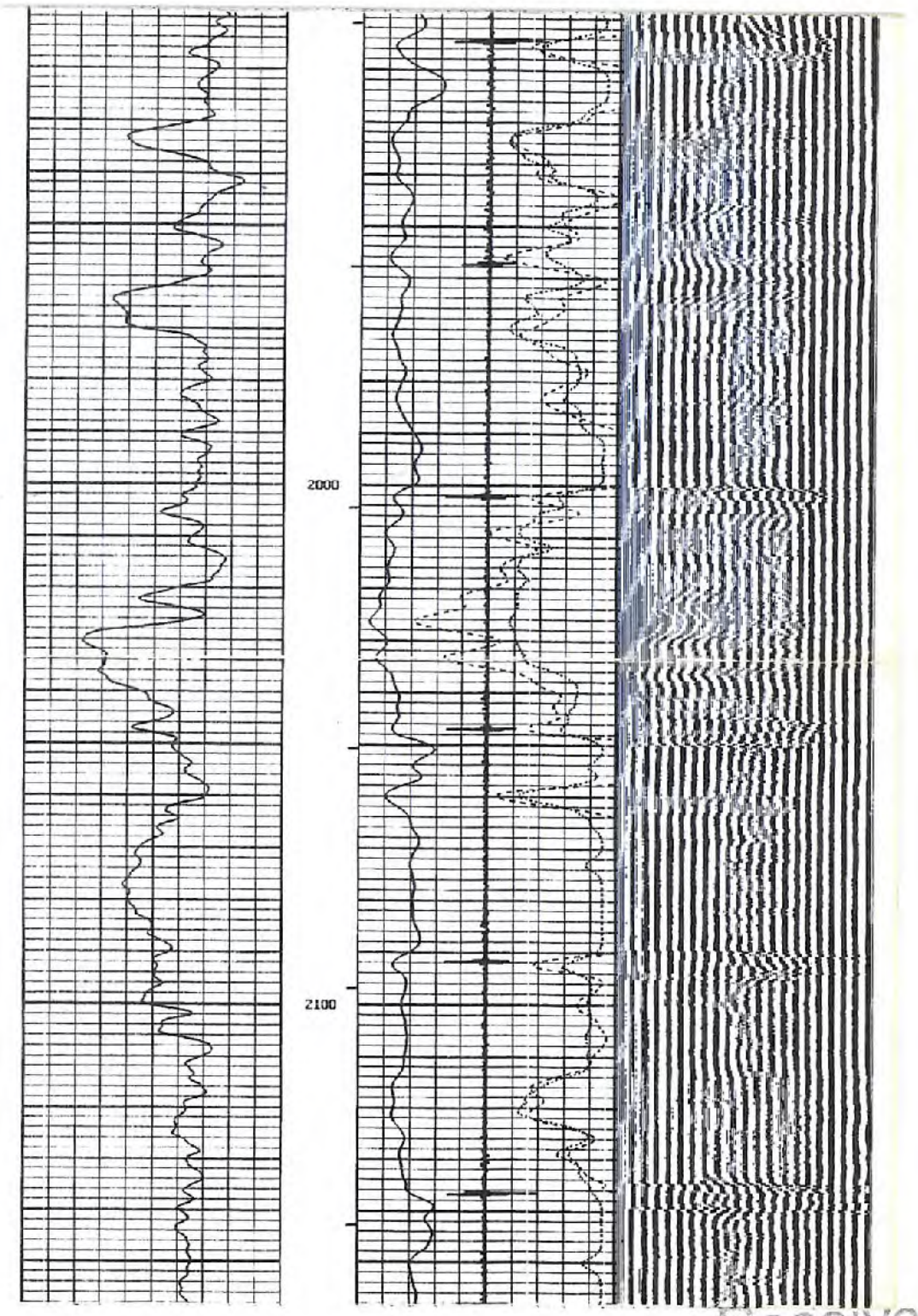


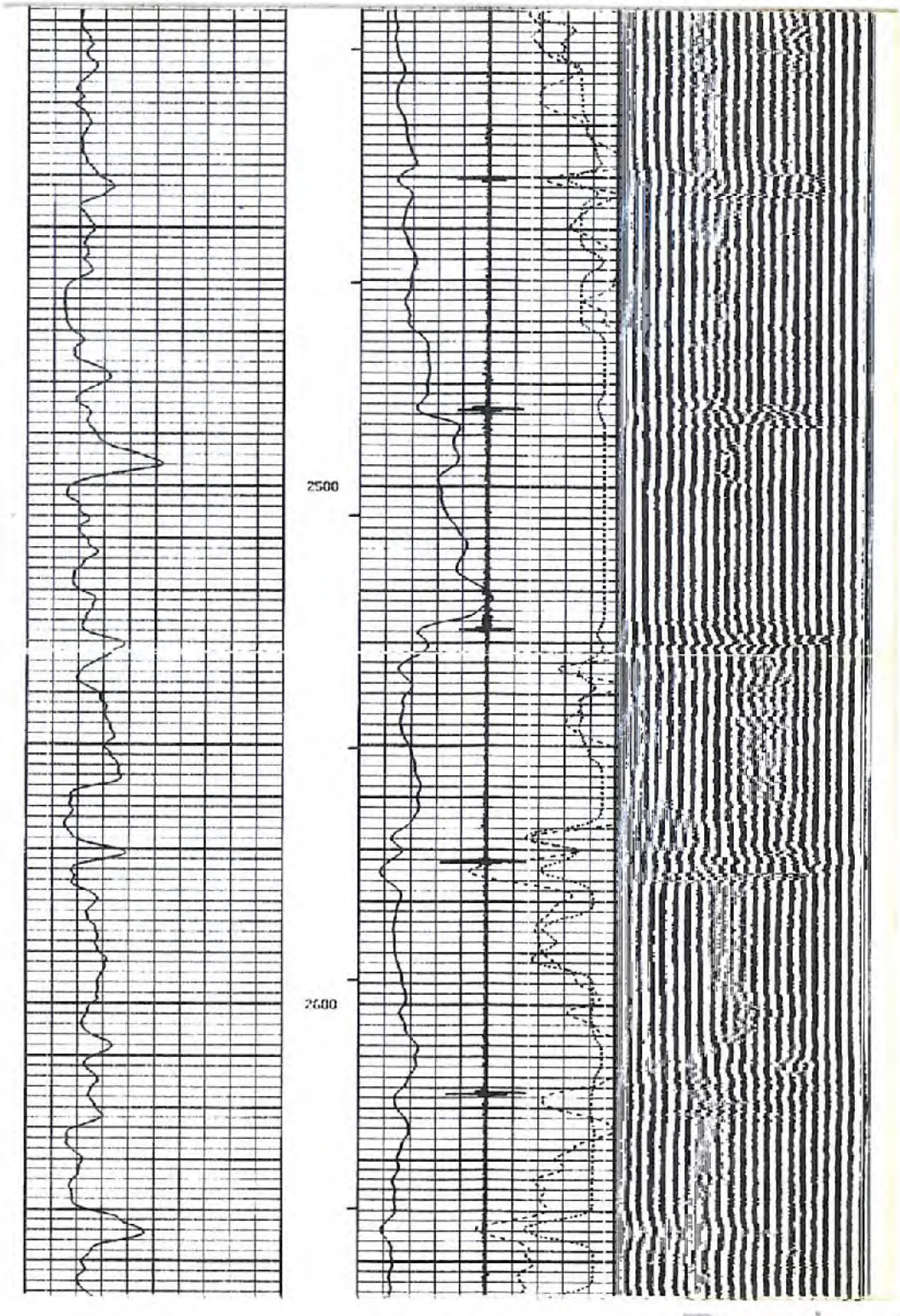


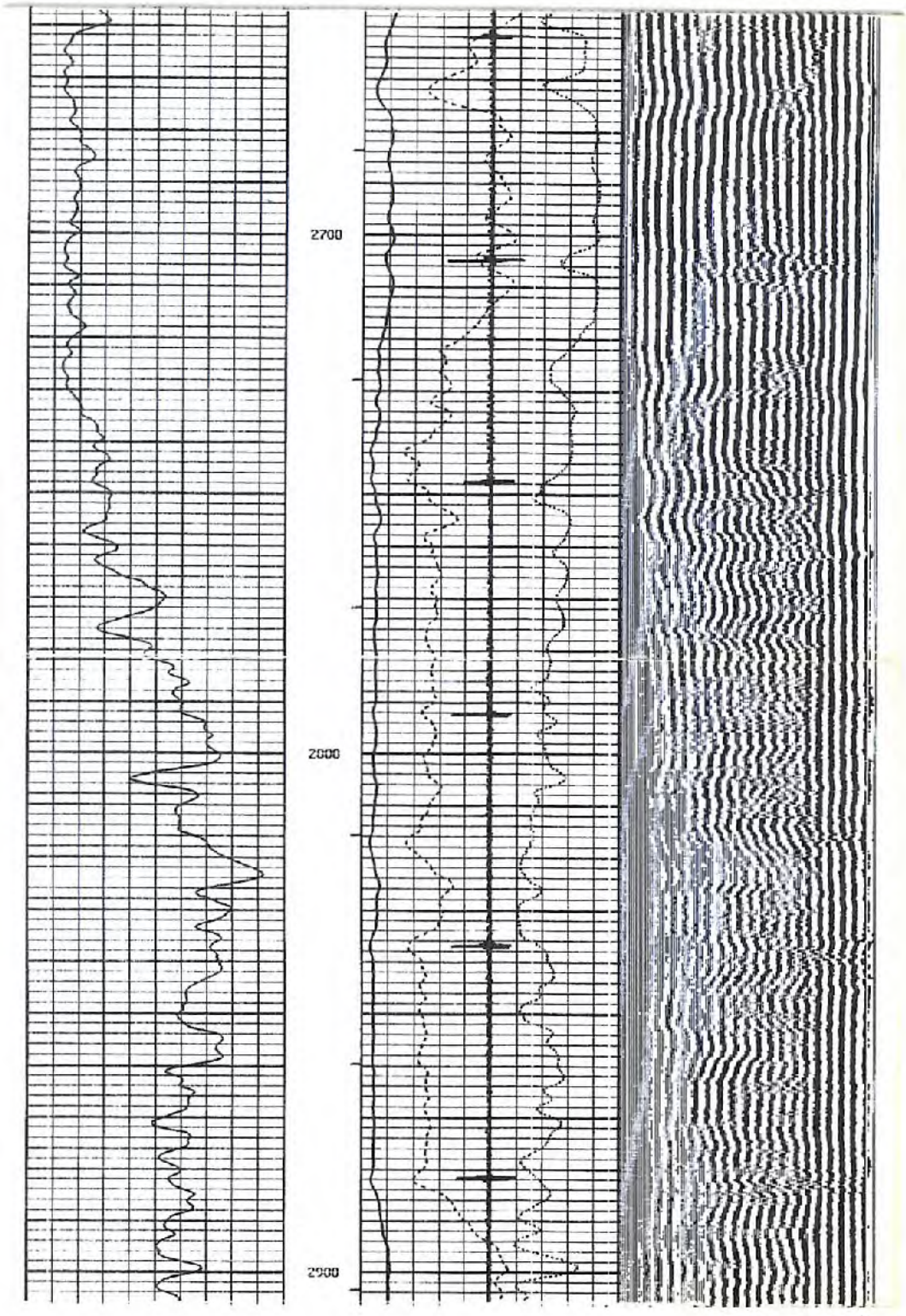


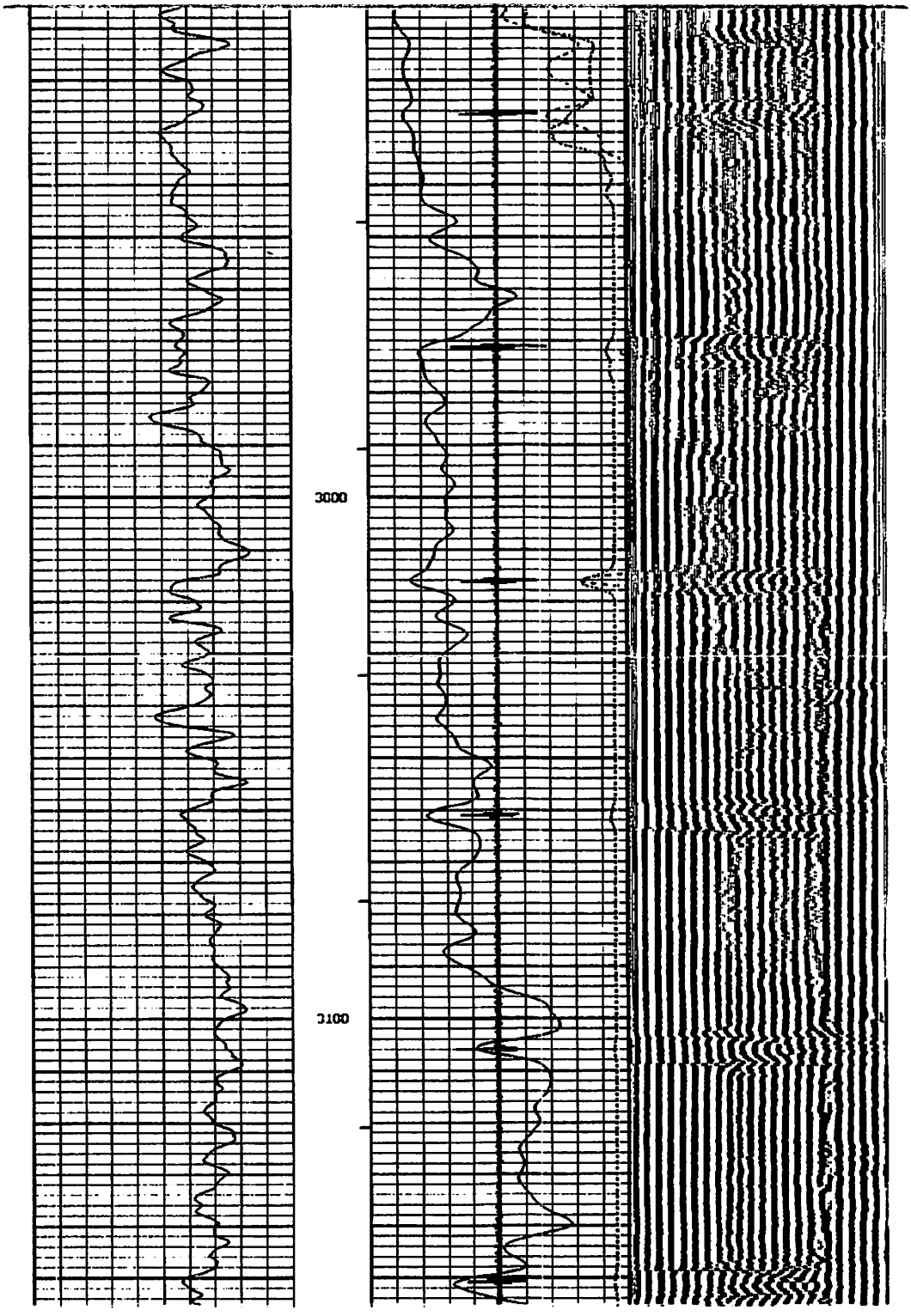


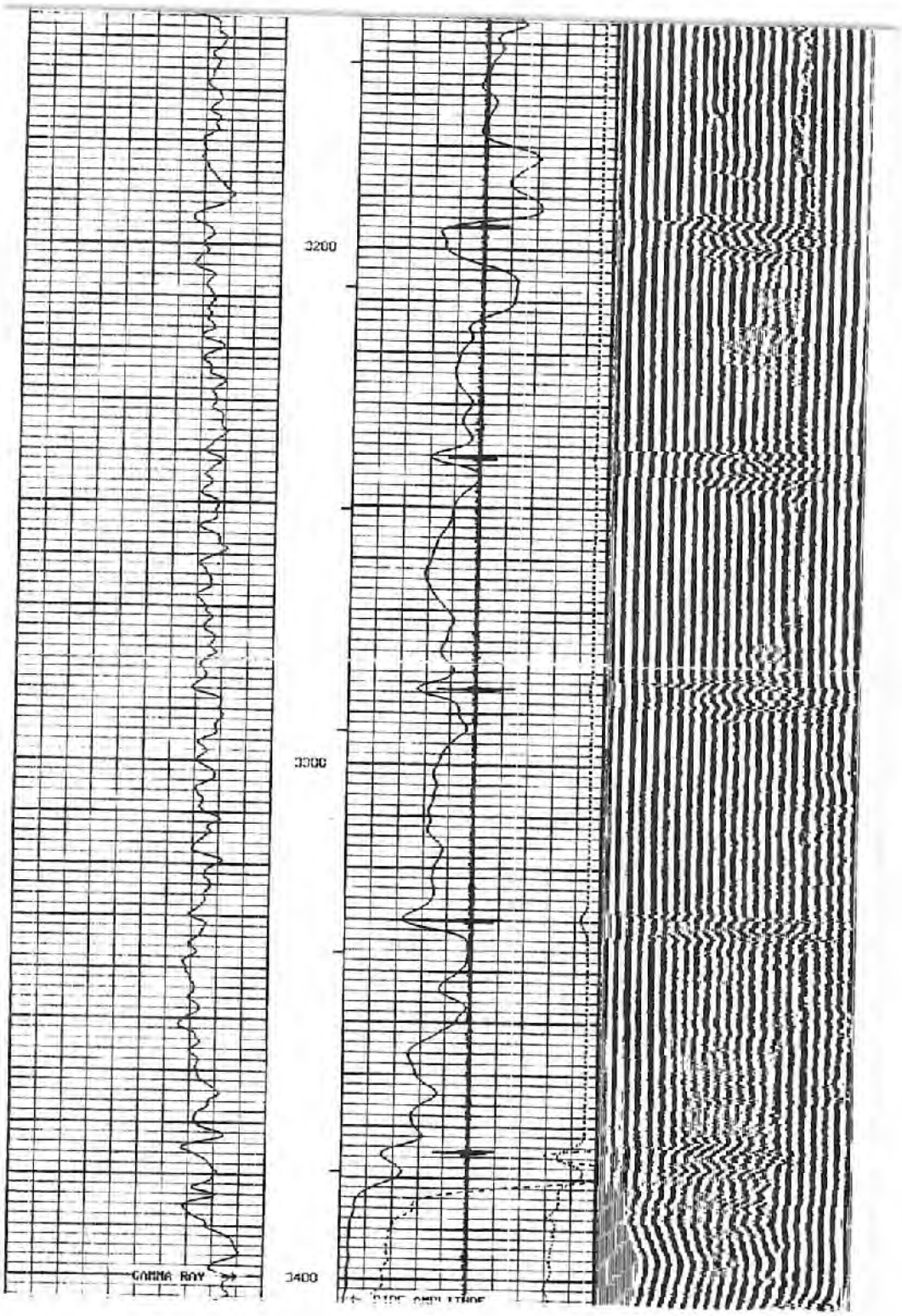


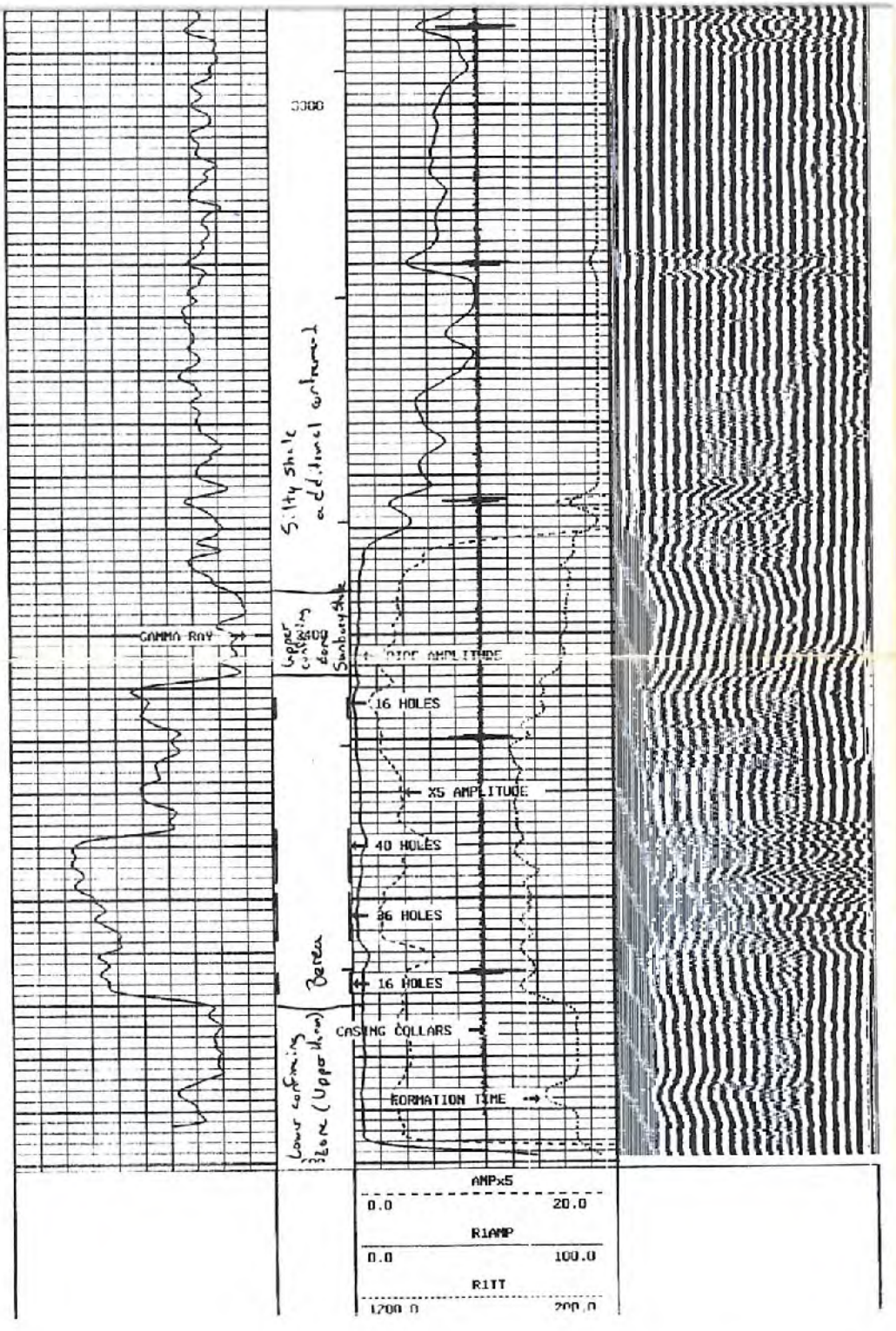












Attachment C

Area of Review Analytical Sampling Data

09-Jun-2016

David Connelly
ERM, Inc
204 Chase Drive
Hurricane, WV 25526

Re: **EQT - UIC** Work Order: **16051544**

Dear David,

ALS Environmental received 2 samples on 26-May-2016 through 27-May-2016 for the analyses presented in the following report.

This is a REVISED REPORT. The Case Narrative provides information discussing the reason for issuing a revised report. The total number of pages in this revision is 22.

If you have any questions regarding these test results, please feel free to contact me.

Sincerely,

Rebecca Kiser

Electronically approved by: Rebecca Kiser

Rebecca Kiser
Project Manager

Certificate No: MN 998501

ALS Group USA, Corp

Date: 09-Jun-16

Client: ERM, Inc
Project: EQT - UIC
Work Order: 16051544

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
16051544-01	RSW - 2 Grab	Water		5/26/2016 12:15	5/26/2016 15:40	☐
16051544-01	RSW - 2 Grab	Water		5/26/2016 12:15	5/26/2016 15:40	☐
16051544-01	RSW - 2 Grab	Water		5/26/2016 12:15	5/27/2016 14:00	☐
16051544-01	RSW - 2 Grab	Water		5/26/2016 12:15	5/27/2016 14:00	☐
16051544-02	Trip Blank	Water		5/26/2016	5/27/2016 14:00	☐

ALS Group USA, Corp *Date: 09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Work Order: 16051544

Case Narrative

This report was revised to include Sodium.

