



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

July 29, 2014

WELL WORK PERMIT

Vertical Well

This permit, API Well Number: 47-10701751, issued to COLUMBIA GAS TRANSMISSION, LLC, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.



James Martin
Chief

Operator's Well No: ROCKPORT 12591

Farm Name: COX, SANDRA

API Well Number: 47-10701751

Permit Type: Vertical Well

Date Issued: 07/29/2014

Promoting a healthy environment.

PERMIT CONDITIONS

West Virginia Code §22-6-11 allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code §22-6-20, which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
2. Pursuant to 35 CSR 4-19.1.a, at the request of the surface owner all water wells or springs within 1000 feet of the proposed well that are actually utilized for human consumption, domestic animals or other general use shall be sampled and analyzed.
3. Pursuant to 35 CSR 4-19.1.c, if the operator is unable to sample and analyze any water well or spring with one thousand (1,000) feet of the permitted well location, the Office of Oil and Gas requires the operator to sample, at a minimum, one water well or spring located between one thousand (1,000) feet and two thousand (2,000) feet of the permitted well location.
4. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
5. In the event of an accident or explosion causing loss of life or serious personal injury in or about the well or while working on the well, the well operator or its contractor shall give notice, stating the particulars of the accident or explosion, to the oil and gas inspector and the Chief within twenty-four (24) hours.
6. During the surface casing and cementing process, in the event cement does not return to the surface, or any other casing string that is permitted to circulate cement to the surface and does not return to the surface, the oil and gas inspector shall be notified within twenty-four (24) hours.
7. Well work activities shall not constitute a hazard to the safety of persons.
8. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

WW - 2B
(Rev. 8/10)

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

6 583

1) Well Operator: Columbia Gas Transmission, LLC 307032 Wood Steele Rockport
Operator ID County District Quadrangle

2) Operator's Well Number: Rockport 12591 3) Elevation: 1048 ✓

4) Well Type: (a) Oil _____ or Gas X _____
(b) If Gas: Production _____ / Underground Storage X _____
Deep X _____ / Shallow _____

5) Proposed Target Formation(s): Oriskany Proposed Target Depth: 5494' MD

6) Proposed Total Depth: 5609' MD Feet Formation at Proposed Total Depth: Helderberg

7) Approximate fresh water strata depths: no known water wells within 1000' - no offset well drilling records reported fresh water

8) Approximate salt water depths: Salt Sand 1863 - 2229'

9) Approximate coal seam depths: none expected

10) Approximate void depths,(coal, Karst, other): none expected

11) Does land contain coal seams tributary to active mine? no

12) Describe proposed well work and fracturing methods in detail (attach additional sheets if needed)

Drill well for underground natural gas storage service. Fracture stimulate with +/- 500 bbls fluid.

Refer to directional drilling well plan.

James Stewart
6/26/2014

13) **CASING AND TUBING PROGRAM**

TYPE	SPECIFICATIONS			FOOTAGE INTERVALS		CEMENT
	Size	Grade	Weight per ft	For Drilling	Left in Well	Fill -up (Cu. Ft.)
Conductor	20	B-35	59	20	20	20 (to surface) ✓
Fresh Water	13-3/8"	H-40	48	400	400	280 (to surface) ✓
Coal						
Intermediate	9-5/8"	J-55	36	2280	2280	730 (to surface) ✓
Production	7"	N-80	23	5470	5470	150 (1000 ft) ✓
Tubing						
Liners						

Received

Packers: Kind: _____
Sizes: _____
Depths Set _____

JUN 30 2014

PRE-DRILLING WELL PLAN

Columbia Gas Transmission, LLC

Wood County, WV

Rockport Storage Pad #1

Rockport Storage Pad #1 - Well 12591

Rockport 12591 - Orig Hole

Plan: Rockport 12591 - Plan #6

Standard Planning Report

05 June, 2014

Received

JUN 30 2014

Office of Oil and Gas
WV Dept. of Environmental Protection



Directional Drilling Contractors, LLC.

