



west virginia department of environmental protection

Office of Oil and Gas
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Charleston, WV 25304
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Jim Justice, Governor
Austin Caperton, Cabinet Secretary
www.dep.wv.gov

January 19, 2018
PERMIT MODIFICATION APPROVAL
Horizontal 6A / Horizontal 6A Well - 1

CHEVRON APPALACHIA, LLC
700 CHERRINGTON PARKWAY

CORAOPOLIS, PA 15108

Re: Permit Modification Approval for TAYLOR C 3H
47-051-01802-00-00

Modified Lateral Location

CHEVRON APPALACHIA, LLC

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

If there are any questions, please feel free to contact me at (304) 926- 0450.

James A. Martin
Chief

Operator's Well Number: TAYLOR C 3H
Farm Name: WILLIAMS OHIO VALLEY MIDSTREAM LLC
U.S. WELL NUMBER: 47-051-01802-00-00
Horizontal 6A / Horizontal 6A Well - 1
Date Issued: January 19, 2018

Promoting a healthy environment.

01/26/2018

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Chevron Appalachia, LLC 49449935 Marshall Clay Glen Easton, WV
Operator ID County District Quadrangle

2) Operator's Well Number: 3H Well Pad Name: Taylor C

3) Farm Name/Surface Owner: Williams Ohio Midstream LLC Public Road Access: CR 17 Fork Ridge Road

4) Elevation, current ground: 1257' Elevation, proposed post-construction: 1236'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No Yes *JW 1/12/18*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 6,555', 56' thick - 0.64 psi/ft gradient

8) Proposed Total Vertical Depth: 6,555'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 16,102

11) Proposed Horizontal Leg Length: 9,547

12) Approximate Fresh Water Strata Depths: 470' GL

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13) Method to Determine Fresh Water Depths: 1 mi radius search around pad location

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14) Approximate Saltwater Depths: 1276', 1880' - 2370' KB; Francis 1V offset well

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15) Approximate Coal Seam Depths: 800' GL Pittsburgh

16) Approximate Depth to Possible Void (coal mine, karst, other): None

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: Ireland Mine

Depth: 800' GL

Seam: Pittsburgh No 8

Owner: Consol Energy

18)

CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20'	New			40'	40'	141.8
Fresh Water	13-3/8"	New	J-55	54.5#	520'	520'	691.0
Coal							
Intermediate	9-5/8"	New	J-55	40#	2,104'	2,104'	941.0
Production	5-1/2"	New	P-110	20#	16,102'	16,102'	3,457.0
Tubing							
Liners							

JW 1/12/18

TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	26"					
Fresh Water	13-3/8"	17-1/2"	0.380"	2,730 psi	1,911 psi	Class A	1.18
Coal							
Intermediate	9-5/8"	12-1/4"	0.395"	3,950 psi	2,768 psi	Class A	1.19
Production	5-1/2"	8-1/2"	0.361"	14,360 psi	9,975 psi	Class A, G, or H	1.15
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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JW 1/12/18

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill 17 1/2" hole to 600 then run and cement 13 3/8" casing to surface covering the fresh water. Drill 12.25" hole to 2,330' then run and cement to surface 9 5/8" casing, covering the Big Injun. Drill 8 1/2" hole to KOP at 5,778'. Drill 8 1/2" curve and lateral to 16,102' MD and 6,555' TVD. Run 5 1/2" production casing and cement back to surface.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Chevron will utilize plug and perf method with 52 stages using 8.572 bbl of fluid and 315,000 lbm of sand per stage.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 22.01

22) Area to be disturbed for well pad only, less access road (acres): 4.66

23) Describe centralizer placement for each casing string:

There will be a bow string centralizer every two jts on the Water string and intermediate. Vertical Production: bow string - (1) per every other jt over coupling; Curve and Lateral: solid composite (1) per jt of csg to KOP.

24) Describe all cement additives associated with each cement type:

For the Water string the blend will contain class A cement, 3% CaCl₂, and flake. The intermediate will contain class A cement, 10% CaCl₂, salt and flake. The production cement will have a lead and tail cement. The lead will contain class A cement, KCl, dispersant, suspension agent, and retarder. The tail will contain class a cement, Calcium Carbonate, KCl, dispersant, de-foamer, suspension agent, and friction reducer.

25) Proposed borehole conditioning procedures:

Well will be circulated a minimum of 3 bottoms up once casing point has been reached on all hole sections and until uniform mud properties are achieved.

*Note: Attach additional sheets as needed.



Chevron
Appalachian LLC
WV Well Site Safety Plan
Pad: Taylor Pad C
Well # M03H

488 Spoon Lane
Moundsville, WV 26041
Clay District
Marshall County, WV
Access Point – 39° 52' 05.45"
80° 41' 29.36"
Well Site – 39° 51' 07.18"
80° 41' 50.06"
Marshall County, West Virginia

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Contents

Marshall County, West Virginia	1
1. Contacts and Meetings	3
Emergency Points of Contact	3
Pre-Spud and Safety Meeting Plan	4
2. Maps and Diagrams	4
Plan View of Well Location	4
Topographic Map of Well Location	4
Evacuation and Notification Plan	4
3. Well Work	5
Well Work Description	5
Site Safety Plan (SSP) Distribution	5
4. Chemical Inventory	5
Safety Data Sheet (SDS) Availability and Location	5
Drilling Fluid Materials Inventory	5
5. Well Control	5
BOP Equipment by Hole Section	5
BOP Testing	5
BOP Equipment and Assembly Installation Schedule	6
Well Control Certification and Methodology	6
BOP Equipment Diagram	6
Wellhead Schematic	6
Recording and Reporting of Significant Events	6
6. Hydrogen Sulfide (H ₂ S)	6
Detection, Monitoring and Warning Equipment	6
Notification and Protection Zones	7
H ₂ S Contingency Plan	7
7. Flaring	7
8. Collision Avoidance	7
9. Deep Well Additional Requirements	9
Geoprog	9
Casing and Cement	9
Flaring Activities	9
Emergency Notification List (1 Mile Radius)	9
10. Deep Vertical Well Requirements	10
11. Appendices	10
1. Plan View Map of Location	11
2. Topographic Map and Emergency Notification List (1 Mile Radius)	13
3. Geoprog	19
4. Well Bore Diagram	21
5. Casing and Cementing Information	22
6. BOP Schematic	23
7. Wellhead Assembly	24
8. Spider Plot	25

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JAN 16 2018

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1. Contacts and Meetings

Emergency Points of Contact

Construction Phase	
Primary:	Shawn Smith Construction TL Cell: 724-323-3173 Office: 724-564-5507
Secondary:	Chevron 24 Hour Emergency Response Line 724-564-3700
Drilling & Completions Phase	
Primary:	John Johnson, D&C General Manager Cell: 713-825-6462 Office: 412-865-3137
Secondary:	Chevron 24 Hour Emergency Response Line 724-564-3700
Production Phase	
Primary:	John Johnson, Operations General Manager Cell: 713-825-6462 Office: 412-865-3137
Secondary:	Chevron 24 Hour Emergency Response Line 724-564-3700

Important Telephone Numbers

Agency	Phone Number
James Nicholson, OOG Inspector	(304) 552-3874
Fort Ridge Volunteer Fire Department	(304) 845-3990
Local Police, Fire, & Ambulance	911
Reynolds Memorial Hospital	(304) 845-3211
Marshall County Office of Emergency Management	(304) 843-1130
WV Spill Release Hotline	(800) 642-3074
WVDEP NW Region	(304) 368-2000
WVDEP State Emergency	(800) 642-3074
WV Division of Homeland Security & Emer. Mgt.	(304) 558-5380

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Public Notification and Control of Access for H2S Locations

If H2S gas is known or found to be persistently present at hazardous concentrations, the public will be notified through the county emergency response center as detailed in Section 2 of this SSP. Reference Section 6 for further information on H2S. Chevron will coordinate with the first responders to notify and evacuate residents within the affected zones and establish physical barriers and demarcations as may be required to identify the zones. This may include using barricades, mobile equipment, or materials to physically block points of vehicle or pedestrian access, use of caution tape, temporary fence and other markers to identify the perimeters of areas with restricted access, and establishment of decontamination pads and access/egress checkpoints.

Pre-Spud and Safety Meeting Plan

Prior to starting drilling operations, a pre-spud meeting will be held onsite. The DEP Inspector will be notified of the planned pre-spud meeting, as per regulation. Attendees' names will be recorded on a sign-in sheet and that sheet kept in the Drill Site Manager's (DSM) office.

During drilling, completions and workover operations, pre-tour meetings are held prior to the start of each day and night shift. A Plan of Action is discussed which details the critical operations to be performed during the tour. Health, Environment and Safety (HES) hazards and mitigations are discussed with onsite personnel who will be performing those tasks. Attendance is recorded and records kept with the DSM and drilling contractor Rig Manager.

During all phases of operation, tailgate safety meetings are held just prior to the start of safety critical tasks. Personnel who are performing or that are affected by the work discuss execution steps, hazards, and job planning documents such as procedures, job safety analyses (JSA), or permits. Attendance at tailgate safety meetings is recorded on JSAs or permits and the records kept with the contractors performing the work.

A log of personnel on location during all phases of operation will be maintained onsite with the Chevron Representative or contractor site supervisor.

2. Maps and Diagrams

Plan View of Well Location

See Appendix 1

Topographic Map of Well Location

See Appendix 2

Evacuation and Notification Plan

If onsite response efforts are unable to prevent the escalation of an event and site personnel or the general public are in imminent danger, the Chevron DSM, in consultation with the Rig Manager and Chevron Drilling Superintendent, will make the decision to evacuate the location of all personnel. Personnel rosters will be taken with the DSM or other Chevron representative to give an accurate accounting of all personnel at the evacuation point. The evacuation point will vary by site depending on topography and wind direction.

The Chevron DSM or delegate will contact local emergency responders to determine if residents and the general public must be evacuated from the surrounding area. If the incident poses an immediate threat to local residents and the community, the Chevron DSM or delegate will begin contacting local residents, starting with those closest to the well site and most likely to be affected based on wind conditions and other factors, until emergency responders arrive. The local resident emergency notification table and 1 mile radius map are found in Appendix 2

Upon arrival, emergency responders will have primary responsibility for notifications and evacuation of citizens. Chevron will assist the emergency responders as appropriate and directed. The local authorities will have final say in determining the limits of the area requiring evacuation.

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3. Well Work

Well Work Description

The well will be drilled, cased, and cemented as per the Wellbore Diagram shown in Appendix 4 of this SSP and the well plan submitted with the permit application. The well will then be perforated, hydraulically fractured, flowed back, and then put on production. The detailed well procedure will be located in the DSM or Well Site Manager's (WSM) office and will be made available to the DEP Inspector or Emergency Response Personnel at their request.

Site Safety Plan (SSP) Distribution

The SSP will be submitted with each horizontal well application, and a copy of the plan will be submitted to the applicable County Office of Emergency Management at least seven days prior to work that involves disturbance of land for well development. The SSP will be provided to the surface owner and any water purveyor or surface owner subject to notice and water testing as provided in section 15 of this rule. A copy of this plan will be kept in the well site's mailbox during construction, drilling, completions, and production operations activities.

Chevron conducts additional reporting and notification, including but not limited to

- EPCRA Tier II reporting to Environmental Protection Agency within 90 days of disturbance
- CFATS Top Screen to the Department of Homeland Security where LNG fuel is anticipated to be stored and used onsite

4. Chemical Inventory

Safety Data Sheet (SDS) Availability and Location

A current copy of SDSs for all chemicals on location is kept with the Chevron and/or contractor representative during each phase of operation and will be made available to the DEP Inspector or Emergency Response Personnel at their request.

Drilling Fluid Materials Inventory

An inventory of all materials on site for mixing and weighting drilling fluids will be kept current by the Mud Engineer and will be made available to the DEP Inspector or Emergency Response Personnel at their request.

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5. Well Control

BOP Equipment by Hole Section

A 5K 13-5/8" multi-bowl wellhead will be utilized for both the 12.25" intermediate and the 8.5" production hole sections. The Intermediate section will be drilled with a 5K annular BOP and the production hole section will be drilled with a 10K BOP stack (Pipe and Blind Rams) and a 5K annular.

BOP Testing

Air Rig: Pressure test annular, blind, and pipe ram to 250 psi low / 2,500 psi high for 30 mins, all other ancillary valves 250 psi low / 2,500 psi high for 5 min. No observable pressure decline
BOP Test Frequency to be full test every 21 days, when only the BOP to wellhead connection is broken, the connection which was broken must be re-tested.

Fluid Rig: Upon initial installation and at a 21 day interval the BOP will be re-tested. The annular for both hole sections will be tested to 3,500 psi (70% of its rated capacity) for 30 minutes. Upon initial installation and at a 21 day interval thereafter the BOP stack will be tested to 3,500 psi for 30 minutes. All other well control equipment (Choke, TIW, HRC etc.) will be tested to 3,500 psi.

The BOP will be function tested upon initial installation and after each bit trip.

BOP Equipment and Assembly Installation Schedule

BOP will be nipped up prior to drilling intermediate and production strings.