ALS Environmental
1740 Union Carbide Dr.
South Charleston, WV 25303
(304) 356-3168

The following parameters were received and analyzed for WO# 16051544 at the ALS South Charleston facility under WVDEP Attachment I, Certificate No. 385:

Coliform, Total (MF) - SM9222 B-97

ALS Environmental
34 Dogwood Lane
Middletown, PA 17057
(717) 944-5541

The following parameters were received and analyzed for WO# 16051544 at the ALS Middletown facility under WVDEP Attachment I, Certificate No. 343:

Dissolved Gases - RSK-175
Surfactants - SM5540 C-11

ALS Group USA, Corp

Date: 09-Jun-16

Client: ERM, Inc
Project: EQT - UIC
WorkOrder: 16051544

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
cfu/100ml	Colony Forming Units per 100 Milliliters
mg MBAS/L	Milligrams Methylene Blue Active Substances per Liter
mg/L	Milligrams per Liter

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: RSW - 2 Grab
Collection Date: 5/26/2016 12:15 PM

Work Order: 16051544
Lab ID: 16051544-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			Method:**SW8015C**		Prep: SW3511 / 6/1/16		Analyst: **IT**
DRO (C10-C28)	U		0.023	0.10	mg/L	1	6/2/2016 11:42
ORO (C28-C40)	U		0.026	0.10	mg/L	1	6/2/2016 11:42
Surr: 4-Terphenyl-d14	*97.2*			*31-176*	*%REC*	1	6/2/2016 11:42
GASOLINE RANGE ORGANICS BY GC-FID			Method:**SW8015D**				Analyst: **IT**
GRO (C6-C10)	U		48	200	µg/L	1	6/1/2016 13:09
Surr: Toluene-d8	*99.8*			*70-130*	*%REC*	1	6/1/2016 13:09
METALS BY ICP-MS			Method:**E200.8**		Prep: E200.8 / 5/31/16		Analyst: **RH**
Aluminum	**0.013**		**0.0042**	**0.010**	**mg/L**	1	5/31/2016 23:22
Arsenic	U		0.00087	0.0050	mg/L	1	5/31/2016 23:22
Barium	**0.39**		**0.0022**	**0.0050**	**mg/L**	1	5/31/2016 23:22
Calcium	**15**		**0.086**	**0.50**	**mg/L**	1	5/31/2016 23:22
Iron	**2.0**		**0.0046**	**0.080**	**mg/L**	1	5/31/2016 23:22
Manganese	**0.20**		**0.00051**	**0.0050**	**mg/L**	1	5/31/2016 23:22
Sodium	**73**	X	**0.034**	**0.20**	**mg/L**	1	5/31/2016 23:22
TOTAL COLIFORM, MF			Method:**A9222 B-97**				Analyst: **ARC**
Total Coliform, MF	*<10*		10	10	cfu/100ml	1	5/26/2016 16:06
GASES IN WATER			Method:**RSK-175**				Analyst: **ALS**
Butane	U		0.35	4.3	µg/L	1	6/1/2016 07:17
Ethane	U		0.23	3.3	µg/L	1	6/1/2016 07:17
Methane	**3,700**		**0.34**	**1.5**	**µg/L**	1	6/1/2016 07:17
Propane	U		0.22	3.2	µg/L	1	6/1/2016 07:17
VOLATILE ORGANIC COMPOUNDS			Method:**E624**				Analyst: **BG**
Benzene	U		0.25	1.0	µg/L	1	5/28/2016 12:18
Ethylbenzene	U		0.22	1.0	µg/L	1	5/28/2016 12:18
m,p-Xylene	U		0.40	2.0	µg/L	1	5/28/2016 12:18
o-Xylene	U		0.21	1.0	µg/L	1	5/28/2016 12:18
Toluene	U		0.20	1.0	µg/L	1	5/28/2016 12:18
Xylenes, Total	U		0.62	3.0	µg/L	1	5/28/2016 12:18
Surr: 1,2-Dichloroethane-d4	*106*			*75-120*	*%REC*	1	5/28/2016 12:18
Surr: 4-Bromofluorobenzene	*92.7*			*80-110*	*%REC*	1	5/28/2016 12:18
Surr: Dibromofluoromethane	*103*			*85-115*	*%REC*	1	5/28/2016 12:18
Surr: Toluene-d8	*96.6*			*85-110*	*%REC*	1	5/28/2016 12:18
ANIONS BY ION CHROMATOGRAPHY			Method:**E300.0**				Analyst: **EE**
Chloride	**11**		**0.068**	**1.0**	**mg/L**	1	6/1/2016 16:26
Sulfate	**0.13**	J	**0.099**	**1.0**	**mg/L**	1	6/1/2016 16:26

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: RSW - 2 Grab
Collection Date: 5/26/2016 12:15 PM

Work Order: 16051544
Lab ID: 16051544-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
ANIONIC SURFACTANTS AS MBAS		Method: **A5540C**					Analyst: **ALS**
Anionic Surfactants as MBAS	U		0.0050	0.025	mg MBAS/L	1	5/28/2016 05:20
TOTAL DISSOLVED SOLIDS		Method: **A2540 C-97**			Prep: FILTER / 6/1/16		Analyst: **STP**
Total Dissolved Solids	**230**		**8.5**	**10**	**mg/L**	1	6/1/2016 13:42
ORGANIC CARBON, TOTAL		Method: **A5310C-00**					Analyst: **JJG**
Organic Carbon, Total	**2.5**		**0.039**	**0.50**	**mg/L**	1	6/1/2016 13:47
TOTAL SUSPENDED SOLIDS		Method: **A2540 D-97**			Prep: FILTER / 5/31/16		Analyst: **YM**
Total Suspended Solids	U		2.3	3.0	mg/L	1	5/31/2016 11:31

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: Trip Blank
Collection Date: 5/26/2016

Work Order: 16051544
Lab ID: 16051544-02
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method: **E624**					Analyst: **BG**
Benzene	U		0.25	1.0	µg/L	1	5/27/2016 20:16
Ethylbenzene	U		0.22	1.0	µg/L	1	5/27/2016 20:16
m,p-Xylene	U		0.40	2.0	µg/L	1	5/27/2016 20:16
o-Xylene	U		0.21	1.0	µg/L	1	5/27/2016 20:16
Toluene	U		0.20	1.0	µg/L	1	5/27/2016 20:16
Xylenes, Total	U		0.62	3.0	µg/L	1	5/27/2016 20:16
Surr: 1,2-Dichloroethane-d4	*105*			*75-120*	*%REC*	1	5/27/2016 20:16
Surr: 4-Bromofluorobenzene	*94.2*			*80-110*	*%REC*	1	5/27/2016 20:16
Surr: Dibromofluoromethane	*102*			*85-115*	*%REC*	1	5/27/2016 20:16
Surr: Toluene-d8	*97.6*			*85-110*	*%REC*	1	5/27/2016 20:16

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 09-Jun-16

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86765** Instrument ID **GC8** Method: **SW8015C**

MBLK Sample ID: **DBLKW1-86765-86765** Units: **mg/L** Analysis Date: **6/2/2016 10:12 AM**
Client ID: Run ID: **GC8_160602B** SeqNo: **3857341** Prep Date: **6/1/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	0.023	0.10								
ORO (C28-C40)	U	0.026	0.10								
Surr: 4-Terphenyl-d14	*0.1198*	0	0	*0.1143*	0	*105*	*31-176*	0			

LCS Sample ID: **DLCSW1-86765-86765** Units: **mg/L** Analysis Date: **6/2/2016 10:42 AM**
Client ID: Run ID: **GC8_160602B** SeqNo: **3857342** Prep Date: **6/1/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	6.403	0.023	0.10	11.43	0	56	35-95	0			
ORO (C28-C40)	6.377	0.026	0.10	11.43	0	55.8	44-77	0			
Surr: 4-Terphenyl-d14	*0.126*	0	0	*0.1143*	0	*110*	*31-176*	0			

MS Sample ID: **16051544-01C MS** Units: **mg/L** Analysis Date: **6/2/2016 11:12 AM**
Client ID: **RSW - 2 Grab** Run ID: **GC8_160602B** SeqNo: **3857343** Prep Date: **6/1/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	7.763	0.023	0.10	11.43	0	67.9	29-96	0			
ORO (C28-C40)	7.57	0.026	0.10	11.43	0	66.2	41-84	0			
Surr: 4-Terphenyl-d14	*0.1247*	0	0	*0.1143*	0	*109*	*31-176*	0			

The following samples were analyzed in this batch: 16051544-01C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R188697** Instrument ID **GC9** Method: **SW8015D**

MBLK Sample ID: **GBLKW1-160601-R188697** Units: **µg/L** Analysis Date: **6/1/2016 11:54 AM**
Client ID: Run ID: **GC9_160601A** SeqNo: **3855684** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	48	200								
Surr: Toluene-d8	*92.62*	0	0	*100*	0	*92.6*	*70-130*	0			

LCS Sample ID: **GLCSW1-160601-R188697** Units: **µg/L** Analysis Date: **6/1/2016 11:30 AM**
Client ID: Run ID: **GC9_160601A** SeqNo: **3855683** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9965	48	200	10000	0	99.6	70-130	0			
Surr: Toluene-d8	*89.57*	0	0	*100*	0	*89.6*	*70-130*	0			

MS Sample ID: **16051425-01A MS** Units: **µg/L** Analysis Date: **6/1/2016 01:34 PM**
Client ID: Run ID: **GC9_160601A** SeqNo: **3855688** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9552	48	200	10000	0	95.5	70-130	0			
Surr: Toluene-d8	*95.43*	0	0	*100*	0	*95.4*	*70-130*	0			

MSD Sample ID: **16051425-01A MSD** Units: **µg/L** Analysis Date: **6/1/2016 01:58 PM**
Client ID: Run ID: **GC9_160601A** SeqNo: **3855689** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9325	48	200	10000	0	93.3	70-130	9552	2.4	30	
Surr: Toluene-d8	*97.41*	0	0	*100*	0	*97.4*	*70-130*	95.43	*2.05*	*30*	

The following samples were analyzed in this batch: 16051544-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86678** Instrument ID **ICPMS2** Method: **E200.8**

MBLK Sample ID: **MBLK-86678-86678** Units: **mg/L** Analysis Date: **5/31/2016 08:40 PM**
Client ID: Run ID: **ICPMS2_160531A** SeqNo: **3853941** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	U	0.0042	0.010								
Arsenic	U	0.00087	0.0050								
Barium	U	0.0022	0.0050								
Calcium	U	0.086	0.50								
Iron	U	0.0046	0.080								
Manganese	U	0.00051	0.0050								
Sodium	0.06976	0.034	0.20								J

LCS Sample ID: **LCS-86678-86678** Units: **mg/L** Analysis Date: **5/31/2016 08:45 PM**
Client ID: Run ID: **ICPMS2_160531A** SeqNo: **3853942** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1034	0.0042	0.010	0.1	0	103	85-115	0			
Arsenic	0.09747	0.00087	0.0050	0.1	0	97.5	85-115	0			
Barium	0.09729	0.0022	0.0050	0.1	0	97.3	85-115	0			
Calcium	9.959	0.086	0.50	10	0	99.6	85-115	0			
Iron	10.04	0.0046	0.080	10	0	100	85-115	0			
Manganese	0.09897	0.00051	0.0050	0.1	0	99	85-115	0			
Sodium	9.856	0.034	0.20	10	0	98.6	85-115	0			

MS Sample ID: **16051501-01DMS** Units: **mg/L** Analysis Date: **5/31/2016 10:25 PM**
Client ID: Run ID: **ICPMS2_160531A** SeqNo: **3853961** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1837	0.0042	0.010	0.1	0.0557	128	70-130	0			
Arsenic	0.1	0.00087	0.0050	0.1	0.0009217	99.1	70-130	0			
Barium	0.1249	0.0022	0.0050	0.1	0.02214	103	70-130	0			
Calcium	47.92	0.086	0.50	10	37.04	109	70-130	0			
Iron	10.43	0.0046	0.080	10	0.1901	102	70-130	0			
Manganese	0.1143	0.00051	0.0050	0.1	0.01247	102	70-130	0			
Sodium	29.86	0.034	0.20	10	19.66	102	70-130	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86678** Instrument ID **ICPMS2** Method: **E200.8**

MS Sample ID: **16051501-02DMS** Units: **mg/L** Analysis Date: **5/31/2016 10:40 PM**
Client ID: Run ID: **ICPMS2_160531A** SeqNo: **3853964** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1917	0.0042	0.010	0.1	0.058	134	70-130	0			S
Arsenic	0.0964	0.00087	0.0050	0.1	0.0009598	95.4	70-130	0			
Barium	0.1219	0.0022	0.0050	0.1	0.02365	98.2	70-130	0			
Calcium	46.58	0.086	0.50	10	39.4	71.8	70-130	0			
Iron	10.08	0.0046	0.080	10	0.1985	98.8	70-130	0			
Manganese	0.1114	0.00051	0.0050	0.1	0.01363	97.8	70-130	0			
Sodium	29.32	0.034	0.20	10	20.71	86.1	70-130	0			

MSD Sample ID: **16051501-01DMSD** Units: **mg/L** Analysis Date: **5/31/2016 10:30 PM**
Client ID: Run ID: **ICPMS2_160531A** SeqNo: **3853962** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1828	0.0042	0.010	0.1	0.0557	127	70-130	0.1837	0.491	20	
Arsenic	0.09825	0.00087	0.0050	0.1	0.0009217	97.3	70-130	0.1	1.77	20	
Barium	0.1208	0.0022	0.0050	0.1	0.02214	98.7	70-130	0.1249	3.34	20	
Calcium	47.52	0.086	0.50	10	37.04	105	70-130	47.92	0.838	20	
Iron	10.23	0.0046	0.080	10	0.1901	100	70-130	10.43	1.94	20	
Manganese	0.1124	0.00051	0.0050	0.1	0.01247	99.9	70-130	0.1143	1.68	20	
Sodium	29.71	0.034	0.20	10	19.66	100	70-130	29.86	0.504	20	

MSD Sample ID: **16051501-02DMSD** Units: **mg/L** Analysis Date: **5/31/2016 10:46 PM**
Client ID: Run ID: **ICPMS2_160531A** SeqNo: **3853965** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1915	0.0042	0.010	0.1	0.058	134	70-130	0.1917	0.104	20	S
Arsenic	0.09788	0.00087	0.0050	0.1	0.0009598	96.9	70-130	0.0964	1.52	20	
Barium	0.1218	0.0022	0.0050	0.1	0.02365	98.2	70-130	0.1219	0.0821	20	
Calcium	47.08	0.086	0.50	10	39.4	76.8	70-130	46.58	1.07	20	
Iron	10.22	0.0046	0.080	10	0.1985	100	70-130	10.08	1.38	20	
Manganese	0.1113	0.00051	0.0050	0.1	0.01363	97.7	70-130	0.1114	0.0898	20	
Sodium	29.41	0.034	0.20	10	20.71	87	70-130	29.32	0.306	20	

The following samples were analyzed in this batch: 16051544-01G

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R188514** Instrument ID **WETCHEM** Method: **A9222 B-97**

MBLK Sample ID: **MB-R188514-R188514** Units: **cfu/100ml** Analysis Date: **5/26/2016 04:06 PM**
Client ID: Run ID: **WETCHEM_160526Q** SeqNo: **3851791** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Coliform, MF	U	10	10								

MBLK Sample ID: **MB-R188514-R188514** Units: **cfu/100ml** Analysis Date: **5/26/2016 04:06 PM**
Client ID: Run ID: **WETCHEM_160526Q** SeqNo: **3851814** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Coliform, MF	U	10	10								

DUP Sample ID: **16051544-01F DUP** Units: **cfu/100ml** Analysis Date: **5/26/2016 04:06 PM**
Client ID: **RSW - 2 Grab** Run ID: **WETCHEM_160526Q** SeqNo: **3851809** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Coliform, MF	U	10	10	0	0	0		0	0	20	

The following samples were analyzed in this batch: 16051544-01F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R189013** Instrument ID **SUB** Method: **RSK-175**

MBLK Sample ID: **MB-R189013-R189013** Units: **µg/L** Analysis Date: **6/1/2016 05:39 AM**
Client ID: Run ID: **SUB_160601G** SeqNo: **3863036** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Butane	U	0.35	4.3								
Ethane	U	0.23	3.3								
Methane	U	0.34	1.5								
Propane	U	0.22	3.2								

The following samples were analyzed in this batch: 16051544-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R188478b** Instrument ID **VMS10** Method: **E624**

MBLK Sample ID: **VBLKW2-160527-R188478b** Units: **µg/L** Analysis Date: **5/27/2016 06:39 PM**
Client ID: Run ID: **VMS10_160527B** SeqNo: **3851256** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.25	1.0								
Ethylbenzene	U	0.22	1.0								
m,p-Xylene	U	0.4	2.0								
o-Xylene	U	0.21	1.0								
Toluene	U	0.2	1.0								
Xylenes, Total	U	0.62	3.0								
Surr: 1,2-Dichloroethane-d4	*20.51*	0	0	*20*	0	*103*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*18.74*	0	0	*20*	0	*93.7*	*80-110*	0			
Surr: Dibromofluoromethane	*20.2*	0	0	*20*	0	*101*	*85-115*	0			
Surr: Toluene-d8	*19.65*	0	0	*20*	0	*98.2*	*85-110*	0			

LCS Sample ID: **VLCSW2-160527-R188478b** Units: **µg/L** Analysis Date: **5/27/2016 05:26 PM**
Client ID: Run ID: **VMS10_160527B** SeqNo: **3851255** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	21.92	0.25	1.0	20	0	110	85-125	0			
Ethylbenzene	23.35	0.22	1.0	20	0	117	85-125	0			
m,p-Xylene	48.09	0.4	2.0	40	0	120	75-130	0			
o-Xylene	23.36	0.21	1.0	20	0	117	80-125	0			
Toluene	22.35	0.2	1.0	20	0	112	85-125	0			
Xylenes, Total	71.45	0.62	3.0	60	0	119	80-126	0			
Surr: 1,2-Dichloroethane-d4	*19.92*	0	0	*20*	0	*99.6*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*20.36*	0	0	*20*	0	*102*	*80-110*	0			
Surr: Dibromofluoromethane	*20.41*	0	0	*20*	0	*102*	*85-115*	0			
Surr: Toluene-d8	*20.32*	0	0	*20*	0	*102*	*85-110*	0			

MS Sample ID: **16051498-05A MS** Units: **µg/L** Analysis Date: **5/28/2016 02:43 AM**
Client ID: Run ID: **VMS10_160527B** SeqNo: **3851262** Prep Date: DF: **100**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	2242	25	100	2000	0	112	85-125	0			
Ethylbenzene	2341	22	100	2000	38	115	85-125	0			
m,p-Xylene	5065	40	200	4000	242	121	75-130	0			
o-Xylene	2339	21	100	2000	51	114	80-125	0			
Toluene	2240	20	100	2000	0	112	85-125	0			
Xylenes, Total	7404	62	300	6000	293	119	80-126	0			
Surr: 1,2-Dichloroethane-d4	*2024*	0	0	*2000*	0	*101*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*2066*	0	0	*2000*	0	*103*	*80-110*	0			
Surr: Dibromofluoromethane	*2100*	0	0	*2000*	0	*105*	*85-115*	0			
Surr: Toluene-d8	*2025*	0	0	*2000*	0	*101*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R188478b** Instrument ID **VMS10** Method: **E624**

MSD Sample ID: **16051498-05A MSD** Units: **µg/L** Analysis Date: **5/28/2016 03:08 AM**
Client ID: Run ID: **VMS10_160527B** SeqNo: **3851263** Prep Date: DF: **100**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	2290	25	100	2000	0	114	85-125	2242	2.12	30	
Ethylbenzene	2482	22	100	2000	38	122	85-125	2341	5.85	30	
m,p-Xylene	5314	40	200	4000	242	127	75-130	5065	4.8	30	
o-Xylene	2453	21	100	2000	51	120	80-125	2339	4.76	30	
Toluene	2362	20	100	2000	0	118	85-125	2240	5.3	30	
Xylenes, Total	7767	62	300	6000	293	125	80-126	7404	4.79	30	
Surr: 1,2-Dichloroethane-d4	*2008*	0	0	*2000*	0	*100*	*75-120*	2024	*0.794*	*30*	
Surr: 4-Bromofluorobenzene	*2043*	0	0	*2000*	0	*102*	*80-110*	2066	*1.12*	*30*	
Surr: Dibromofluoromethane	*2054*	0	0	*2000*	0	*103*	*85-115*	2100	*2.21*	*30*	
Surr: Toluene-d8	*2040*	0	0	*2000*	0	*102*	*85-110*	2025	*0.738*	*30*	

The following samples were analyzed in this batch: 16051544-01E 16051544-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86696** Instrument ID **TSS** Method: **A2540 D-97**

MBLK Sample ID: **MBLK-86696-86696** Units: **mg/L** Analysis Date: **5/31/2016 11:31 AM**
Client ID: Run ID: **TSS_160531A** SeqNo: **3854536** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	U	1.8	2.4								

LCS Sample ID: **LCS-86696-86696** Units: **mg/L** Analysis Date: **5/31/2016 11:31 AM**
Client ID: Run ID: **TSS_160531A** SeqNo: **3854535** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	100	4.6	6.0	100	0	100	80-115	0			

DUP Sample ID: **1605039-25A DUP** Units: **mg/L** Analysis Date: **5/31/2016 11:31 AM**
Client ID: Run ID: **TSS_160531A** SeqNo: **3854509** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	170	9.2	12	0	0	0	0-0	174	2.33	10	

DUP Sample ID: **1605039-26A DUP** Units: **mg/L** Analysis Date: **5/31/2016 11:31 AM**
Client ID: Run ID: **TSS_160531A** SeqNo: **3854511** Prep Date: **5/31/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	86	9.2	12	0	0	0	0-0	84	2.35	10	

The following samples were analyzed in this batch: 16051544-01H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86736** Instrument ID **TDS** Method: **A2540 C-97**

MBLK Sample ID: **MBLK-86736-86736** Units: **mg/L** Analysis Date: **6/1/2016 01:42 PM**
Client ID: Run ID: **TDS_160601A** SeqNo: **3855304** Prep Date: **6/1/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	U	8.5	10								

LCS Sample ID: **LCS-86736-86736** Units: **mg/L** Analysis Date: **6/1/2016 01:42 PM**
Client ID: Run ID: **TDS_160601A** SeqNo: **3855303** Prep Date: **6/1/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	483	8.5	10	495	0	97.6	80-120	0			

DUP Sample ID: **16051509-01E DUP** Units: **mg/L** Analysis Date: **6/1/2016 01:42 PM**
Client ID: Run ID: **TDS_160601A** SeqNo: **3855291** Prep Date: **6/1/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	200	8.5	10	0	0	0	0-0	202	0.995	10	

The following samples were analyzed in this batch: 16051544-01H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R188716A** Instrument ID **TOC2** Method: **A5310C-00**

MBLK	Sample ID: **MBLK-R188716A**				Units: **mg/L**			Analysis Date: **6/1/2016 01:47 PM**			
Client ID:	Run ID: **TOC2_160601A**				SeqNo: **3855989**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	0.039	0.50								

LCS	Sample ID: **LCS-R188716A**				Units: **mg/L**			Analysis Date: **6/1/2016 01:47 PM**			
Client ID:	Run ID: **TOC2_160601A**				SeqNo: **3855990**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	5.076	0.039	0.50	5	0	102	91-110	0			

MS	Sample ID: **16051544-01I MS**				Units: **mg/L**			Analysis Date: **6/1/2016 01:47 PM**			
Client ID: **RSW - 2 Grab**	Run ID: **TOC2_160601A**				SeqNo: **3855992**			Prep Date:		DF: **4**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	23.9	0.16	2.0	20	2.488	107	87-120	0			

MSD	Sample ID: **16051544-01I MSD**				Units: **mg/L**			Analysis Date: **6/1/2016 01:47 PM**			
Client ID: **RSW - 2 Grab**	Run ID: **TOC2_160601A**				SeqNo: **3855993**			Prep Date:		DF: **4**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	23.59	0.16	2.0	20	2.488	106	87-120	23.9	1.31	10	

The following samples were analyzed in this batch: 16051544-01I

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R188739** Instrument ID **IC4** Method: **E300.0**

MBLK	Sample ID: **CCB/MBLK-R188739**				Units: **mg/L**			Analysis Date: **6/1/2016 11:22 AM**			
Client ID:	Run ID: **IC4_160601A**				SeqNo: **3856701**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.29	1.0								
Sulfate	U	0.41	1.0								

LCS	Sample ID: **LCS-R188739**				Units: **mg/L**			Analysis Date: **6/1/2016 11:42 AM**			
Client ID:	Run ID: **IC4_160601A**				SeqNo: **3856702**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.748	0.29	1.0	10	0	97.5	90-110	0			
Sulfate	9.993	0.41	1.0	10	0	99.9	90-110	0			

MS	Sample ID: **16051446-01A MS**				Units: **mg/L**			Analysis Date: **6/1/2016 02:04 PM**			
Client ID:	Run ID: **IC4_160601A**				SeqNo: **3856709**			Prep Date:		DF: **5**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	68.13	1.5	5.0	50	14.48	107	80-120	0			
Sulfate	71.37	2	5.0	50	14.2	114	80-120	0			

MSD	Sample ID: **16051446-01A MSD**				Units: **mg/L**			Analysis Date: **6/1/2016 02:24 PM**			
Client ID:	Run ID: **IC4_160601A**				SeqNo: **3856710**			Prep Date:		DF: **5**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	68.12	1.5	5.0	50	14.48	107	80-120	68.13	0.0037	20	
Sulfate	71.76	2	5.0	50	14.2	115	80-120	71.37	0.548	20	

The following samples were analyzed in this batch: 16051544-01H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 16051544
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R189010** Instrument ID **SUB** Method: **A5540C**

MBLK Sample ID: **MB-R189010-R189010** Units: **mg MBAS/L** Analysis Date: **5/28/2016 05:20 AM**
Client ID: Run ID: **SUB_160528A** SeqNo: **3862995** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Anionic Surfactants as MBAS	U	0.005	0.025								

The following samples were analyzed in this batch: 16051544-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

☒ **ALS Environmental**
1740 Union Carbide Drive
South Charleston, WV 25303
(Tel) 304.356.3168
(Fax) 304.205.6262

Chain of Custody Form

Page ____ of ____

3738

☐ **ALS Environmental**
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

ALS Project Manager: | ALS Work Order #: 1605364

Customer Information		Project Information		Parameter/Method Request for Analysis
Purchase Order		Project Name	EQT UIC	A TPH - DRO, DRO, GRO via 8015
Work Order		Project Number		B BTEX - 8026
Company Name	ERM	Bill To Company		C Metals (Al, As, Ba, Ca, Fe, Mn) 200.8
Send Report To	GRANT MORGAN	Invoice Attn.		D Chloride 300.1
Address	204 Chase Dr	Address		E MBAS SM 5540C
				F TDS SM 2540C
City/State/Zip	Hurricane WV, 25526	City/State/Zip		G TSS SM 5310D
Phone		Phone		H Sulfate 300.1
Fax		Fax		I R. Gas RSK 175
e-Mail Address	GRANT.MORGAN@ERM.com			J Coliform SM 9222

No.	Sample Description	Comp / Grab	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	RSW-2	G	5/26/16	1215	H2O			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2	TB-(05262016)																	
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

pH: 6.99

Sampler(s): Please Print & Sign: Ryan B.

Shipment Method:

Turnaround Time in Business Days (BD): ☐ Other ____ ☐ 10 BD (STD) ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Temp:	Notes:
	5/26/16	1540		2.6°C ALSSC	
Relinquished by:	Date:	Time:	Received by:		
	5/26/16	1700			
Relinquished by:	Date:	Time:	Received by:	Temp: 2.6°C ALSHO	QC Package: (Check Box Below)
Relinquished by:	Date:	Time:	Received by (Laboratory):		Level II: Standard QC ☐
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		Level III: Standard QC + Raw Data ☐
					Level IV: SW846 Methods/CLP ☐
					Other: ____ ☐

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **ERM-HURRICANE** Date/Time Received: **26-May-16 15:40**

Work Order: **16051544** Received by: **JAS**

Checklist completed by Janet Smith (eSignature) 27-May-16 (Date) Reviewed by: Rebecca Kiser (eSignature) 07-Jun-16 (Date)

Matrices: Water
Carrier name: Client

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	<6c	IR	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Holland <6 deg C

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

09-Jun-2016

David Connelly
ERM, Inc
204 Chase Drive
Hurricane, WV 25526

Re: **EQT - UIC** Work Order: **1605596**

Dear David,

ALS Environmental received 3 samples on 10-May-2016 through 12-May-2016 for the analyses presented in the following report.

This is a REVISED REPORT. The Case Narrative provides information discussing the reason for issuing a revised report. The total number of pages in this revision is 46.

If you have any questions regarding these test results, please feel free to contact me.

Sincerely,

Rebecca Kiser

Electronically approved by: Rebecca Kiser

Rebecca Kiser
Project Manager

Certificate No: MN 998501

ALS Group USA, Corp

Date: 09-Jun-16

Client: ERM, Inc
Project: EQT - UIC
Work Order: 1605596

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1605596-01	Brine Sample -1 Grab	Liquid		5/10/2016 11:30	5/10/2016 16:30	☐
1605596-01	Brine Sample -1 Grab	Liquid		5/10/2016 11:30	5/10/2016 16:30	☐
1605596-01	Brine Sample -1 Grab	Liquid		5/10/2016 11:30	5/12/2016 09:30	☐
1605596-01	Brine Sample -1 Grab	Liquid		5/10/2016 11:30	5/12/2016 09:30	☐
1605596-02	RWS - 1 Grab	Liquid		5/10/2016 12:20	5/10/2016 16:30	☐
1605596-02	RWS - 1 Grab	Liquid		5/10/2016 12:20	5/12/2016 09:30	☐
1605596-03	Trip Blank	Water		5/10/2016	5/12/2016 09:30	☐

Client: ERM, Inc
Project: EQT - UIC
Work Order: 1605596

Case Narrative

This report was revised to include Sodium.

Per 40CFR Part 136 Table II Sample Handling Guidelines:

The holding time associated with the following parameters is defined as not to exceed 15 minutes:

Hydrogen Ion (pH)

Results for analyses conducted in the laboratory, for the above noted parameters, shall be considered non-compliant.

QC Comments:

Batch R187251, Method PH_4500WV_W, Sample 1605596-01J: Sample was analyzed outside of the holding time at the request of the client. The reported pH result should be considered estimated.

Batch 86026, Method ICP_200.8WV_W, Sample 1605596-01G: Beryllium (C) was detected in the bracketing continuing calibration blank where the MDL< C <PQL.

Batch 86026, Method ICP_200.8WV_W, Sample 1605596-02G: Beryllium (C) was detected in the bracketing continuing calibration blank where the MDL< C <PQL.

Batch 86026, Method ICP_200.8WV_W, Sample 1605596-01G: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference.

Batch R187665, Method IC_300.0_WW, Sample 1605596-01H: The reporting limit for Sulfate is elevated due to dilution for high concentrations of non-target analytes.