An Archer Company

10701751J

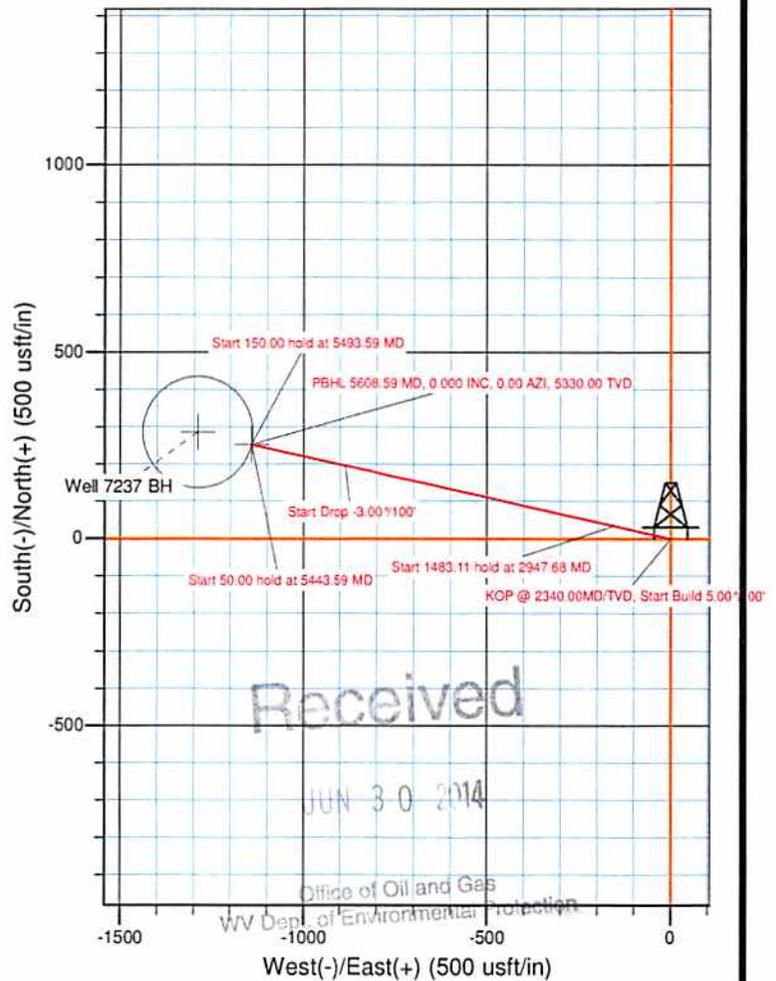
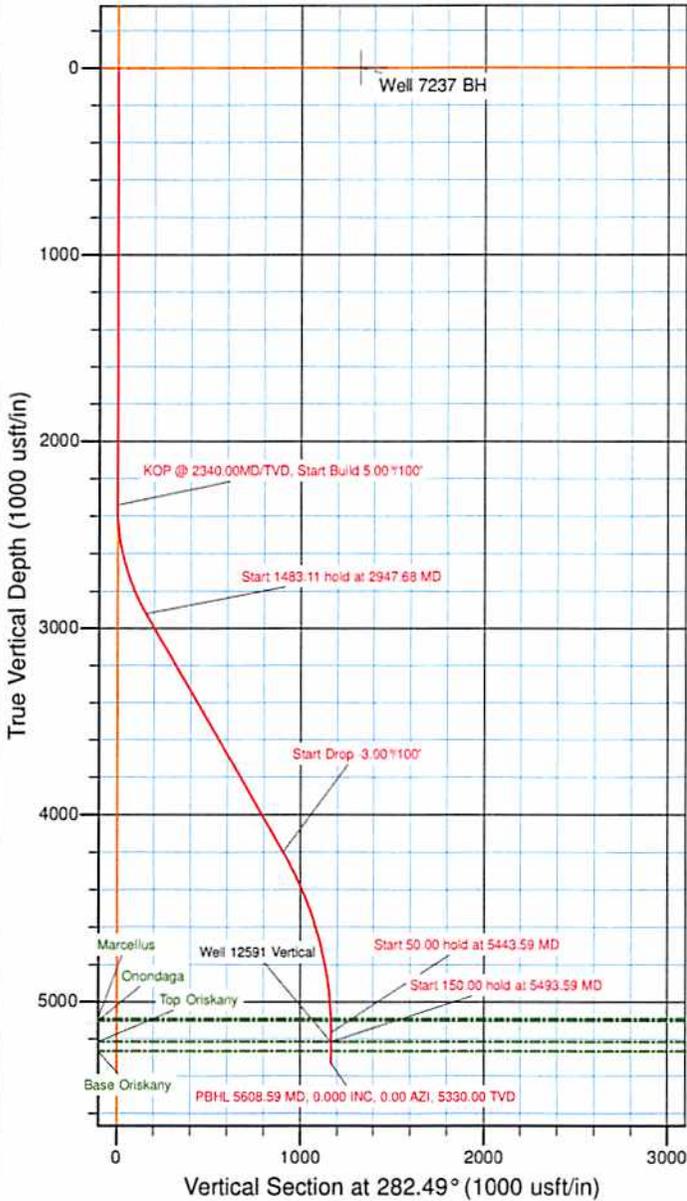
Columbia Gas Transmission, LLC

Rockport Storage Pad #1 - Well 12591						
+N/-S	+E/-W	Northing	Ground Level: Easting	0.00	Latitude	Longitude
0.00	0.00	215257.1400	1387831.8400	39° 4' 22.242 N	81° 32' 43.514 W	

Project: Wood County, WV
 Site: Rockport Storage Pad #1
 Well: Rockport Storage Pad #1 - Well 12591
 Wellbore: Rockport 12591 - Orig Hole
 Design: Rockport 12591 - Plan #6

Azimuths to Grid North
 True North: 1.30°
 Magnetic North: -7.12°

Magnetic Field
 Strength: 52486.0snT
 Dip Angle: 66.80°
 Date: 05/13/2014
 Model: HDGM



Received

JUN 30 2014

Office of Oil and Gas
 WV Dept. of Environmental Protection

ANNOTATIONS

TVD	MD	Inc	Azi	+N/-S	+E/-W	Vsect	Departure	Annotation
2340.00	2340.00	0.000	0.00	0.00	0.00	0.00	0.00	KOP @ 2340.00MD/TVD, Start Build 5.00°/100'
2919.59	2947.68	30.384	282.49	34.05	-153.66	157.39	157.39	Start 1483.11 hold at 2947.68 MD
4199.01	4430.79	30.384	282.49	196.32	-886.04	907.53	907.53	Start Drop -3.00°/100'
5165.00	5443.59	0.000	0.00	253.06	-1142.14	1169.84	1169.84	Start 50.00 hold at 5443.59 MD
5215.00	5493.59	0.000	0.00	253.06	-1142.14	1169.84	1169.84	Start 150.00 hold at 5493.59 MD
5329.99	5608.58	0.000	0.00	253.06	-1142.14	1169.84	1169.84	PBHL 5608.59 MD, 0.000 INC, 0.00 AZI, 5330.00 TVD

DDC, LLC
 646 Hall Road, Buckhannon, WV 26201
 Phone: (304) 473-1825 Fax: (304) 473-1826



10701751T

Directional Drilling Contractors
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Rockport Storage Pad #1 - Well 12591
Company:	Columbia Gas Transmission, LLC	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Project:	Wood County, WV	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Rockport Storage Pad #1	North Reference:	Grid
Well:	Rockport Storage Pad #1 - Well 12591	Survey Calculation Method:	Minimum Curvature
Wellbore:	Rockport 12591 - Orig Hole		
Design:	Rockport 12591 - Plan #6		