Well Control Certification and Methodology

The Drill Site Manager, Rig Manager, Engineer, and Superintendent are all required as a condition of employment to have valid International Accredited Drilling Contractors (IADC) Well Control Supervisory Level certifications. The Driller will have IADC Well Control Fundamental Level certifications. A Drill Site Manager, Rig Manager, and Driller will be on location at all times during drilling operations. The Engineer and Superintendent will be available to provide well control support as needed. Individual names and certifications are available upon request.

Chevron uses the IADC Approved Drillers Method of Well Control.

BOP Equipment Diagram

See Appendix 6

Wellhead Schematic

See Appendix 7

Recording and Reporting of Significant Events

Lost circulation, the presence of Hydrogen Sulfide gas, fluid entry into the wellbore, or the presence of abnormally pressured zones will be noted in the daily drilling report that is kept in the Wellview reporting software. The data from this report will be made available to DEP Inspector or Emergency Response Personnel at their request in the event of a significant event. The DEP Inspector will be notified by phone immediately if any of the above significant events occur.

6. Hydrogen Sulfide (H2S)

Based on geologic records, offset well data, and area-specific information, formations containing hydrogen sulfide (H2S) gas at levels of concern are not anticipated to be encountered during drilling and completion activities conducted in Marshall County, West Virginia. During drilling and completion of Utica explorations wells only, the following precautions will be employed.

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Detection, Monitoring and Warning Equipment

Wind socks / indicators are installed onsite during drilling, completions, workover and production operations.

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Fixed monitors set to alarm at 5 parts per million (ppm) H2S will be installed at the rig floor, substructure, shakers, and mud pits. Fixed monitors are wired to digital readouts on the rig floor and in the DSM's office. If an alarm condition exists, sirens capable of being heard around the site will automatically sound.

If H2S is detected by fixed monitors at ≥ 10 ppm and persists, the well will be secured, wind direction observed, and all site personnel will muster upwind of the hazard. The DSM will consult with the appropriate technical experts and monitor H2S levels before work resumes.

Notification and Protection Zones

If notifications of H2S presence and protection zones will be made to site workers, visitors, local responders, and/or residents, the procedures described in Section 2 will be followed.

H2S Contingency Plan

If sites are known to have concentrations of H2S and work must continue in that environment, Chevron will implement its H2S Contingency Plan.

A specialized contractor will be brought in to provide training, fit testing and supplied air breathing apparatus or a cascade system. Five minute emergency escape packs will be available on site (attached to the railing on the rig floor (4 on rig floor, 1 on monkey board for derrickman). All personnel working on or visiting a known H2S site will be trained to use, and required to don, a personal monitor set to alarm at 5 ppm.

Employees and visitors to these sites will be provided with an awareness level of H2S training prior to entering any H2S areas. At a minimum, awareness level training will include:

- Physical and chemical properties of H2S
- Health hazards of H2S
- Personal protective equipment
- Information regarding potential sources of H2S
- Alarms and emergency evacuation procedures

7. Flaring

Continuous flaring is not anticipated during normal air drilling operations. During air drilling operations, a flare is maintained onsite and available for contingency to flare off gas for short durations. Chevron does not plan to flare during fluid drilling, completion or flowback activities. See Section 9 for additional detail.

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8. Collision Avoidance

1. Plan Components:

Hole Section	Survey Tool	Survey Frequency
Surface (17.5" Hole)	Multi-Shot Gyro	Every 25 feet
Intermediate I (12.25" Hole)	EMWD	Every Joint of Drill Pipe (~31')
Curve & Landing Point (8.5" Hole)	MWD	At least every ~45'
Landing Point to TMD (8.5" Hole)	MWD	At least every ~90'

- a. Nudge activity if necessary will take place in the 12.25" and vertical production hole sections in order to achieve a SF >1.5 during planning
- b. COMPASS software, or a qualified alternate directional software, will be used for directional and anti-collision planning.
- c. General protocol and QA/QC during drilling activities

Drilling Engineer & BP Well Planner	<p>Prior to the commencement of drilling on a pad (multi-well or single well)</p> <ul style="list-style-type: none"> • Verify convergence calculation between Compass and BP software. • Verify declination calculation between Compass and BP software.
-------------------------------------	--

	<ul style="list-style-type: none"> Ensure that PU model and survey tools state if the correction is applied for documentation
BP MWD Engineer	<ul style="list-style-type: none"> Ensure that the correct Geodetic and Magnetic references are in use on all rig site computers and that calculated values for declination and convergence match those supplied by the BP Well Planner. Ensure the precise application of directional survey corrections that follow their internal QA/QC process

- d. For offset wellbore if any point satisfies either of the following proximity criteria, that wellbore shall be classified as an offset.
- C-C distance less than or equal to 100'
 - Separation factor is less than or equal to 3.0
2. Plan for proposed wellbore: All wells will be planned with a minimum 1.5 anti-collision safety factor
- a. Required Collision Monitoring

Separation Factor	Health, Environment, & Safety Risk Offset Wellbore(s)
SF ≤ 1.5 Collision monitoring rule	Perform collision monitoring
SF ≤ 1.0 Shut-in rule	Shut in (temporarily plug) offset wellbore at least 200 ft (60 m) below deepest MD on offset wellbore where SF ≤ 1 with wellbore projection to TD Depressurize offset wellbore above plug to reference wellbore pressure or less Record wellbore projection Continued drilling requires authorization from Drilling Operations Manager Actions are exempted for relief well
SF ≤ 0.75 Acceptable projection rule	Wellbore projection to TD with minimum SF > 0.5 Continued drilling requires authorization from D&C Manager Actions are exempted for relief well
SF ≤ 0.5 Acceptable drilling limit	Stop drilling, plug back Actions are exempted for relief well

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3. Current spacing requirements for well pad surface layout is: 15' between wells and 30' between rows.
4. If suspected collision occurs:
- Cease drilling immediately
 - For air drilling: Pick up off bottom, monitor if a significant increase in the amount of water is produced within the returns (e.g. a well drilling using air encounters an offset well filled with water from the cement displacement) or if a significant increase in the amount of SBM is produced within the returns (e.g. a well drilling using air encounters an offset well filled with SBM from the wells suspension).

- c. For fluid drilling: Pick up off bottom and perform flow check. If flow check is positive then shut-in well and determine if well control can be established. If flow check is negative and losses are occurring, monitor and determine rate of losses. Also monitor if a significant change in mud properties has occurred (e.g. a well drilling using SBM encounters an offset well filled with water from the cement displacement).
- d. Further actions and decision to continue drilling shall be based upon offset wellbore risk classification and status in association with the appropriate AMBU's drilling authority.
- e. If decision is made to cease drilling, the well will be plugged back as necessary.
- 5. Notification to the OOG Oil and Gas inspector will take place within a reasonable time frame once operations are deemed under control.
- 6. Local directional drilling standard operating procedures and Chevron Global Technical Standards for Wellbore Positioning & Collision Avoidance can be shared upon request.

9. Deep Well Additional Requirements

Geoprogram

See Appendix 3

Casing and Cement

See Appendix 5

Flaring Activities

Chevron does not conduct routine flaring activities during any phase of operation and maintains flaring equipment onsite as a contingency. Chevron will notify the county emergency response operator and/or fire department as soon as possible if a flare occurs or is anticipated to occur.

For air drilling operations, an 8" steel flare line will be available. If excessive gas is encountered during air drilling operations (volume of gas has the potential of exceeding the cuttings separator resulting in gas venting through cuttings line) the gas flow will be routed through the rig choke manifold, the 8" flare line, and the eco-tank to the flare stack. The flare line stack rises vertically 20 ft and is equipped with an electronic, continuously-arcigniter.

During fluid drilling of Utica / explorations wells, an 8" steel flare line is employed. If significant gas is encountered during fluid drilling operations, it may be routed through the choke manifold, the mud-gas separator and the 8" flare line to the flare stack. The flare line stack rises vertically 20 ft and is equipped with an electronic, continuously-arcigniter.

Chokes that will be used to regulate gas flow while drilling will be adjustable drilling type chokes. Chokes used shall meet the requirements of American Petroleum Institute (API) Spec 16C – Specification for Choke and Kill Systems.

Special anchoring will not be required for the 8" flare lines because their size will reduce backpressure and pressure spikes and the potential for whipping. Flare stacks will be at least 20' tall and flammable materials will be kept at least 20' away from the base of the flare stack.

Emergency Notification List (1 Mile Radius)

See Appendix 2

Spider Plot

See Appendix 8

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10. Deep Vertical Well Requirements

Chevron does not anticipate drilling deep vertical wells.

11. Appendices

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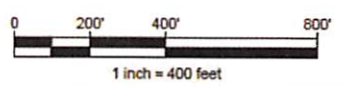
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1. Plan View Map of Location



MATCHLINE TO SHEET 1 RECEIVED
MATCHLINE TO SHEET 2
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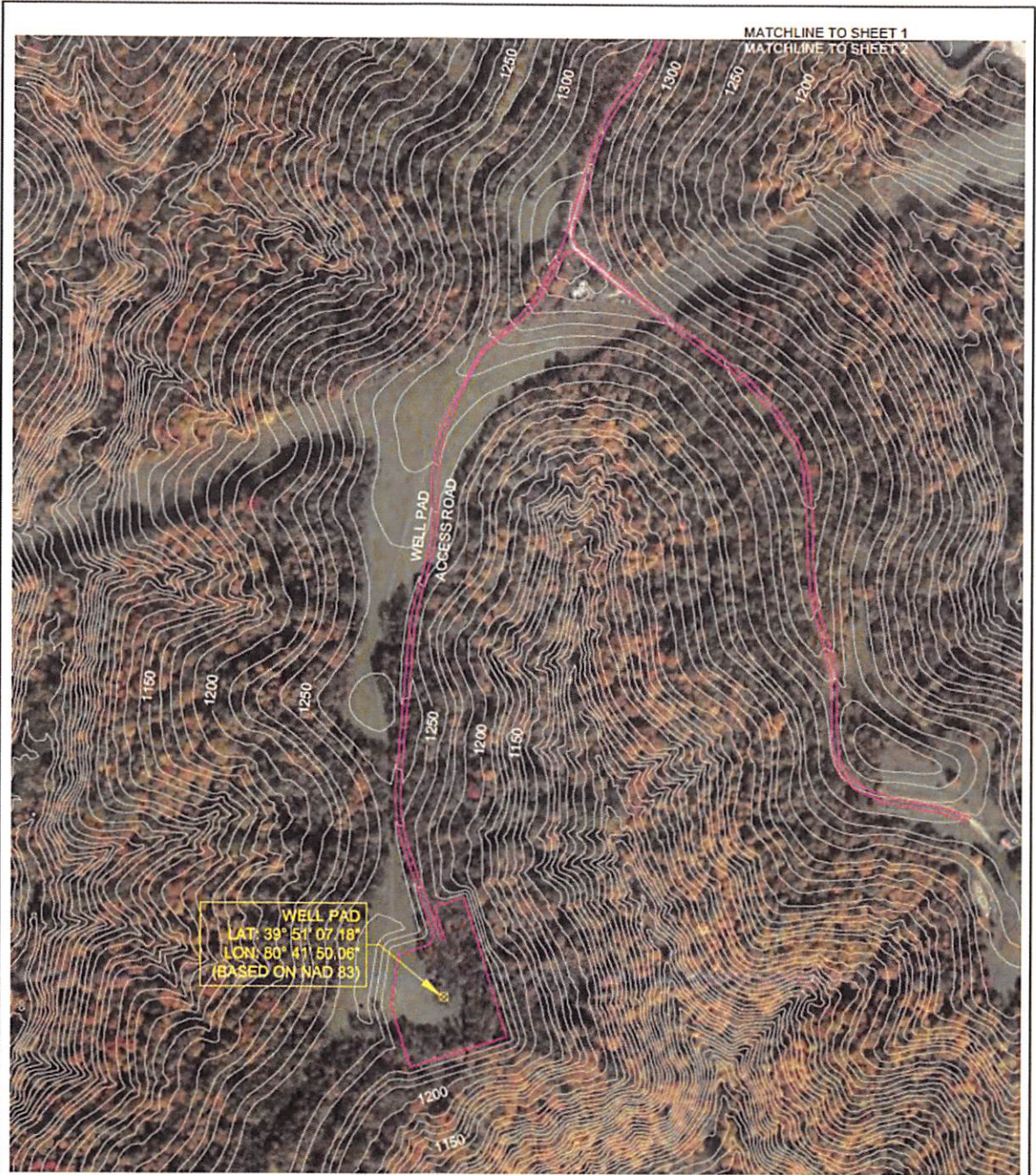