ALS Group USA, Corp

Date: 09-Jun-16

Client: ERM, Inc
Project: EQT - UIC
WorkOrder: 1605596

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
as noted	
cfu/100ml	Colony Forming Units per 100 Milliliters
mg MBAS/L	Milligrams Methylene Blue Active Substances per Liter
mg/L	Milligrams per Liter
s.u.	Standard Units

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: Brine Sample -1 Grab
Collection Date: 5/10/2016 11:30 AM

Work Order: 1605596
Lab ID: 1605596-01
Matrix: LIQUID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			Method:**SW8015C**		Prep: SW3511 / 5/13/16		Analyst: **IT**
DRO (C10-C28)	**17**		**0.023**	**0.10**	**mg/L**	1	5/16/2016 13:20
ORO (C28-C40)	**9.5**		**0.026**	**0.10**	**mg/L**	1	5/16/2016 13:20
Surr: 4-Terphenyl-d14	*80.5*			*31-176*	*%REC*	1	5/16/2016 13:20
GASOLINE RANGE ORGANICS BY GC-FID			Method:**SW8015D**				Analyst: **IT**
GRO (C6-C10)	**58,000**		**1,200**	**5,000**	**µg/L**	25	5/13/2016 13:24
Surr: Toluene-d8	*95.2*			*70-130*	*%REC*	25	5/13/2016 13:24
METALS BY ICP-MS			Method:**E200.8**		Prep: E200.8 / 5/13/16		Analyst: **RH**
Aluminum	**0.19**	JX	**0.11**	**1.0**	**mg/L**	100	5/14/2016 14:15
Arsenic	**0.096**	J	**0.070**	**0.50**	**mg/L**	100	5/14/2016 14:15
Barium	**350**	X	**2.2**	**5.0**	**mg/L**	1000	5/23/2016 15:11
Beryllium	U		0.020	0.20	mg/L	100	5/14/2016 14:15
Calcium	**3,600**		**38**	**50**	**mg/L**	100	5/14/2016 14:15
Iron	**91**	X	**1.0**	**8.0**	**mg/L**	100	5/14/2016 14:15
Manganese	**4.7**	X	**0.020**	**0.50**	**mg/L**	100	5/14/2016 14:15
Sodium	**13,000**		**5.1**	**20**	**mg/L**	100	5/14/2016 14:15
TOTAL COLIFORM, MF			Method:**A9222 B-97**				Analyst: **ARC**
Total Coliform, MF	*<10*		10	10	cfu/100ml	1	5/10/2016 17:04
PH (LABORATORY)			Method:**A4500-H B-11**				Analyst: **ARC**
pH (laboratory)	**6.20**	H	**0.020**	**0.0200**	**s.u.**	1	5/10/2016 16:58
GASES IN WATER			Method:**RSK-175**				Analyst: **ALS**
Butane	**41**		**0.35**	**4.3**	**µg/L**	1	5/12/2016 08:03
Ethane	**43**		**0.23**	**3.3**	**µg/L**	1	5/12/2016 08:03
Methane	**470**		**0.34**	**1.5**	**µg/L**	1	5/12/2016 08:03
Propane	**7.1**		**0.22**	**3.2**	**µg/L**	1	5/12/2016 08:03
SUBCONTRACTED ANALYSES			Method:**SUBCONTRACT**				Analyst: **PACE**
Subcontracted Analyses	**See attached**		**0**		**as noted**	1	6/4/2016
VOLATILE ORGANIC COMPOUNDS			Method:**E624**				Analyst: **BG**
Benzene	**3,400**		**130**	**500**	**µg/L**	500	5/15/2016 01:22
Ethylbenzene	**140**		**2.2**	**10**	**µg/L**	10	5/14/2016 08:45
m,p-Xylene	**3,200**		**200**	**1,000**	**µg/L**	500	5/15/2016 01:22
o-Xylene	**1,000**		**110**	**500**	**µg/L**	500	5/15/2016 01:22
Toluene	**9,000**		**98**	**500**	**µg/L**	500	5/15/2016 01:22
Xylenes, Total	**4,200**		**310**	**1,500**	**µg/L**	500	5/15/2016 01:22
Surr: 1,2-Dichloroethane-d4	*100*			*75-120*	*%REC*	10	5/14/2016 08:45

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: Brine Sample -1 Grab
Collection Date: 5/10/2016 11:30 AM

Work Order: 1605596
Lab ID: 1605596-01
Matrix: LIQUID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	500	5/15/2016 01:22
Surr: 4-Bromofluorobenzene	*107*			*80-110*	*%REC*	10	5/14/2016 08:45
Surr: 4-Bromofluorobenzene	*96.3*			*80-110*	*%REC*	500	5/15/2016 01:22
Surr: Dibromofluoromethane	*98.0*			*85-115*	*%REC*	10	5/14/2016 08:45
Surr: Dibromofluoromethane	*102*			*85-115*	*%REC*	500	5/15/2016 01:22
Surr: Toluene-d8	*100*			*85-110*	*%REC*	10	5/14/2016 08:45
Surr: Toluene-d8	*97.8*			*85-110*	*%REC*	500	5/15/2016 01:22
ANIONS BY ION CHROMATOGRAPHY			Method:**E300.0**				Analyst: **EE**
Chloride	**26,000**		**170**	**2,500**	**mg/L**	2500	5/14/2016 18:32
Sulfate	U		9.9	100	mg/L	100	5/14/2016 18:11
ANIONIC SURFACTANTS AS MBAS			Method:**A5540C**				Analyst: **ALS**
Anionic Surfactants as MBAS	**1.8**		**0.020**	**0.10**	**mg MBAS/L**	1	5/12/2016 03:00
TOTAL DISSOLVED SOLIDS			Method:**A2540 C-97**		Prep: FILTER / 5/13/16		Analyst: **STP**
Total Dissolved Solids	**44,000**		**17**	**20**	**mg/L**	1	5/13/2016 14:17
ORGANIC CARBON, TOTAL			Method:**A5310C-00**				Analyst: **JJG**
Organic Carbon, Total	**270**		**1.6**	**20**	**mg/L**	40	5/16/2016 14:28
TOTAL SUSPENDED SOLIDS			Method:**A2540 D-97**		Prep: FILTER / 5/13/16		Analyst: **YM**
Total Suspended Solids	**96**		**9.2**	**12**	**mg/L**	1	5/13/2016 12:28

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: RWS - 1 Grab
Collection Date: 5/10/2016 12:20 PM

Work Order: 1605596
Lab ID: 1605596-02
Matrix: LIQUID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
DIESEL RANGE ORGANICS BY GC-FID			Method:**SW8015C**		Prep: SW3511 / 5/13/16		Analyst: **IT**
DRO (C10-C28)	U		0.023	0.10	mg/L	1	5/16/2016 13:50
ORO (C28-C40)	U		0.026	0.10	mg/L	1	5/16/2016 13:50
Surr: 4-Terphenyl-d14	*118*			*31-176*	*%REC*	1	5/16/2016 13:50
GASOLINE RANGE ORGANICS BY GC-FID			Method:**SW8015D**				Analyst: **IT**
GRO (C6-C10)	U		48	200	µg/L	1	5/13/2016 11:20
Surr: Toluene-d8	*100*			*70-130*	*%REC*	1	5/13/2016 11:20
METALS BY ICP-MS			Method:**E200.8**		Prep: E200.8 / 5/13/16		Analyst: **RH**
Aluminum	**0.0069**	JX	**0.0011**	**0.010**	**mg/L**	1	5/14/2016 14:20
Arsenic	U		0.00070	0.0050	mg/L	1	5/14/2016 14:20
Barium	**0.044**	X	**0.00020**	**0.0050**	**mg/L**	1	5/14/2016 14:20
Beryllium	U		0.00020	0.0020	mg/L	1	5/14/2016 14:20
Calcium	**24**		**0.38**	**0.50**	**mg/L**	1	5/14/2016 14:20
Iron	U	X	0.010	0.080	mg/L	1	5/14/2016 14:20
Manganese	U	X	0.00020	0.0050	mg/L	1	5/14/2016 14:20
Sodium	**19**		**0.051**	**0.20**	**mg/L**	1	5/14/2016 14:20
TOTAL COLIFORM, MF			Method:**A9222 B-97**				Analyst: **ARC**
Total Coliform, MF	*<10*		10	10	cfu/100ml	1	5/10/2016 17:04
GASES IN WATER			Method:**RSK-175**				Analyst: **ALS**
Butane	U		0.35	4.3	µg/L	1	5/12/2016 08:33
Ethane	U		0.23	3.3	µg/L	1	5/12/2016 08:33
Methane	U		0.34	1.5	µg/L	1	5/12/2016 08:33
Propane	U		0.22	3.2	µg/L	1	5/12/2016 08:33
VOLATILE ORGANIC COMPOUNDS			Method:**E624**				Analyst: **BG**
Benzene	U		0.25	1.0	µg/L	1	5/15/2016 12:56
Ethylbenzene	U		0.22	1.0	µg/L	1	5/15/2016 12:56
m,p-Xylene	U		0.40	2.0	µg/L	1	5/15/2016 12:56
o-Xylene	U		0.21	1.0	µg/L	1	5/15/2016 12:56
Toluene	U		0.20	1.0	µg/L	1	5/15/2016 12:56
Xylenes, Total	U		0.62	3.0	µg/L	1	5/15/2016 12:56
Surr: 1,2-Dichloroethane-d4	*102*			*75-120*	*%REC*	1	5/15/2016 12:56
Surr: 4-Bromofluorobenzene	*94.3*			*80-110*	*%REC*	1	5/15/2016 12:56
Surr: Dibromofluoromethane	*102*			*85-115*	*%REC*	1	5/15/2016 12:56
Surr: Toluene-d8	*97.6*			*85-110*	*%REC*	1	5/15/2016 12:56
ANIONS BY ION CHROMATOGRAPHY			Method:**E300.0**				Analyst: **EE**
Chloride	**1.0**		**0.068**	**1.0**	**mg/L**	1	5/14/2016 19:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

RECEIVED

Office of Oil and Gas
WV Dept. of Environmental Protection

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: RWS - 1 Grab
Collection Date: 5/10/2016 12:20 PM

Work Order: 1605596
Lab ID: 1605596-02
Matrix: LIQUID

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Sulfate	**71**		**0.50**	**5.0**	**mg/L**	5	5/14/2016 19:53
ANIONIC SURFACTANTS AS MBAS			Method:**A5540C**				Analyst: **ALS**
Anionic Surfactants as MBAS	U		0.0050	0.025	mg MBAS/L	1	5/12/2016 03:00
TOTAL DISSOLVED SOLIDS			Method:**A2540 C-97**		Prep: FILTER / 5/13/16		Analyst: **STP**
Total Dissolved Solids	**190**		**8.5**	**10**	**mg/L**	1	5/13/2016 14:17
ORGANIC CARBON, TOTAL			Method:**A5310C-00**				Analyst: **JJG**
Organic Carbon, Total	**1.2**		**0.039**	**0.50**	**mg/L**	1	5/13/2016 14:30
TOTAL SUSPENDED SOLIDS			Method:**A2540 D-97**		Prep: FILTER / 5/13/16		Analyst: **YM**
Total Suspended Solids	U		2.3	3.0	mg/L	1	5/13/2016 12:28

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-Jun-16*

Client: ERM, Inc
Project: EQT - UIC
Sample ID: Trip Blank
Collection Date: 5/10/2016

Work Order: 1605596
Lab ID: 1605596-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
VOLATILE ORGANIC COMPOUNDS		Method:E624					Analyst: BG
Benzene	U		0.25	1.0	µg/L	1	5/14/2016 07:27
Ethylbenzene	U		0.22	1.0	µg/L	1	5/14/2016 07:27
m,p-Xylene	U		0.40	2.0	µg/L	1	5/14/2016 07:27
o-Xylene	U		0.21	1.0	µg/L	1	5/14/2016 07:27
Toluene	U		0.20	1.0	µg/L	1	5/14/2016 07:27
Xylenes, Total	U		0.62	3.0	µg/L	1	5/14/2016 07:27
Surr: 1,2-Dichloroethane-d4	*100*			*75-120*	*%REC*	1	5/14/2016 07:27
Surr: 4-Bromofluorobenzene	*96.1*			*80-110*	*%REC*	1	5/14/2016 07:27
Surr: Dibromofluoromethane	*101*			*85-115*	*%REC*	1	5/14/2016 07:27
Surr: Toluene-d8	*98.2*			*85-110*	*%REC*	1	5/14/2016 07:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

Date: 09-Jun-16

QC BATCH REPORT

Batch ID: **86039** Instrument ID **GC8** Method: **SW8015C**

MBLK Sample ID: **DBLKW1-86039-86039** Units: **mg/L** Analysis Date: **5/16/2016 10:05 AM**
Client ID: Run ID: **GC8_160516A** SeqNo: **3829814** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	0.023	0.10								
ORO (C28-C40)	U	0.026	0.10								
Surr: 4-Terphenyl-d14	*0.1301*	0	0	*0.1143*	0	*114*	*31-176*	0			

LCS Sample ID: **DLCSW1-86039-86039** Units: **mg/L** Analysis Date: **5/16/2016 10:46 AM**
Client ID: Run ID: **GC8_160516A** SeqNo: **3829815** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	6.525	0.023	0.10	11.43	0	57.1	35-95	0			
ORO (C28-C40)	6.884	0.026	0.10	11.43	0	60.2	44-77	0			
Surr: 4-Terphenyl-d14	*0.1333*	0	0	*0.1143*	0	*117*	*31-176*	0			

MS Sample ID: **1605723-01B MS** Units: **mg/L** Analysis Date: **5/16/2016 11:16 AM**
Client ID: Run ID: **GC8_160516A** SeqNo: **3829816** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	7.699	0.023	0.10	11.43	0	67.4	29-96	0			
ORO (C28-C40)	7.949	0.026	0.10	11.43	0	69.6	41-84	0			
Surr: 4-Terphenyl-d14	*0.136*	0	0	*0.1143*	0	*119*	*31-176*	0			

DUP Sample ID: **1605729-01B DUP** Units: **mg/L** Analysis Date: **5/16/2016 05:20 PM**
Client ID: Run ID: **GC8_160516A** SeqNo: **3830564** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
DRO (C10-C28)	U	0.023	0.10	0	0	0		0.4493	0	30	
Surr: 4-Terphenyl-d14	*0.1346*	0	0	*0.1143*	0	*118*	*31-176*	0.1269	*5.87*	*30*	

The following samples were analyzed in this batch: 1605596-01C 1605596-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187466** Instrument ID **GC9** Method: **SW8015D**

MBLK Sample ID: **GBLKW1-160513-R187466** Units: **µg/L** Analysis Date: **5/13/2016 10:55 AM**
Client ID: Run ID: **GC9_160513A** SeqNo: **3826847** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	U	48	200								
Surr: Toluene-d8	*103*	0	0	*100*	0	*103*	*70-130*	0			

LCS Sample ID: **GLCSW1-160513-R187466** Units: **µg/L** Analysis Date: **5/13/2016 10:31 AM**
Client ID: Run ID: **GC9_160513A** SeqNo: **3826846** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9879	48	200	10000	0	98.8	70-130	0			
Surr: Toluene-d8	*100*	0	0	*100*	0	*100*	*70-130*	0			

MS Sample ID: **1605723-01A MS** Units: **µg/L** Analysis Date: **5/13/2016 01:49 PM**
Client ID: Run ID: **GC9_160513A** SeqNo: **3826854** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9946	48	200	10000	0	99.5	70-130	0			
Surr: Toluene-d8	*100.1*	0	0	*100*	0	*100*	*70-130*	0			

SD Sample ID: **1605723-01A MSD** Units: **µg/L** Analysis Date: **5/13/2016 02:14 PM**
Client ID: Run ID: **GC9_160513A** SeqNo: **3826855** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
GRO (C6-C10)	9768	48	200	10000	0	97.7	70-130	9946	1.81	30	
Surr: Toluene-d8	*101.3*	0	0	*100*	0	*101*	*70-130*	100.1	*1.17*	*30*	

The following samples were analyzed in this batch: 1605596-01D 1605596-02D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86026** Instrument ID **ICPMS2** Method: **E200.8**

MBLK Sample ID: **MBLK-86026-86026** Units: **mg/L** Analysis Date: **5/13/2016 03:26 PM**
Client ID: Run ID: **ICPMS2_160513A** SeqNo: **3827220** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002046	0.0011	0.010								J
Arsenic	U	0.0007	0.0050								
Barium	0.0009139	0.0002	0.0050								J
Beryllium	U	0.0002	0.0020								
Calcium	U	0.38	0.50								
Iron	0.01429	0.01	0.080								J
Manganese	0.0005565	0.0002	0.0050								J
Sodium	U	0.051	0.20								

LCS Sample ID: **LCS-86026-86026** Units: **mg/L** Analysis Date: **5/13/2016 03:31 PM**
Client ID: Run ID: **ICPMS2_160513A** SeqNo: **3827221** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09283	0.0011	0.010	0.1	0	92.8	85-115	0			
Arsenic	0.1014	0.0007	0.0050	0.1	0	101	85-115	0			
Barium	0.1035	0.0002	0.0050	0.1	0	104	85-115	0			
Beryllium	0.1008	0.0002	0.0020	0.1	0	101	85-115	0			
Calcium	10.4	0.38	0.50	10	0	104	85-115	0			
Iron	10.31	0.01	0.080	10	0	103	85-115	0			
Manganese	0.0946	0.0002	0.0050	0.1	0	94.6	85-115	0			
Sodium	10.13	0.051	0.20	10	0	101	85-115	0			

MS Sample ID: **1605663-01BMS** Units: **mg/L** Analysis Date: **5/13/2016 03:52 PM**
Client ID: Run ID: **ICPMS2_160513A** SeqNo: **3827225** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09627	0.0011	0.010	0.1	0.004477	91.8	70-130	0			
Arsenic	0.1027	0.0007	0.0050	0.1	0.0009097	102	70-130	0			
Barium	0.117	0.0002	0.0050	0.1	0.01479	102	70-130	0			
Beryllium	0.09808	0.0002	0.0020	0.1	-0.00002716	98.1	70-130	0			
Calcium	89.48	0.38	0.50	10	80.06	94.2	70-130	0			O
Iron	10.34	0.01	0.080	10	0.2663	101	70-130	0			
Manganese	0.1106	0.0002	0.0050	0.1	0.01749	93.1	70-130	0			
Sodium	109.7	0.051	0.20	10	101	87	70-130	0			O

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86026** Instrument ID **ICPMS2** Method: **E200.8**

MS Sample ID: **1605675-04AMS** Units: **mg/L** Analysis Date: **5/13/2016 09:03 PM**
Client ID: Run ID: **ICPMS2_160513A** SeqNo: **3827673** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2577	0.0011	0.010	0.1	0.1349	123	70-130	0			
Arsenic	0.1058	0.0007	0.0050	0.1	0.001631	104	70-130	0			
Barium	0.1382	0.0002	0.0050	0.1	0.03528	103	70-130	0			
Beryllium	0.09645	0.0002	0.0020	0.1	-0.00004799	96.5	70-130	0			
Calcium	97.77	0.38	0.50	10	85.11	127	70-130	0			O
Iron	10.35	0.01	0.080	10	0.1639	102	70-130	0			
Manganese	0.1619	0.0002	0.0050	0.1	0.05196	110	70-130	0			
Sodium	160.6	0.051	0.20	10	146.3	143	70-130	0			SO

MSD Sample ID: **1605663-01BMSD** Units: **mg/L** Analysis Date: **5/13/2016 03:57 PM**
Client ID: Run ID: **ICPMS2_160513A** SeqNo: **3827226** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09689	0.0011	0.010	0.1	0.004477	92.4	70-130	0.09627	0.642	20	
Arsenic	0.1033	0.0007	0.0050	0.1	0.0009097	102	70-130	0.1027	0.583	20	
Barium	0.117	0.0002	0.0050	0.1	0.01479	102	70-130	0.117	0	20	
Beryllium	0.09917	0.0002	0.0020	0.1	-0.00002716	99.2	70-130	0.09808	1.11	20	
Calcium	90.97	0.38	0.50	10	80.06	109	70-130	89.48	1.65	20	O
Iron	10.35	0.01	0.080	10	0.2663	101	70-130	10.34	0.0967	20	
Manganese	0.111	0.0002	0.0050	0.1	0.01749	93.5	70-130	0.1106	0.361	20	
Sodium	111.5	0.051	0.20	10	101	105	70-130	109.7	1.63	20	O

MSD Sample ID: **1605675-04AMSD** Units: **mg/L** Analysis Date: **5/13/2016 09:08 PM**
Client ID: Run ID: **ICPMS2_160513A** SeqNo: **3827674** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.2506	0.0011	0.010	0.1	0.1349	116	70-130	0.2577	2.79	20	
Arsenic	0.1062	0.0007	0.0050	0.1	0.001631	105	70-130	0.1058	0.377	20	
Barium	0.1356	0.0002	0.0050	0.1	0.03528	100	70-130	0.1382	1.9	20	
Beryllium	0.0939	0.0002	0.0020	0.1	-0.00004799	93.9	70-130	0.09645	2.68	20	
Calcium	96.37	0.38	0.50	10	85.11	113	70-130	97.77	1.44	20	O
Iron	10.53	0.01	0.080	10	0.1639	104	70-130	10.35	1.72	20	
Manganese	0.1591	0.0002	0.0050	0.1	0.05196	107	70-130	0.1619	1.74	20	
Sodium	156.2	0.051	0.20	10	146.3	99	70-130	160.6	2.78	20	O

The following samples were analyzed in this batch: 1605596-01G 1605596-02G

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187251** Instrument ID **WETCHEM** Method: **A4500-H B-11**

LCS	Sample ID: **LCS-R187251-R187251**				Units: **s.u.**			Analysis Date: **5/10/2016 04:58 PM**			
Client ID:	Run ID: **WETCHEM_160510X**				SeqNo: **3821963**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	4.04	0.02	0.020	4	0	101	90-110	0			

DUP	Sample ID: **1605596-01J DUP**				Units: **s.u.**			Analysis Date: **5/10/2016 04:58 PM**			
Client ID: **Brine Sample -1 Grab**	Run ID: **WETCHEM_160510X**				SeqNo: **3821965**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	6.23	0.02	0.020	0	0	0		6.2	0.483	20	H

The following samples were analyzed in this batch: 1605596-01J

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187301** Instrument ID **WETCHEM** Method: **A9222 B-97**

MBLK	Sample ID: **MB-R187301-R187301**				Units: **cfu/100ml**			Analysis Date: **5/10/2016 05:04 PM**			
Client ID:	Run ID: **WETCHEM_160510**			SeqNo: **3822984**		Prep Date:		DF: **1**			
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Coliform, MF	U	10	10								

MBLK	Sample ID: **MB-R187301-R187301**				Units: **cfu/100ml**			Analysis Date: **5/10/2016 05:04 PM**			
Client ID:	Run ID: **WETCHEM_160510**			SeqNo: **3822989**		Prep Date:		DF: **1**			
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Coliform, MF	U	10	10								

DUP	Sample ID: **1605596-02F DUP**				Units: **cfu/100ml**			Analysis Date: **5/10/2016 05:04 PM**			
Client ID: **RWS - 1 Grab**	Run ID: **WETCHEM_160510**			SeqNo: **3822988**		Prep Date:		DF: **1**			
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Coliform, MF	U	10	10	0	0	0		0	0	20	

The following samples were analyzed in this batch: 1605596-01F 1605596-02F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187777** Instrument ID **SUB** Method: **RSK-175**

MBLK Sample ID: **MB-R187777-R187777** Units: **µg/L** Analysis Date: **5/12/2016 07:48 AM**
Client ID: Run ID: **SUB_160512D** SeqNo: **3834452** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Butane	U	0.35	4.3								
Ethane	U	0.23	3.3								
Methane	U	0.34	1.5								
Propane	U	0.22	3.2								

DUP Sample ID: **1605596-01B DUP** Units: **µg/L** Analysis Date: **5/12/2016 08:18 AM**
Client ID: **Brine Sample -1 Grab** Run ID: **SUB_160512D** SeqNo: **3834457** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Butane	63.2	0.35	4.3	0	0	0		40.7	43.3	40	R
Ethane	44.1	0.23	3.3	0	0	0		43	2.53	20	
Methane	476	0.34	1.5	0	0	0		468	1.69	20	
Propane	7.9	0.22	3.2	0	0	0		7.1	10.7	20	

The following samples were analyzed in this batch: 1605596-01B 1605596-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187500B** Instrument ID **VMS5** Method: **E624**

MBLK Sample ID: **VBLKW2-160513-R187500B** Units: **µg/L** Analysis Date: **5/14/2016 03:35 AM**
Client ID: Run ID: **VMS5_160513C** SeqNo: **3827919** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.25	1.0								
Ethylbenzene	U	0.22	1.0								
m,p-Xylene	U	0.4	2.0								
o-Xylene	U	0.21	1.0								
Toluene	U	0.2	1.0								
Xylenes, Total	U	0.62	3.0								
Surr: 1,2-Dichloroethane-d4	*20.15*	0	0	*20*	0	*101*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*19.49*	0	0	*20*	0	*97.4*	*80-110*	0			
Surr: Dibromofluoromethane	*20.11*	0	0	*20*	0	*101*	*85-115*	0			
Surr: Toluene-d8	*19.99*	0	0	*20*	0	*100*	*85-110*	0			

LCS Sample ID: **VLCSW2-160513-R187500B** Units: **µg/L** Analysis Date: **5/14/2016 02:17 AM**
Client ID: Run ID: **VMS5_160513C** SeqNo: **3827918** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.06	0.25	1.0	20	0	100	85-125	0			
Ethylbenzene	20.18	0.22	1.0	20	0	101	85-125	0			
m,p-Xylene	41.17	0.4	2.0	40	0	103	75-130	0			
o-Xylene	20.12	0.21	1.0	20	0	101	80-125	0			
Toluene	19.88	0.2	1.0	20	0	99.4	85-125	0			
Xylenes, Total	61.29	0.62	3.0	60	0	102	80-126	0			
Surr: 1,2-Dichloroethane-d4	*19.6*	0	0	*20*	0	*98*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*20.28*	0	0	*20*	0	*101*	*80-110*	0			
Surr: Dibromofluoromethane	*19.82*	0	0	*20*	0	*99.1*	*85-115*	0			
Surr: Toluene-d8	*20.04*	0	0	*20*	0	*100*	*85-110*	0			

MS Sample ID: **1605515-06B MS** Units: **µg/L** Analysis Date: **5/14/2016 12:12 PM**
Client ID: Run ID: **VMS5_160513C** SeqNo: **3827935** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.59	0.25	1.0	20	0	98	85-125	0			
Ethylbenzene	18.6	0.22	1.0	20	0	93	85-125	0			
m,p-Xylene	38.01	0.4	2.0	40	0	95	75-130	0			
o-Xylene	18.52	0.21	1.0	20	0	92.6	80-125	0			
Toluene	18.77	0.2	1.0	20	0	93.8	85-125	0			
Xylenes, Total	56.53	0.62	3.0	60	0	94.2	80-126	0			
Surr: 1,2-Dichloroethane-d4	*20.23*	0	0	*20*	0	*101*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*20.42*	0	0	*20*	0	*102*	*80-110*	0			
Surr: Dibromofluoromethane	*20*	0	0	*20*	0	*100*	*85-115*	0			
Surr: Toluene-d8	*19.92*	0	0	*20*	0	*99.6*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187500B** Instrument ID **VMS5** Method: **E624**

MSD Sample ID: **1605515-06B MSD** Units: **µg/L** Analysis Date: **5/14/2016 12:38 PM**
Client ID: Run ID: **VMS5_160513C** SeqNo: **3827936** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.43	0.25	1.0	20	0	97.2	85-125	19.59	0.82	30	
Ethylbenzene	19.09	0.22	1.0	20	0	95.4	85-125	18.6	2.6	30	
m,p-Xylene	39.27	0.4	2.0	40	0	98.2	75-130	38.01	3.26	30	
o-Xylene	18.98	0.21	1.0	20	0	94.9	80-125	18.52	2.45	30	
Toluene	19.21	0.2	1.0	20	0	96	85-125	18.77	2.32	30	
Xylenes, Total	58.25	0.62	3.0	60	0	97.1	80-126	56.53	3	30	
Surr: 1,2-Dichloroethane-d4	*19.44*	0	0	*20*	0	*97.2*	*75-120*	20.23	*3.98*	*30*	
Surr: 4-Bromofluorobenzene	*20.27*	0	0	*20*	0	*101*	*80-110*	20.42	*0.737*	*30*	
Surr: Dibromofluoromethane	*20.1*	0	0	*20*	0	*100*	*85-115*	20	*0.499*	*30*	
Surr: Toluene-d8	*20.17*	0	0	*20*	0	*101*	*85-110*	19.92	*1.25*	*30*	