Project	Wood County, WV		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	West Virginia Northern Zone		

Site	Rockport Storage Pad #1				
Site Position:		Northing:	214,987.1000 usft	Latitude:	39° 4' 19.585 N
From:	Map	Easting:	1,387,883.7000 usft	Longitude:	81° 32' 42.779 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.30 °

Well	Rockport Storage Pad #1 - Well 12591					
Well Position	+N/-S	270.04 usft	Northing:	215,257.1400 usft	Latitude:	39° 4' 22.242 N
	+E/-W	-51.86 usft	Easting:	1,387,831.8400 usft	Longitude:	81° 32' 43.514 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	0.00 usft

Wellbore	Rockport 12591 - Orig Hole				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	User Defined	05/13/14	-8.42	66.80	52,486

Design	Rockport 12591 - Plan #6			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	282.49

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,340.00	0.000	0.00	2,340.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,947.68	30.384	282.49	2,919.59	34.05	-153.66	5.00	5.00	0.00	282.49	
4,430.79	30.384	282.49	4,199.01	196.32	-886.04	0.00	0.00	0.00	0.00	
5,443.59	0.000	0.00	5,165.00	253.06	-1,142.14	3.00	-3.00	0.00	180.00	
5,493.59	0.000	0.00	5,215.00	253.06	-1,142.14	0.00	0.00	0.00	0.00	Well 12591 Vertical
5,608.59	0.000	0.00	5,330.00	253.06	-1,142.14	0.00	0.00	0.00	0.00	

Received

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Directional Drilling Contractors
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Rockport Storage Pad #1 - Well 12591
Company:	Columbia Gas Transmission, LLC	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Project:	Wood County, WV	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Rockport Storage Pad #1	North Reference:	Grid
Well:	Rockport Storage Pad #1 - Well 12591	Survey Calculation Method:	Minimum Curvature
Wellbore:	Rockport 12591 - Orig Hole		
Design:	Rockport 12591 - Plan #6		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,340.00	0.000	0.00	2,340.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP @ 2340.00MD/TVD, Start Build 5.00°/100'									
2,400.00	3.000	282.49	2,399.97	0.34	-1.53	1.57	5.00	5.00	0.00
2,500.00	8.000	282.49	2,499.48	2.41	-10.89	11.15	5.00	5.00	0.00
2,600.00	13.000	282.49	2,597.77	6.35	-28.67	29.37	5.00	5.00	0.00
2,700.00	18.000	282.49	2,694.11	12.13	-54.76	56.09	5.00	5.00	0.00
2,800.00	23.000	282.49	2,787.74	19.71	-88.94	91.09	5.00	5.00	0.00
2,900.00	28.000	282.49	2,877.97	29.02	-130.96	134.13	5.00	5.00	0.00
2,947.68	30.384	282.49	2,919.59	34.05	-153.66	157.39	5.00	5.00	0.00
Start 1483.11 hold at 2947.68 MD									
3,000.00	30.384	282.49	2,964.73	39.77	-179.50	183.85	0.00	0.00	0.00
3,100.00	30.384	282.49	3,051.00	50.71	-228.88	234.43	0.00	0.00	0.00
3,200.00	30.384	282.49	3,137.26	61.65	-278.26	285.01	0.00	0.00	0.00
3,300.00	30.384	282.49	3,223.53	72.59	-327.64	335.59	0.00	0.00	0.00
3,400.00	30.384	282.49	3,309.79	83.54	-377.02	386.17	0.00	0.00	0.00
3,500.00	30.384	282.49	3,396.06	94.48	-426.40	436.74	0.00	0.00	0.00
3,600.00	30.384	282.49	3,482.32	105.42	-475.79	487.32	0.00	0.00	0.00
3,700.00	30.384	282.49	3,568.59	116.36	-525.17	537.90	0.00	0.00	0.00
3,800.00	30.384	282.49	3,654.85	127.30	-574.55	588.48	0.00	0.00	0.00
3,900.00	30.384	282.49	3,741.12	138.24	-623.93	639.06	0.00	0.00	0.00
4,000.00	30.384	282.49	3,827.39	149.18	-673.31	689.64	0.00	0.00	0.00
4,100.00	30.384	282.49	3,913.65	160.12	-722.69	740.22	0.00	0.00	0.00
4,200.00	30.384	282.49	3,999.92	171.07	-772.07	790.80	0.00	0.00	0.00
4,300.00	30.384	282.49	4,086.18	182.01	-821.46	841.38	0.00	0.00	0.00
4,400.00	30.384	282.49	4,172.45	192.95	-870.84	891.96	0.00	0.00	0.00
4,430.79	30.384	282.49	4,199.01	196.32	-886.04	907.53	0.00	0.00	0.00
Start Drop -3.00°/100'									
4,500.00	28.308	282.49	4,259.33	203.65	-919.16	941.45	3.00	-3.00	0.00
4,600.00	25.308	282.49	4,348.58	213.41	-963.18	986.54	3.00	-3.00	0.00
4,700.00	22.308	282.49	4,440.06	222.14	-1,002.59	1,026.90	3.00	-3.00	0.00
4,800.00	19.308	282.49	4,533.52	229.82	-1,037.27	1,062.42	3.00	-3.00	0.00
4,900.00	16.308	282.49	4,628.72	236.44	-1,067.12	1,093.00	3.00	-3.00	0.00
5,000.00	13.308	282.49	4,725.39	241.97	-1,092.07	1,118.56	3.00	-3.00	0.00
5,100.00	10.308	282.49	4,823.26	246.39	-1,112.05	1,139.02	3.00	-3.00	0.00
5,200.00	7.308	282.49	4,922.07	249.70	-1,126.99	1,154.33	3.00	-3.00	0.00
5,300.00	4.308	282.49	5,021.55	251.89	-1,136.87	1,164.44	3.00	-3.00	0.00
5,368.57	2.251	282.49	5,090.00	252.74	-1,140.70	1,168.37	3.00	-3.00	0.00
Marcellus									
5,381.58	1.860	282.49	5,103.00	252.84	-1,141.16	1,168.83	3.00	-3.00	0.00
Onondaga									
5,400.00	1.308	282.49	5,121.42	252.95	-1,141.65	1,169.34	3.00	-3.00	0.00
5,443.59	0.000	0.00	5,165.00	253.06	-1,142.14	1,169.84	3.00	-3.00	0.00
Start 50.00 hold at 5443.59 MD									
5,493.59	0.000	0.00	5,215.00	253.06	-1,142.14	1,169.84	0.00	0.00	0.00
Start 150.00 hold at 5493.59 MD - Top Oriskany									
5,500.00	0.000	0.00	5,221.41	253.06	-1,142.14	1,169.84	0.00	0.00	0.00
5,543.59	0.000	0.00	5,265.00	253.06	-1,142.14	1,169.84	0.00	0.00	0.00
Base Oriskany									
5,600.00	0.000	0.00	5,321.41	253.06	-1,142.14	1,169.84	0.00	0.00	0.00
5,608.58	0.000	0.00	5,329.99	253.06	-1,142.14	1,169.84	0.00	0.00	0.00
PBHL 5608.59 MD, 0.000 INC, 0.00 AZI, 5330.00 TVD									
5,608.59	0.000	0.00	5,330.00	253.06	-1,142.14	1,169.84	0.00	0.00	0.00