NOTE:
THE BEARINGS AND COORDINATES ARE BASED ON NAD 83,
WEST VIRGINIA NORTH ZONE

WV Department of Environmental Protection

Project Number: C-17544-0275 Drawing Scale: 1"=400' Date Issued: 06/12/2014 Index Number: 100_303 Drawn By: JCS Checked By: JCS Project Manager: JCS Sheet: 1 of 2	TAYLOR "C" WELL SITE SAFETY PLAN #1 FORK RIDGE ROAD CLAY DISTRICT, MARSHALL COUNTY, WV PREPARED FOR: CHEVRON APPALACHIA, LLC 600 MOUNTAIN VIEW DRIVE SMITHFIELD, PA 15478	<table border="1"> <thead> <tr> <th>Date</th> <th>No.</th> <th>REVISION RECORD</th> </tr> </thead> <tbody> <tr><td>-</td><td>01</td><td>-</td></tr> <tr><td>-</td><td>02</td><td>-</td></tr> <tr><td>-</td><td>03</td><td>-</td></tr> <tr><td>-</td><td>04</td><td>-</td></tr> <tr><td>-</td><td>05</td><td>-</td></tr> <tr><td>-</td><td>06</td><td>-</td></tr> <tr><td>-</td><td>07</td><td>-</td></tr> <tr><td>-</td><td>08</td><td>-</td></tr> <tr><td>-</td><td>09</td><td>-</td></tr> <tr><td>-</td><td>10</td><td>-</td></tr> </tbody> </table>	Date	No.	REVISION RECORD	-	01	-	-	02	-	-	03	-	-	04	-	-	05	-	-	06	-	-	07	-	-	08	-	-	09	-	-	10	-	<p>GATEWAY Consulting Engineers & Surveyors 400 Holiday Drive, Suite 300 Pittsburgh, PA 15220 Phone: (412) 921-4030 • Fax: (412) 921-9960 • Butler, PA (724) 287-1085 • Washington, PA (724) 239-3362 http://www.gatewayengineers.com</p>
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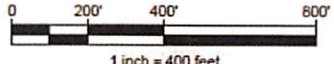
Path & Filename: O:\Projects\100017544 Allen Energy\0370 L Taylor Well\DWG\02-Sheet1\TAYLOR C SAFETY PLAN #1.dwg
 Plot Date: 01/16/2018 2:10 PM Kenneth C. Walker
 Save Date: 01/16/2018 2:06 PM



MATCHLINE TO SHEET 1
MATCHLINE TO SHEET 2

WELL PAD
LAT: 39° 51' 07.18"
LON: 80° 41' 50.06"
(BASED ON NAD 83)

NOTE:
THE BEARINGS AND COORDINATES ARE BASED ON NAD 83,
WEST VIRGINIA NORTH ZONE



Project Number: C-17244-0979
Drawing Scale: 1"=400'
Date Issued: 06/20/2014
Issue Number: 102_363
Drawn By: JCM
Checked By: JCM
Project Manager: JCM
Sheet: 2 of 3

TAYLOR "C" WELL SITE SAFETY PLAN #1
FORK RIDGE ROAD
CLAY DISTRICT, MARSHALL COUNTY, WV
PREPARED FOR:
CHEVRON APPALACHIA, LLC
800 MOUNTAIN VIEW DRIVE
SMITHFIELD, PA 15475

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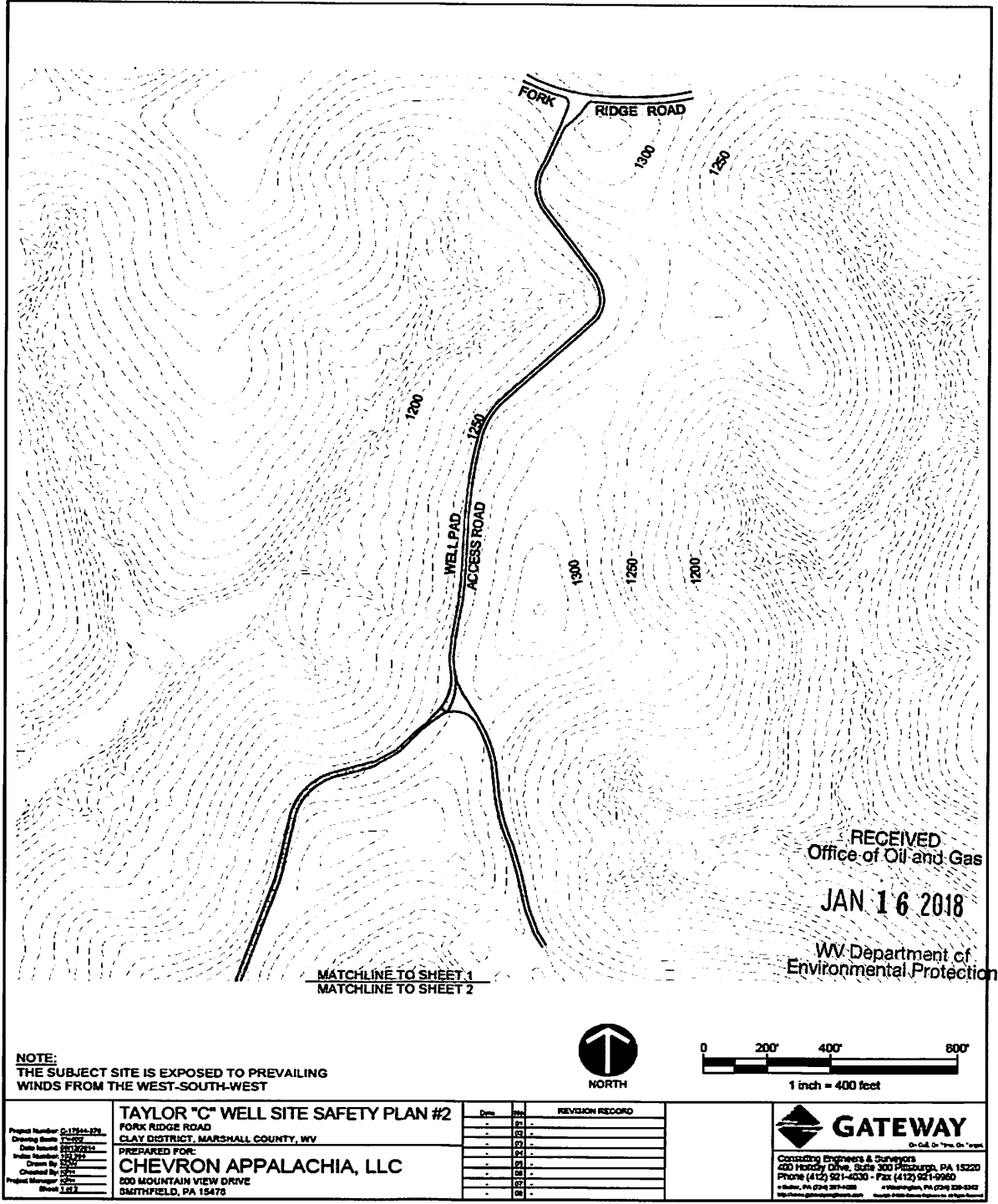
GATEWAY
Consulting Engineers & Surveyors
400 Holiday Drive, Suite 300 Pittsburgh, PA 15220
Phone: (412) 921-6530 • Fax: (412) 921-6960
• Butler, PA (724) 261-1225 • West Virginia, PA (724) 228-2362
http://www.gatewayengineers.com

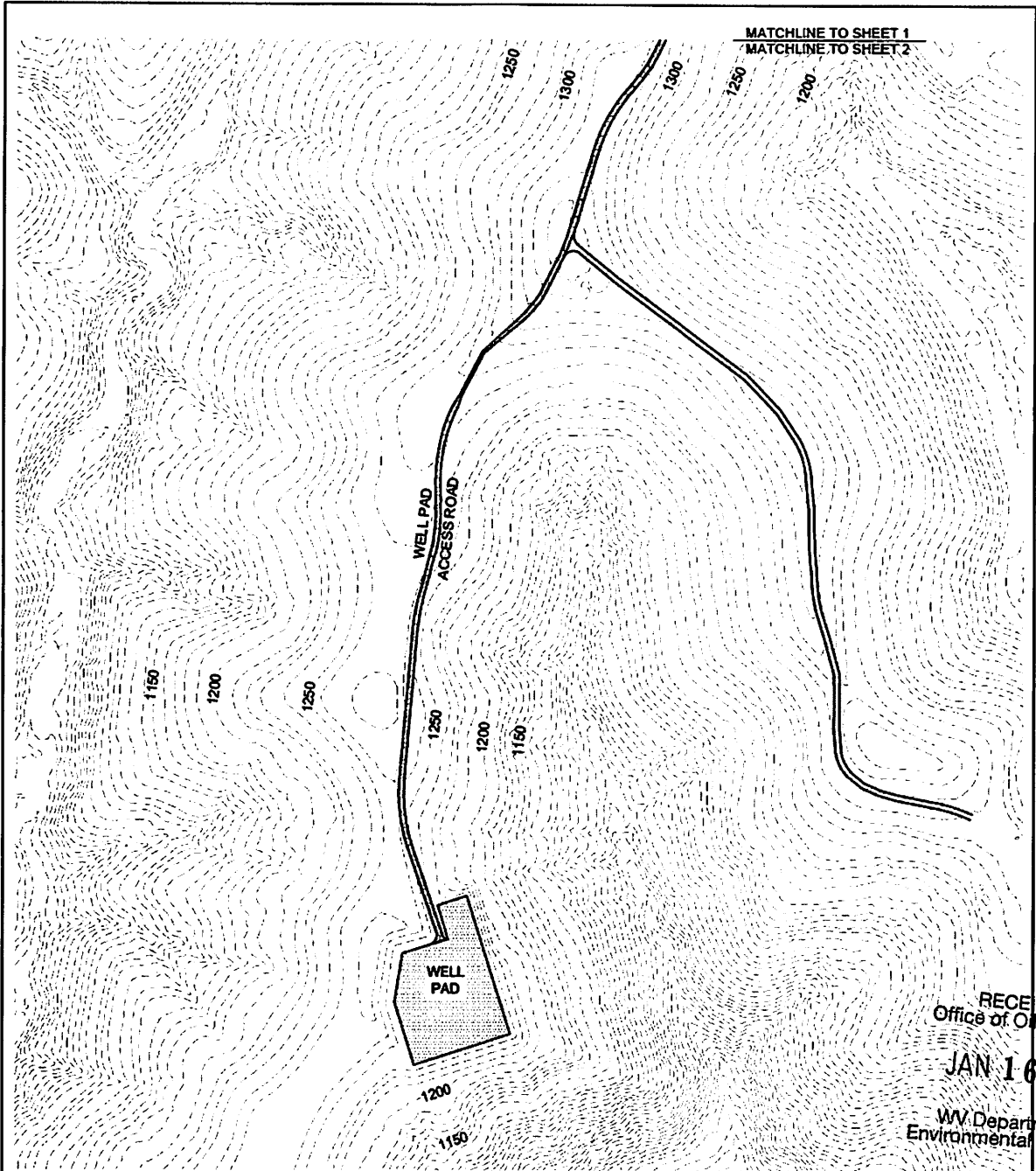
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Path & Filename: C:\Project\1700017844 Atlas Energy\0270 1 Taylor Well\Eng\22-Sheet\TAYLOR C SAFETY PLAN #1.dwg
Plot Date: 01/17/2014 2:10 PM Plot Name: C:\Windows

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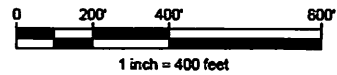
2. Topographic Map and Emergency Notification List (1 mile radius)





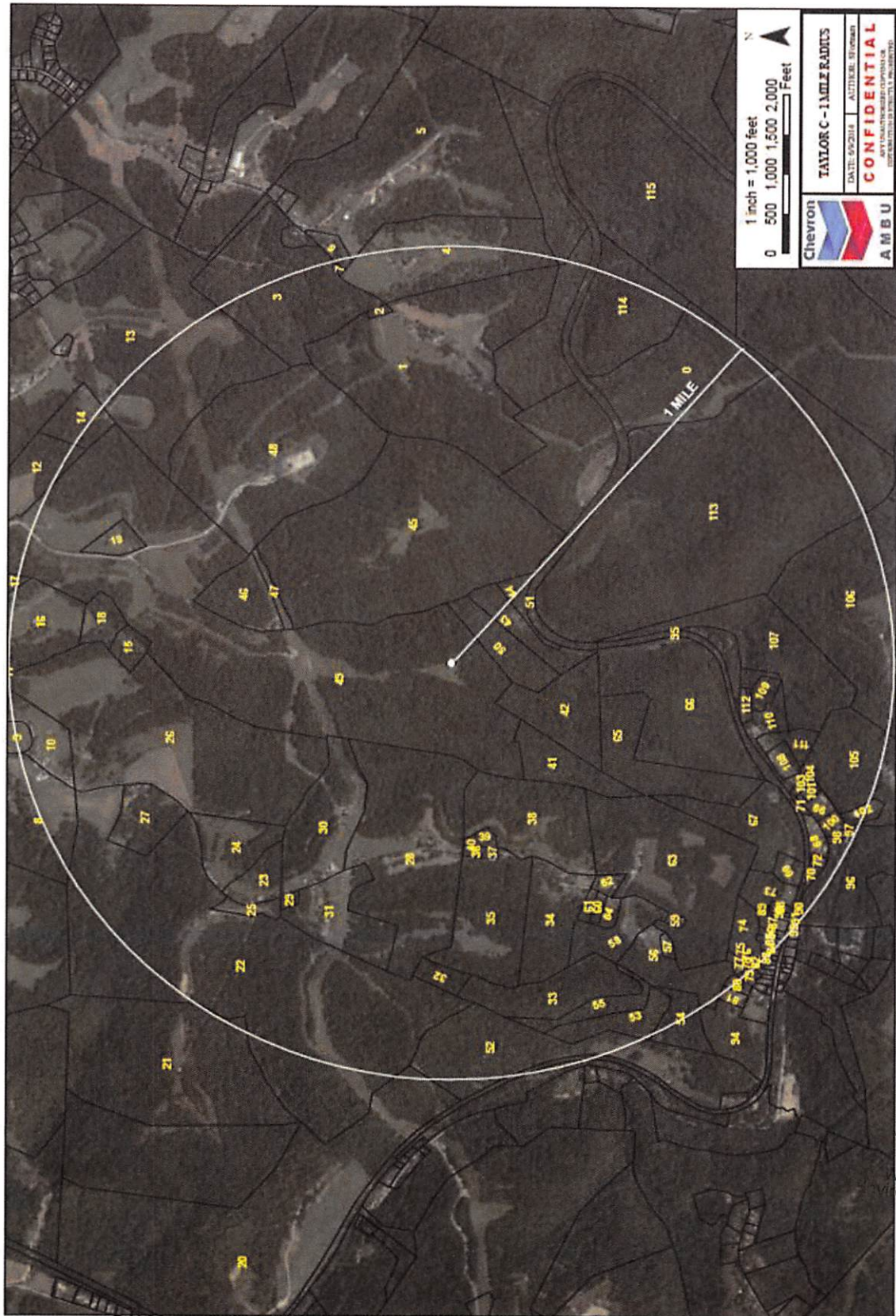
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NOTE:
THE SUBJECT SITE IS EXPOSED TO PREVAILING
WINDS FROM THE WEST-SOUTH-WEST