The following samples were analyzed in this batch: 1605596-01E 1605596-02E 1605596-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187511b** Instrument ID **VMS5** Method: **E624**

MBLK Sample ID: **VBLKW1-160514-R187511b** Units: **µg/L** Analysis Date: **5/14/2016 08:12 PM**
Client ID: Run ID: **VMS5_160514A** SeqNo: **3829022** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	0.25	1.0								
Ethylbenzene	U	0.22	1.0								
m,p-Xylene	U	0.4	2.0								
o-Xylene	U	0.21	1.0								
Toluene	U	0.2	1.0								
Xylenes, Total	U	0.62	3.0								
Surr: 1,2-Dichloroethane-d4	*19.79*	0	0	*20*	0	*99*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*18.95*	0	0	*20*	0	*94.8*	*80-110*	0			
Surr: Dibromofluoromethane	*19.99*	0	0	*20*	0	*100*	*85-115*	0			
Surr: Toluene-d8	*19.59*	0	0	*20*	0	*98*	*85-110*	0			

LCS Sample ID: **VLCSW1-160514-R187511b** Units: **µg/L** Analysis Date: **5/14/2016 06:54 PM**
Client ID: Run ID: **VMS5_160514A** SeqNo: **3829021** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	20.47	0.25	1.0	20	0	102	85-125	0			
Ethylbenzene	20.09	0.22	1.0	20	0	100	85-125	0			
m,p-Xylene	41.4	0.4	2.0	40	0	104	75-130	0			
o-Xylene	20.37	0.21	1.0	20	0	102	80-125	0			
Toluene	19.85	0.2	1.0	20	0	99.2	85-125	0			
Xylenes, Total	61.77	0.62	3.0	60	0	103	80-126	0			
Surr: 1,2-Dichloroethane-d4	*19.7*	0	0	*20*	0	*98.5*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*20.12*	0	0	*20*	0	*101*	*80-110*	0			
Surr: Dibromofluoromethane	*19.79*	0	0	*20*	0	*99*	*85-115*	0			
Surr: Toluene-d8	*19.68*	0	0	*20*	0	*98.4*	*85-110*	0			

MS Sample ID: **1605706-01A MS** Units: **µg/L** Analysis Date: **5/15/2016 04:49 AM**
Client ID: Run ID: **VMS5_160514A** SeqNo: **3829024** Prep Date: DF: **10**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	218.6	2.5	10	200	0	109	85-125	0			
Ethylbenzene	209.5	2.2	10	200	0	105	85-125	0			
m,p-Xylene	429	4	20	400	0	107	75-130	0			
o-Xylene	208.7	2.1	10	200	0	104	80-125	0			
Toluene	210.5	2	10	200	0	105	85-125	0			
Xylenes, Total	637.7	6.2	30	600	0	106	80-126	0			
Surr: 1,2-Dichloroethane-d4	*197.6*	0	0	*200*	0	*98.8*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*198.5*	0	0	*200*	0	*99.2*	*80-110*	0			
Surr: Dibromofluoromethane	*199.2*	0	0	*200*	0	*99.6*	*85-115*	0			
Surr: Toluene-d8	*198.2*	0	0	*200*	0	*99.1*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187511b** Instrument ID **VMS5** Method: **E624**

MSD Sample ID: **1605706-01A MSD** Units: **µg/L** Analysis Date: **5/15/2016 05:14 AM**
Client ID: Run ID: **VMS5_160514A** SeqNo: **3829025** Prep Date: DF: **10**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	210.5	2.5	10	200	0	105	85-125	218.6	3.78	30	
Ethylbenzene	206.4	2.2	10	200	0	103	85-125	209.5	1.49	30	
m,p-Xylene	422	4	20	400	0	106	75-130	429	1.65	30	
o-Xylene	204.3	2.1	10	200	0	102	80-125	208.7	2.13	30	
Toluene	205.2	2	10	200	0	103	85-125	210.5	2.55	30	
Xylenes, Total	626.3	6.2	30	600	0	104	80-126	637.7	1.8	30	
Surr: 1,2-Dichloroethane-d4	*195.7*	0	0	*200*	0	*97.8*	*75-120*	197.6	*0.966*	*30*	
Surr: 4-Bromofluorobenzene	*201*	0	0	*200*	0	*100*	*80-110*	198.5	*1.25*	*30*	
Surr: Dibromofluoromethane	*196.4*	0	0	*200*	0	*98.2*	*85-115*	199.2	*1.42*	*30*	
Surr: Toluene-d8	*199*	0	0	*200*	0	*99.5*	*85-110*	198.2	*0.403*	*30*	

The following samples were analyzed in this batch: 1605596-01E 1605596-02E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86005** Instrument ID **TDS** Method: **A2540 C-97**

MBLK Sample ID: **MBLK-86005-86005** Units: **mg/L** Analysis Date: **5/13/2016 02:17 PM**
Client ID: Run ID: **TDS_160513A** SeqNo: **3826736** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	U	8.5	10								

LCS Sample ID: **LCS-86005-86005** Units: **mg/L** Analysis Date: **5/13/2016 02:17 PM**
Client ID: Run ID: **TDS_160513A** SeqNo: **3826735** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	492	8.5	10	495	0	99.4	80-120	0			

DUP Sample ID: **1605596-01H DUP** Units: **mg/L** Analysis Date: **5/13/2016 02:17 PM**
Client ID: **Brine Sample -1 Grab** Run ID: **TDS_160513A** SeqNo: **3826713** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	44510	17	20	0	0	0	0-0	44370	0.311	10	

DUP Sample ID: **1605683-01A DUP** Units: **mg/L** Analysis Date: **5/13/2016 02:17 PM**
Client ID: Run ID: **TDS_160513A** SeqNo: **3826725** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids	551	8.5	10	0	0	0	0-0	553	0.362	10	

The following samples were analyzed in this batch: 1605596-01H 1605596-02H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **86041** Instrument ID **TSS** Method: **A2540 D-97**

MBLK Sample ID: **MBLK-86041-86041** Units: **mg/L** Analysis Date: **5/13/2016 12:28 PM**
Client ID: Run ID: **TSS_160513A** SeqNo: **3828984** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	U	1.8	2.4								

LCS Sample ID: **LCS-86041-86041** Units: **mg/L** Analysis Date: **5/13/2016 12:28 PM**
Client ID: Run ID: **TSS_160513A** SeqNo: **3828983** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	96	4.6	6.0	100	0	96	80-115	0			

DUP Sample ID: **1605002-25A DUP** Units: **mg/L** Analysis Date: **5/13/2016 12:28 PM**
Client ID: Run ID: **TSS_160513A** SeqNo: **3828957** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	66	9.2	12	0	0	0	0-0	64	3.08	10	

DUP Sample ID: **1605039-11A DUP** Units: **mg/L** Analysis Date: **5/13/2016 12:28 PM**
Client ID: Run ID: **TSS_160513A** SeqNo: **3828959** Prep Date: **5/13/2016** DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Suspended Solids	88	9.2	12	0	0	0	0-0	88	0	10	

The following samples were analyzed in this batch: 1605596-01H 1605596-02H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187526** Instrument ID **TOC2** Method: **A5310C-00**

MBLK	Sample ID: MBLK-R187526				Units: mg/L			Analysis Date: 5/13/2016 02:30 PM			
Client ID:	Run ID: TOC2_160513A				SeqNo: 3828460			Prep Date:		DF: 1	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	0.039	0.50								

LCS	Sample ID: LCS-R187526				Units: mg/L			Analysis Date: 5/13/2016 02:30 PM			
Client ID:	Run ID: TOC2_160513A				SeqNo: 3828461			Prep Date:		DF: 1	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	5.179	0.039	0.50	5	0	104	91-110	0			

MS	Sample ID: 1605625-02A MS				Units: mg/L			Analysis Date: 5/13/2016 02:30 PM			
Client ID:	Run ID: TOC2_160513A				SeqNo: 3828477			Prep Date:		DF: 4	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	26.7	0.16	2.0	20	4.997	108	87-120	0			

MSD	Sample ID: 1605625-02A MSD				Units: mg/L			Analysis Date: 5/13/2016 02:30 PM			
Client ID:	Run ID: TOC2_160513A				SeqNo: 3828478			Prep Date:		DF: 4	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	26.44	0.16	2.0	20	4.997	107	87-120	26.7	0.948	10	

The following samples were analyzed in this batch: 1605596-01I 1605596-02I

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187654** Instrument ID **SUB** Method: **A5540C**

MBLK Sample ID: **MB-R187654-R187654** Units: **mg MBAS/L** Analysis Date: **5/12/2016 03:00 AM**
Client ID: Run ID: **SUB_160512B** SeqNo: **3831066** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Anionic Surfactants as MBAS	U	0.005	0.025								

The following samples were analyzed in this batch: 1605596-01A 1605596-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187661A** Instrument ID **TOC2** Method: **A5310C-00**

MBLK	Sample ID: **MBLK-R187661A**				Units: **mg/L**			Analysis Date: **5/16/2016 02:28 PM**			
Client ID:	Run ID: **TOC2_160516A**				SeqNo: **3831175**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	0.039	0.50								

LCS	Sample ID: **LCS-R187661A**				Units: **mg/L**			Analysis Date: **5/16/2016 02:28 PM**			
Client ID:	Run ID: **TOC2_160516A**				SeqNo: **3831176**			Prep Date:		DF: **1**	
Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	5.164	0.039	0.50	5	0	103	91-110	0			

The following samples were analyzed in this batch: 1605596-01I

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: ERM, Inc
Work Order: 1605596
Project: EQT - UIC

QC BATCH REPORT

Batch ID: **R187665** Instrument ID **IC3** Method: **E300.0**

MBLK Sample ID: **CCB/MBLK-R187665** Units: **mg/L** Analysis Date: **5/14/2016 08:45 AM**
Client ID: Run ID: **IC3_160514A** SeqNo: **3831294** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	0.14	1.0								
Sulfate	U	0.14	1.0								

LCS Sample ID: **LCS-R187665** Units: **mg/L** Analysis Date: **5/14/2016 09:05 AM**
Client ID: Run ID: **IC3_160514A** SeqNo: **3831295** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.765	0.14	1.0	10	0	97.6	90-110	0			
Sulfate	10.17	0.14	1.0	10	0	102	90-110	0			

MS Sample ID: **1605796-12D MS** Units: **mg/L** Analysis Date: **5/14/2016 12:07 PM**
Client ID: Run ID: **IC3_160514A** SeqNo: **3831297** Prep Date: DF: **25**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	347	3.6	25	250	82.98	106	80-120	0			
Sulfate	416.2	3.5	25	250	152.9	105	80-120	0			

MSD Sample ID: **1605796-12D MSD** Units: **mg/L** Analysis Date: **5/14/2016 12:27 PM**
Client ID: Run ID: **IC3_160514A** SeqNo: **3831298** Prep Date: DF: **25**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	346.2	3.6	25	250	82.98	105	80-120	347	0.25	20	
Sulfate	409.6	3.5	25	250	152.9	103	80-120	416.2	1.59	20	

The following samples were analyzed in this batch: 1605596-01H 1605596-02H

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 04, 2016

Ms. Rebecca Kiser
ALS Environmental
1740 Union Carbide Drive
Charleston, WV 25303

RE: Project: 1605596
Pace Project No.: 30183136

Dear Ms. Kiser:
Enclosed are the analytical results for sample(s) received by the laboratory on May 12, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1605596
Pace Project No.: 30183136

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1605596
Pace Project No.: 30183136

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30183136001	1605596-01K Grab	Water	05/10/16 11:30	05/12/16 09:15

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1605596
Pace Project No.: 30183136

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30183136001	**1605596-01K Grab**	EPA 900.0	NEG	2
		EPA 903.1	WRR	1
		EPA 904.0	JLW	1
		HSL-300	LAL	6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1605596
Pace Project No.: 30183136

Method: EPA 900.0
Description: 900.0 Gross Alpha/Beta
Client: ALS Life Sciences Division | Environmental
Date: June 04, 2016

General Information:
1 sample was analyzed for EPA 900.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1605596
Pace Project No.: 30183136

Method: EPA 903.1
Description: 903.1 Radium 226
Client: ALS Life Sciences Division | Environmental
Date: June 04, 2016

General Information:
1 sample was analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1605596
Pace Project No.: 30183136

Method: EPA 904.0
Description: 904.0 Radium 228
Client: ALS Life Sciences Division | Environmental
Date: June 04, 2016

General Information:
1 sample was analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1605596
Pace Project No.: 30183136

Method: **HSL-300**
Description: HSL300(AS) Actinides
Client: ALS Life Sciences Division | Environmental
Date: June 04, 2016

General Information:
1 sample was analyzed for HSL-300. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: RADC/29607

N2: The lab does not hold TNI accreditation for this parameter.

- 1605596-01K Grab (Lab ID: 30183136001)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - Uranium-234
  - Uranium-235
  - Uranium-238
- BLANK (Lab ID: 1081663)
  - Thorium-228
  - Thorium-230
  - Thorium-232
  - Uranium-234
  - Uranium-235
  - Uranium-238

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1605596
Pace Project No.: 30183136

Sample: 1605596-01K Grab **Lab ID: 30183136001** Collected: 05/10/16 11:30 Received: 05/12/16 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**406 ± 135 (148) C:NA T:NA**	pCi/L	05/26/16 07:22	12587-46-1	
Gross Beta	EPA 900.0	**158 ± 80.8 (128) C:NA T:NA**	pCi/L	05/26/16 07:22	12587-47-2	
Radium-226	EPA 903.1	**201 ± 24.5 (0.652) C:NA T:92%**	pCi/L	06/03/16 19:33	13982-63-3	
Radium-228	EPA 904.0	**105 ± 19.2 (1.79) C:81% T:32%**	pCi/L	06/01/16 15:45	15262-20-1	
Thorium-228	HSL-300	**2.30 ± 0.623 (0.483) C:NA T:75%**	pCi/L	05/26/16 13:50	14274-82-9	N2
Thorium-230	HSL-300	**0.169 ± 0.134 (0.156) C:NA T:75%**	pCi/L	05/26/16 13:50	14269-63-7	N2
Thorium-232	HSL-300	**0.021 ± 0.097 (0.156) C:NA T:75%**	pCi/L	05/26/16 13:50	7440-29-1	N2
Uranium-234	HSL-300	**0.388 ± 0.199 (0.205) C:NA T:83%**	pCi/L	05/27/16 14:53	13966-29-5	N2
Uranium-235	HSL-300	**0.273 ± 0.166 (0.067) C:NA T:83%**	pCi/L	05/27/16 14:53	15117-96-1	N2
Uranium-238	HSL-300	**0.019 ± 0.099 (0.205) C:NA T:83%**	pCi/L	05/27/16 14:53		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1605596
Pace Project No.: 30183136

Sample: 1605596-01K Grab **Lab ID: 30183136001** Collected: 05/10/16 11:30 Received: 05/12/16 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample Acceptance Policy Waiver on file from the client.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**406 ± 135 (148) C:NA T:NA**	pCi/L	05/26/16 07:22	12587-46-1	
Gross Beta	EPA 900.0	**158 ± 80.8 (128) C:NA T:NA**	pCi/L	05/26/16 07:22	12587-47-2	
Radium-226	EPA 903.1	**201 ± 24.5 (0.652) C:NA T:92%**	pCi/L	06/03/16 19:33	13982-63-3	
Radium-228	EPA 904.0	**105 ± 19.2 (1.79) C:81% T:32%**	pCi/L	06/01/16 15:45	15262-20-1	
Thorium-228	HSL-300	**2.30 ± 0.623 (0.483) C:NA T:75%**	pCi/L	05/26/16 13:50	14274-82-9	N2
Thorium-230	HSL-300	**0.169 ± 0.134 (0.156) C:NA T:75%**	pCi/L	05/26/16 13:50	14269-63-7	N2
Thorium-232	HSL-300	**0.021 ± 0.097 (0.156) C:NA T:75%**	pCi/L	05/26/16 13:50	7440-29-1	N2
Uranium-234	HSL-300	**0.388 ± 0.199 (0.205) C:NA T:83%**	pCi/L	05/27/16 14:53	13966-29-5	N2
Uranium-235	HSL-300	**0.273 ± 0.166 (0.067) C:NA T:83%**	pCi/L	05/27/16 14:53	15117-96-1	N2
Uranium-238	HSL-300	**0.019 ± 0.099 (0.205) C:NA T:83%**	pCi/L	05/27/16 14:53		N2

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1605596
Pace Project No.: 30183136

QC Batch: RADC/29553 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30183136001

METHOD BLANK: 1079575 Matrix: Water
Associated Lab Samples: 30183136001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.175 ± 0.379 (0.839) C:76% T:77%	pCi/L	06/01/16 12:02	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1605596
Pace Project No.: 30183136

QC Batch: RADC/29569
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30183136001

METHOD BLANK: 1079741
Matrix: Water
Associated Lab Samples: 30183136001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.010 ± 0.388 (1.19) C:NA T:NA	pCi/L	05/25/16 10:32	
Gross Beta	-0.087 ± 0.903 (2.23) C:NA T:NA	pCi/L	05/25/16 10:32	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1605596
Pace Project No.: 30183136

QC Batch: RADC/29540
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30183136001

METHOD BLANK: 1079547
Matrix: Water
Associated Lab Samples: 30183136001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.140 ± 0.321 (0.190) C:NA T:96%	pCi/L	06/03/16 19:37	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1605596
Pace Project No.: 30183136

QC Batch: RADC/29607
QC Batch Method: HSL-300
Analysis Method: HSL-300
Analysis Description: HSL300(AS) Actinides
Associated Lab Samples: 30183136001

METHOD BLANK: 1081663
Matrix: Water
Associated Lab Samples: 30183136001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Thorium-228	0.212 ± 0.108 (0.139) C:NA T:79%	pCi/L	05/26/16 13:50	N2
Thorium-230	0.006 ± 0.033 (0.069) C:NA T:79%	pCi/L	05/26/16 13:50	N2
Thorium-232	0.006 ± 0.029 (0.047) C:NA T:79%	pCi/L	05/26/16 13:50	N2
Uranium-234	0.032 ± 0.044 (0.075) C:NA T:96%	pCi/L	05/27/16 14:53	N2
Uranium-235	0.028 ± 0.038 (0.064) C:NA T:96%	pCi/L	05/27/16 14:53	N2
Uranium-238	0.032 ± 0.039 (0.064) C:NA T:96%	pCi/L	05/27/16 14:53	N2

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1605596
Pace Project No.: 30183136

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

N2 The lab does not hold TNI accreditation for this parameter.

ALS Environmental
1740 Union Carbide Drive
South Charleston, WV 25303
(Tel) 304.356.3168

Chain of Custody Form

Page 1 of 1

WO#: 30183136

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	1605596	A	Gross A/B; Ra 226/228; U-234/235/238;Th-228/230/232
Work Order		Project Number		B	
Company Name	ALS Environmental	Bill To Company		C	
Send Report To	Rebecca Kiser	Invoice Attn		D	
Address	1740 Union Carbide Drive	Address		E	
				F	
City/State/Zip	South Charleston, WV 25303	City/State/Zip		G	
Phone	304-356-3168	Phone		H	
Fax	304-205-6262	Fax		I	
e-Mail Address	rebecca.kiser@alsglobal.com			J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	1605596-01K Grab	5/10/2016	11:30 AM	Liquid	2	4	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

001

Sampler(s): Please Print & Sign

Shipment Method:

Required Turnaround Time: ☐ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☐ Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Cooler Temp:	Notes:
Brett Smith	5/11/16	1700	Ashley Rae Pace	5-12-16 0915	
Relinquished by:	Date:	Time:	Received by:		
Relinquished by:	Date:	Time:	Received by:	Cooler Temp:	QC Package: (Check Box Below)
Relinquished by:	Date:	Time:	Received by (Laboratory):		Level II: Standard QC ☐
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		Level III: Standard QC + Raw Data ☐
					Level IV: SW846 Methods/CLP ☐
					Other: ☐

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS

Sample Condition Upon Receipt Pittsburgh

30183136

Pace Analytical

Client Name: ALS Project #

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other

Tracking #: 7763 1843 3235

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used N/A Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp ___ °C Correction Factor: ___ °C Final Temp: ___ °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: AMR 5.12.16

Comments:	Yes	No	N/A	
Chain of Custody Present:	X			1.
Chain of Custody Filled Out:	X			2.
Chain of Custody Relinquished:	X			3.
Sampler Name & Signature on COC:		X		4.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: WT		X		5. only sample ID on bottles
Samples Arrived within Hold Time:	X			6.
Short Hold Time Analysis (<72hr remaining):		X		7.
Rush Turn Around Time Requested:		X		8.
Sufficient Volume:	X			9.
Correct Containers Used:	X			10.
-Pace Containers Used:		X		
Containers Intact:	X			11.
Filtered volume received for Dissolved tests			X	12.
All containers needing preservation have been checked.	X			13. pHL2
All containers needing preservation are found to be in compliance with EPA recommendation.	X			
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed AMR Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			X	14.
Trip Blank Present:		X		15.
Trip Blank Custody Seals Present			X	

Client Notification/ Resolution:

Person Contacted: ___ Date/Time: ___ Contacted By: ___

Comments/ Resolution: ___

Received by WV Dept. of Environmental Protection

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (I.e out of hold, incorrect preservative, out of temp, incorrect containers)

Chain of Custody Form

☒ ALS Environmental
1740 Union Carbide Drive
South Charleston, WV 25303
(Tel) 304.356.3168
(Fax) 304.205.6262

☐ ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

Page 1 of 1

3684

ALS Project Manager: | ALS Work Order #: 1605510

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	EQT/UEC	A	TPH GRO/DRO/6RO/8015 / BTEX 8I5
Work Order		Project Number		B	~~BTEX 8015~~ Coliform/SM 9222
Company Name	ERM	Bill To Company		C	Al, As, Be, Ca, Fe, Mn / 200.8
Send Report To	Grant Morgan	Invoice Attn		D	Chloride / 300.1
Address	204 Chase Dr	Address		E	MBAS / SM 5540C
City/State/Zip	Hurricane WV	City/State/Zip		F	TDS / SM 2540C.
Phone		Phone		G	TSS / SM 2540D
Fax		Fax		H	TOC / Sm 5310B
e-Mail Address	Grant.Morgan@erm.com			I	Sulfate 300.1
				J	Dissolved Gas / RSK 175

No.	Sample Description	Comp / Grab	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Brine Sample - 1	G	5/10/16	1130				/	/	/	/	/	/	/	/	/	/	
2	RWS - 1	G	5/10/16	12:20				/	/	/	/	/	/	/	/	/	/	pH: 6.5
3	TB-1							/	/									
4	TB-2																	
5																		
6																		
7																		
8																		
9																		
10																		

Sampler(s): Please Print & Sign

Shipment Method:

Turnaround Time in Business Days (BD): ☐ Other ☑ 10 BD (STD) ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Temp:	Notes:
	5/10/16	1830		26° ACC	
Relinquished by:	Date:	Time:	Received by:		
	5/11/16	1700	FED EX		
Relinquished by:	Date:	Time:	Received by:	Temp:	QC Package: (Check Box Below)
FED EX	5/12/16	0930		ACSHN 26°	
Relinquished by:	Date:	Time:	Received by (Laboratory):		☐ Level II: Standard QC
					☐ Level III: Standard QC + Raw Data
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		☐ Level IV: SW846 Methods/CLP
					☐ Other:

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS

☒ **ALS Environmental**
1740 Union Carbide Drive
South Charleston, WV 25303
(Tel) 304.356.3168
(Fax) 304.205.6262

Chain of Custody Form

Page 2 of 2

3685

☐ **ALS Environmental**
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

ALS Project Manager: | ALS Work Order #: 160-5960

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	EQT/VEC	A	pH
Work Order		Project Number		B	Alpha/Beta
Company Name	ERM	Bill To Company		C	Radium 226/228
Send Report To	Grant Morgan	Invoice Attn		D	U-234/235/238
Address	264 Chase Dr	Address		E	Th-228/230/232
City/State/Zip	Hurricane/WV	City/State/Zip		F	
Phone		Phone		G	
Fax		Fax		H	
e-Mail Address	Grant.Morgan@erm.com			I	
				J	

No.	Sample Description	Comp/ Grab	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Borne Sample-1	G	5/10/16	1130				✓	✓	✓	✓	✓						
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Sampler(s): Please Print & Sign

Shipment Method:

Turnaround Time in Business Days (BD): ☐ Other ☑ 10 BD (STD) ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD

Results Due Date:

	Date:	Time:		Temp:	Notes:
Relinquished by:	5/10/16	1830	Received by:	26.2	
Relinquished by:	5/11/16	1200	Received by: FED EX	ALS 2C	
Relinquished by: FED EX	5/12/16	0930	Received by:	Temp: ALSHb 26.0C	QC Package: (Check Box Below)
Relinquished by:	Date:	Time:	Received by (Laboratory):		
Logged by (Laboratory)	Date:	Time:	Checked by (Laboratory):		

Level II: Standard QC
Level III: Standard QC + Raw Data
Level IV: SW846 Methods/CLP
Other:

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **ERM-HURRICANE** Date/Time Received: **10-May-16 16:30**

Work Order: **1605596** Received by: **JAS**

Checklist completed by Janet Smith (eSignature) 11-May-16 (Date) Reviewed by: Rebecca Kiser (eSignature) 11-May-16 (Date)

Matrices: Liquid
Carrier name: Client

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☐	No ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	<6C	IR	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes: Sample received out of holding time for pH. Client listed TB1 and TB2 on COC, but there is no designation on the vials. Holland <6.0 c

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

ALS Environmental

12-Mar-2018

Shannon Cox
Triad Engineering, Inc.
4980 Teays Valley Road
Scott Depot, WV 25560

Re: **EQT Injection Well Sample** Work Order: **1802742**

Dear Shannon,

ALS Environmental received 1 sample on 14-Feb-2018 09:55 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 22.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Rebecca Kiser

Electronically approved by: Rebecca Kiser

Rebecca Kiser
Project Manager

Report of Laboratory Analysis

Certificate No: WV: 355

ALS Group, USA

Date: 12-Mar-18

Client: Triad Engineering, Inc.
Project: EQT Injection Well Sample
Work Order: 1802742

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1802742-01	506168 Grab	Water		2/13/2018 09:25	2/14/2018 09:55	☐
1802742-01	506168 Grab	Water		2/13/2018 09:25	2/15/2018 14:00	☐

Client:	Triad Engineering, Inc.
Project:	EQT Injection Well Sample
Work Order:	1802742

Case Narrative

RadChem parameters were analyzed at Pace Analytical (see attached report).

ALS Group, USA

Date: 12-Mar-18

Client: Triad Engineering, Inc.
Project: EQT Injection Well Sample
WorkOrder: 1802742

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
as noted	
none	

ALS Group, USA

Date: *12-Mar-18*

Client: Triad Engineering, Inc.
Project: EQT Injection Well Sample
Sample ID: 506168 Grab
Collection Date: 2/13/2018 09:25 AM

Work Order: 1802742
Lab ID: 1802742-01
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
SPECIFIC GRAVITY			Method:D5057-90				Analyst: RZM
Specific Gravity	1.03		0		none	1	2/19/2018 17:15
SUBCONTRACTED ANALYSES			Method:SUBCONTRACT				Analyst: PACE
Subcontracted Analyses	See attached		0		as noted	1	3/8/2018

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 12-Mar-18

Client: Triad Engineering, Inc.