Received

10701751T

Directional Drilling Contractors
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Rockport Storage Pad #1 - Well 12591
Company:	Columbia Gas Transmission, LLC	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Project:	Wood County, WV	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Rockport Storage Pad #1	North Reference:	Grid
Well:	Rockport Storage Pad #1 - Well 12591	Survey Calculation Method:	Minimum Curvature
Wellbore:	Rockport 12591 - Orig Hole		
Design:	Rockport 12591 - Plan #6		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
Well 7237 BH	0.000	360.00	0.00	285.46	-1,288.56	215,542.6001	1,386,543.2752	39° 4' 24.772 N	81° 32' 59.931 W
- plan misses target center by 2686.54usft at 2340.00usft MD (2340.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 150.00)									
Well 12591 Vertical	0.000	360.00	5,215.00	253.06	-1,142.14	215,510.2000	1,386,689.7000	39° 4' 24.485 N	81° 32' 58.066 W
- plan hits target center									
- Point									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
5,368.57	5,090.00	Marcellus		0.00		
5,381.58	5,103.00	Onondaga		0.00		
5,493.59	5,215.00	Top Oriskany		0.00		
5,543.59	5,265.00	Base Oriskany		0.00		

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates		Comment	
(usft)	(usft)	+N/-S	+E/-W		
(usft)	(usft)	(usft)	(usft)		
2,340.00	2,340.00	0.00	0.00	KOP @ 2340.00MD/TVD, Start Build 5.00°/100'	
2,947.68	2,919.59	34.05	-153.66	Start 1483.11 hold at 2947.68 MD	
4,430.79	4,199.01	196.32	-886.04	Start Drop -3.00°/100'	
5,443.59	5,165.00	253.06	-1,142.14	Start 50.00 hold at 5443.59 MD	
5,493.59	5,215.00	253.06	-1,142.14	Start 150.00 hold at 5493.59 MD	
5,608.58	5,329.99	253.06	-1,142.14	PBHL 5608.59 MD, 0.000 INC, 0.00 AZI, 5330.00 TVD	

Received

JUN 30 2014

7013 1090 0001 7328 8154

U.S. Postal Service™
CERTIFIED MAIL™ RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

For delivery information visit our website at www.usps.com

ROCKPORT WV 26169

OFFICIAL USE

Postage	\$	\$1.61	
Certified Fee		\$3.30	
Return Receipt Fee (Endorsement Required)		\$2.00	
Restricted Delivery Fee (Endorsement Required)		\$0.00	
Total Postage & Fees	\$	\$7.61	

Sent To Sandra Cox
 Street, Apt. No., or PO Box No. 635 Queen Hollow Rd
 City, State, ZIP+4® Rockport WV 26169



WW-2A1
(Rev. 1/11)

Operator's Well Number Rockport 12591

**INFORMATION SUPPLIED UNDER WEST VIRGINIA CODE
Chapter 22, Article 6, Section 8(d)
IN LIEU OF FILING LEASE(S) AND OTHER CONTINUING CONTRACT(S)**

Under the oath required to make the verification on page 1 of this Notice and Application, I depose and say that I am the person who signed the Notice and Application for the Applicant, and that –

- (1) the tract of land is the same tract described in this Application, partly or wholly depicted in the accompanying plat, and described in the Construction and Reclamation Plan;
- (2) the parties and recordation data (if recorded) for lease(s) or other continuing contract(s) by which the Applicant claims the right to extract, produce or market the oil or gas are as follows:

Grantor, Lessor, etc.	Grantee, Lessee, etc.	Royalty	Book/Page
Frank Gilmore Et Ux (under surface location)	Columbia Gas Transmission, LLC	storage lease 1050684	366 / 308-309
H C McPherson Et Ux (at bottom hole)	Columbia Gas Transmission, LLC	storage lease 1050607	357 / 431-432

**Acknowledgement of Possible Permitting/Approval
In Addition to the Office of Oil and Gas**

The permit applicant for the proposed well work addressed in this application hereby acknowledges the possibility of the need for permits and/or approvals from local, state, or federal entities in addition to the DEP, Office of Oil and Gas, including but not limited to the following:

- WV Division of Water and Waste Management
- WV Division of Natural Resources
- WV Division of Highways
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- County Floodplain Coordinator

Received

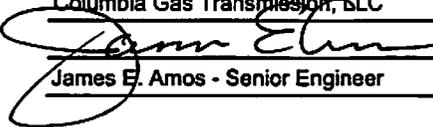
JUN 30 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

The applicant further acknowledges that any Office of Oil and Gas permit in no way overrides, replaces, or nullifies the need for other permits/approvals that may be necessary and further affirms that all needed permits/approvals should be acquired from the appropriate authority before the affected activity is initiated.