Project Number: C-1744-0379 Drawing Scale: 1"=400' Date Issued: 01/12/2014 Author: J. Taylor Drawn By: J. Taylor Checked By: J. Taylor Project Manager: J. Taylor Sheet: 2 of 2	TAYLOR "C" WELL SITE SAFETY PLAN #2 FORK RIDGE ROAD CLAY DISTRICT, MARSHALL COUNTY, WV PREPARED FOR: CHEVRON APPALACHIA, LLC 500 MOUNTAIN VIEW DRIVE SMITHFIELD, PA 15476	<table border="1"> <thead> <tr> <th>DATE</th> <th>BY</th> <th>REVISION RECORD</th> </tr> </thead> <tbody> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> <tr><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	DATE	BY	REVISION RECORD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<p>GATEWAY <small>On-Call, On-Time, On-Target</small> Consulting Engineers & Surveyors 400 Hazledy Drive, Suite 300 Pittsburgh, PA 15220 Phone (412) 921-4030 - Fax (412) 921-5960 • Butler, PA (724) 387-1028 • Washington, PA (724) 228-3300 Website: gatewayinc.com Email: sales@gatewayinc.com</p>
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Plan & Planimeter - G:\Projects\1702017544 Atlas Energy-0278 L Taylor WellSite\022-0404\TAYLOR C SAFETY PLAN 02.dwg
 Plot Date: 01/12/2014 3:11 PM Scale: C: 1/4"=100'



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Taylor C Well Site, Moundsville, Marshall County, WV								
ID#	PID	OWNER	ADDRESS	CITY	STATE	ZIP	Area	Phone1
0	03-0012-0001-0000-0000	KUHN PHILIP L EST - LIFE	1440 SAWMILL LN	GLEN EASTON	WV	26039	304	845-2759
1	03-0012-0002-0000-0000	KUHN PHILIP L EST - LIFE	1440 SAWMILL LN	GLEN EASTON	WV	26039	304	845-2759
2	03-0012-0002-0001-0000	KUHN HUBERT & ANDREA	1293 SAWMILL LN	GLEN EASTON	WV	26039	304	845-7971
3	03-0012-0003-0000-0000	KUHN HUBERT & ANDREA	1293 SAWMILL LN	GLEN EASTON	WV	26039	304	845-7971
4	03-0012-0003-0002-0000	HARDMAN MARY T	PO BOX 6799	WHEELING	WV	26003	304	232-1802
5	03-0012-0004-0000-0000	BUNGARD JOHN A	201 BUNGARD DR	GLEN EASTON	WV	26039	304	845-8048
6	03-0012-0004-0003-0000	WELLS ROGER DALE ET AL	1024 SAWMILL LN	GLEN EASTON	WV	26039	304	845-3001
7	03-0012-0004-0005-0000	WELLS ROGER DALE ET AL	1024 SAWMILL LN	GLEN EASTON	WV	26039	304	845-3001
8	04-0009-0013-0000-0000	ASTON LEWIS A JR ET UX	22 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-1399
9	04-0009-0014-0000-0000	STANDIFORD WILLIAM R & LINDA L	5211 FORK RIDGE RD	MOUNDSVILLE	WV	26041	304	845-4703
10	04-0009-0016-0000-0000	ASTON LEWIS A JR ET UX	22 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-1399
11	04-0009-0017-0002-0000	STANDIFORD WILLIAM R ET UX	5211 FORK RIDGE RD	MOUNDSVILLE	WV	26041	304	845-4703
12	04-0009-0019-0000-0000	FLETCHER H NELSON ET UX - LIFE	5552 FORK RIDGE RD	MOUNDSVILLE	WV	26041	304	845-1937
13	04-0009-0020-0000-0000	RULONG JAMES D C/O CLARENCE RULONG	5832 FORK RIDGE RD	MOUNDSVILLE	WV	26041	304	845-4577
14	04-0009-0022-0000-0000	RULONG JAMES D	5832 FORK RIDGE RD	MOUNDSVILLE	WV	26041	304	845-4577
15	04-0009-0023-0000-0000	ASTON LEWIS A JR ET UX	22 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-1399
16	04-0009-0023-0003-0000	STANDIFORD WILLIAM R ET UX	5211 FORK RIDGE RD	MOUNDSVILLE	WV	26041	304	845-4703
17	04-0009-0023-0005-0000	MCCRACKEN KENNETH L ET UX	32 S HIGHLAND AVE	MOUNDSVILLE	WV	26041	304	845-7770
18	04-0009-0023-0008-0000	STANDIFORD WILLIAM ROGER ET UX	5211 FORK RIDGE RD	MOUNDSVILLE	WV	26041	304	845-4703
19	04-0009-0027-0000-0000	TAYLOR LEE R ET UX	309 MORTON AVE	MOUNDSVILLE	WV	26041	304	845-3315
20	04-0010-0001-0000-0000	MOUNDSVILLE CITY OF	SIXTH STREET	MOUNDSVILLE	WV	26041	304	845-6300
21	04-0010-0003-0000-0000	COSTER EDWARD B ET UX ESTS-LIFE C/O COSTER JAMES	659 ASTON RIDGE RD	MOUNDSVILLE	PA	26041	304	845-8539
22	04-0010-0004-0000-0000	WINGROVE DENNIS D ET UX	719 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-5113
23	04-0010-0004-0001-0000	LILLEY RONALD K SR ET UX	448 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-1176
24	04-0010-0004-0002-0000	LILLEY RONALD K SR ET UX	448 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-1176
25	04-0010-0004-0003-0000	WINGROVE DENNIS D ET UX	719 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-5113
26	04-0010-0006-0000-0000	ASTON LEWIS A JR ET UX	22 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-1399
27	04-0010-0006-0001-0000	HOWARD GEORGE K ET UX	293 EASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-7886
28	04-0010-0007-0000-0000	GOULDSBERRY JOSEPH W ET UX	91 BOTTOM LN	MOUNDSVILLE	WV	26041	304	845-6517
29	04-0010-0007-0001-0000	EMERY CHARLES EDWARD	872 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-8047
30	04-0010-0007-0002-0000	EMERY CHARLES E & DEBBY	872 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-8047
31	04-0010-0007-0003-0000	EMERY CHARLES E & DEBBY	872 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-8047
32	04-0010-0008-0000-0000	WINGROVE DENNIS D ET UX	719 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-5113
33	04-0010-0009-0000-0000	CLARK ROY A ET UX	73 LINDEN AVE	MOUNDSVILLE	WV	26041	304	845-8834
34	04-0010-0010-0000-0000	STOUT JAMES	1460 ASTON RD	MOUNDSVILLE	WV	26041	304	843-1397
35	04-0010-0011-0000-0000	GOULDSBERRY JOSEPH W ET UX	91 BOTTOM LN	MOUNDSVILLE	WV	26041	304	845-6517
36	04-0010-0012-0000-0000	EMERY JOSEPH S ET UX	42 MULBERRY AVE	MOUNDSVILLE	WV	26041	304	845-6027
37	04-0010-0012-0001-0000	WEST DEVRON L ET UX	2546 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-3939
38	04-0010-0013-0000-0000	WEST DEVRON LEE & TRACIE JANE	2546 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-3939
39	04-0010-0013-0001-0000	WEST DEVRON LEE ET UX	2546 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	845-3939
40	04-0010-0013-0002-0000	EMERY JOSEPH S ET UX	42 MULBERRY AVE	MOUNDSVILLE	WV	26041	304	845-6027
41	04-0010-0014-0000-0000	SULLIVAN ROBERT MORRIS	1342 FIRST ST	MOUNDSVILLE	WV	26041		
42	04-0010-0015-0000-0000	SULLIVAN ROBERT MORRIS	1342 FIRST ST	MOUNDSVILLE	WV	26041		
43	04-0010-0016-0000-0000	CONNER DAVID SHAWN	67 N HIGHLAND AVE	MOUNDSVILLE	WV	26041	304	845-0512
44	04-0010-0017-0000-0000	CONSOLIDATION COAL COMPANY	1000 CONSOL ENERGY DR	CANONSBURG	PA	15317	724	485-4000
45	04-0010-0019-0000-0000	MCCARTHY BRENDAN J & JOSEPH E BOJALAD III	FORK RIDGE (REAR)	MOUNDSVILLE	WV	26041	412	301-0815
46	04-0010-0019-0001-0000	WILSON CARY & TRUDY J	845 SPOON LN	MOUNDSVILLE	WV	26041	304	845-7062
47	04-0010-0019-0002-0000	WILSON CARY & TRUDY J	845 SPOON LN	MOUNDSVILLE	WV	26041	304	845-7062
48	04-0010-0020-0000-0000	TAYLOR LEE R ET UX	309 MORTON AVE	MOUNDSVILLE	WV	26041	304	845-3315
49	04-0010-0021-0000-0000	TAYLOR LEE R ET UX	309 MORTON AVE	MOUNDSVILLE	WV	26041	304	845-3315
50	04-0010-0022-0000-0000	SULLIVAN ROBERT MORRIS	1342 FIRST ST	MOUNDSVILLE	WV	26041		
51	04-0010-0023-0000-0000	CONSOLIDATION COAL COMPANY	1000 CONSOL ENERGY DR	CANONSBURG	PA	15317	724	485-4000
52	04-0011-0003-0000-0000	ROUSH HARRY F ET UX	52 ROSBY ROAD DR	MOUNDSVILLE	WV	26041	304	845-6094
53	04-0011-0004-0000-0000	ROUSH HARRY F	52 ROSBY ROAD DR	MOUNDSVILLE	WV	26041	304	845-6094
54	04-0011-0005-0000-0000	ROUSH HARRY F ET UX	52 ROSBY ROAD DR	MOUNDSVILLE	WV	26041	304	845-6094
55	04-0011-0006-0000-0000	ROUSH HARRY F ET UX	52 ROSBY ROAD DR	MOUNDSVILLE	WV	26041	304	845-6094
56	04-0011-0007-0000-0000	HOWARD JEREMY & JOSIAH	1887 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
57	04-0011-0007-0001-0000	BABOUL GEORGE III & HEATHER A	1911 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	740	526-0943