Work Order: 1802742

Project: EQT Injection Well Sample

QC BATCH REPORT

Batch ID: **R230210** Instrument ID **WETCHEM** Method: **D5057-90**

DUP Sample ID: **1802742-01A DUP** Units: **none** Analysis Date: **2/19/2018 05:15 PM**

Client ID: **506168 Grab** Run ID: **WETCHEM_180219M** SeqNo: **4898847** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Gravity	1.032	0	0	0	0	0	0-0	1.031	0.0485	20	

DUP Sample ID: **1802957-01A DUP** Units: **none** Analysis Date: **2/19/2018 05:15 PM**

Client ID: Run ID: **WETCHEM_180219M** SeqNo: **4898849** Prep Date: DF: **1**

Analyte	Result	MDL	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Specific Gravity	1.124	0	0	0	0	0	0-0	1.123	0.0712	20	

The following samples were analyzed in this batch: 1802742-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

March 08, 2018

Ms. Rebecca Kiser
ALS Environmental
1740 Union Carbide Drive
Charleston, WV 25303

RE: Project: 1802742
Pace Project No.: 30243703

Dear Ms. Kiser:
Enclosed are the analytical results for sample(s) received by the laboratory on February 15, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 1802742
Pace Project No.: 30243703

Pennsylvania Certification IDs
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 1802742
Pace Project No.: 30243703

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30243703001	1802742-01B	Water	02/13/18 09:25	02/15/18 10:15

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 1802742
Pace Project No.: 30243703

Lab ID	Sample ID	Method	Analysts	Analytes Reported
30243703001	1802742-01B	EPA 900.0	NEG	2
		EPA 903.1	KAC	1
		EPA 904.0	JLW	1

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1802742
Pace Project No.: 30243703

Method: EPA 900.0
Description: 900.0 Gross Alpha/Beta
Client: ALS Life Sciences Division | Environmental
Date: March 08, 2018

General Information:
1 sample was analyzed for EPA 900.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1802742
Pace Project No.: 30243703

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: ALS Life Sciences Division | Environmental
Date: March 08, 2018

General Information:
1 sample was analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

PROJECT NARRATIVE

Project: 1802742
Pace Project No.: 30243703

Method: EPA 904.0
Description: 904.0 Radium 228
Client: ALS Life Sciences Division | Environmental
Date: March 08, 2018

General Information:
1 sample was analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 1802742
Pace Project No.: 30243703

Sample: 1802742-01B **Lab ID: 30243703001** Collected: 02/13/18 09:25 Received: 02/15/18 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	**752 ± 183 (107) C:NA T:NA**	pCi/L	03/01/18 19:24	12587-46-1	
Gross Beta	EPA 900.0	**372 ± 107 (124) C:NA T:NA**	pCi/L	03/01/18 19:24	12587-47-2	
Radium-226	EPA 903.1	**203 ± 25.5 (1.47) C:NA T:91%**	pCi/L	03/07/18 18:26	13982-63-3	
Radium-228	EPA 904.0	**98.7 ± 18.1 (1.64) C:83% T:41%**	pCi/L	03/02/18 14:36	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1802742
Pace Project No.: 30243703

QC Batch: 289357
QC Batch Method: EPA 900.0
Analysis Method: EPA 900.0
Analysis Description: 900.0 Gross Alpha/Beta
Associated Lab Samples: 30243703001

METHOD BLANK: 1417607
Matrix: Water
Associated Lab Samples: 30243703001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Gross Alpha	-0.119 ± 0.347 (0.981) C:NA T:NA	pCi/L	03/01/18 10:40	
Gross Beta	1.13 ± 0.886 (1.77) C:NA T:NA	pCi/L	03/01/18 10:40	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1802742
Pace Project No.: 30243703

QC Batch: 288376 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30243703001

METHOD BLANK: 1413343 Matrix: Water
Associated Lab Samples: 30243703001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.232 ± 0.214 (0.126) C:NA T:97%	pCi/L	03/07/18 17:59	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 1802742
Pace Project No.: 30243703

QC Batch: 289338
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30243703001

METHOD BLANK: 1417575
Matrix: Water
Associated Lab Samples: 30243703001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0337 ± 0.283 (0.652) C:81% T:86%	pCi/L	03/02/18 14:32	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 1802742
Pace Project No.: 30243703

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ALS Environmental

Subcontractor:
Pace Analytical Services, Inc.
1638 Roseytown Rd
Suites 2,3 & 4
Greensburg, PA 15601
TEL: (724) 850-5600
FAX:
Acct #:

Salesperson: Paul Painter

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

Date: 14-Feb-18
COC ID: 8557
Due Da

Customer Information		Project Information		
Purchase Order		Project Name	1802742	A Ra226, Ra228, Gross alpha, Gross beta
Work Order		Project Number		B
Company Name	ALS Group USA, Corp	Bill To Company	ALS Group USA, Corp	C
Send Report To	Rebecca Kiser	Inv Attn	Accounts Payable	D
Address	3352 128th Ave	Address	3352 128th Ave	E
				F
City/State/Zip	Holland, Michigan 49424	City/State/Zip	Holland, Michigan 49424	G
Phone	(616) 399-6070	Phone	(616) 399-6070	H
Fax	(616) 399-6185	Fax	(616) 399-6185	I
eMail Address	rebecca.kiser@alsglobal.com	eMail CC		J

ALS Sample ID	Client Sample ID	Matrix	Collection Date 24hr	Bottle	A	B	C	D	E	F	G	H	I	J
1802742-01B	506168 Grab	Water	13/Feb/2018 9:25	(4) 1LPHNO3	X									

001

WO#: 30243703

30243703

Comments:

WV Samples

Relinquished by: [signature] Date/Time 2/14/18 1700 Received by: FedEx Date/Time 2/14/18 1700 Cooler IDs Report/QC Level Std

Relinquished by: Date/Time Received by: [signature] Place 2-15-18 1015

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: ALS Project # 30243703

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label DS

Tracking #: 7714 8327 9686

LIMS Login CM

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used N/A Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp NA °C Correction Factor: — °C Final Temp: — °C

Temp should be above freezing to 6°C

Date and Initials of person examining contents: AS 2-15-18

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓	✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation.	✓			16. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics				Initial when completed DS Date/time of preservation; Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: MS Date: 2-15-18

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

☑ **ALS Environmental**
1740 Union Carbide Drive
South Charleston, WV 25303
(Tel) 304.356.3168
(Fax) 304.205.6262

Chain of Custody Form

Page 1 of 1

☐ **ALS Environmental**
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

ALS Project Manager:		ALS Work Order #:	802742

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	EQT Injection Well Sample	A	Gross A/B Rad226/228
Work Order		Project Number	04-17-0262	B	Specific Gravity
Company Name	Triad Engineering, Inc.	Bill To Company	Triad Engineering, Inc.	C	
Send Report To	Shannon Cox	Invoice Attn.	Jamie Stemple	D	
Address	10541 Teays Valley Road	Address	1097 Chaplin Road	E	
				F	
City/State/Zip	Scott Depot, WV 25560	City/State/Zip	Morgantown, WV 26501	G	
Phone	304.755.0721	Phone	304.296.2562	H	
Fax	304.755.1880	Fax	304.296.1832	I	
e-Mail Address	scox@triadeng.com			J	

No.	Sample Description	Comp / Grab	Date	Time	Matrix	Pres.	#Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	506168	Grab	2/13/2018	9:25	W	HNO3	5	X	X									
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Sampler(s): Please Print & Sign: Caderis Woods

Shipment Method: courier

Turnaround Time in Business Days (BD): ☐ Other ☑ 10 BD(STD) ☐ 5 BD ☐ 3 BD ☐ 2 BD ☐ 1 BD

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Temp:	Notes:
Caderis Woods	2-14-18	815	2/14/18 0900	4.6°C Arctic	
Relinquished by:	Date: 2/14/18	Time: 0955	Received by:		
Relinquished by:	Date: 2/14/18	Time: 1700	Received by: 2/15/18 1400	Temp: Auburn 4°C	QC Package: (Check Box Below)
Relinquished by:	Date:	Time:	Received by (Laboratory):		Level II: Standard QC — X
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory):		Level III: Standard QC + Raw Data
					Level IV: SW846 Methods/CLP
					Other:

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS

ALS Group, USA

Sample Receipt Checklist

Client Name: **TRIADENGINEER** Date/Time Received: **14-Feb-18 09:55**

Work Order: **1802742** Received by: **JAS**

Checklist completed by Janet Smith (eSignature) 14-Feb-18 (Date) Reviewed by: Rebecca Kiser (eSignature) 12-Mar-18 (Date)

Matrices: Water

Carrier name: Courier

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	<6C	IR	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: pH of RadChem containers not checked. Holland <6 C

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Attachment D

Sample Letters Sent to Homeowners

May 4, 2016

RE: Courtesy Request Notification: Well Water Sampling

Dear Resident,

The purpose of this letter is to provide a courtesy notification that EQT would like to request access to your well water or other non-public water source in order to sample the water source. As you may be aware, EQT operates an active oil and gas facility located within in close proximity to your residence. EQT is a private natural gas production operator with assets across West Virginia and McDowell County. Every five years, the West Virginia Department of Environmental Protection requires that we renew our operating permit. We are currently in the process of renewing for 2016 and the renewal requires us to sample residential water within 0.25 miles of the facility.

We have requested the assistance of a private consulting firm, ERM, to complete the permit renewal process. EQT and ERM personnel will be collecting residential water samples during the week of May 2nd. Mr. Rodney Kirkendoll (EQT), Mr. Ryan Baisden (ERM), and Mr. Tyler Fewell (ERM) would like to sample on May 10th, between the hours of 12:00pm- 6:00pm. On this date, EQT and ERM personnel will be testing within the residential community, will be traveling in company marked vehicles, and will be able to provide identification to residents. The water sampling and analysis is a free service and the results will be provided to you at the completion of the process.

Please feel free to contact me at (304) 348-7661 or our ERM representative Grant Morgan at (304) 757-4777 during business hours (8am-5pm) with any questions or concerns.

Sincerely,

Chad Carmichael
Senior Environmental Coordinator
1710 Pennsylvania Ave
Charleston, WV 25302
T: 304.348.7661
C: 304.539.8892

Attachment E

Safety Data Sheets for Injection Additives

Product Data

BAKER HUGHES

Baker Petrolite

X-CIDE® 370

Industrial Bactericide

DESCRIPTION:

X-CIDE® 370 industrial bactericide is a water-soluble, organic nitrogen bactericide designed for bacterial control in non-potable, oil field water systems. It also effectively controls bacterial growth in a variety of industrial applications.

APPLICATION:

X-CIDE 370 is recommended for use in disposal water systems, in water injection systems associated with petrochemical and oil field operations, and in cooling water recirculating systems. This bactericide will control the growth of both aerobic and anaerobic bacteria. It is particularly effective in controlling anaerobic, sulfate reducing bacteria which are responsible for producing hydrogen sulfide. Typical applications range from 30 to 50 ppm for continuous application and up to 500 ppm for a slug treatment.

This biocide should only be applied as specified.

TYPICAL PROPERTIES:

Form	Liquid
Color:	Light yellow
Solubility	Water soluble
Ionic Character	Cationic
Specific Gravity @ 60°F (16°C)	0.923
Specific Weight @ 60°F (16°C)	7.69 lbs/US gal
Flash Point, SFCC	80°F (27°C)
Pour Point	-40°F (-40°C)
Viscosity	
@ 100°F	58 SUS
@ 130°F	45 SUS

FEATURES AND BENEFITS:

Feature:
- Will not react with H_2S

Benefit:
- Can be used in sour water

Feature:
- Effective against sulfate reducing bacteria at low concentrations

Benefit:
- Reduces microbially influenced corrosion and biogenic H_2S production

Feature:
- Highly surface active

Benefit:
- Cleans lines and penetrates biofilms

Feature:
- Corrosion inhibiting film forming amine

Benefit:
- Provides enhanced corrosion protection

Feature:
- Very effective in low brine waters

Benefit:
- Treats fresh waters at low concentrations

MATERIAL COMPATIBILITY:

Suitable:

Metals:	admiralty brass, aluminum, copper, 304 stainless steel, 316 stainless steel
Plastics:	PLEXIGLAS, polyethylene HD, polypropylene HD, polyurethane, PVC, fiberglass
Elastomers:	Buna N, neoprene, TEFLON, VITON

Not Suitable:

Metals:	mild steel
Plastics:	
Elastomers:	E.P., HYPALON,

(continued)

Product Data

BAKER HUGHES

Baker Petrolite

(X-CIDE® 370 Industrial Bactericide, continued)

SAFETY AND HANDLING:

X-CIDE 370 is a registered biocide. (EPA Registration Number: 10707-8) Refer to the container label for precautionary, environmental, first aid, handling, storage and disposal information. Goggles and impermeable gloves should be worn when handling this product.

X-CIDE 370 Industrial Bactericide is available in 55 gallon drums and in bulk quantities from any Baker Petrolite distribution center.

Before handling, storage or use, see the Material Safety Data Sheet (MSDS) for details.

Baker Petrolite 24 Hour Emergency Hotline:
1-800-424-9300 (CHEMTREC) U.S.A.
1-613-996-6666 (CANUTEC) Canada
Baker Petrolite Customer Care Hotline:
1-800-872-1916 (8 a.m. to 5 p.m. CST)

Product Data

BAKER HUGHES

Baker Petrolite

OSW5200

Oxygen Scavenger

DESCRIPTION:

OSW5200 oxygen scavenger is a catalyzed bisulfite oxygen scavenger used for the removal of dissolved oxygen from oilfield brines.

APPLICATION:

OSW5200 oxygen scavenger reacts with dissolved oxygen at calculated rate of 10 parts OSW5200 for each one part of dissolved oxygen, however, in actual practice 11-12 ppm are generally applied. It should be injected continuously into injection waters and disposal systems. If added batchwise to water storage tanks, a gas blanket should be maintained to prevent air ingress until the water is used. OSW5200 is formulated to be fully winterized.

TYPICAL PROPERTIES:

Specific Gravity @ 60°F(16°C)	1.33
Density @ 60°F(16°C)	11.1
Flash Point, SFCC	above 200°F (96°C)
Pour Point	-40°F(-40°C)
Solubility	Soluble

FEATURES AND BENEFITS:

Feature:
- Reacts with dissolved oxygen

Benefit:
- Reduces system corrosivity

Feature:
- Excellent cold weather handling properties

Benefit:
- Minimal pumping and storage requirement

Feature:
- Catalyzed formulation

Benefit:
- Works in fresh water

MATERIAL COMPATIBILITY:

Suitable:

Metals:	aluminum, 304 stainless steel, 316 stainless steel
Plastics:	HD polyethylene, fiberglass, PLEXIGLAS, HD polypropylene, PVC
Elastomers:	TEFLON, VITON, Buna N (rubber)

Not Suitable:

Metals:	admiralty brass, copper, mild steel
Plastics:	
Elastomers:	neoprene, HYPALON

SAFETY AND HANDLING:

Before handling, storage or use, see the Material Safety Data Sheet (MSDS) for details.

Baker Petrolite 24 Hour Emergency Hotline:
1-800-424-9300 (CHEMTREC) U.S.A.
1-613-996-6666 (CANUTEC) Canada
Baker Petrolite Customer Care Hotline:
1-800-872-1916 (8 a.m. to 5 p.m. CST)

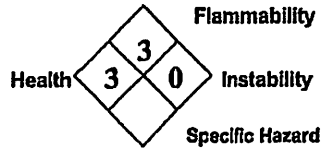
Baker Petrolite

Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product Name	**X-CIDE® 370 INDUSTRIAL BACTERICIDE**	**Code**	XC370
Supplier	Baker Petrolite A Baker Hughes Company 12645 W. Airport Blvd. (77478) P.O. Box 5050 Sugar Land, TX 77487-5050 For Product Information/MSDSs Call: 800-231-3606 (8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400	**Version**	2.0
Material Uses	Industrial Bactericide.	**Effective Date**	8/18/2005
24 Hour Emergency Numbers	CHEMTREC 800-424-9300 (U.S. 24 hour) Baker Petrolite 800-231-3606 (001)281-276-5400 CANUTEC 613-996-6666 (Canada 24 hours) CHEMTREC Int'l 01-703-527-3887 (International 24 hour)	**Print Date**	8/18/2005

National Fire Protection Association (U.S.A.)



Section 2. Hazards Identification

Physical State and Appearance	State: Liquid., Color: Yellow., Odor: Alcohol like.
CERCLA Reportable Quantity	Methanol, 2203 gal. of this product.
Hazard Summary	DANGER. May cause chronic effects. Flammable liquid. Vapors can form an ignitable or explosive mixture with air. Can form explosive mixtures at temperatures at or above the flash point. Vapors can flow along surfaces to a distant ignition source and flash back. Static discharges can cause ignition or explosion when container is not bonded. May be irritating to eyes, skin and respiratory tract. May be toxic by skin absorption. May be toxic if inhaled.
Routes of Exposure	Skin (Permeator), Skin (Contact), Eyes, Inhalation.
Potential Acute Health Effects	*Eyes* May be corrosive to the eyes. May cause eye burns and permanent eye injury. *Skin* May be irritating to skin. May be toxic if absorbed through the skin. *Inhalation* May be toxic if inhaled. May be severely irritating to the lungs. *Ingestion* Not considered a likely route of exposure, however, may be toxic if swallowed.
Medical Conditions aggravated by Exposure	Exposure to this product may aggravate medical conditions involving the following: nervous system, gastrointestinal tract, respiratory tract, skin/epithelium, eyes.
See Toxicological Information (section 11)	
Additional Hazard Identification Remarks	Repeated or prolonged contact may cause dermatitis (inflammation) and defatting of the skin (dryness).

Continued on Next Page

Section 3. Composition and Information on Ingredients

Name	CAS #	% by Weight
Methanol	67-56-1	10 - 30
Oxydiethylene bis(alkyl* dimethyl ammonium chloride)	68607-28-3	30 - 60

See Section 8 for information on permissible exposure limits and threshold limit values.

Section 4. First Aid Measures

Eye Contact	Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Get medical attention immediately.
Skin Contact	Remove and launder or clean contaminated clothing and shoes. Wash with soap and water for at least 15 minutes or until no evidence of material remains. Get medical attention if irritation occurs.
Inhalation	Remove to fresh air. Oxygen may be administered if breathing is difficult. If not breathing, administer artificial respiration and seek medical attention. Get medical attention if symptoms appear.
Ingestion	Get medical attention immediately. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Wash out mouth with water if person is conscious. Never induce vomiting or give anything by mouth to a victim who is unconscious or having convulsions.
Notes to Physician	Not available.
Additional First Aid Remarks	Not available.

Section 5. Fire Fighting Measures

Flammability of the Product	Flammable liquid. Vapors can form an ignitable or explosive mixture with air. Can form explosive mixtures at temperatures at or above the flash point. Vapors can flow along surfaces to a distant ignition source and flash back. Static discharges can cause ignition or explosion when container is not bonded.
OSHA Flammability Class	IC
Products of Combustion	These products are carbon oxides (CO, CO2) Hydrogen chloride fumes. nitrogen oxides (NO, NO2...).
Fire Hazards in Presence of Various Substances	Open Flames/Sparks/Static. Heat.
Fire Fighting Media and Instructions	In case of fire, use foam, dry chemicals, or CO2 fire extinguishers. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and public waterways. Note that flammable vapors may form an ignitable mixture with air. Vapors may travel considerable distances and flash back if ignited.
Protective Clothing (Fire)	Do not enter fire area without proper personal protective equipment, including NIOSH-approved self-contained breathing apparatus.
Special Remarks on Fire Hazards	Not available.

Continued on Next Page

Section 6. Accidental Release Measures

Spill	Put on appropriate personal protective equipment. Keep personnel removed and upwind of spill. Shut off all ignition sources; no flares, smoking, or flames in hazard area. Approach release from upwind. Shut off leak if it can be done safely. Contain spilled material. Keep out of waterways. Dike large spills and use a non-sparking or explosion-proof means to transfer material to an appropriate container for disposal. For small spills add absorbent (soil may be used in the absence of other suitable materials) scoop up material and place in a sealed, liquid-proof container. Note that flammable vapors may form an ignitable mixture with air. Vapors may travel considerable distances from spill and flash back, if ignited. Waste must be disposed of in accordance with federal, state and local environmental control regulations.
Other Statements	If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.
Additional Accidental Release Measures Remarks	Not available.

Section 7. Handling and Storage

Handling and Storage	Put on appropriate personal protective equipment. Avoid contact with eyes, skin, and clothing. Avoid breathing vapors or spray mists. Use only with adequate ventilation. Store in a dry, cool and well ventilated area. Keep away from heat, sparks and flame. Keep away from incompatibles. Keep container tightly closed and dry. To avoid fire or explosion, ground container equipment and personnel before handling product.
Additional Handling and Storage Remarks	Not available.

Section 8. Exposure Controls/Personal Protection

Exposure Limits	Methanol	**ACGIH (United States). Skin** TWA: 262 mg/m³ 8 hour(s). STEL: 328 mg/m³ 15 minute(s). TWA: 200 ppm 8 hour(s). STEL: 250 ppm 15 minute(s). **OSHA PEL 1989 (United States). Skin** TWA: 200 ppm 8 hour(s). STEL: 250 ppm 15 minute(s). TWA: 260 mg/m³ 8 hour(s). STEL: 325 mg/m³ 15 minute(s).
	Oxydiethylene bis(alkyl* dimethyl ammonium chloride)	Not available.
Additional Information on Exposure Limits	*Alkyl is derived from coconut oil fatty acids. The OSHA permissible exposure levels shown above are the OSHA 1989 levels or from subsequent OSHA regulatory actions. Although the 1989 levels have been vacated the 11th Circuit Court of Appeals, Baker Petrolite Corporation recommends that these lower exposure levels be observed as reasonable worker protection.	
Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors or particles below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.	
Personal Protection		

Continued on Next Page

Personal Protective Equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended, however, to determine the level of personal protective equipment appropriate for these job tasks and conditions.

Eyes Chemical safety goggles.

Body Wear long sleeves to prevent repeated or prolonged skin contact.

Respiratory Respirator use is not expected to be necessary under normal conditions of use. In poorly ventilated areas, emergency situations or if exposure levels are exceeded, use NIOSH approved full face respirator.

Hands Chemical resistant gloves. Nitrile or Neoprene gloves. 4H gloves.

Feet Chemical resistant boots or overshoes.

Other information Not available.

Additional Exposure Control Remarks	Not available.

Section 9. Typical Physical and Chemical Properties

Physical State and Appearance	Liquid.	**Odor**	Alcohol like.
pH	5 - 7 (5% in water)	**Color**	Yellow.
Specific gravity	0.917 - 0.929 @ 16°C (60°F)		
Density	7.64 - 7.74 lbs/gal @ 16°C (60°F)		
Flash Points	Closed cup: 26.7°C (80°F). (SFCC)		
Flammable Limits	L.E.L. Not available. U.E.L. Not available.		
Autoignition Temperature	Not available.		
Initial Boiling Point	Not available.		
Boiling Point	66°C (150°F)		
Vapor Density	>1 (Air = 1)		
Vapor Pressure	45.3 - mmHg @ 21°C (70°F) Calculated Value for all Components.		
Evaporation Rate	Not Available or Not Applicable for Solids.		
VOC	Not available.		
Viscosity	11 - 13 cps @ 38°C (100°F)		
Pour Point	-40°C (-40°F)		
Solubility (Water)	Soluble		
Physical Chemical Comments	Not available.		

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Oxidizing material.

Continued on Next Page

Hazardous Decomposition Products	Not applicable.
Hazardous Polymerization	Hazardous polymerization is not expected to occur.
Special Stability & Reactivity Remarks	Not available.

Section 11. Toxicological Information

Component Toxicological Information

Acute Animal Toxicity

Methanol	ORAL (LD50): Acute: 5628 mg/kg [Rat]. 7300 mg/kg [Mouse]. DERMAL (LD50): Acute: 15800 mg/kg [Rabbit]. VAPOR (LC50): Acute: 64000 ppm 4 hour(s) [Rat]. 50000 ppm 4 hour(s) [Mouse].
Oxydiethylene bis(alkyl* dimethyl ammonium chloride)	Not available.

Chronic Toxicity Data

1) Methanol

Methanol is a component of this product. Because methanol is eliminated from the body more slowly than ethanol, it can have cumulative toxicity with repeated exposures (ACGIH, 1992).

Acute dermal, oral, and inhalation exposure to methanol can cause Central Nervous System effects, optic nerve effects, diminished vision, and brain effects (necrosis and hemorrhaging). (Bennett, I.L. et al, 1953)

Ingestion of methanol can cause Central Nervous System depression, metabolic acidosis, blurred vision and blindness, gastrointestinal effects, and coma and death. (Clayton, G.D. and Clayton, F.E., 1982, Patty's Industrial Hygiene and Toxicology, Vol2C) Dermal exposure to methanol can cause Central Nervous System depression, blurred vision, and gastrointestinal effects. (Downie, A et al, 1992, Occupational Medicine, 42, pp 47-9) Chronic inhalation of methanol can cause Central Nervous System depression, blurred vision, and gastrointestinal effects. (Frederick, L.J. et al, 1984, AIHA Journal, 45, pp 51-5) Chronic inhalation of methanol has caused liver effects in laboratory animals. (Poon, R et al, 1994, Toxocology and Industrial Health 10: 231-245) Chronic oral exposure has caused Central Nervous System effects and eye effects in laboratory animals. [Youssef, A. F. et al (1993) Neurotoxicology and Teratology 15: 223-227; Baumbach, G.L. et al (1977) Archives of Ophthalmology 95: 1859-1865; Hayreh, M.S. et al (1977) Archives of Ophthalmology 95: 1851-1858; Hayreh, M.S. et al (1980) Ocular toxicity of methanol: An experimental study -- Raven Press, New York, pages 35-53; and Martin-Amat, G. et al (1977) Archives of Ophthalmology 95: 1847-1850]

Methanol has produced in vivo mutagenicity in animal studies. (Pereira, M.A. et al, 1982) and (Ward, J. B. et al, 1983)

Methanol was mutagenic in yeast (RTECS). Methanol has caused chromosome aberrations in yeast (RTECS) and grasshoppers (Saha & Khudabaksh, 1974).

Methanol has caused birth defects in rats exposed by the oral (Infurna et al, 1981) and inhalation (Nelson et al, 1984; Nelson et al, 1985) routes. Exencephaly (a defect in the skull bone structure that leaves the brain exposed) and cleft palate (a fissure or unformed bone structure in the roof of the mouth (palate), lip, or facial area, occurring during the embryonic stage of development) were increased in fetal mice exposed to methanol at an airborne concentration of 5,000 ppm or higher for 7 hours/day on days 6 to 15 of gestation.

Embryotoxicity and fetotoxicity were seen with maternal exposure to airborne concentrations of 7,500 ppm and above, and reduced fetal weights with concentrations of 10,000 ppm or greater. The NOAEL was 1,000 ppm. Effects similar to those seen in the 10,000 ppm dosage group were also seen in offspring of mice given a dose of 4 g/kg orally (Rogers et al, 1993).

Continued on Next Page

2) Oxydiethylene bis(alkyl* dimethyl ammonium chloride)

Not available.

Product Toxicological Information

Acute Animal Toxicity	ORAL (LD50): Acute: 1700 mg/kg [Rat]. DERMAL (LD50): Acute: 9700 mg/kg [Rabbit]. VAPOR (LC50): Acute: 1.05 mg/l 4 hour(s) [Rat].
Target Organs	nervous system, gastrointestinal tract, respiratory tract, skin/epithelium, eyes.
Other Adverse Effects	Eye Irritation Score = 4 (Extreme Irritant/Corrosive). Skin Irritation Score = 2 (Moderate Irritant).