Well Operator:
By: Its:

Columbia Gas Transmission, LLC


James E. Amos - Senior Engineer

10701751T

WW-2B1
(5-12)

Well No. Rockport 12591

West Virginia Department of Environmental Protection
Office of Oil and Gas

NOTICE TO SURFACE OWNERS

The well operator named below is preparing to file for a permit from the state to drill a new well. Before a well work permit can be filed with the Chief of the Office of Oil and Gas, the well operator is required to have given notice of the right to request water well or spring analytical testing. This notice shall be given to the owners or occupants of land which have a water well or spring being utilized for human consumption, domestic animals, or other general use and which is located within 1000 feet of the proposed well site.

With this form, the operator is giving you notice of your right to request analytical testing. The operator is required to sample and analyze the water wells or springs of all owners or occupants who request it. Therefore, if you wish to have your water well or spring tested, contact the operator named below.

All sampling shall be completed prior to drilling. Within thirty (30) days of the receipt of such sample analyses the operator shall submit the results to the Chief of the Office of Oil and Gas and to the owners or occupants who may have requested them.

Be advised, you have the right to sample and analyze any water supply at your own expense.

Listed below is the laboratory chosen by operator to perform analysis, and contactor chosen to collect sample.

Certified Laboratory Name Standard Laboratories, Inc.
Sampling Contractor Standard Laboratories, Inc.

Well Operator Columbia Gas Transmission, LLC
Address 1700 MacCorkle Ave. SE
Charleston, WV 25325-1273
Telephone Jim Amos 304-483-0073

FOR OPERATOR'S USE ONLY: Below, or on an attached page, list those persons which were given this notice. Place an asterisk beside the one(s) that contacted you and requested sampling and analyses. If there were no requests made, indicate by underling which one you have selected to sample and analyze. If there are no water wells or springs within 1000 feet of the proposed site, the Chief may require the operator to test wells up to 2000 feet from the proposed site.

* refer to water testing plan on next page

REFER TO PERMIT CONDITION PAGE.

Received

JUN 30 2014

1070751T



Rockport well 12590 & 12591
 elevation (pad): 1030 ft
 surface csg setting depth above sea level: 630 ft

1000 ft radius around well

no spring or water well
 dwelling utilizes municipal water

Google earth



Water well ???
 municipal water available
 * tried calling but only get busy signal - will stop by house
 Gary M Belcher
 8468 Slate Creek Rd
 Rockport, WV 26169
 304-474-3790
 surface elevation: ??? ft
 water depth: ??? ft
 water elevation above sea level: ??? ft

* dwelling has a water well, but utilizes municipal water as main source - will test water well if pump works
 Drew Theys
 8429 Slate Creek Rd
 Rockport, WV 26169
 734-689-8872
 atheys@accurate-test.biz
 theys18@gmail.com
 surface elevation: ??? ft
 water depth: ??? ft
 water elevation above sea level: ??? ft

WATER TESTING TO BE PERFORMED

1. Gary M Belcher dwelling - will test water if they have a well or spring, and permission granted
2. Drew Theys dwelling - will test well water if able to obtain a sample

Received

JUN 30 2014

10701751T

WW-9
(5/13)

Page _____ of _____
API Number 47 - 107 - _____
Operator's Well No. Rockport 12591

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Columbia Gas Transmission, LLC OP Code 307032

Watershed (HUC 10) Tygart Creek Quadrangle Rockport

Elevation 1048 County Wood District Steele

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes _____ No X

Will a pit be used for drill cuttings? Yes X No _____

If so, please describe anticipated pit waste: fresh water, drilling fluid, cement returns, rock cuttings

Will a synthetic liner be used in the pit? Yes X No _____ If so, what ml.? 30

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number 34-105-23619, 34-167-29395, 34-167-23862)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain EnviroTank Clean (Rt. 7, Belpre, OH))

Will closed loop system be used? yes

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. air, freshwater based drilling fluid

-If oil based, what type? Synthetic, petroleum, etc. _____

Additives to be used in drilling medium? air - KCl & surfactant drilling fluid - KCl, NaCl, biocide, polymer, starch, soda ash

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. leave in pit

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) _____

-Landfill or offsite name/permit number? if needed: EnviroTank Clean (Rt. 7, Belpre, OH)

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto 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 or imprisonment.