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58	04-0011-0009-0000-0000	CLARK ROY A ET UX	1621 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
59	04-0011-0009-0001-0000	MAINS LESLIE	781 BOLSTERS MILLS RD	OXFORD	ME	04270		
60	04-0011-0009-0002-0000	STOUT JAMES	1460 ASTON RD	MOUNDSVILLE	WV	26041	304	843-1397
61	04-0011-0009-0003-0000	STOUT JAMES DAVIS MARGARET	1460 ASTON RD	MOUNDSVILLE	WV	26041	304	843-1397
62	04-0011-0009-0004-0000	C/O MOORE MARGARET L	1580 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
63	04-0011-0009-0005-0000	STANDIFORD WILLIAM R II ET UX	1606 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
64	04-0011-0009-0006-0000	STOUT JAMES	1460 ASTON RD	MOUNDSVILLE	WV	26041	304	843-1397
65	04-0011-0009-0000-0000	SULLIVAN ROBERT MORRIS	1342 FIRST ST	MOUNDSVILLE	WV	26041		
66	04-0011-0010-0000-0000	SULLIVAN ROBERT MORRIS	1342 FIRST ST	MOUNDSVILLE	WV	26041		
67	04-0011-0011-0000-0000	LITMAN FLOYD MILTON C/O LITMAN STEVEN K	PO BOX 723	MOUNDSVILLE	WV	26041		
68	04-0011-0011-0001-0000	WOOD CHARLES M ET UX	79 BOULDER RD	MOUNDSVILLE	WV	26041	304	843-0328
69	04-0011-0011-0002-0000	LITMAN FLOYD MILTON ET AL	PO BOX 723	MOUNDSVILLE	WV	26041		
70	04-0011-0011-0003-0000	WOOD WILLIAM T ET UX - LIFE WOOD WILLIAM S & DANIEL J WOOD	1210 NORTH ST	MOUNDSVILLE	WV	26041	304	843-1747
71	04-0011-0011-0004-0000	GUMP CLARK T	1033 ROSBY ROCK DR	MOUNDSVILLE	WV	26041	304	843-1161
72	04-0011-0011-0005-0000	WOOD ANGELA R	53 BOULDER RD	MOUNDSVILLE	WV	26041		
73	04-0011-0013-0000-0000	SEDOSKY DOROTHY DAKAN	240 CURTIS AVE	MOUNDSVILLE	WV	26041	304	843-2701
74	04-0011-0014-0000-0000	WEST DEVRON LEE ET UX	2346 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
75	04-0011-0015-0000-0000	WEST DEVRON LEE ET UX	2346 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
76	04-0011-0016-0000-0000	WEST DEVRON ET UX	2346 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
77	04-0011-0017-0000-0000	WEST DEVRON ET UX	2346 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
78	04-0011-0018-0000-0000	WEST DEVRON L & TRACE J	2346 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
79	04-0011-0019-0000-0000	CONNOR GLEN WILLIAM ET AL	2619 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-6194
80	04-0011-0020-0000-0000	YOHIO LARRY E ET UX	2611 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-1619
81	04-0011-0021-0000-0000	YOHIO LARRY E ET UX - G E YOHIO	2611 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-1619
82	04-0011-0028-0000-0000	WEST DEVRON L & TRACE J	2346 ASTON RIDGE RD	MOUNDSVILLE	WV	26041		
83	04-0011-0029-0000-0000	HENRY CHARLES M ET UX	634 ROSBY ROCK RD	MOUNDSVILLE	WV	26041		
84	04-0011-0030-0000-0000	SEDOSKY DOROTHY	240 CURTIS AVE	MOUNDSVILLE	WV	26041	304	843-2701
85	04-0011-0031-0000-0000	OTT FRANKLIN L ET UX	716 ROSBY ROCK DR	MOUNDSVILLE	WV	26041	304	843-6116
86	04-0011-0032-0000-0000	OTT FRANKLIN L ET UX	716 ROSBY ROCK DR	MOUNDSVILLE	WV	26041	304	843-6116
87	04-0011-0033-0000-0000	WAYSON MAXINE SEDOSKY	300 WILLIAM ST	CAMDEN WYOMING	DE	19934		
88	04-0011-0034-0000-0000	SEDOSKY DOROTHY DAKAN	240 CURTIS AVE	MOUNDSVILLE	WV	26041	304	843-2701
89	04-0011-0034-0001-0000	SEDOSKY DOROTHY DAKAN	240 CURTIS AVE	MOUNDSVILLE	WV	26041	304	843-2701
90	04-0011-0035-0000-0000	OLIVER GOLDIE M	2724 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-5907
91	04-0011-0036-0000-0000	OLIVER GOLDIE M	2724 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-5907
92	04-0011-0037-0000-0000	OLIVER GOLDIE M	2724 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-5907
93	04-0011-0049-0000-0000	SEDOSKY DOROTHY DAKAN	240 CURTIS AVE	MOUNDSVILLE	WV	26041	304	843-2701
94	04-0011-0051-0000-0000	CONNOR GLEN W ET UX	2619 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-6194
95	04-0011-0059-0000-0000	CONSOLIDATION COAL COMPANY C/O MURRAY ENERGY	46226 NATIONAL RD	SAINT CLAIRSVILLE	OH	43950	740	338-3100
96	09-0001-0005-0000-0000	CONSOLIDATION COAL COMPANY C/O MURRAY ENERGY	46226 NATIONAL RD	SAINT CLAIRSVILLE	OH	43950	740	338-3100
97	09-0001-0006-0000-0000	UNKNOWN	UNKNOWN	MOUNDSVILLE	WV	26041		
98	09-0001-0007-0000-0000	UNKNOWN	UNKNOWN	MOUNDSVILLE	WV	26041		
99	09-0001-0008-0000-0000	BOGES DEBORRAH E	71 CANYON CREEK DR	MOUNDSVILLE	WV	26041		
100	09-0001-0009-0001-0000	BOGES DEBORRAH E	71 CANYON CREEK DR	MOUNDSVILLE	WV	26041		
101	09-0001-0009-0002-0000	BOGES DEBORRAH E	71 CANYON CREEK DR	MOUNDSVILLE	WV	26041		
102	09-0001-0009-0000-0000	MAJEWSKI JEREMY A & NICOLE M	BOX 129 ROSBY ROCK	MOUNDSVILLE	WV	26041	304	843-9351
103	09-0001-0010-0000-0000	CROW JAMES EARL EST C/O CROW JAMES B	187 CANYON CREEK DR	MOUNDSVILLE	WV	26041	304	843-5234
104	09-0001-0010-0001-0000	CROW JAMES EARL EST C/O CROW JAMES B	187 CANYON CREEK DR	MOUNDSVILLE	WV	26041	304	843-5234
105	09-0001-0012-0000-0000	CLARK ROBERT L ET AL C/O MORRIS KEVIN	RD 2 BOX 128	MOUNDSVILLE	WV	26041		
106	09-0002-0001-0000-0000	CROW CLARA I	634 LONE WOLF LN	MOUNDSVILLE	WV	26041	304	843-3780
107	09-0002-0002-0000-0000	CROW HAROLD ET UX	243 CANYON CREEK DR	MOUNDSVILLE	WV	26041	304	843-0788
108	09-0002-0002-0001-0000	CROW JAMES EARL EST C/O CROW JAMES B	187 CANYON CREEK DR	MOUNDSVILLE	WV	26041	304	843-5234
109	09-0002-0002-0002-0000	CROW HAROLD B & CONNIE S	243 CANYON CREEK DR	MOUNDSVILLE	WV	26041	304	843-0788
110	09-0002-0002-0003-0000	CROW HAROLD B & CONNIE S	243 CANYON CREEK DR	MOUNDSVILLE	WV	26041	304	843-0788
111	09-0002-0002-0004-0000	CROW JAMES EARL EST C/O CROW GREG	231 CANYON CREEK DR	MOUNDSVILLE	WV	26041		
112	09-0002-0002-0005-0000	WOOD MARCUS L ET UX	249 CANYON CREEK DR	MOUNDSVILLE	WV	26041		

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113	09-0002-0003-0000-0000	CNX LAND RESOURCES INC	1000 CONSOL ENERGY DR	CANONSBURG	PA	15317	724	483-4000
114	09-0002-0004-0000-0000	CONKLE LAWRENCE & SHIRLEY ESTS C/O CONKLE ROY	73 ARLINGTON AVE	MOUNDSVILLE	WV	26041	304	843-1808
115	09-0002-0005-0000-0000	WEST TRACE L ET AL	2546 ASTON RIDGE RD	MOUNDSVILLE	WV	26041	304	843-3939

ID - corresponds with Map ID shown on Figure X included with SSP

DISCLAIMER: This list was compiled using publicly available sources, including tax parcel ownership information and internet phone number and reverse lookup databases. While all reasonable efforts were used to ensure that the list is complete and accurate as of the date submitted, Chevron does not warrant the completeness or accuracy of the list and disclaims all liability for its use. In the event of an emergency situation that requires notification or evacuation of local residents, Chevron will coordinate with local emergency responders as provided in the well site safety plan.

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3. Geoprog

L. Taylor Pad (Taylor C)						
Fm Top/Casing	Pre-Drill Depths				Shallow Hazards/Comments	
	Sea Level	GL	Air KB	Fluid KB		
Surface	1235	0	17	25		
Conductor	1178	57	74	82	Conductor set 57' below surface	
Dunkard Formation Base	760	475	492	500	The Dunkard Grp. is bedrock to the top of the Waynesburgh Coal. This is where the freshwater resides in WV. Below the Dunkard Grp it is more likely to be brine rather than fresh water.	
Waynesburgh Coal Top/Monongahela Grp Top	760	475	492	500	The Waynesburgh Coal depth was determined by using Francis Waynesburgh coal depth (715' Sub Sea) as an offset, then it was deepened by 15' based on contour maps. There is a 15' structural deepening in formation tops from the Francis pad to the Taylor C pad. The Waynesburgh coal is roughly 6" thick.	
Water String	710	525	542	550	2" water stream 619-648' MD Francis pad (-596-625' TVDKB air on Taylor C) Deepest known FW at 765' SS (470' GL) based on deepest water well within 1 mile radius.	
Pittsburgh Coal Top	435	800	817	825	-Pittsburg Coal prog'd from Coal Contour map (WVGES) -Pittsburg Coal indicated ~816' MD on Francis mudlog = 808' TVDKB (air) on Taylor C pad (~793'+15' structural dip). On Taylor C BH mudlog, the Pcoal is in a thick limestone bed**	
Pittsburgh Coal Base/Monogahela	430	806	823	831	Closest well is 136' from Ireland coal mine, solid coal is expected. NO VOID	
Drilling on air down to the 9-5/8" casing point	Conemaugh Group Top and Base	430	806	823	831	Potential redbeds up to 150' below seam 970-1250' KBTVD. Redbeds seen on Berger 7H in Conemaugh group (seen at 1,125-1,150' MD on Berger)
		-9	1244	1261	1269	Potential brine @ 1276 KBTVD; encountered on Francis offset
		-33	1268	1285	1293	Potential redbeds @ 1300-1420' KBTVD. Encountered on Francis
		-54	1289	1306	1314	There is a pretty distinctive SS bed @ 1230' KBTVD-1280' KBTVD.
	Allegheny Formation Top and Base	-54	1289	1306	1314	On Taylor C BH mudlog the Allegheny Fm is mostly siltstone with some limestone in the silts. There are some traces of redrock. There is a pretty distinctive limestone bed @ 1410' KBTVD-1435' KBTVD. The Clarion coal (in West Virginia) marks the base of the Allegheny Fm. There is coal on the mudlog but we did not have the Clarion coal labeled
		-264	1499	1516	1524	
	Pottsville Group/Salt Sands Top and Base	-264	1499	1516	1524	Kick on Berger 7H (6,101 units) occurred in the Salt Sands @ 1545-1565' KBTVD in Berger depth.
		-504	1739	1756	1764	
	Mauch Chunk Group Top and Base	-504	1739	1756	1764	Potential redbeds @ 1650-2460' KBTVD. Encountered on Francis
		-611	1846	1863	1871	
Drilling on syn fluid to TD	Big Lime Top and Base	-611	1846	1863	1871	
		-613	1848	1865	1873	Potential brine @ 1880-2870' KBTVD; encountered on Francis 1H and encountered water at a rate of 25 bbls/hr on Francis 13H
		-699	1934	1951	1959	
	Burgoon Top and Base	-699	1934	1951	1959	Potential H2O or gas at Burgoon. Gas flare on Francis at top of Burgoon. Flared for roughly 30 mins for 14' MD drilling
		-919	2154	2171	2179	
	Squaw Top	-919	2154	2171	2179	
	Coal/Intermediate	-969	2204	2221	2229	Set Intermediate Casing 50' below top of Squaw formation
	Squaw Base	-1044	2279	2296	2304	
	Weir Top and Base	-1044	2279	2296	2304	Encountered abundant water (rate of 45 bbls/hr) on Francis somewhere within the Squaw/Weir transition
		-1244	2479	2496	2504	
	Berea Top and Base	-1258	2493	2510	2518	
		-1274	2509	2526	2534	
	RED BEDS	-1303	2538	2555	2563	Potential redbeds @ 1570-1810' KBTVD on Francis 1V
	RED BEDS	-1318	2553	2570	2578	Potential redbeds @ 1592-2832' KBTVD on Francis 13H
	Gordon Top and Base	-1504	2739	2756	2764	
		-1584	2819	2836	2844	
	RED BEDS	-1783	3018	3035	3043	Potential redbeds @ 3030-3380' KBTVD on Francis 1V
	Upper Bayard Top and Base	-1857	3092	3109	3117	Pore pressure gradient 0.65 psi/ft from SYCM to TD
	-1889	3124	3141	3149	Possible gas to TD from MDLX to TD	
Rhinestreet Top and Base	-4664	5899	5916	5924		
	-4961	6196	6213	6221		
Sycamore Grit	-4961	6196	6213	6221		
Middlesex	-5056	6291	6308	6316		



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Burkett	-5132	6367	6384	6392
Tully	-5152	6387	6404	6412
S5	-5186	6421	6438	6446
S3	-5254	6489	6506	6514
Stafford (Cval)	-5283	6518	6535	6543
S2B (Lower Marcellus)	-5285	6520	6537	6545
S2A	-5294	6529	6546	6554
Purcell	-5307	6542	6559	6567
S1B (Basal Marcellus)	-5310	6545	6562	6570
Onondaga	-5315	6550	6567	6575
Huntersville	0	1235	1252	1260