Section 12. Ecological Information

Ecotoxicity	X-CIDE® 370 INDUSTRIAL BACTERICIDE	Fathead minnow	96 hour(s)	0.42 mg/l
		Rainbow trout	96 hour(s)	0.6 mg/l
		Daphnia magna	96 hour(s)	1.7 mg/l
		Grass shrimp	96 hour(s)	4 mg/l
		Brown shrimp.	96 hour(s)	34 mg/l
		Sheepshead minnow	96 hour(s)	0.55 mg/l
BOD5 and COD	Not available.			
Biodegradable/OECD	Not available.			
Toxicity of the Products of Biodegradation	Not available.			
Special Remarks	An EcoTox™ Report, and/or the material's environmental fate is available upon request at the following number: 1-800-235-4249, then press 4. This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, steams, ponds or estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) Permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.			

Section 13. Disposal Considerations

Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable federal, state and local regulations. Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change.

Additional Waste Remarks	Not available.

Section 14. Transport Information

DOT Classification	FLAMMABLE LIQUID, TOXIC, N.O.S. (Contains: Methanol, Oxydiethylene bis(alkyl dimethyl ammonium chloride)), 3(6.1), UN1992, III

Continued on Next Page

DOT Reportable Quantity	Methanol, 2203 gal. of this product.
Marine Pollutant	Not applicable.
Additional DOT Information	Not available.
Emergency Response Guide Page Number	131

Section 15. Regulatory Information

HCS Classification	Target organ effects. Flammable liquid. Irritant. Toxic.
U.S. Federal Regulations	
Environmental Regulations	Extremely Hazardous Substances: Not applicable to any components in this product. SARA 302/304 Emergency Planning and Notification substances: Not applicable to any components in this product. Hazardous Substances (CERCLA 302): Methanol, 2203 gal. of this product.; SARA 311/312 MSDS distribution - chemical inventory - hazard identification: fire; immediate health hazard; delayed health hazard; Clean Water Act (CWA) 307 Priority Pollutants: Not applicable to any components in this product. Clean Water Act (CWA) 311 Hazardous Substances: Not applicable to any components in this product. Clean Air Act (CAA) 112(r) Accidental Release Prevention Substances: Not applicable to any components in this product.
Threshold Planning Quantity (TPQ)	Not applicable.
TSCA Inventory Status	All components are included or are exempted from listing on the US Toxic Substances Control Act Inventory. This product does not contain any components that are subject to the reporting requirements of TSCA Section 12(b) if exported from the United States.
State Regulations	State specific information is available upon request from Baker Petrolite.
International Regulations	
Canada	All components are compliant with or are exempted from listing on the Canadian Domestic Substance List.
WHMIS (Canada)	B-2, D-1B, D-2A, D-2B
European Union	All components are included or are exempted from listing on the European Inventory of Existing Commercial Chemical Substances or the European List of Notified Chemical Substances.
	International inventory status information is available upon request from Baker Petrolite for the following countries: Australia, China, Korea (TCCL), Philippines (RA6969), or Japan.
Other Regulatory Information	This product is subject to regulation under the US Federal Insecticide, Fungicide and Rodenticide ACT (FIFRA) and is therefore exempt from US Toxic Substance Control Act (TSCA) Inventory listing requirements. EPA Registration No. 10707-48

Continued on Next Page

Section 16. Other Information

Other Special Considerations	File 105 06/30/03 - Changes to Sections 1, 2, 3, 5, 8, 9, 11, 12, 14, and 15. 08/18/05 - Changes to Sections 2, 3, 5, 8, 9 and 15.

In April, 2005, a number of format changes were made. The most notable of these were switching Sections 2 and 3, moving the exposure limits to Section 8, and moving the flash point from Section 5 to Section 9.

Baker Petrolite Disclaimer

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Petrolite, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

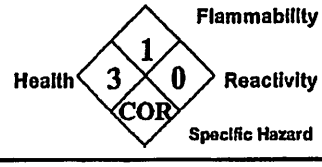
BAKER HUGHES
Baker Petrolite

Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product Name	**OSW5200 OXYGEN SCAVENGER**	**Code**	OSW5200
Supplier	Baker Petrolite A Baker Hughes Company 12645 W. Airport Blvd. (77478) P.O. Box 5050 Sugar Land, TX 77487-5050 For Product Information/MSDSs Call: 800-231-3606 (8:00 a.m. - 5:00 p.m. cst, Monday - Friday) 281-276-5400	**Version**	3.0
Material Uses	Oxygen scavenger	**Effective Date**	11/19/2004
24 Hour Emergency Numbers	CHEMTREC 800-424-9300 (U.S. 24 hour) Baker Petrolite 800-231-3606 (001)281-276-5400 CANUTEC 613-996-6666 (Canada 24 hours) CHEMTREC Int'l 01-703-527-3887 (International 24 hour)	**Print Date**	11/19/2004

National Fire Protection Association (U.S.A.)



Section 2. Composition and Information on Ingredients

Name	CAS #	% by Weight	Exposure Limits
Ammonium bisulfite	10192-30-0	60-100	Not available.
Nickel sulfate	7786-81-4	0.1-1	Not available.

Section 3. Hazards Identification

Physical State and Appearance	State: Clear. Liquid., Color: Light Yellow., Odor: Pungent.
CERCLA Reportable Quantity	Ammonium bisulfite 734 gal. Nickel sulfate 4712 gal.
Hazard Summary	DANGER. May be corrosive to eyes, skin and respiratory tract. Contains a component that may cause cancer.
Routes of Exposure	Skin (Contact), Eyes, Inhalation.

Potential Acute Health Effects

Eyes May be corrosive to the eyes. May cause eye burns and permanent eye injury.

Skin May be corrosive. Skin contact may produce burns.

Inhalation May be corrosive to lungs. May cause burns.

Ingestion Not considered a likely route of exposure, however, may be corrosive if swallowed.

Continued on Next Page

Medical Conditions aggravated by Exposure	Exposure to this product may aggravate medical conditions involving the following: gastrointestinal tract, respiratory tract, skin/epithelium, eyes.
See Toxicological Information (section 11)	
Additional Hazard Identification Remarks	Not available.

Section 4. First Aid Measures

Eye Contact	Immediately flush the eye(s) continuously with lukewarm, gently flowing water for at least 20-60 minutes while holding the eyelid(s) open. Get medical attention immediately.
Skin Contact	Remove contaminated clothing and shoes immediately. Wash affected area with soap and mild detergent and large amounts of lukewarm, gently flowing water until no evidence of chemical remains (for at least 20-60 minutes). Get medical attention if irritation occurs.
Inhalation	Remove to fresh air. Oxygen may be administered if breathing is difficult. If not breathing, administer artificial respiration and seek medical attention. Get medical attention if symptoms appear.
Ingestion	Get medical attention immediately. If swallowed, do not induce vomiting unless directed to do so by medical personnel. Wash out mouth with water if person is conscious. Never induce vomiting or give anything by mouth to a victim who is unconscious or having convulsions.
Notes to Physician	Not available.
Additional First Aid Remarks	Not available.

Section 5. Fire Fighting Measures

Flammability of the Product	Not regulated as flammable or combustible.
OSHA Flammability Class	IIIB
Autoignition temperature	Not available.
Flash Points	Not applicable.
Flammable Limits	L.E.L. Not available. U.E.L. Not available.
Products of Combustion	These products are carbon oxides (CO, CO2) nitrogen oxides (NO, NO2...) sulfur oxides (SO2, SO3...) Ammonia..
Fire Hazards In Presence of Various Substances	Open Flames/Sparks/Static. Heat.
Fire Fighting Media and Instructions	In case of fire, use foam, dry chemicals, or CO2 fire extinguishers. Evacuate area and fight fire from a safe distance. Water spray may be used to keep fire-exposed containers cool. Keep water run off out of sewers and public waterways.
Protective Clothing (Fire)	Do not enter fire area without proper personal protective equipment, including NIOSH approved self-contained breathing apparatus.
Special Remarks on Fire Hazards	Not available.

Continued on Next Page

Section 6. Accidental Release Measures

Spill	Put on appropriate personal protective equipment. Keep personnel removed and upwind of spill. Shut off all ignition sources; no flares, smoking, or flames in hazard area. Approach release from upwind. Shut off leak if it can be done safely. Contain spilled material. Keep out of waterways. Dike large spills and use a non-sparking or explosion proof means to transfer material to an appropriate container for disposal. For small spills add absorbent (soil may be used in absence of other suitable materials scoop up material and place in a sealed, liquid-proof container. Waste must be disposed of in accordance with federal, state and local environmental control regulations.
Other Statements	If RQ (Reportable Quantity) is exceeded, report to National Spill Response Office at 1-800-424-8802.
Additional Accidental Release Measures Remarks	Not available.

Section 7. Handling and Storage

Handling and Storage	Put on appropriate personal protective equipment. Avoid contact with eyes, skin and clothing. Avoid breathing vapors or spray mists. Use only with adequate ventilation. Protect from ignition. Store in a dry, cool and well ventilated area. Keep away from incompatibles. Keep container tightly closed and dry.
Additional Handling and Storage Remarks	Not available.

Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors or particles below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection

Personal Protective Equipment recommendations are based on anticipated known manufacturing and use conditions. These conditions are expected to result in only incidental exposure. A thorough review of the job tasks and conditions by a safety professional is recommended, however, to determine the level of personal protective equipment appropriate for these job tasks and conditions.

Eyes Chemical safety goggles. Use full face shield if splashes could occur.

Body Wear long sleeves and chemical resistant apron to prevent repeated or prolonged skin contact.

Respiratory Respirator use is not expected to be necessary under normal conditions of use. In poorly ventilated areas or in emergency situations, use NIOSH approved full face respirator.

Hands Chemical resistant gloves. Butyl rubber gloves.

Feet Chemical resistant boots or overshoes.

Other information Not available.

Additional Exposure Control Remarks	Not available.

Continued on Next Page

Section 9. Typical Physical and Chemical Properties

Physical State and Appearance	Clear. Liquid.	Odor	Pungent.
pH	4.5 - 5.5 (Neat - without dilution)	Color	Light Yellow.
Specific gravity	1.335 - 1.347 @ 16°C (60°F)		
Density	11.12 - 11.22 lbs/gal @ 16°C (60°F)		
Vapor Density	>1 (Air = 1)		
Vapor Pressure	Not Available or Not Applicable for Solids.		
Evaporation Rate	Not Available or Not Applicable for Solids.		
VOC	Not available.		
Viscosity	7 - 9 cps		
Pour Point	-40°C(-40°F)		
Solubility (Water)	Soluble		
Boiling Point	Not available.		
Physical Chemical Comments	Not available.		

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Oxidizing material. Acid. Alkali.
Hazardous Decomposition Products	Not applicable.
Hazardous Polymerization	Hazardous polymerization is not expected to occur.
Special Stability & Reactivity Remarks	Avoid strong mineral acids which will yield sulfur dioxide gas. Do not use copper or its alloys

Section 11. Toxicological Information

Component Toxicological Information

Acute Animal Toxicity

Ammonium bisulfite	Not available.
Nickel sulfate	Not available.

Chronic Toxicity Data

Continued on Next Page

1) Ammonium bisulfite

Ammonium bisulfite is a component of this product. Prolonged contact can produce corrosion of the skin and permanent damage to the eye. Under acidic conditions, sulfur dioxide may be formed. Inhalation of sulfur dioxide can cause stricture of the esophagus, acute pulmonary edema, and respiratory failure. Sulfur dioxide has been linked to miscarriages, gynecological disease, and abnormal pregnancies (Reprotext).

2) Nickel sulfate

Sulfuric acid, nickel(2+) salt (1:1) (Nickel sulfate) is a component of this product. The International Agency of Research on Cancer (IARC) classifies nickel sulfate (a nickel compound) as a Group 1 carcinogen. Repeated or chornic exposure to nickel salts can lead to allergic contact dermatitis known as "nickel itch" (Clayton Clayton 1994). In chornically exposed experimental naimals, nickel sulfate in the drinking water produced severe myocardial (middle layer of the heart muscle) and liver damage in rabbits after 60 days (HSDB, 1996). Inhalation of nickel sulfate aerosol reduced the resistance of mice to pulmonary bacterial infection (Adkins et al, 1979). Low grade renal (kidney) damage was reported when 100 mg/L of nickel sulfate in drinking water was provided to rats (Vyskocil et al, 1994). Nickel sulfate selectively damaged the testes and sperm produciton in rats when given orally (Waltscheva et al, 1972) or dermally (Mathur et al, 1977).

Product Toxicological Information	
Acute Animal Toxicity	Not available.
Target Organs	gastrointestinal tract, respiratory tract, skin/epithelium, eyes.
Other Adverse Effects	Not available.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Biodegradable/OECD	Not available.
Toxicity of the Products of Biodegradation	Not available.
Special Remarks	Not available.

Section 13. Disposal Considerations

Responsibility for proper waste disposal rests with the generator of the waste. Dispose of any waste material in accordance with all applicable federal, state and local regulations. Note that these regulations may also apply to empty containers, liners and rinsate. Processing, use, dilution or contamination of this product may cause its physical and chemical properties to change.

Additional Waste Remarks	Not available.

Continued on Next Page

Section 14. Transport Information

DOT Classification	BISULFITES, AQUEOUS SOLUTION, N.O.S. (Contains: Ammonium bisulfite), 8, UN2693, III
DOT Reportable Quantity	Ammonium bisulfite 734 gal. Nickel sulfate 4712 gal.
Marine Pollutant	Not applicable.
Additional DOT Information	Not available.
Emergency Response Guide Page Number	154

Section 15. Regulatory Information

HCS Classification	Corrosive. Contains a component that may cause cancer..
U.S. Federal Regulations	
Environmental Regulations	Extremely Hazardous Substances: Not applicable to any components in this product. SARA 313 Toxic Chemical Notification and Release Reporting: Nickel sulfate; SARA 302/304 Emergency Planning and Notification substances: Not applicable to any components in this product. Hazardous Substances (CERCLA 302): Ammonium bisulfite 734 gal.; Nickel sulfate 4712 gal.; SARA 311/312 MSDS distribution - chemical inventory - hazard identification: immediate health hazard; delayed health hazard; Clean Water Act (CWA) 307 Priority Pollutants: Nickel sulfate; Clean Water Act (CWA) 311 Hazardous Substances: Ammonium bisulfite; Nickel sulfate; Clean Air Act (CAA) 112(r) Accidental Release Prevention Substances: Not applicable to any components in this product.
Threshold Planning Quantity (TPQ)	Not applicable.
TSCA Inventory Status	All components are included or are exempted from listing on the US Toxic Substances Control Act Inventory. This product does not contain any components that are subject to the reporting requirements of TSCA Section 12(b) if exported from the United States.
State Regulations	State specific information is available upon request from Baker Petrolite.
International Regulations	
Canada	All components are compliant with or are exempted from listing on the Canadian Domestic Substance List.
WHMIS (Canada)	E
European Union	All components are included or are exempted from listing on the European Inventory of Existing Commercial Chemical Substances or the European List of Notified Chemical Substances.

Continued on Next Page

	International inventory status information is available upon request from Baker Petrolite for the following countries: Australia, China, Korea (TCCL), Philippines (RA6969), or Japan.
Harmonized Tariff Code	Not available.
Other Regulatory Information	No further regulatory information is available.

Section 16. Other Information

Other Special Considerations	701 06/28/04 - Changes to Sections 5, 8 and 10. 11/19/04 - Changes to Sections 2, 3, 5, 9, 11, 12 and 15.

Baker Petrolite Disclaimer

NOTE: The information on this MSDS is based on data which is considered to be accurate. Baker Petrolite, however, makes no guarantees or warranty, either expressed or implied of the accuracy or completeness of this information.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

This MSDS was prepared and is to be used for this product. If the product is used as a component in another product, this MSDS information may not be applicable.

AQUA-CLEAR, INC.

MATERIAL SAFETY DATA SHEET Page 1 of 6
PRODUCT NAME: Alpha 3207 Preparation Date: 7/29/05

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION
MSDS REVISION #: 001
PRODUCT NAME: Alpha 3207
SYNONYMS: None
MANUFACTURED BY: 608 Virginia Street, East
Charleston, West Virginia 25301
Telephone (304) 343-4792
Fax (304) 345-3535

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

Component	**%**	**CAS No.**	**Exposure Limits**
Isopropanol	10-30	67-63-0	OSHA PEL – 400 ppm ACGIH TLV – 200 ppm ACGIH STEL – 400 ppm

SECTION 3 - HAZARDS IDENTIFICATION
********** **EMERGENCY OVERVIEW**
****

Product is a dark, amber, flammable liquid with an alcohol odor. Causes irritation to the
skin, eyes and mucous membranes. Inhalation of high concentrations of vapors can
cause irritation of the respiratory tract and dizziness.
Vapors are heavier than air and may travel along the ground to remote ignition sources.
Vapors may then ignite explosively.
Keep away from heat, sparks and open flames. Wear protective goggles and gloves
when handling this product. Avoid breathing vapors. Avoid contact with skin, eyes and
clothing. Wash thoroughly after handling.
****
****

Section 3 continued on next page

SECTION 3 - HAZARDS IDENTIFICATION (continued)
POTENTIAL HEALTH EFFECTS

EYES:
Liquid can cause severe irritation, with tearing and redness. High concentrations of
vapors may cause irritation.

SKIN:
Can cause irritation, defatting cracking and dermatitis. Persons with pre-existing skin conditions are particularly susceptible.

INGESTION (swallowing):
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.

INHALATION (breathing):
Causes irritation to the respiratory tract. Symptoms may include sore throat, coughing, headache, nausea and shortness of breath. High concentrations can cause dizziness.

CHRONIC EFFECTS/CARCINOGENICITY:
This product (or component) is not listed in IARC Monographs, the NTP Eleventh Annual Report or ACGIH TLVs as a carcinogen or potential carcinogen. OSHA does not regulate it as a carcinogen.

SECTION 4 - FIRST AID MEASURES

EYE CONTACT:
Immediately flush with large amounts of water for at least 15 minutes, lifting upper
and lower lids occasionally. Get medical attention. Do **not** use chemical antidote.

SKIN CONTACT:
Wash exposed area with lots of soap and water. Remove contaminated clothing and launder before re-use.

INGESTION (swallowing):
Immediately drink two large glasses. Never give anything by mouth to an unconscious person. Get immediate medical attention.

INHALATION (breathing):
If affected, move to fresh air. If breathing has stopped, give artificial respiration and
call a physician.

SECTION 5 - FIRE FIGHTING MEASURES
FLASH POINT: 70o F (21o C) FLASH POINT METHOD: TCC
UPPER EXPLOSION LIMIT: 13% (isopropanol)
LOWER EXPLOSION LIMIT: 2% (isopropanol)
AUTOIGNITION TEMPERATURE: Unavailable
EXTINGUISHING MEDIA:
Dry chemical, carbon dioxide, water spray or alcohol foam
FIRE AND EXPLOSION HAZARDS:
Vapors are heavier than air and may travel along the ground to remote ignition sources. Vapors may then ignite explosively. All 5 gallon and larger size containers should be properly bonded and grounded.
FIRE-FIGHTING EQUIPMENT:
Keep personnel removed from and upwind. Wear full protective clothing and selfcontained
breathing apparatus with full face-piece. Cool containers with water.
Water may be ineffective against large spills of flammable liquids.
Decomposition/combustion products may include toxic fumes, carbon monoxide and carbon dioxide.

SECTION 6 - ACCIDENTAL RELEASE MEASURES
Eliminate all open flames, heat, sparks and other ignition sources from the area of
the spill. Use only explosion-proof equipment. Persons not wearing protective equipment should be excluded from the area of the spill until clean up has been completed. Dike area of spill with sand or dirt to prevent spreading. Pump liquid to
salvage tank or other containers. Remaining liquid may be absorbed on vermiculite
or other absorbent material and shoveled into containers.

SECTION 7 - HANDLING AND STORAGE
HANDLING:
Containers should be properly bonded and grounded before transferring contents to other containers. Use non-sparking tools and explosion-proof equipment when handling flammable liquids.
Avoid contact with skin, eyes and clothing. Avoid inhalation of vapors. Wash thoroughly after handling.
Section 7 continued on next page

SECTION 7 - HANDLING AND STORAGE (continued)
STORAGE:
Keep in closed or covered containers away from heat, sparks and open flames when not in use. Do not store near oxidizing materials. Store in cool dry place with
adequate ventilation.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION
RESPIRATORY PROTECTION:
A NIOSH/MSHA approved supplied air respirator or canister-type respirator equipped with organic vapor cartridge is recommended if exposure exceeds established exposure limits or level of overexposure.
SKIN PROTECTION:
Wear protective gloves such as Neoprene.
EYE PROTECTION:
Chemical splash goggles in compliance with OSHA regulations and full face-shield
are advised.
OTHER PROTECTION:
Impervious clothing and boots are recommended.
ENGINEERING CONTROLS:
Provide sufficient ventilation to maintain exposure below established exposure limits.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES
APPEARANCE: Dark amber liquid @ 77o F (25o C)
ODOR: Alcohol
SPECIFIC GRAVITY: 0.94-1.0
VAPOR PRESSURE (mm Hg): Unavailable
VAPOR DENSITY (Air = 1): Unavailable
INITIAL BOILING POINT: >180o F (82o C)
FREEZING POINT: Unavailable
EVAPORATION RATE: Unavailable
(Butyl Acetate = 1)
SOLUBILITY in WATER: Soluble
VOLATILE %: Unavailable
pH: 4.5-6

SECTION 10 - STABILITY AND REACTIVITY
STABILITY (conditions to avoid):
Stable under normal conditions.
INCOMPATIBILITIES (materials to avoid):
Avoid contact with strong oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS:
Thermal decomposition may form nitrogen oxides, carbon monoxide and carbon dioxide.
HAZARDOUS POLYMERIZATION:
Not known to occur

SECTION 11 - TOXICOLOGICAL INFORMATION
No data available for product

SECTION 12 - ECOLOGICAL INFORMATION
No data available

SECTION 13 - DISPOSAL CONSIDERATIONS
Incineration is the recommended disposal method for all chemical wastes such as
this product. Material collected on absorbent material may be deposited in a landfill
in accordance with all applicable local, state and federal regulations.
This product, if disposed of, is considered an ignitable waste (D001) under current
RCRA regulations.

SECTION 14 - TRANSPORT INFORMATION
DOT Shipping Description: Isopropanol solution, 3, UN 1219, PG II

SECTION 15 - REGULATORY INFORMATION

TSCA INFORMATION:
All components in this product are in compliance with TSCA Inventory requirements.
CERCLA:
None of the components in this product have been designated as hazardous substances.
SARA 313 INFORMATION:
SARA requires submission of annual reports of release of toxic chemicals that appear in 40 CFR 372. This information must be included in all MSDS that are copied and distributed for this material.
Components present in this product at a level which could require reporting under
the statute are: None

SECTION 16 - OTHER INFORMATION

HAZARD RATING:
HEALTH 2 0 - LEAST
FIRE 3 1 - SLIGHT
REACTIVITY 0 2 - MODERATE
OTHER - 3 - HIGH
4 - EXTREME
HAZARD RATING METHOD: NFPA
REASON FOR REVISION:
Changed format, reviewed and updated

The product information contained herein is believed to be accurate as of the date of the Material
Safety Data Sheet, and is provided without warranty, expressed or implied, as to the results of use
of this information or the product to which it relates. Recipient assumes all responsibility for the
use of this information and the use (alone or in combination with any other product), storage or
disposal of the product, including any resultant personal injury or property damage.

****END OF REPORT****

Safety Data Sheet
SI 7218

SDS Revision Date: 01/21/2016

INTERRACHEM

1. Identification

1.1. Product identifier

Product Identity	SI 7218
Alternate Names	Scale Inhibitor

1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use	Scale Inhibitor
Application Method	See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet

Company Name	Interrachem, LLC P.O. Box 8233 Evansville, IN 47716 U.S.A.
Emergency	
CHEMTREC (USA)	(800) 424-9300
24 hour Emergency Telephone No.	Chemtrec (800) 424-9300 (Within Continental U.S.) Chemtrec (703) 527-3887 (Outside Continental U.S.)
Customer Service: Interrachem, LLC	812-425-0989 (7 AM - 5 PM Monday to Friday, CST).

2. Hazard(s) identification

2.1. Classification of the substance or mixture

Acute Tox. 4;H302	Harmful if swallowed.
Acute Tox. 5;H313	May be harmful in contact with skin.
STOT SE 2;H371	May cause damage to organs. Specific Target Organs: (Not Available)

2.2. Label elements

Using the Toxicity Data listed in section 11 and 12 the product is labeled as follows.

Warning

H302 Harmful if swallowed.
H313 May be harmful in contact with skin.
H371 May cause damage to organs.

[Prevention]:

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.
P235 Keep cool.
P240 Ground / bond container and receiving equipment.
P241 Use explosion-proof electrical / ventilating / light / equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing dust / fume / gas / mist / vapors / spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves / eye protection / face protection.

[Response]:

P301+312 IF SWALLOWED: Call a POISON CENTER or doctor / physician if you feel unwell.
P302+352 IF ON SKIN: Wash with plenty of soap and water.
P303+361+353 IF ON SKIN (or hair): Remove / Take off immediately all contaminated clothing. Rinse skin with water / shower.
P304+340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P307+311 IF exposed: Call a POISON CENTER or doctor / physician.
P321 Specific treatment (see information on this label).
P330 Rinse mouth.
P363 Wash contaminated clothing before reuse.
P370+378 In case of fire: Use extinguishing media listed in section 5 of SDS for extinction.

[Storage]:

P403+233 Store in a well ventilated place. Keep container tightly closed.
P405 Store locked up.

[Disposal]:

P501 Dispose of contents / container in accordance with local / national regulations.

3. Composition/information on ingredients

This product contains the following substances that present a hazard within the meaning of the relevant State and Federal Hazardous Substances regulations.

Ingredient/Chemical Designations	Weight %	GHS Classification	Notes
Scale Inhibitor Package **CAS Number: Proprietary**	**50 - 75**	**Not Classified**	**[1]**
Ethylene glycol **CAS Number: 0000107-21-1**	**10 - 30**	**Acute Tox. 4;H302** **STOT SE 2;H371**	**[1][2]**

[1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.
[3] PBT-substance or vPvB-substance.
*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures

General — In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

Inhalation — Move the exposed person to fresh air at once. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if any discomfort continues.

Eyes — Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.

Skin — Remove contaminated clothing. Wash skin thoroughly with soap and water or use a recognized skin cleanser.

Ingestion	Get medical attention immediately. Do not give anything by mouth to an unconscious person. Place victim on left side with head down to prevent aspiration into lungs. Call a physician or poison control center immediately for advice on inducing vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Overview	EYE: Liquid, aerosols and vapors of this product may be irritating and can cause pain, tearing, reddening and swelling accompanied by a stinging sensation and/or a feeling like that of fine dust in the eyes. SKIN: May cause skin irritation. Allergic reactions are possible. Passage of this material into the body through the skin is possible, which will add to the toxic effects from ingestion and inhalation. INGESTION: This material may be harmful or if swallowed. Swallowing even small amounts may cause blindness. INHALATION: Prolonged inhalation may be harmful and can cause headaches, dizziness, nausea, lachrymation, decreased blood pressure, changes in heart rate and cyanosis. May be irritating to mucous membranes and lung tissue. CHRONIC INFORMATION: Over exposure may cause kidney and liver damage. PRIMARY ROUTE(S) OF ENTRY: Skin absorption, Inhalation, Ingestion Reproductive or genetic defect hazard. See section 2 for further details.
Eyes	Causes eye irritation.
Skin	May be harmful in contact with skin. (Not adopted by US OSHA).
Ingestion	Harmful if swallowed.