Company Official Signature James E. Amos JUN 30 2014

Company Official (Typed Name) James E. Amos

Company Official Title Senior Engineer

Office of Oil and Gas
WV Dept. of Environmental Protection

Subscribed and sworn before me this 25th day of June, 2014

Mary Marie Clendenin Notary Public

My commission expires March 22, 2015



Form WW-9

Operator's Well No. Rockport 12591

Proposed Revegetation Treatment: Acres Disturbed 10.7 (dual well pad) Prevegetation pH 6.0

Lime 2 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)

Mulch 2 Tons/acre

Seed Mixtures

Area I		Area II	
Seed Type	lbs/acre	Seed Type	lbs/acre
Orchard Grass	20	Orchard Grass	20
Ledino Clover	10	Ledino Clover	10
Annual Rye	20	Annual Rye	20

Attach:
Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: _____

Comments: _____

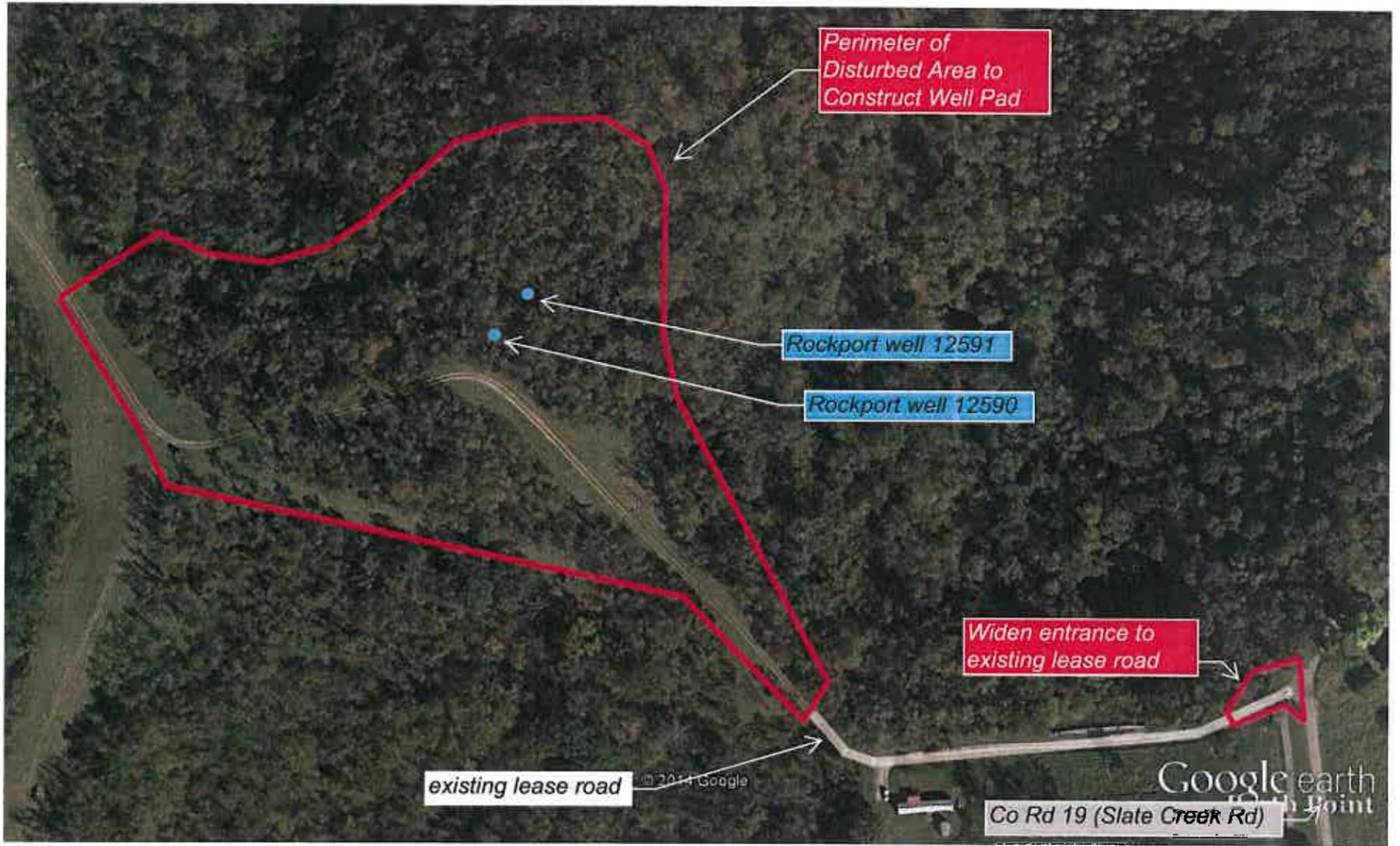
Title: Jamie Stevens
Inspector

Date: 6/26/2014

Field Reviewed? Yes No

Received

JUN 30 2014



Google earth



Received

JUN 30 2014

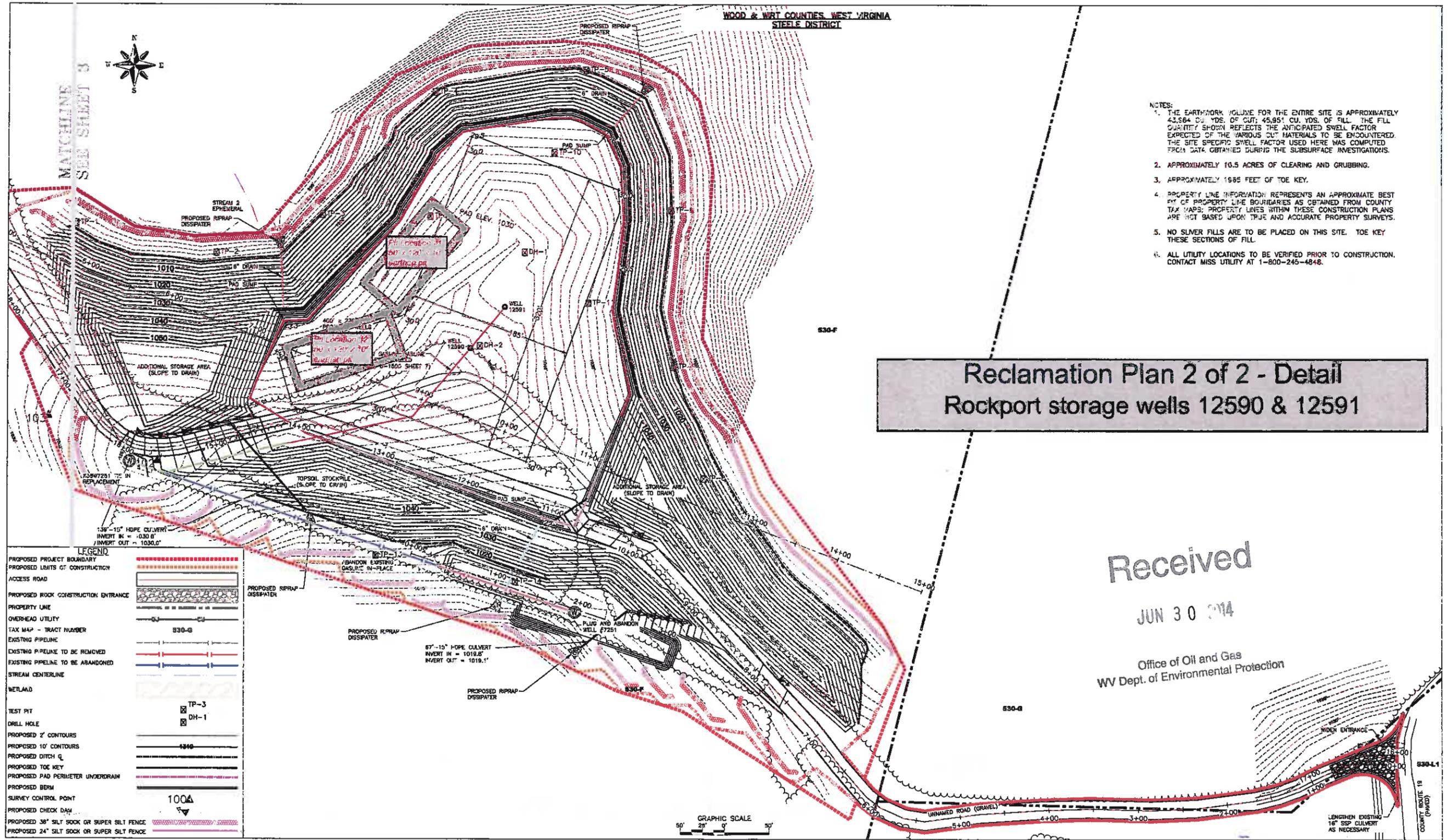
Office of Oil and Gas
WV Dept. of Environmental Protection

Reclamation Plan 1 of 2 - Overview
Rockport storage wells 12590 & 12591

- Crushed limestone to be applied to existing access road
- Drainage along existing road to be maintained
- Well site to be constructed per details on Reclamation Plan 2 of 2
- BMPs to be utilized per WV DEP & FERC requirements

1070757

WOOD & WRT COUNTIES, WEST VIRGINIA
STEELE DISTRICT



- NOTES:
1. THE EARTHWORK VOLUME FOR THE ENTIRE SITE IS APPROXIMATELY 43,564 CU. YDS. OF CUT; 45,951 CU. YDS. OF FILL. THE QUANTITY SHOWN REFLECTS THE ANTICIPATED SWELL FACTOR EXPECTED OF THE VARIOUS CUT MATERIALS TO BE ENCOUNTERED. THE SITE SPECIFIC SWELL FACTOR USED HERE WAS COMPUTED FROM DATA OBTAINED DURING THE SUBSURFACE INVESTIGATIONS.