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4. Well Bore Diagram &

5. Casing and Cementing Information

Taylor C 3H									
Marshall Co. WV January 9, 2018			Casing & Cementing Details				Ground Level Elevation: 1235 Depths are measured from KB 17 ft above GL		
	AZM	Casing Formation	DEPTH		Inclination	HOLE SIZE	CASING SPECS	CEMENT INFO	GENERAL INFO
			MD	TVD					
		20.0" Conductor	91'			28"	Conductor grout to surface Minimum 40 ft from GL or at least 10 ft into bedrock		
Centralizers per Cementing SOP							Fresh Water Casing 13-3/8" 54.5# J-55 BTC 0.458" wall Capacity = 0.808 bbl/ft Annulus = 0.237 bbl/ft (+6 bbl for shoe track) Burst = 2730 psi	Cement to surface Class A Yield = 1.18 cf/sk Weight = 15.6 ppg 80 bbl 378 s ks 84 bbl capacity to shoe	30% OH Excess
		13 3/8" Casing	642'			17 1/2"	56,485 lbs air w/t with water Minimum 60 ft past deepest known fresh water		
Centralizers per Cementing SOP		Pittsburgh Coal NO VOCD					Intermediate Casing 9-5/8" 40# J 55 BTC Burst = 3950 psi Collapse = 2570 psi ID = 8.835"	Cement to surface Class A Yield = 1.29 cf/sk Weight = 15.6 ppg 132.1 bbl 575 s ks 165 bbl cap to shoe	30% OH Excess
		780-850	1300-1400'						
		Potential Gas	1600' - 1666'						
		780-850	1550' - TD						
		Potential Brine	1880' - TD						
		9 5/8" Casing	2,221'			12 1/4"	1,104 psi lift pressure		
<u>BOPE Class for section</u>								Class A: 1) LEAD SLURRY 327.3 bbls 1392.2 sacks 15.2 ppg 1.32 cf/sk TOC Lead = Surface	
13-5/8" 10K Class III BOPE		KOP	5,778'				Prod. Casing 6-1/2", 20# P-110, VA Superior Capacity = 0.221 bbl/ft (+1 bbl for shoe track) Burst = 2,640 psi Collapse = 1,080 psi ID = 4.775" Drift = 4.835"	Class A: 2) TAIL SLURRY 385.2 bbls 1343.4 sacks 15.2 ppg 1.61 cf/sk TOC Tail = 6,885 ft MD	
		Burkett Sh.	6,289'						
		Tully Lm.	6,302'						
		S5 (Hamilton Sh.)	6,339'						
		S4 (Upper Marcellus)	6,381'						
		Stafford (Cherry Valley)	6,399'						
		S2b (L. Marcellus)	6,402'						
Centralization * 2 Torq glider per jt from shoe to KOP * 1 single bow per 2 jt from KOP to surface		Horizontal Landing Point	6,897'						
		S1b (Basal Marcellus)	6,460'						
		Onondaga	6,466'						
						90.0°	90.0°		
							Lateral length = 9,105'		
						8 1/2"	6 1/2" Casing		46# Shoe Track 16,102'

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Rig KB-GL = 32.0
 40" csg ID = 19.26
 Wall Thickness = 0.376

Conductor cmt= -198.5 bbl

446.6434167 cu ft
 Deepest Acquirer: 166

13-3/8" csg ID = 12.62
 13-3/8" ST lgt= 44.0
 Wall Thickness = 0.458
 Depth = 991

Top of Coal mine: 834
 if no mine:
 normal cement job
 30% excess:

132 bbl
 575 sks

2363

13-3/8" csg ID = 8.84
 13-3/8" ST lgt= 40.0
 Wall Thickness = 0.396
 Depth = 991

Berea 2602
 9-5/8" csg ID = 8.836
 9-5/8" ST lgt= 45.0
 Wall Thickness = 0.396
 Planned shoe py= 2600
 Depth = 2602

Cement Slurries
 1) VARICEM™
 #REF! bbls-(estm'd)
 0.0 bbls-(extra)
 #REF! bbls-(Total)
 #REF! sks
 14.2 ppq
 1.32 eff/ex

General cement calculations:
 O.H. excess = 10%
 Cement to surface
 1 bbl shoe track
 TOC Tail 200' above Marcellus
 Surface casing is 8-5/8" 28#

Planned top of Lead Slurry 0 ft TVD
 TOC Lead 0 ft MD
 8-5/8", 28# casing shoe 0 ft
 Planned TD 16102 ft
 Top Marcellus TBD w hile drilling ft

Lead Length:
 0'
 (Surface to 2000'
 MD)

VariCem Slurry
 Lead-Slurry-GH length = 0 ft
 Lead-Slurry-GH volume = #REF! bbl
 Lead-Slurry-GH volume = #REF! sacks
 4000.784689 cu ft

5-1/2" csg ID = 4.778

Lead Slurry
 Slurry OH length = 6685.0 ft
 Slurry OH volume = 327.3 bbl
 Slurry COH volume = 0.0 bbl
 Slurry Volume = 327.3 bbl
 Slurry Volume = 1392.2 sacks

20% excess

Planned top of Tail Slurry 6181 ft TVD
 TOC Tail = 6685.0 ft MD
 Tail slurry length = 9417.0 ft
 Tail Slurry Volume = 385.2 bbl
 Tail Slurry Volume = 1343.4 sacks
 Disp Vol to Ball seat = 355.1 bbl
 Displacement Vol to FC = 356.1 bbl

% excess
 5-1/2" csg ID = 4.778
 5-1/2" ST lgt= 45.0
 5-1/2" Ball seat lgt= 92.00
 Wall Thickness = 0.361

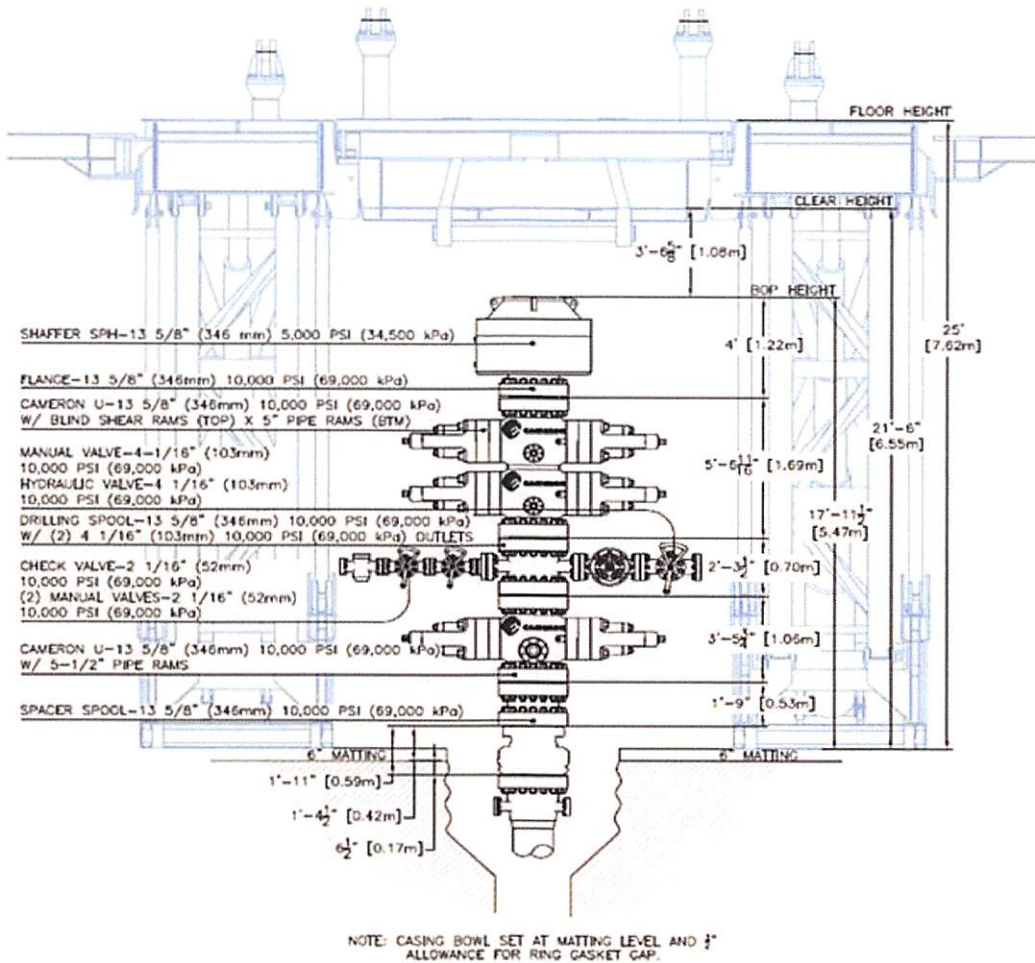
Hydrostatic Pressure due to cement placement:
 Due to VariCem: 0.0 psi
 Due to SuperCBL: 4885.5 psi
 Due to Fracem: -4885.5 psi
 Total press on bttm = 0.0 psi
 Inside csg hyd w/ SW= 2677.4 psi
 SW U-tube press = 2677.4 psi
 8839.6

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6. BOP Schematic

BOP LAYOUT

RIG 560ST



STACK COMPONENTS REPRESENTED ARE SUBJECT TO AVAILABILITY, PLEASE CONFIRM WITH WELL CONTROL DEPARTMENT MANAGER.