5. Fire-fighting measures

5.1. Extinguishing media

Dry chemical, foam or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition: High temperatures and fires may produce such toxic substances as carbon monoxide and carbon dioxide.

Keep away from heat / sparks / open flames / hot surfaces - No smoking.

Keep cool.

Ground / bond container and receiving equipment.

Use explosion-proof electrical / ventilating / light / equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Avoid breathing dust / fume / gas / mist / vapors / spray.

5.3. Advice for fire-fighters

Explosion data: Empty containers retain product residue (liquid and/or vapor) and can be dangerous.
Oxidizing properties: None known.
Special fire-fighting procedures/equipment: Containers can build up pressure if exposed to heat (fire). As in any fire, wear a self-contained breathing apparatus pressure-demand (MSHA/NIOSH approved or equivalent) and full protective gear. Apply alcohol-type foam or all-purpose foam by manufacturers recommended techniques for large fires. Use carbon dioxide or dry chemical for small fires. Use water spray to keep containers cool.

ERG Guide No.	128

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Put on appropriate personal protective equipment (see section 8).

6.2. Environmental precautions

Do not allow spills to enter drains or waterways.

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

6.3. Methods and material for containment and cleaning up

Steps to be taken in case material is released or spilled: Extinguish any possible ignition source until the area is determined to be free from fire or explosion hazard. Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. (See exposure controls / personal protection section) Spilled material should be disposed of according to applicable regulations.

Special spill response procedures: In case of a transportation accident, contact CHEMTREC at 1-800-424-9300 or International at 1-703-527-3887.

If a spill/release in excess of EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8802).

7. Handling and storage

7.1. Precautions for safe handling

The requirements of the Highly Flammable Liquids and Liquefied Petroleum Gases Regulations apply if the flashpoint is between 21°C and 32°C.

See section 2 for further details. - [Prevention]:

7.2. Conditions for safe storage, including any incompatibilities

Handle containers carefully to prevent damage and spillage.

Naked flames and smoking should not be permitted in storage areas. It is recommended that fork lift trucks and electrical equipment are protected to the appropriate standard.

Incompatible materials: This substance is not compatible with strong oxidizing agents, acetyl bromide, alkylaluminum solutions, beryllium hydride, boron trichloride, with carbon tetrachloride and metals, chloroform and sodium or sodium hydroxide, cyanuric chloride, dichloromethane and air, diethylzinc, hydrogen and raney nickel catalyst.

Storage requirements: Keep away from heat, sparks, and flames. Keep container closed when not in use. Store in a cool, dry, well ventilated place away from incompatible materials.

See section 2 for further details. - [Storage]:

7.3. Specific end use(s)

No data available.

8. Exposure controls and personal protection

8.1. Control parameters

Exposure

CAS No.	Ingredient	Source	Value
0000107-21-1	Ethylene glycol	OSHA	No Established Limit
		ACGIH	TWA: 10 mg/m3 (Particulate) Ceiling: 100 mg/m3 (Aerosol) 50 ppm (Vapor)STEL: 20 mg/m3 (Particulate)
		NIOSH	no established RELs
		Supplier	No Established Limit
Proprietary	Scale Inhibitor Package	OSHA	No Established Limit
		ACGIH	No Established Limit
		NIOSH	No Established Limit
		Supplier	No Established Limit

Carcinogen Data

CAS No.	Ingredient	Source	Value
0000107-21-1	Ethylene glycol	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;
Proprietary	Scale Inhibitor Package	OSHA	Select Carcinogen: No
		NTP	Known: No; Suspected: No
		IARC	Group 1: No; Group 2a: No; Group 2b: No; Group 3: No; Group 4: No;

8.2. Exposure controls

Respiratory — No protection needed under normal use and conditions. Use a NIOSH/MSHA approved air purifying respirator with an organic vapor cartridge when airborne concentrations are expected to exceed exposure limits. Protection by air purifying respirators is limited.

Eyes — Safety glasses with side shields (or goggles).

Skin	Wear overalls to keep skin contact to a minimum. When contact is likely wear chemical resistant gloves and boots.
Engineering Controls	Provide adequate ventilation. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. If these are not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn.
Other Work Practices	Emergency eye wash stations and deluge showers should be available in the work area. Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing and wash thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

Appearance	Yellow - Amber/Orange Liquid
Odor	No Distinct
Odor threshold	Not Measured
pH	4.5-7.5
Melting point / freezing point	0°F
Initial boiling point and boiling range	Not Measured
Flash Point	> 212°F (Closed-Cup)
Evaporation rate (Ether = 1)	Not Measured
Flammability (solid, gas)	Not Applicable
Upper/lower flammability or explosive limits	**Lower Explosive Limit:** Not Measured **Upper Explosive Limit:** Not Measured
Vapor pressure (Pa)	Not Measured
Vapor Density	> 1 (Air=1)
Specific Gravity	1.05 – 1.15
Solubility in Water	Miscible
Partition coefficient n-octanol/water (Log Kow)	Not Measured
Auto-ignition temperature	Not Measured
Decomposition temperature	Not Measured
Viscosity (cSt)	Not Measured

9.2. Other information

No other relevant information.

10. Stability and reactivity

10.1. Reactivity

Hazardous Polymerization will not occur.

10.2. Chemical stability

Stable under normal circumstances.

10.3. Possibility of hazardous reactions

No data available.

10.4. Conditions to avoid

Extreme heat may cause product to decompose, producing acrid smoke and irritating fumes.

10.5. Incompatible materials

This substance is not compatible with strong oxidizing agents, acetyl bromide, alkylaluminum solutions, beryllium hydride, boron trichloride, with carbon tetrachloride and metals, chloroform and sodium or sodium hydroxide, cyanuric chloride, dichloromethane and air, diethylzinc, hydrogen and raney nickel catalyst.

10.6. Hazardous decomposition products

High temperatures and fires may produce such toxic substances as carbon monoxide and carbon dioxide.

11. Toxicological information

Acute toxicity

Ingredient	Oral LD50, mg/kg	Skin LD50, mg/kg	Inhalation Vapor LD50, mg/L/4hr	Inhalation Dust/Mist LD50, mg/L/4hr	Inhalation Gas LD50, ppm
Scale Inhibitor Package - (Proprietary)	No data available	No data available	No data available	No data available	No data available
Ethylene glycol - (107-21-1)	4,700.00, Rat - Category: 5	10,626.00, Rabbit - Category: NA	No data available	No data available	No data available

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

Classification	Category	Hazard Description
Acute toxicity (oral)	4	Harmful if swallowed.
Acute toxicity (dermal)	5	May be harmful in contact with skin.
Acute toxicity (inhalation)	---	Not Applicable
Skin corrosion/irritation	---	Not Applicable
Serious eye damage/irritation	---	Not Applicable
Respiratory sensitization	---	Not Applicable
Skin sensitization	---	Not Applicable
Germ cell mutagenicity	---	Not Applicable
Carcinogenicity	---	Not Applicable
Reproductive toxicity	---	Not Applicable
STOT-single exposure	---	Not Applicable
STOT-repeated exposure	---	Not Applicable
Aspiration hazard	---	Not Applicable

12. Ecological information

12.1. Toxicity

No additional information provided for this product. See Section 3 for chemical specific data.

Aquatic Ecotoxicity

Ingredient	96 hr LC50 fish, mg/l	48 hr EC50 crustacea, mg/l	ErC50 algae, mg/l
Scale Inhibitor Package - (Proprietary)	Not Available	Not Available	Not Available
Ethylene glycol - (107-21-1)	8,050.00, Pimephales promelas	100.00, Crangon crangon	6,500.00 (96 hr), Selenastrum capricornutum

12.2. Persistence and degradability

There is no data available on the preparation itself.

12.3. Bioaccumulative potential

Not Measured

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

12.6. Other adverse effects

No data available.

13. Disposal considerations

13.1. Waste treatment methods

Observe all federal, state and local regulations when disposing of this substance.

14. Transport information

	DOT (Domestic Surface Transportation)	IMO / IMDG (Ocean Transportation)	ICAO/IATA
14.1. UN number	Not Regulated	Not Regulated	Not Regulated
14.2. UN proper shipping name	Not Regulated	Not Regulated	Not Regulated
14.3. Transport hazard class(es)	**DOT Hazard Class:** Not Applicable **DOT Label:** None	**IMDG:** Not Applicable **Sub Class:** Not Applicable	**Air Class:** Not Applicable
14.4. Packing group	Not Applicable	Not Applicable	Not Applicable

14.5. Environmental hazards

IMDG Marine Pollutant: No

14.6. Special precautions for user

No further information

15. Regulatory information

Regulatory Overview The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented.

Toxic Substance Control Act (TSCA) All components of this material are either listed or exempt from listing on the TSCA Inventory.

WHMIS Classification None

US EPA Tier II Hazards

Fire: No
Sudden Release of Pressure: No
Reactive: No
Immediate (Acute): Yes
Delayed (Chronic): Yes

EPCRA 311/312 Chemicals and RQs (lbs):

Ethylene glycol (500.00)

EPCRA 302 Extremely Hazardous:
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

EPCRA 313 Toxic Chemicals:

Ethylene glycol

Proposition 65 - Carcinogens (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Developmental Toxins (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Female Repro Toxins (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

Proposition 65 - Male Repro Toxins (>0.0%):
To the best of our knowledge, there are no chemicals at levels which require reporting under this statute.

N.J. RTK Substances (>1%):

Ethylene glycol

Penn RTK Substances (>1%):

Ethylene glycol

16. Other information

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to our products. Customers/users of this product must comply with all applicable health and safety laws, regulations, and orders.

The full text of the phrases appearing in section 3 is:

H302 Harmful if swallowed.

H371 May cause damage to organs.

This is the first version in the GHS SDS format. Listings of changes from previous versions in other formats are not applicable.

The information in this SDS was obtained from sources, which we believe are reliable. However, the information is provided without any warranty, express or implied, regarding its correctness. The conditions or methods of handling, storage, use or disposal of the product are beyond our control and knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product. This SDS was prepared and is to be used for this product only. If the product is used as a component in another product, this information may not be applicable. This document is generated for the purpose of distributing health, safety and environmental data. It is not a specification sheet nor should any displayed data be construed as a specification. Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself.

End of Document

Material Safety Data Sheet
The Dow Chemical Company

Product Name: AQUCAR(TM) DB 20 Water Treatment Microbiocide **Issue Date:** 02/14/2014
Print Date: 17 Feb 2014

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name
AQUCAR™ DB 20 Water Treatment Microbiocide

COMPANY IDENTIFICATION
The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
United States

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview
Color: Colorless to brown
Physical State: Liquid.
Odor: Odorless to mild
Hazards of product:

DANGER! Keep out of reach of children. Causes severe eye burns. Causes skin burns. May cause allergic skin reaction. May be harmful if swallowed. Evacuate area. Keep upwind of spill. Toxic fumes may be released in fire situations. Avoid temperatures above 70°C (158°F)

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects
Eye Contact: May cause pain disproportionate to the level of irritation to eye tissues. May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin Contact: Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.
Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.
Skin Sensitization: For similar material(s): Has caused allergic skin reactions when tested in guinea pigs.
Inhalation: Mist may cause irritation of upper respiratory tract (nose and throat).
Ingestion: Low toxicity if swallowed. Swallowing may result in irritation or burns of the mouth, throat, and gastrointestinal tract. May cause dizziness and drowsiness.
Aspiration hazard: Based on available information, aspiration hazard could not be determined.
Effects of Repeated Exposure: Excessive exposure may increase the blood and tissue levels of bromine. Observations in animals include kidney effects following repeated ingestion of active ingredient, but no evidence of systemic toxicity following repeated dermal exposure at maximum attainable doses.
Birth Defects/Developmental Effects: For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother.

3. Composition Information

Component	CAS #	Amount
Polyethylene glycol	25322-68-3	>= 46.5 - <= 54.5 %
2,2-Dibromo-3-nitrilopropionamide	10222-01-2	20.0 %
Dibromoacetonitrile	3252-43-5	<= 3.0 %
Sodium bromide	7647-15-6	<= 4.0 %

4. First-aid measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Inhalation: Move person to fresh air. If person is not breathing, call an emergency responder or ambulance, then give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask etc). Call a poison control center or doctor for treatment advice.
Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing. Seek medical attention if symptoms occur or irritation persists. Wash clothing before reuse. Suitable emergency safety shower facility should be immediately available.
Eye Contact: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.
Ingestion: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by the poison control center or doctor. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of immediate medical attention and special treatment needed

Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. If burn is present, treat as any thermal burn, after decontamination. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Aspiration of vomitus may cause lung injury. Suggest endotracheal/esophageal control if lavage is done. Probable mucosal damage may contraindicate the use of gastric lavage. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Have the Safety Data Sheet, and if available, the

product container or label with you when calling a poison control center or doctor, or going for treatment.

5. Fire Fighting Measures

Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistant foams (ATC type) may function.

Extinguishing Media to Avoid: Do not use direct water stream. May spread fire.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: Under fire conditions some components of this product may decompose. The smoke may contain unidentified toxic and/or irritating compounds. Combustion products may include and are not limited to: Nitrogen oxides. Hydrogen bromide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: This material will not burn until the water has evaporated. Residue can burn. Container may rupture from gas generation in a fire situation.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. If product becomes contaminated with water, monitor product for heat generation and/or decomposition. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Evacuate area. Keep upwind of spill. Refer to Section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Ventilate area of leak or spill. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Attempt to neutralize by adding materials such as Sodium bisulphite. Sodium metabisulfite. Neutralize with approximately 17.2 grams sodium bisulfite ($NaHSO_3$) or 15.7 grams sodium meta bisulphite ($Na_2S_2O_5$) for every 100 grams biocidal product. Absorb with materials such as: Dirt. Sand. Vermiculite. Zorb-all®. Hazorb®. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Keep out of reach of children. Do not get in eyes, on skin, on clothing. Avoid breathing mist. Avoid prolonged or repeated contact with skin. Do not swallow. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

Store in original container. Keep container tightly closed. Do not store in: Aluminum. Brass. Copper. Copper alloys. Mild steel. Stainless steel.

Shelf life: Use within 12 Months

Storage temperature: <= 35 °C

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Polyethylene glycol	AIHA WEEL	TWA Particulate.	10 mg/m3
2,2-Dibromo-3-nitrilopropionamide	Dow IHG	Ceiling	2 mg/m3
Dibromoacetonitrile	Dow IHG	Ceiling	0.1 ppm SKIN
Sodium bromide	Dow IHG	TWA	6 mg/m3

A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.
It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

Personal Protection

Eye/Face Protection: Use chemical goggles.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Chlorinated polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Viton. Neoprene. Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Avoid ingestion of even very small amounts; do not consume or store food or tobacco in the work area; wash hands and face before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance	
Physical State	Liquid.
Color	Colorless to brown
Odor	Odorless to mild
Odor Threshold	No test data available
pH	1.5 - 5.0 *Literature*
Melting Point	Not applicable
Freezing Point	< -50 °C (< -58 °F) *Literature*
Boiling Point (760 mmHg)	> 70 °C (> 158 °F) *Literature* decomposition.
Flash Point - Closed Cup	*Literature* none to 100°C (212 °F)
Flash Point - Open Cup	>= 182 °C (>= 360 °F) *Cleveland Open Cup*
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	Not applicable to liquids
Flammable Limits In Air	**Lower:** No test data available **Upper:** No test data available
Vapor Pressure	18.9 mmHg @ 25 °C *Estimated.*
Vapor Density (air = 1)	No test data available
Specific Gravity (H2O = 1)	1.20 - 1.30 *Literature*
Solubility in water (by weight)	7.5 % @ 20 °C *Literature*
Partition coefficient, n-octanol/water (log Pow)	No data available for this product. See Section 12 for individual component data.
Autoignition Temperature	No test data available
Decomposition Temperature	No test data available
Dynamic Viscosity	20 cps @ 25 °C (Brookfield Viscosity - @ 100 rpm, #0 spindle)
Kinematic Viscosity	16 cSt @ 25 °C *Calculated*
Explosive properties	no data available
Oxidizing properties	no data available
Molecular Weight	No test data available

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions

Polymerization will not occur.

Conditions to Avoid: Avoid temperatures above 70°C (158°F) Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Oxidizers. Strong bases. Avoid contact with metals such as: Aluminum.

Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Carbon dioxide. Bromine. Cyanogen bromide. Dibromoacetonitrile.

11. Toxicological Information

Acute Toxicity

Ingestion

LD50, rat 510 mg/kg

Dermal

LD50, rabbit > 2,000 mg/kg

Inhalation

LC50, 4 h, Aerosol, rat, female 1.25 mg/l

LC50, 4 h, Aerosol, rat, male 1.40 mg/l

Eye damage/eye irritation

May cause pain disproportionate to the level of irritation to eye tissues. May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin corrosion/irritation

Brief contact may cause skin burns. Symptoms may include pain, severe local redness and tissue damage.

Sensitization

Skin

For similar material(s): Has caused allergic skin reactions when tested in guinea pigs. Did not cause allergic skin reactions when tested in humans.

Respiratory

No relevant information found.

Repeated Dose Toxicity

Excessive exposure may increase the blood and tissue levels of bromine. Observations in animals include kidney effects following repeated ingestion of active ingredient, but no evidence of systemic toxicity following repeated dermal exposure at maximum attainable doses.

Chronic Toxicity and Carcinogenicity

Active ingredient did not cause cancer in laboratory animals.

Carcinogenicity Classifications:

Component	List	Classification
Dibromoacetonitrile	IARC	Possibly carcinogenic to humans.; 2B

Developmental Toxicity

For the active ingredient(s): Has been toxic to the fetus in laboratory animals at doses toxic to the mother. For the active ingredient(s): Did not cause birth defects in laboratory animals.

Reproductive Toxicity

No relevant data found.

Genetic Toxicology

For the active ingredient(s): In vitro genetic toxicity studies were negative. For the major component(s): Animal genetic toxicity studies were negative.

12. Ecological Information

Toxicity

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, Oncorhynchus mykiss (rainbow trout), 96 h: 3.6 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, Daphnia magna (Water flea), static test, 48 h, immobilization: 2.5 mg/l

Aquatic Plant Toxicity
ErC50, Pseudokirchneriella subcapitata (green algae), Growth rate inhibition, 72 h: 1.5 mg/l

Persistence and Degradability

Data for Component: **Polyethylene glycol**

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
85 %	28 d	OECD 301F Test	pass

Theoretical Oxygen Demand: 1.67 mg/mg

Data for Component: **2,2-Dibromo-3-nitrilopropionamide**

Abiotic degradation: The material is rapidly degradable by abiotic means.

Stability in Water (1/2-life):
65 h; 25 °C; pH 7

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method	10 Day Window
35 - 78 %	28 d	OECD 301B Test	fail
83.3 %	28 d	OECD 303A Test	Not applicable
17 - 22 %	28 d	OECD 306 Test	Not applicable

Indirect Photodegradation with OH Radicals

Rate Constant	Atmospheric Half-life	Method
2.00E-12 cm3/s	5.3 d	Estimated.

Chemical Oxygen Demand: 0.26 mg/mg
Theoretical Oxygen Demand: 0.59 mg/mg

Data for Component: **Sodium bromide**

Biodegradation is not applicable.

Bioaccumulative potential

Data for Component: **Polyethylene glycol**

Bioaccumulation: No bioconcentration is expected because of the relatively high water solubility.

Data for Component: **2,2-Dibromo-3-nitrilopropionamide**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 0.79 Measured
Bioconcentration Factor (BCF): 13; Fish; Measured

Data for Component: **Sodium bromide**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).
Bioconcentration Factor (BCF): < 40; Fish; Measured

Mobility in soil

Data for Component: **Polyethylene glycol**

Mobility in soil: No data available.

Data for Component: **2,2-Dibromo-3-nitrilopropionamide**

Mobility in soil: Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient, soil organic carbon/water (Koc): 15 Estimated.
Henry's Law Constant (H): 4.67E-10 atm*m3/mole; 25 °C Estimated.

Data for Component: **Sodium bromide**

Mobility in soil: No relevant data found.

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and

regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical Name: 2,2-Dibromo-3-nitrilopropionamide
Hazard Class: 8 **ID Number:** UN3265 **Packing Group:** PG III

DOT Bulk
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical Name: 2,2-Dibromo-3-nitrilopropionamide
Hazard Class: 8 **ID Number:** UN3265 **Packing Group:** PG III

IMDG
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical Name: 2,2-Dibromo-3-nitrilopropionamide
Hazard Class: 8 **ID Number:** UN3265 **Packing Group:** PG III
EMS Number: F-A,S-B
Marine pollutant: No

ICAO/IATA
Proper Shipping Name: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S.
Technical Name: 2,2-Dibromo-3-nitrilopropionamide
Hazard Class: 8 **ID Number:** UN3265 **Packing Group:** PG III
Cargo Packing Instruction: 856
Passenger Packing Instruction: 852

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:
To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)
This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act
This product contains chemical substance(s) exempt from TSCA Inventory requirements. It is sold solely for use as a pesticide subject to Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements.

16. Other Information

Recommended Uses and Restrictions

Identified uses
For biocidal applications. For industrial use. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Revision

Identification Number: 1001399 / 1001 / Issue Date 02/14/2014 / Version: 13.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have

obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

Attachment F

Supporting Geological Information

SCHLUMBERGER

FORMATION DENSITY LOG

Gamma-Gamma

SCHLUMBERGER WELL SURVEYING CORPORATION

Houston, Texas

F-21603

COMPANY UNITED FUEL GAS COMPANY

CENTRAL DIVISION WELCH-2-

WELL NEW RIVER & POCAHONTUS CONSOL. COMPANY #9356 S-320-W-04

FIELD BROWN'S CREEK DISTRICT

COUNTY MCDOWELL STATE WEST VIRGINIA

COUNTY MCDOWELL
FIELD or LOCATION CENTRAL DIVISION BROWN'S CREEK
WELL 9356
COMPANY UNITED FUEL GAS COMPANY

Location: MAP SQ. 64-407
UPPER SHANNON BRANCH
OF TUG RIVER
PERMIT NO, MCD-287

Other Services:
IND

Permanent Datum: G.L. ; Elev.: 1369.4
Log Measured From K.B., 9 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 1378.4
D.F.
G.L. 1369.4

Date	12/4/64
Run No.	ONE
Type Log	FDL-GR
Depth—Driller	3830
Depth—Logger	3838
Bottom logged interval	3838
Top logged interval	100
Type fluid in hole	EMPTY
Salinity, PPM Cl.	-
Density	-
Level	-
Max rec. temp., deg F.	
Operating rig time	3 HOURS
Recorded by	HARRIS
Witnessed by	PRENTICE

MAP NO.
CORR.
ANAL.
GMP. DRY HOLE-PEA
POSTED K/L
T.D. THRU BEREA

RUN No.	BORE-HOLE RECORD Bit	From	To	CASING RECORD Size	Wgt.	From	To
ONE	6-1/4	CSG	T.D.	7"		SURF	1265

FOLD HERE

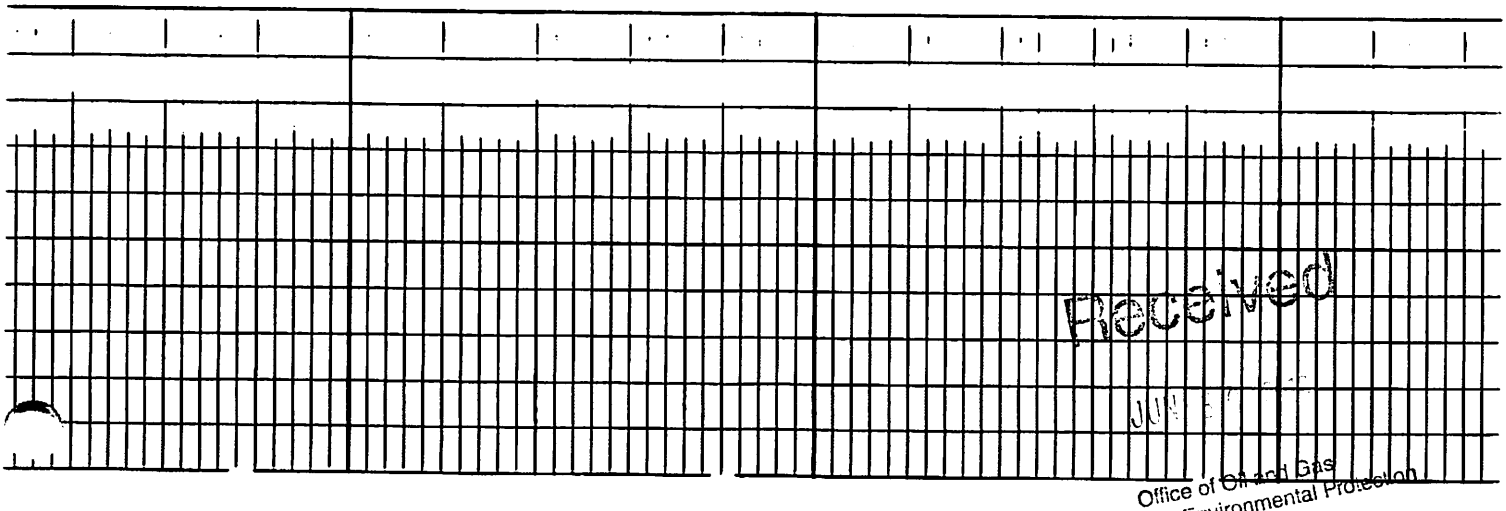
A7-047-00287 PG1

Received

JUN

Office of Oil and Gas
WV Dept. of Environmental Protection

47-047-00287 P62



47-047-00244

SCHLUMBERGER

COMPANY

WELL

FIELD

COUNTY

STATE

LOCATION

Permanent Datum

Log Measured From

Drilling Measured From

Elev. K.B. 1525

D.F.

G.L.

Other Services

EQUIPMENT DATA

Gamma Gamma

Run No.

Inst. Model No.

Diameter

Det. Metal No.

Type

General

Run No.

Hoist Truck No.

Inst. Truck No.

Tool Serial No.

Location

LOGGING DATA

General

Depths

Gamma Ray

Gamma Gamma

Remarks:

Changes in Mud Type or Additional Samples

Scale Changes

Type Log

Depth

Scale Up Hole

Scale Down Hole

Run No.

Tool Type

Equipment Data

Pad Type

Tool Pos.

Other

CD

SO

Equip. Used CART No.

PANEL No.

SONDE No.