 2. APPROXIMATELY 10.5 ACRES OF CLEARING AND GRUBBING.
 3. APPROXIMATELY 1985 FEET OF TOE KEY.
 4. PROPERTY LINE INFORMATION REPRESENTS AN APPROXIMATE BEST FIT OF PROPERTY LINE BOUNDARIES AS OBTAINED FROM COUNTY TAX MAPS. PROPERTY LINES WITHIN THESE CONSTRUCTION PLANS ARE NOT BASED UPON TRUE AND ACCURATE PROPERTY SURVEYS.
 5. NO SILVER FILLS ARE TO BE PLACED ON THIS SITE. TOE KEY THESE SECTIONS OF FILL.
 6. ALL UTILITY LOCATIONS TO BE VERIFIED PRIOR TO CONSTRUCTION. CONTACT MISS UTILITY AT 1-800-245-4848.

Reclamation Plan 2 of 2 - Detail
Rockport storage wells 12590 & 12591

Received
JUN 30 2014
Office of Oil and Gas
WV Dept. of Environmental Protection

LEGEND

- PROPOSED PROJECT BOUNDARY
- PROPOSED LIMITS OF CONSTRUCTION
- ACCESS ROAD
- PROPOSED ROCK CONSTRUCTION ENTRANCE
- PROPERTY LINE
- OVERHEAD UTILITY
- TAX MAP - TRACT NUMBER
- EXISTING PIPELINE
- EXISTING PIPELINE TO BE REMOVED
- EXISTING PIPELINE TO BE ABANDONED
- STREAM CENTERLINE
- WETLAND
- TEST PIT
- DRILL HOLE
- PROPOSED 2' CONTOURS
- PROPOSED 10' CONTOURS
- PROPOSED DITCH
- PROPOSED TOE KEY
- PROPOSED PAD PERIMETER UNDERDRAIN
- PROPOSED BERM
- SURVEY CONTROL POINT
- PROPOSED CHECK DAM
- PROPOSED 36" SILT SOCK OR SUPER SILT FENCE
- PROPOSED 24" SILT SOCK OR SUPER SILT FENCE



James Stevens 6/26/2014

FOR PERMITTING
6/12/2014

March Matt MacDonald
Columbia Gas Transmission

COLUMBIA GAS TRANSMISSION
ROCKPORT EFFICIENCY
WELL PAD PLAN - #12590 & #12591

No.	REVISIONS	APPROVED BY	DATE	No.	REVISIONS	APPROVED BY	DATE	Dwg. No.	REFERENCE	DATE	DRAWING NUMBER	SHEET	ISSUE
										06/12/2014	C-101	02 OF 06	F