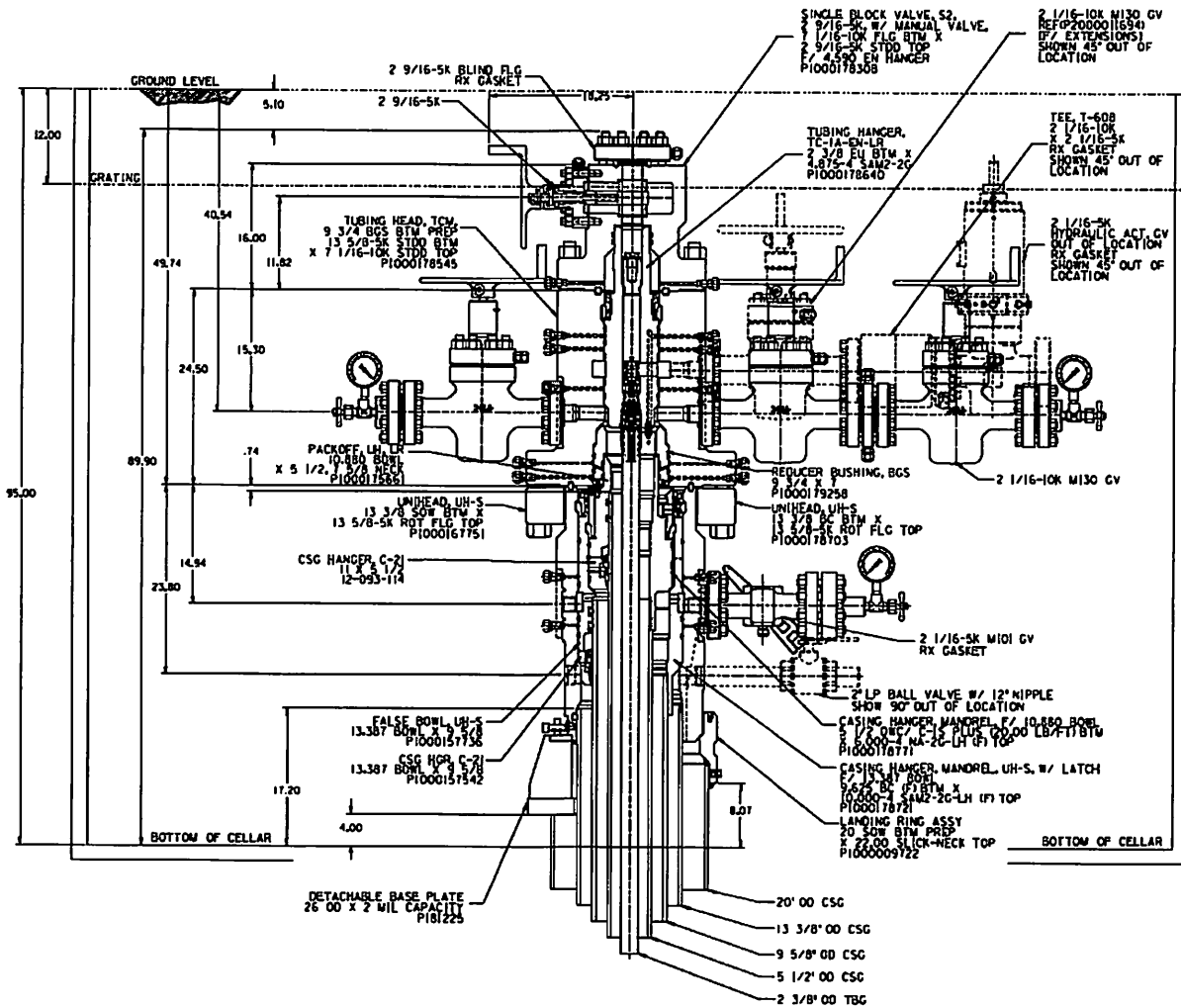
EQUIPMENT REPRESENTATION ONLY
NOT DRAWN TO SCALE

PRECISION DRILLING

DATE: 2017/09/08
DRG No: BOP-560-005
DRG BY: CR

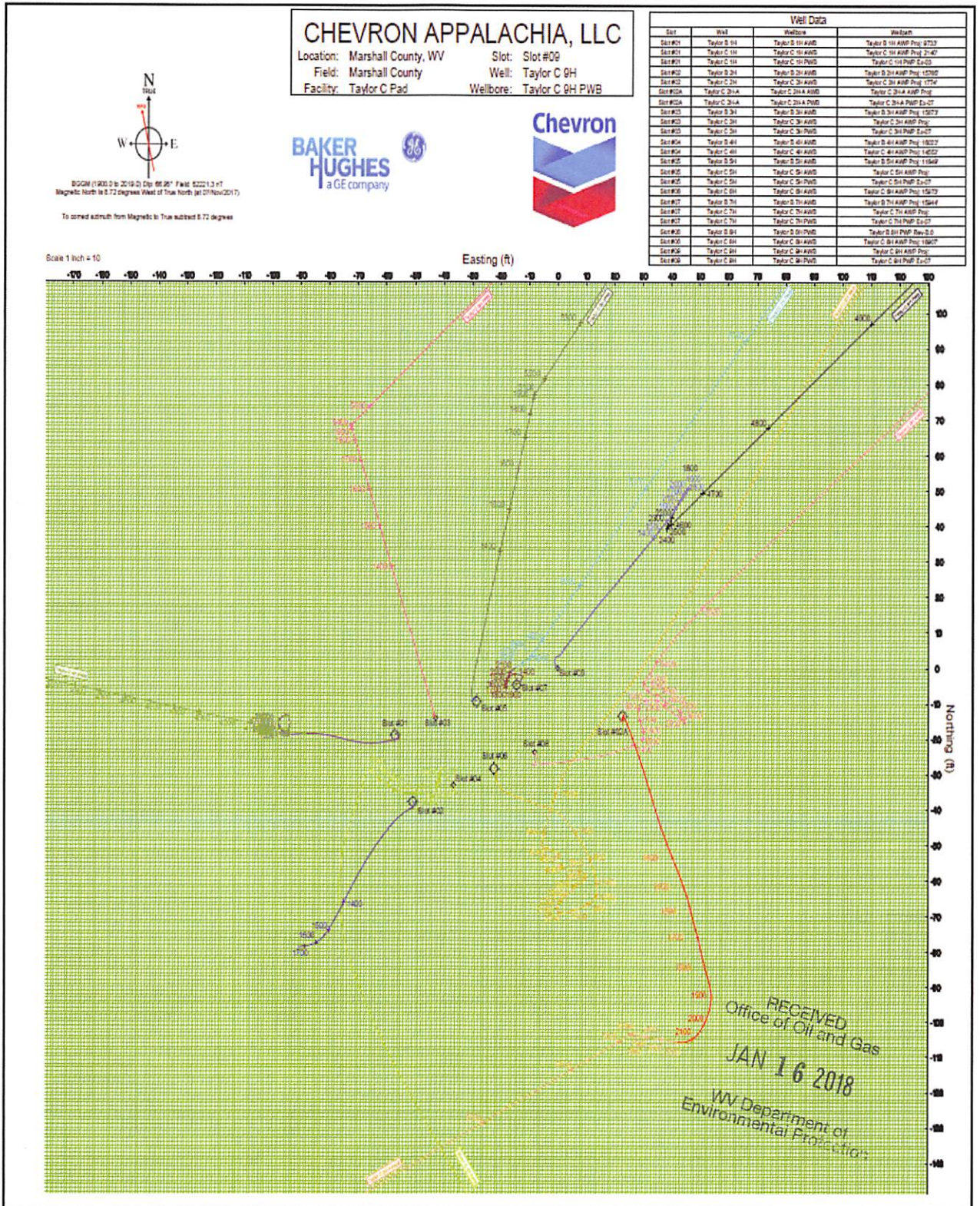
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7. Wellhead Assembly



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8. Spider Plot



WW-6AW
(1-12)

API NO. _____
OPERATOR WELL NO. TAYLOR C 3H
Well Pad Name: Taylor C

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
VOLUNTARY STATEMENT OF NO OBJECTION

Instructions to Persons Named on Page WW-6A

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

Comment and Waiver Provisions

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary.

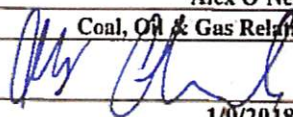
Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

VOLUNTARY STATEMENT OF NO OBJECTION

I, Alex O'Neill, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through _____, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	<u>West Virginia</u>	West Virginia	East:	<u>1,663,767.374 ft</u>
County:	<u>Marshall</u>	North State Plane	North:	<u>494,580.229 ft</u>
District:	<u>Clay</u>	NAD 27	Public Road Access:	_____
Quadrangle:	<u>GLEN EASTON</u>	Generally used farm name:		<u>TAYLOR C</u>
Watershed:	<u>Middle Grave Creek - Grave Creek</u>			

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials, **provided that Chevron U.S.A. Inc. drills the well on West Virginia North State Plane NAD 27 coordinates of North 494,580.229 ft, East 1,663,767.374 ft in accordance with the Agreement between Consolidation Coal Company, Murray American Energy and Chevron U.S.A. Inc. dated 2014-11-19.**

<p>*Please check the box that applies</p> <p><input type="checkbox"/> SURFACE OWNER</p> <p><input type="checkbox"/> SURFACE OWNER (Road and/or Other Disturbance)</p> <p><input type="checkbox"/> SURFACE OWNER (Impoundments/Pits)</p> <p><input type="checkbox"/> COAL OWNER OR LESSEE</p> <p><input checked="" type="checkbox"/> COAL OPERATOR</p> <p><input type="checkbox"/> WATER PURVEYOR</p> <p><input type="checkbox"/> OPERATOR OF ANY NATURAL GAS STORAGE FIELD</p>	<p style="text-align: right;">RECEIVED Office of Oil and Gas JAN 16 2018</p> <p>FOR EXECUTION BY A NATURAL PERSON</p> <p>Signature: _____</p> <p>Print Name: _____</p> <p>Date: _____</p> <p>FOR EXECUTION BY A CORPORATION, ETC.</p> <p>Company: <u>Consolidation Coal Company</u></p> <p>By: <u>Alex O'Neill</u></p> <p>Its: <u>Coal, Oil & Gas Relations Manager</u></p> <p>Signature: </p> <p>Date: <u>1/9/2018</u></p> <p style="text-align: right; font-size: small;">WV Department of Environmental Protection</p>
--	--

Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use of your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov

01/26/2018

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
VOLUNTARY STATEMENT OF NO OBJECTION

Instructions to Persons Named on Page WW-6A

The well operator named on page WW-6A is applying for a permit from the State of West Virginia to conduct oil or gas well work. Well work permits are valid for twenty-four (24) months. Please contact the listed well operator and the Office of Oil and Gas if you do not own any interest in the listed surface tract.

Comment and Waiver Provisions

Pursuant to West Virginia Code § 22-6A-11(a), all persons described in subsection (b), section ten of this article may file written comments with the secretary as to the location or construction of the applicant's proposed well work within thirty days after the application is filed with the secretary.

Pursuant to West Virginia Code § 22-6A-8(b) No permit may be issued less than thirty days after the filing date of the application for any well work except plugging or replugging; and no permit for plugging or replugging may be issued less than five days after the filing date of the application except a permit for plugging or replugging a dry hole: *Provided*, That if the applicant certifies that all persons entitled to notice of the application under the provisions of subsection (b), section ten of this article have been served in person or by certified mail, return receipt requested, with a copy of the well work application, including the erosion and sediment control plan, if required, and the well plat, and further files written statements of no objection by all such persons, the secretary may issue the well work permit at any time.

VOLUNTARY STATEMENT OF NO OBJECTION

I, Casey V. Saunders, hereby state that I have read the Instructions to Persons Named on Page WW-6A and the associated provisions listed above, and that I have received copies of a Notice of Application, an Application for a Well Work Permit on Form WW-6A and attachments consisting of pages one (1) through _____, including the erosion and sediment control plan, if required, and the well plat, all for proposed well work on the tract of land as follows:

State:	<u>West Virginia</u>	Eastings:	<u>WV North State Plane - 1,663,767.374</u>
County:	<u>Marshall</u>	Northing:	<u>WV North State Plane - 494,580.229</u>
District:	<u>Clay</u>	Public Road Access:	<u></u>
Quadrangle:	<u>Glen Easton</u>	Generally used farm name:	<u>Taylor C</u>
Watershed:	<u>Middle Grave Creek - Grave Creek</u>		

I further state that I have no objection to the planned work described in these materials, and I have no objection to a permit being issued on those materials.

*Please check the box that applies

SURFACE OWNER

SURFACE OWNER (Road and/or Other Disturbance)

SURFACE OWNER (Impoundments/Pits)

COAL OWNER OR LESSEE

COAL OPERATOR

WATER PURVEYOR

OPERATOR OF ANY NATURAL GAS STORAGE FIELD

FOR EXECUTION BY A NATURAL PERSON

Signature: _____

Print Name: _____

Date: _____

FOR EXECUTION BY A CORPORATION, ETC.

Company: CONSOL Energy, Inc.

By: Casey V. Saunders

Its: Manager Coal-Gas Coordination

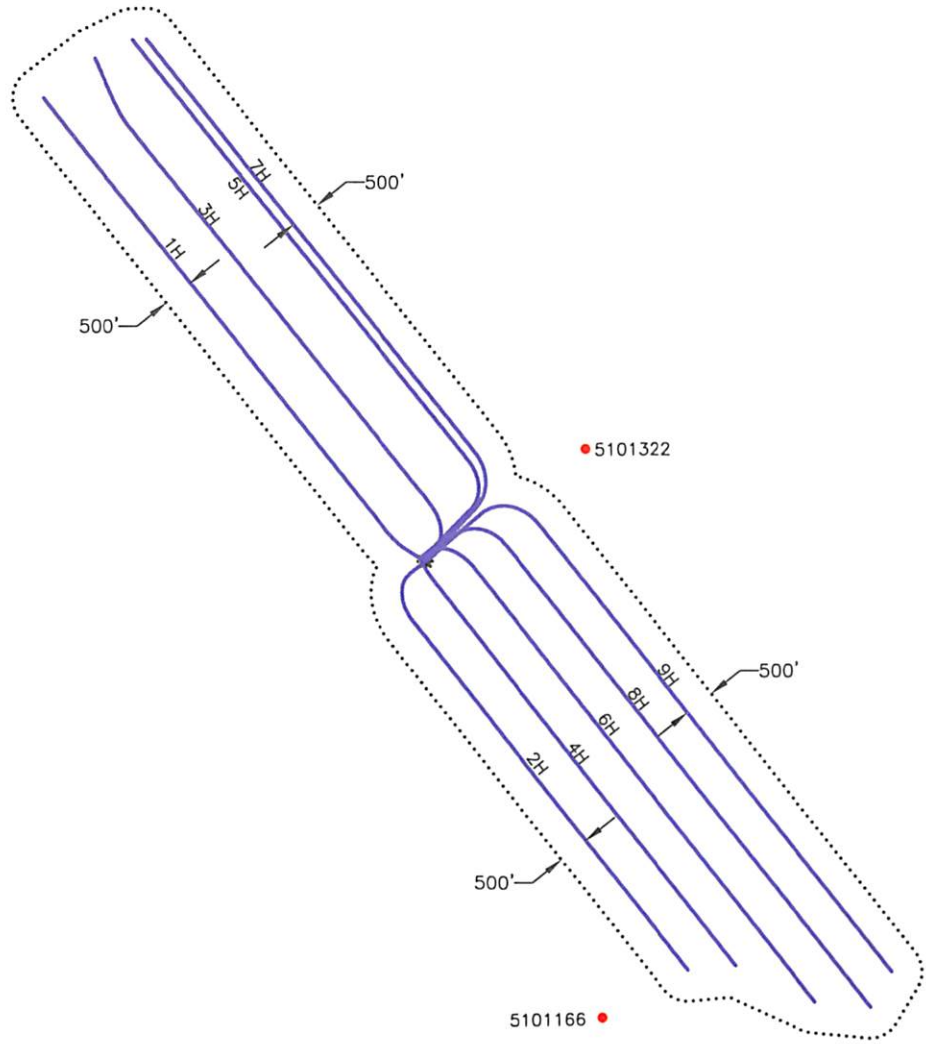
Signature: Casey V. Saunders

Date: 01/09/2018

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Oil and Gas Privacy Notice:

The Office of Oil and Gas processes your personal information, such as name, address and telephone number, as part of our regulatory duties. Your personal information may be disclosed to other State agencies or third parties in the normal course of business or as needed to comply with statutory or regulatory requirements, including Freedom of Information Act requests. Our office will appropriately secure your personal information. If you have any questions about our use or your personal information, please contact DEP's Chief Privacy Officer at depprivacyofficer@wv.gov.