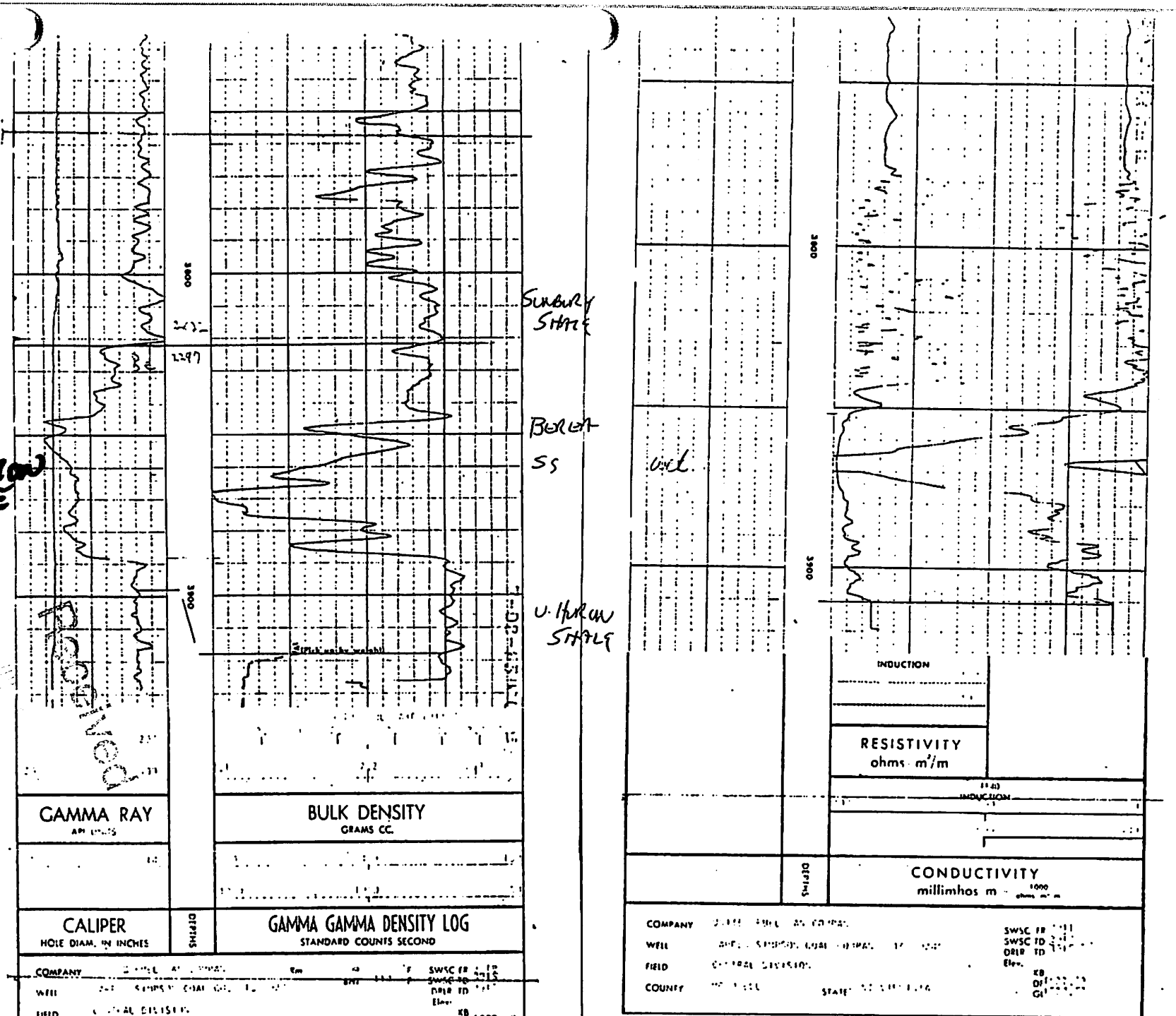
CALIPER	DEPTHS	GAMMA GAMMA DENSITY LOG
HOLE DIAM IN INCHES		STANDARD COUNTS SECOND

	DEPTHS	CONDUCTIVITY
		millimhos m
		1740 INDUCTION

Received

Office of Oil and Gas
WV Dept. of Environmental Protection

47-047-00244 P61



INJECTION ZONE

Received

Office of Oil and Gas
WV Dept. of Environmental Protection

47-041-00244 P62

McD 212

SCHLUMBERGER WELL SURVEYING CORPORATION

Induction Log

COMPANY	UNITED FUEL GAS COMPANY	Other Surveys: GG GR-T
WELL	RODERFIELD REALTY COMPANY #1 #9068	Location of Well: III 2237-3
FIELD	CENTRAL DIVISION	
LOCATION	BROWNS CREEK DISTRICT	Elevation: K.B. 1191.14; G.L. 1181.14
COUNTY	MCDOWELL	
STATE	WEST VIRGINIA	FILING No.

COUNTY: MCDOWELL; FIELD or LOCATION: CENTRAL DIVISION; WELL: RODERFIELD REALTY COMPANY #1 #9068; COMPANY: UNITED FUEL GAS COMPANY

RUN No.	ONE
Date	8-9-61
First Reading	3644
Last Reading	412
Feet Measured	3232
Csg Schlum	412
Csg Driller	411
Depth Reached	3650
Bottom Driller	3665
Depth Datum	K.B. 10' ABOVE G.L.
Mud Nat.	EMPTY
Dens. Visc.	
Mud Resist.	
Res. BHT	
Rmf	
Rmc	
pH	
Wtr. loss	CC 30 min
Bit Size	8 3/4"
Spacings IND.	5FF40"
Opr. Rig Time	2 HOURS
Truck No.	2902 - HUNTINGTON
Recorded By	RINNERT
Witness	WEEKLEY

REMARKS: HOLE MAKING SOME SALT WATER

Cartridge No. 143; Panel No. 190; Sonde No. 221; C4 Calibration 80

CPS. 450 DIV. 10 CALIB. 500

CONDUCTIVITY millimhos/m = 1000/ohms-m²/m — INDUCTION 0 100 200

RESISTIVITY -ohms. m²/m 0 100 200

DEPTHS

GAMMA RAY MICROGRAMS RA-EQ/TON 0 12 24

McD 212 4

SCHLUMBERGER GAMMA RAY

COMPANY	UNITED FUEL GAS COMPANY	Other Surveys: GG -- IND
WELL	RODERFIELD REALTY COMPANY #1 #9068	Location of Well: III 2237-3
FIELD	CENTRAL DIVISION	
LOCATION	BROWNS CREEK DISTRICT	Elevation: K.B. 1191.14; G.L. 1181.14
COUNTY	MCDOWELL	
STATE	WEST VIRGINIA	FILING No.

Log Depths Measured from K.B. 10 Ft. above G.L.

El. 1181 gr.

Dry

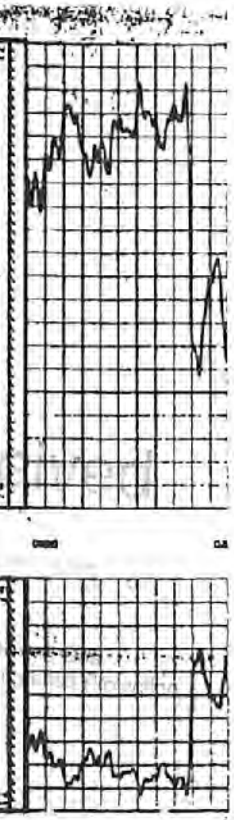
RUN NO.	ONE		
Date	8-9-61		
First Reading	3642		
Last Reading	100		
Footage Measured	3542		
Max. Depth Reached	3650		
Bottom Driller	3665		
Maximum Temp. °F	----		
Fluid Nature	EMPTY		
Fluid Level	----		
Casing Size	8 5/8		
Casing Weight	G.L. to 411		
Casing Size			
Casing Weight			
Bit Size	7 7/8	411 to 1642	
Bit Size	6 3/4	1642 to T.D.	
No. Counters Used	SCINTILLATION		
Type Equipment	GMT-6		
Type Panel	GMP-6		
Opr. Rig Time	1 HOURS		
Truck No.	2902 - HUNTINGTON		
Observer	RINNERT		
Witness	WEEKLEY		

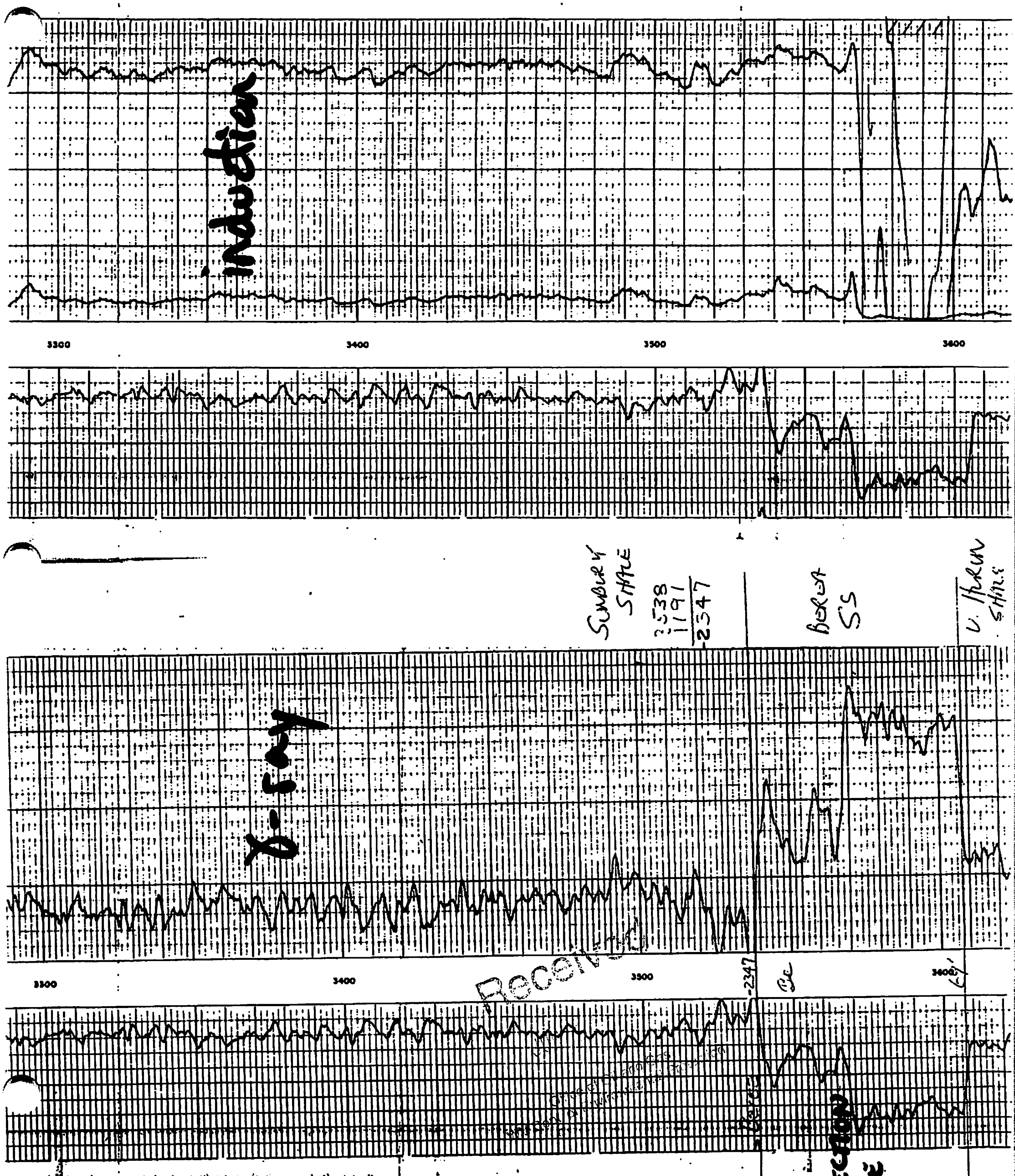
REMARKS, CALIBRATION, BACKGROUND CPS 80; TEST SOURCE CPS 450; GALV. DIVISIONS INCREASE 10; PANEL SENS. TAP FOR CAL. 500

GAMMA RAY MICROGRAMS RA-EQ/TON: ZERO 0 divisions to right of this line 60; Time Constant 2 sec. Logging Speed; 12 24

DEPTHS

GAMMA RAY MICROGRAMS RA-EQ/TON: INTERVAL from SURF to 600; Sensitivity; ZERO 0 divisions to left of this line; 0 12

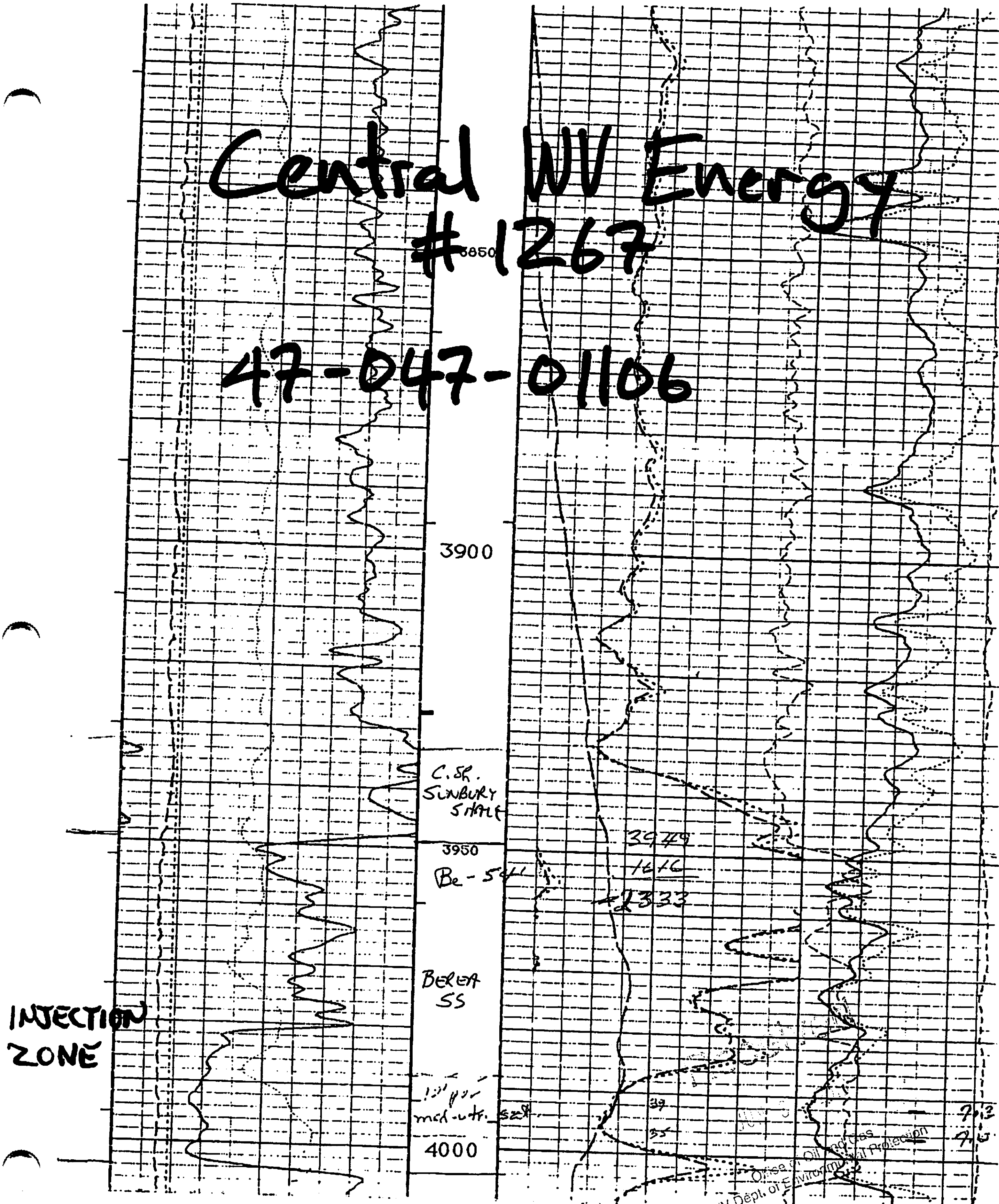




47-047-00212 Pg 2

Central WV Energy
#1267

47-047-01106



GEARHART

COMPENSATED DENSITY
SIDE WALL NEUTRON
LOG

FILING NO.
7623
-135
324977

47
047
0938

COMPANY T.X.O. PRODUCTION CORP.

WELL POCAHONTAS NO. 1

FIELD N/A

COUNTY MC DOWELL 1938 STATE W. V.

M

LOCATION: DIST: BROWNS CREEK
QUAD: DAVY
WSH: TWIN BRANCH OF TUG FORK
SEC ____ TWP ____ RGE ____

Other Services
DIL
TEMP
AUDIO

Permanent Datum GROUND LEVEL Elev. 2103
Log Measured from KELLY, 10' Ft. Above Perm. Datum
Drilling Measured from KELLY

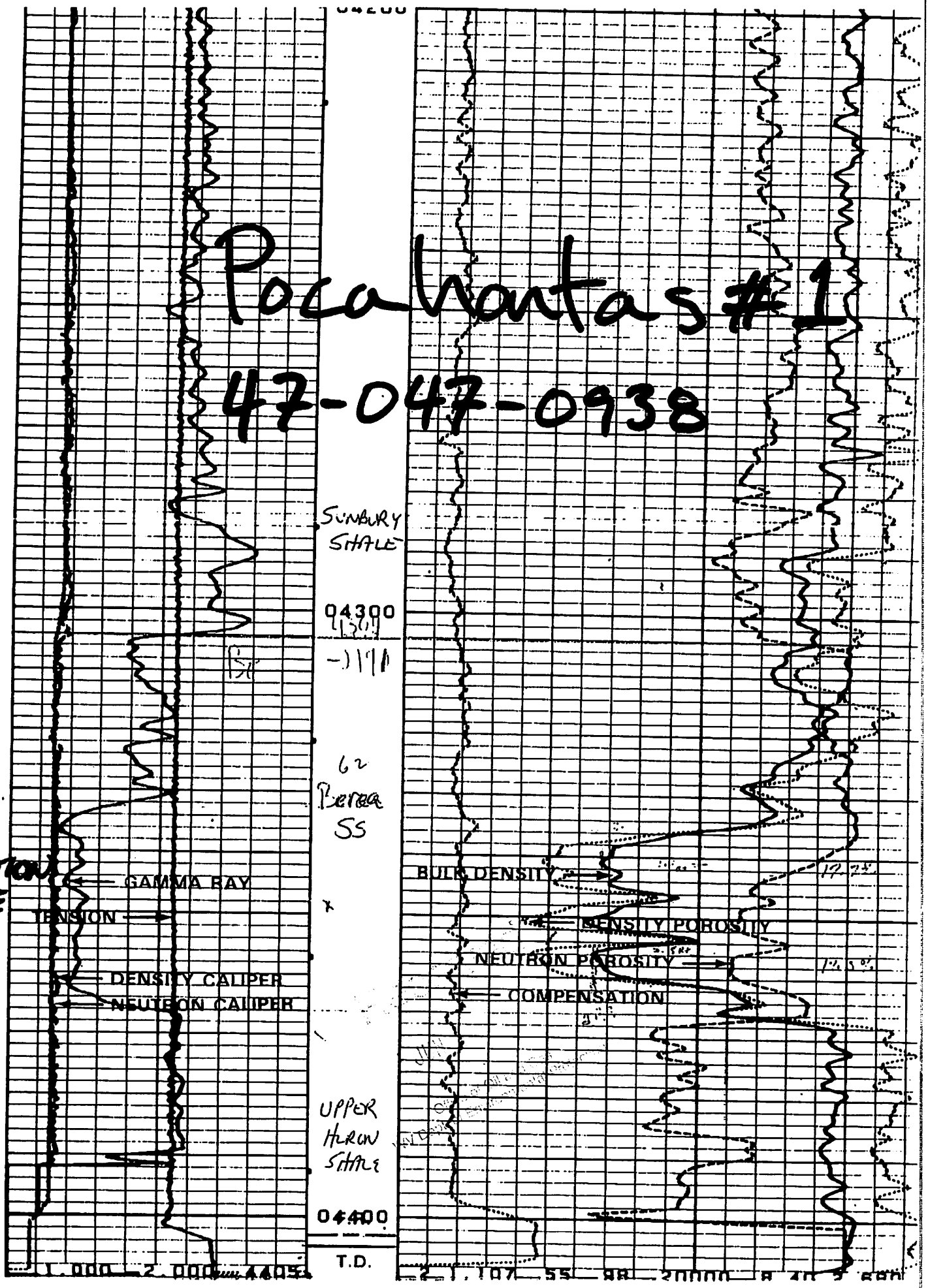
Elev. K.B. 2113
D.F. 2112
G.L. 2103

FIELD PRINT

Date	8-21-85			
Run No.	ONE			
Depth -- Driller	4445'			
Depth-Logger	4405'			
Bottom logged interval	4403'			
Top logged interval	1950'			
Type fluid in hole	AIR			
Density / Visc.	NA			
pH / Fluid Loss	NA			
Max rec. temp., deg F.	98° °F	°F		°F
Source of Samples	NA			
Rm @ Meas. Temp.	NA @ °F	@ °F	@ °F	
Rmf @ Meas. Temp.	NA @ °F	@ °F	@ °F	
Rmc @ Meas. Temp.	NA @ °F	@ °F	@ °F	
Source Rmf / Source Rmc	NA			
Time: End Circulation	NA			
Time: Logger on Bottom	1406			
Recorded By	T. MULCAHY			
Witnessed By	MR. C. BARLOW			

Run No.	Bore-Hole Record Bit	From	To	Casing Record Size	Wgt.	From	To
ONE	7 7/8	1969'	4445'	8 5/8	NA	SURF	1969

47-047-00938 PG1


Pocahontas #1
47-047-0938
SUNBURY SHALE
04300
-1191
62
Berea SS
INJECTION ZONE
GAMMA RAY
TENSION
DENSITY CALIPER
NEUTRON CALIPER
BULK DENSITY
DENSITY POROSITY
NEUTRON POROSITY
COMPENSATION
UPPER HURON SHALE
04400
T.D.
1.000
2.000

ALLEGHENY
NUCLEAR
SURVEYS INC.

TXO PRODUCTION CORP.
POCAHONTAS # 3
G/R * N/N * DEN * CAL

LOCATION DAVY 7.5'
COUNTY MCDOWELL
FIELD BROWNS CREEK DIST.
WELL POCAHONTAS # 3
COMPANY TXO PRODUCTION CORP.

COMPANY TXO PRODUCTION CORP.
WELL POCAHONTAS # 3
FIELD BROWNS CREEK DIST.
COUNTY MCDOWELL 944
COUNTRY/STATE USA / WV
PERMIT NUMBER 47-047-0944

LOCATION
DAVY 7.5'

LSD	SEC	TWP	RGE

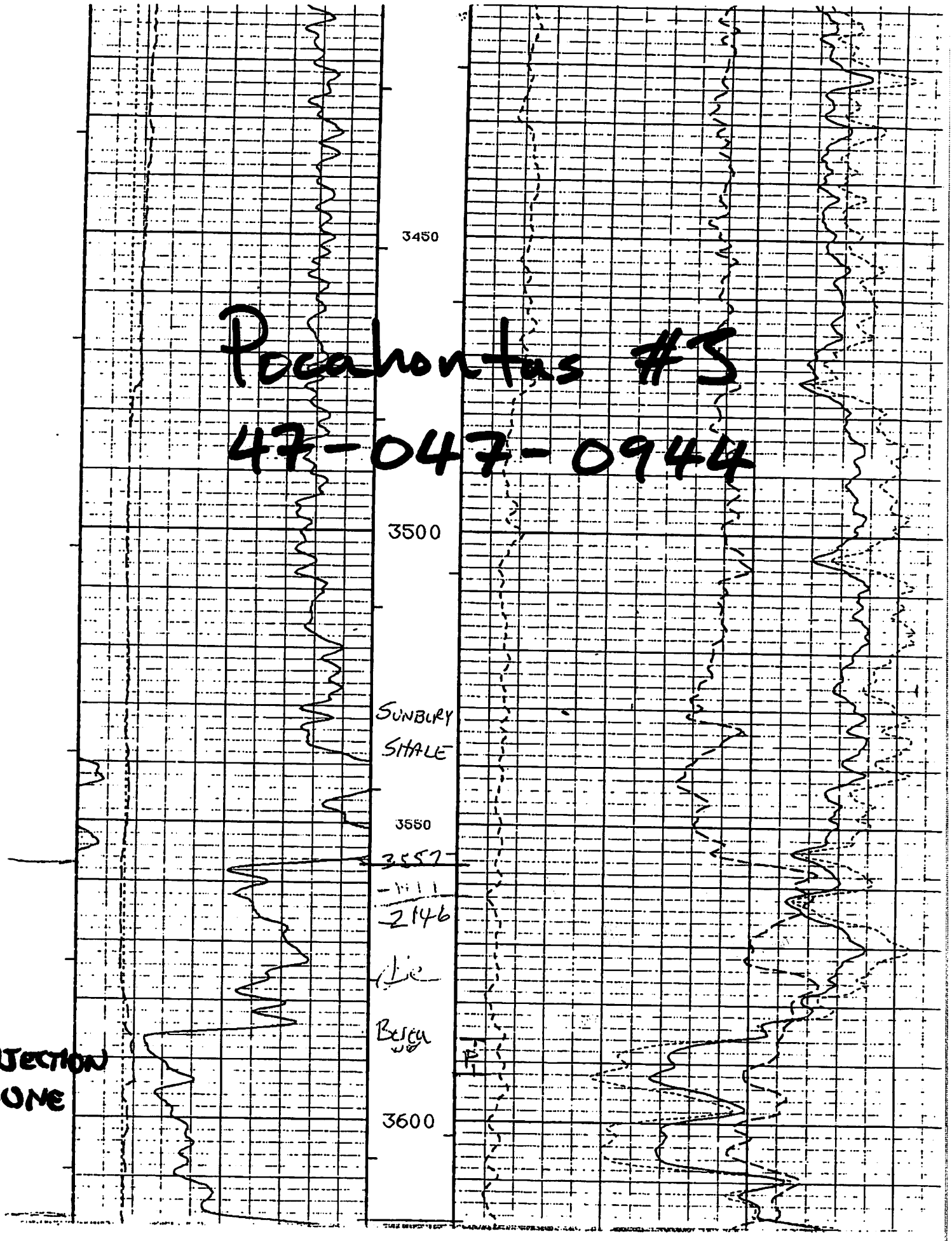
OTHER SERVICES
BHT. USCD
DSI
M

PERMANENT DATUM GROUND LEVEL . ELEVATION 1401.11'
LOG MEASURED FROM K.B. . 10 FT ABOVE PERMANENT DATUM
DRILLING MEASURED FROM K.B.

ELEVATIONS:
KB 1411.11'
DF 1411.11'
GL 1401.11'

DATE	03-SEP-85			
RUN NUMBER	ONE			
DEPTH-DRILLER	3710'			
DEPTH-LOGGER	3706			
FIRST READING	3706'			
LAST READING	SURFACE			
CASING-DRILLER	1346'			
CASING-LOGGER	1347'			
BIT SIZE	7 5/8"			
HOLE FLUID TYPE	SOAP			
DENS./VISC.				
PH/FLUID LOSS				
SAMPLE SOURCE				
RM @ MEAS TEMP				
RMF @ MEAS TEMP				
RMC @ MEAS TEMP				
SOURCE: RMF/RMC				
RM @ BHT				
TIME SINCE CIRC	5.5 HOURS			
MAX REC TEMP	95 DEGREES			
EQUIPMENT/BASE	"264"	CHAS.		
RECORDED BY	V. CASTO			
WITNESSED BY	MR BARLOW			

47-047-00944 P61


Pocahontas #5
47-047-0944
3450
3500
SUNBURY
SHALE
3550
3557
2146
Berea
3600
INJECTION
ZONE

API #	top	base	
047 00025	3754	3792	38
047 00156	3823	3850	27
047 00287	3743	3768	25
047 00050	3949	4004	55
047 00110	3860	3906	46
047 00370	3698	3758	60
047 00356	3428	3484	56
047 00410	4196	4245	49
047 00906	3651	3715	64
047 00212	3540	3604	64
047 00954	4291	4360	69
047 00938	4304	4366	62
047 00944	3557	3617	60
047 00032	3545	3592	47
	average thickness		52

closest wells

- Most logs for surrounding wells that reached the Berea were not located.
- Wells listed to the left can be located on the map by picking the well east and following around Davy 22 clockwise.

EPA Calculation

$FG = [(ISIP + (.433 \times SG \times D)] / D$

$FG = [(2176 + (.433 \times 1.0 \times 7674)) / 7674$

$FG = [2176 + 3323] / 7674$

$5499 / 7674$

$.72$ FG

$MIP = [.72 - (.433 \times 1.04)] \times 7674$

$MIP = [.72 - .45] \times 7674$

2072 PSI

WVDEP

MIP x 0.80 = MIP Final

Not .80

LANGHAM

NEW YORK, FIFTH AVENUE