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NO KNOWN WELLS WITHIN
AREA OF REVIEW



PREPARED FOR:
CHEVRON APPALACHIA, LLC
700 CHERRINGTON PARKWAY
CORAOPLIS, PA 15108

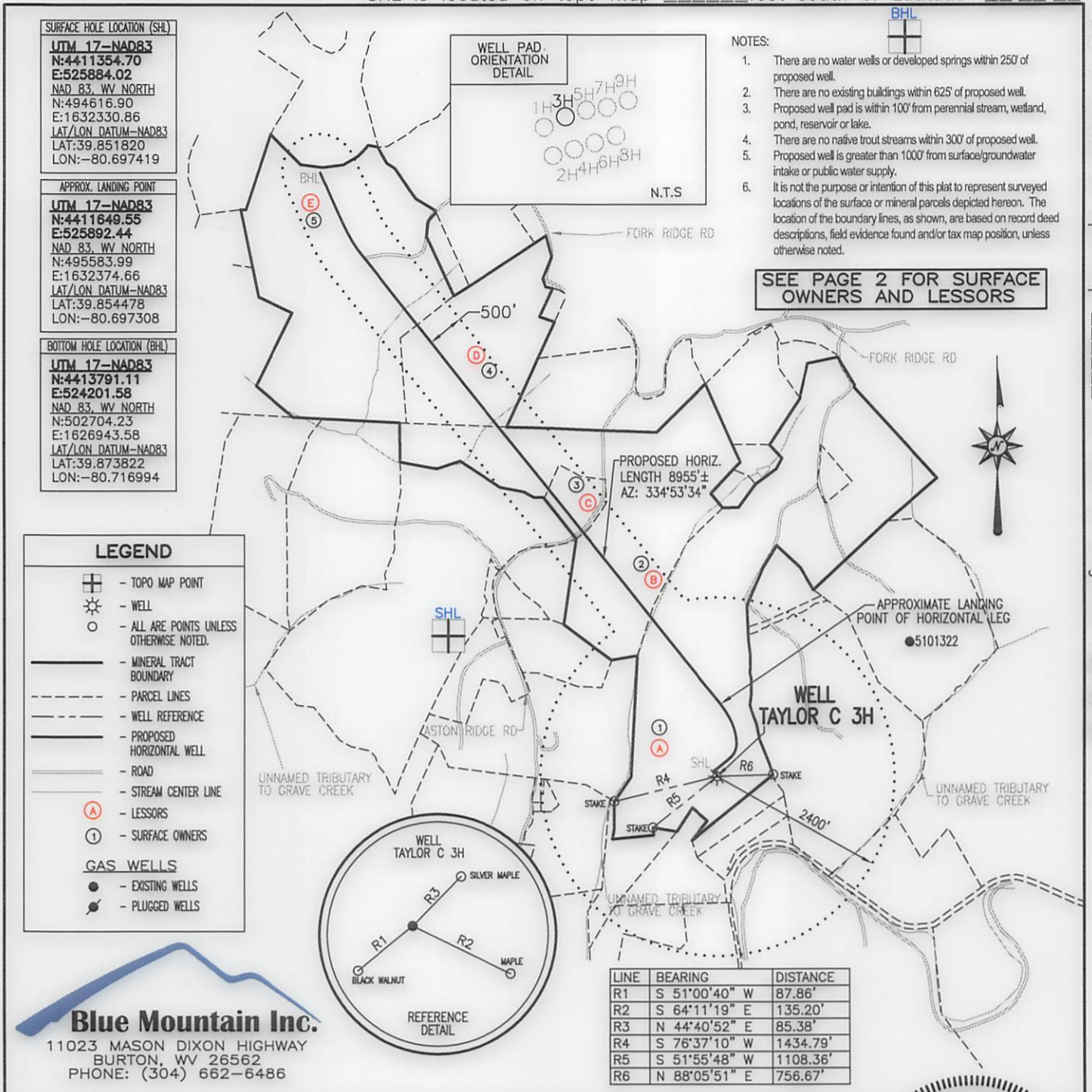
LEGEND
☀ - WELL LOCATION
● - EXISTING WELL

TAYLOR C
AREA OF REVIEW MAP
MARSHALL COUNTY
CLAY DISTRICT
WEST VIRGINIA

TOPO QUAD: GLEN EASTON, WV
SCALE: 1" = 3000'
DATE: JANUARY 08, 2018

BHL is located on topo map 427 feet south of Latitude: 39° 52' 30"
 SHL is located on topo map 8,441 feet south of Latitude: 39° 52' 30"

BHL is located on topo map 2,431 feet west of Longitude: 80° 42' 30"
 SHL is located on topo map 8,633 feet west of Longitude: 80° 40' 00"



Blue Mountain Inc.
 11023 MASON DIXON HIGHWAY
 BURTON, WV 26562
 PHONE: (304) 662-6486

FILE #: TAYLOR C 3H
 DRAWING #: TAYLOR C 3H
 SCALE: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/2500
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: *George D. Six*
 R.P.E.: _____ L.L.S.: P.S. No. 2000

GEORGE D. SIX
 LICENSED
 No. 2000
 STATE OF WEST VIRGINIA
 PROFESSIONAL SURVEYOR
 PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WVDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

DATE: JANUARY 10, 2018
 OPERATOR'S WELL #: TAYLOR C 3H
 API WELL #: 47 51
 STATE COUNTY PERMIT: 01802 Mod H6A

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: MIDDLE GRAVE CREEK - GRAVE CREEK ELEVATION: 1257.00'

COUNTY/DISTRICT: MARSHALL / CLAY QUADRANGLE: GLEN EASTON, WV 7.5'

SURFACE OWNER: WILLIAMS OHIO VALLEY MIDSTREAM LLC ACREAGE: 265.439±

OIL & GAS ROYALTY OWNER: LEE R. & SHERRI L. TAYLOR ACREAGE: 643.246±

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF OLD FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,465.23'± TMD 16,102.55'±

WELL OPERATOR CHEVRON APPALACHIA, LLC DESIGNATED AGENT KENNETH E. TAWNEY
 Address 700 CHERRINGTON PARKWAY Address 500 LEE STREET, EAST SUITE 1600
 City CORAOPOLIS State PA Zip Code 15108 City CHARLESTON State WV Zip Code 25301-3202

01/26/2018

TAYLOR C

3H

PAGE 2 OF 2

	SURFACE OWNER	DIST-TM/PAR
1	WILLIAMS OHIO VALLEY MIDSTREAM LLC	4-10/21
2	LEWIS A. ASTON JR. ET UX	4-10/6
3	GEORGE K. HOWARD ET UX	4-10/6.1
4	MARNIE KAY BUCHANAN EST	4-9/11
5	THOMAS E. HICKS	4-8/37

	LESSOR
A	LEE R. & SHERRI L. TAYLOR
B	LEWIS A. ASTON JR. & CATHY ASTON
C	LEWIS A. ASTON JR. & CATHY ASTON
D	JAMES & MARNIE BUCHANAN
E	CHRISTA D. HICKS & LESLIE M. HICKS

01802 MOD
H6A

SURFACE HOLE LOCATION (SHL)
UTM 17-NAD83 N:4411354.70 E:525884.02 NAD 83, WV NORTH N:494616.90 E:1632330.86 LAT/LON DATUM-NAD83 LAT:39.851820 LON:-80.697419

APPROX. LANDING POINT
UTM 17-NAD83 N:4411649.55 E:525892.44 NAD 83, WV NORTH N:495583.99 E:1632374.66 LAT/LON DATUM-NAD83 LAT:39.854478 LON:-80.697308

BOTTOM HOLE LOCATION (BHL)
UTM 17-NAD83 N:4413791.11 E:524201.58 NAD 83, WV NORTH N:502704.23 E:1626943.58 LAT/LON DATUM-NAD83 LAT:39.873822 LON:-80.716994

01/26/2018

JANUARY 10, 2018



Susan Laird
Permitting Assistant, HES Permitting

January 15, 2018

West Virginia DEP
Office of Oil & Gas
601 57th Street SE
Charleston, WV 25304-2345

RE: Taylor C 1H, 2HA, 3H, 5H, 7H & 9H
Casing Modification Change

Dear Mr. Brewer,

Please accept this as our formal request for a modification to the Well Permit Application (WW-6B) for the Taylor C 1H, 2HA, 3H, 5H, 7H and 9H Casing & Tubing Program.

See below the explanations for the modifications from our drilling department:

- Reason for the 9-5/8" casing change to J-55 was this satisfies our global requirements for casing design and saves money.
- The 5-1/2" burst pressure changed because we switched to a different provider who specifically manufactures their casing to a higher yield stress, thus increasing burst pressure.
- The cement yields have changed because we have changed our slurries and with our provider we wanted to have flexibility to use class A, G or H cement types.

If you have any question please contact me at (412) 865-2504.

Sincerely,

A handwritten signature in black ink that reads "Susan Laird".

Susan Laird

Appalachian Mountain Business Unit
Chevron North America Exploration and Production Company
700 Cherrington Parkway
Coraopolis, PA 15108
Tel 412-865-2504
slaird@chevron.com

01/26/2018

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Chevron Appalachia, LLC 49449935 Marshall Clay Glen Easton, WV
Operator ID County District Quadrangle

2) Operator's Well Number: 3H Well Pad Name: Taylor C

3) Farm Name/Surface Owner: Williams Ohio Valley Midstream Public Road Access: CR 17 Fork Ridge Road

4) Elevation, current ground: 1257' Elevation, proposed post-construction: 1236'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No Yes

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7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Expected Pressure(s):
Marcellus, 6533', 49' - 0.64 psi/ft

8) Proposed Total Vertical Depth: 6,555' GL

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 15,989'

11) Proposed Horizontal Leg Length: 8,955'

12) Approximate Fresh Water Strata Depths: 470' GL

13) Method to Determine Fresh Water Depths: 1 mi radius offset wells, freshwater wells, and freshwater base level

14) Approximate Saltwater Depths: 1276', 1880'-2370' KB: Francis 1V offset well

15) Approximate Coal Seam Depths: 800' GL

16) Approximate Depth to Possible Void (coal mine, karst, other): None

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No Ireland

(a) If Yes, provide Mine Info: Name: Ireland Mine
Depth: 800' GL
Seam: Pittsburgh No. 8'
Owner: CONSOL Energy

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18) CASING AND TUBING PROGRAM

TYPE	Size (in)	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling (ft)	INTERVALS: Left in Well (ft)	CEMENT: Fill-up (Cu. Ft.)/CTS
Conductor	20"	New			40'	40'	141.8
Fresh Water	13 3/8"	New	J-55	54.5#	520'	520'	691.0
Coal							
Intermediate	9 5/8"	New	J-55	40#	2,104'	2,104'	941.0
Production	5 1/2"	New	P-110	20#	15,989	15,989	3430.0
Tubing							
Liners							

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TYPE	Size (in)	Wellbore Diameter (in)	Wall Thickness (in)	Burst Pressure (psi)	Anticipated Max. Internal Pressure (psi)	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	26"					
Fresh Water	13 3/8"	17 1/2"	0.380"	2,730 psi	1,911 psi	Class A	1.18
Coal							
Intermediate	9 5/8"	12 1/4"	0.395"	3,950 psi	2,768 psi	Class A	1.19
Production	5 1/2"	8 1/2"	0.361"	14,360 psi	9,975 psi	Class A, G or H	1.15
Tubing							
Liners							

PACKERS

Kind:				
Sizes:				
Depths Set:				

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill 17 1/2" hole to 600 then run and cement 13 3/8" casing to surface covering the fresh water. Drill 12.25" hole to 2,330' then run and cement to surface 9 5/8" casing, covering the Big Injun. Drill 8 1/2" hole to KOP at 5,778'. Drill 8 1/2" curve and lateral to 15,989' MD and 6,555 TVD. Run 5 1/2" production casing and cement back to surface.

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Chevron will utilize plug and perf method with 52 stages using 8,572 bbl of fluid and 315,000 lbm of sand per stage.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 22.01

22) Area to be disturbed for well pad only, less access road (acres): 4.66

23) Describe centralizer placement for each casing string:

There will be a bow spring centralizer every two jts on the Water string and intermediate. Vertical Production: bow spring - (1) per every other jt over coupling; Curve and Lateral: solid composite (1) per jt of csg to KOP.

24) Describe all cement additives associated with each cement type:

For the Water String the blend will contain Class A cement 3% CaC12, and flake. The intermediate will contain Class A cement 3% CaC12, Salt, and flake. The Production cement will have a lead and tail cement. The lead will contain Class A cement, KCl, dispersant, suspension agent, and retarder. The tail will contain Class A cement, Calcium Carbonate, KCl, dispersant, de-foamer, suspension agent, and friction reducer.

25) Proposed borehole conditioning procedures:

Well will be circulated a minimum of 3 bottoms up once casing point has been reached on all hole sections and until uniform mud properties are achieved.

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*Note: Attach additional sheets as needed.

47-057-01802 34
47-057-01804 54



Susan Laird
Permitting Assistant, HES Permitting

January 11, 2018

West Virginia DEP
Office of Oil & Gas
601 57th Street SE
Charleston, WV 25304-2345

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Certified Mail:

RE: Taylor C 3H and 5H Modification

Dear Mr. Brewer,

Please accept this as our formal request for a modification to the Well Permit Application (WW-6B) for the Taylor C 3H and 5H.

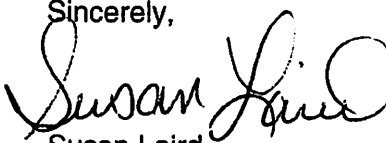
Due to the P&A of the Taylor C 7H, we are adjusting the spacing on the adjacent wells to recover the reserves that will be lost from the 7H proposed lateral. The plan will be to shift the Taylor C 3H ~315 ft. NW and shift Taylor C 5H approximately ~490 ft. NW from there permitted locations.

Included in these modification packages are the following documents for each well:

- WW-6B – (field approved)
- Site Safety Plan
- WW-6AW - Voluntary Statement of No Objection
- Area of Review Map
- Mylar Plats and copy

If you have any question please contact me at (412) 865-2504 or slaird@chevron.com

Sincerely,


Susan Laird

Appalachian Mountain Business Unit
Chevron North America Exploration and Production Company
700 Cherrington Parkway
Coraopolis, PA 15108
Tel 412-865-2504
slaird@chevron.com

01/26/2018