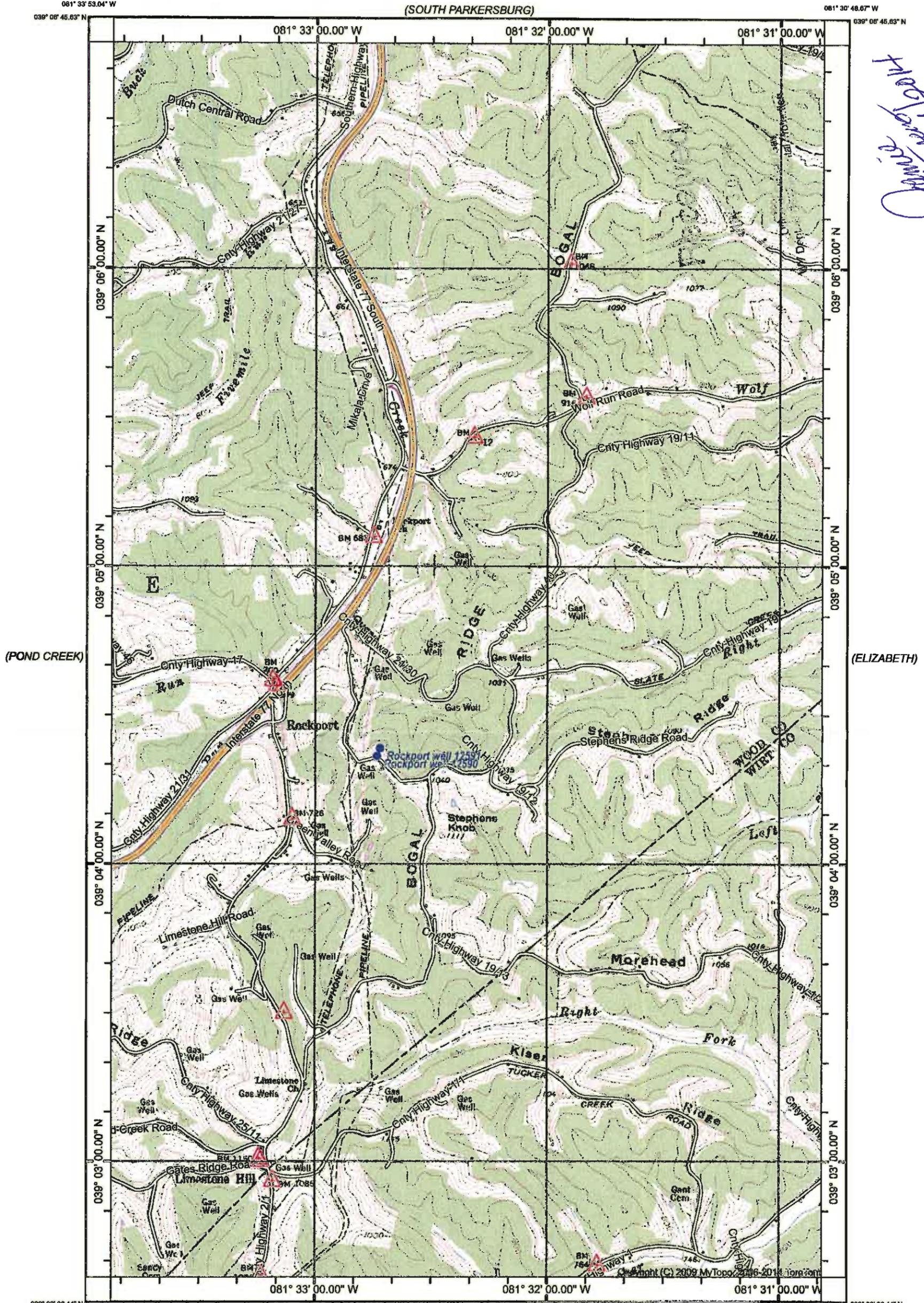
101010101

(LUBECK)



ROCKPORT QUADRANGLE
WEST VIRGINIA
TOPOGRAPHIC SERIES

(KANAWHA)



(POND CREEK)

(ELIZABETH)

(SANDYVILLE)

(REEDY)

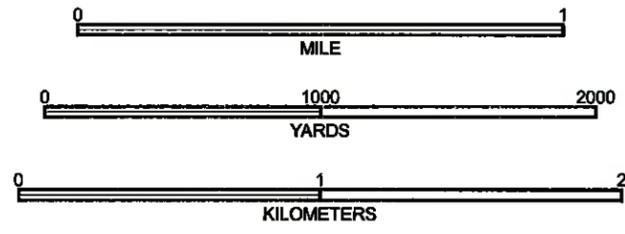
Produced by MyTopo Terrain Navigator
Topography based on USGS 1:24,000 Maps

North American 1983 Datum (NAD83)
Polyconic Projection

To place on the predicted North American 1927 move the
projection lines 9M N and 13M E



(LIVERPOOL)
SCALE 1:24000



Printed: Thu Jun 16, 2016

039° 02' 36.44" N
081° 30' 48.67" W

ROCKPORT, WV
1960

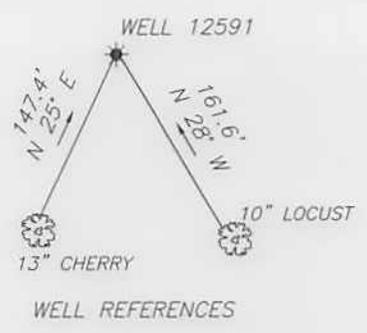
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM 1929

1,065'

LATITUDE 39 05'00"

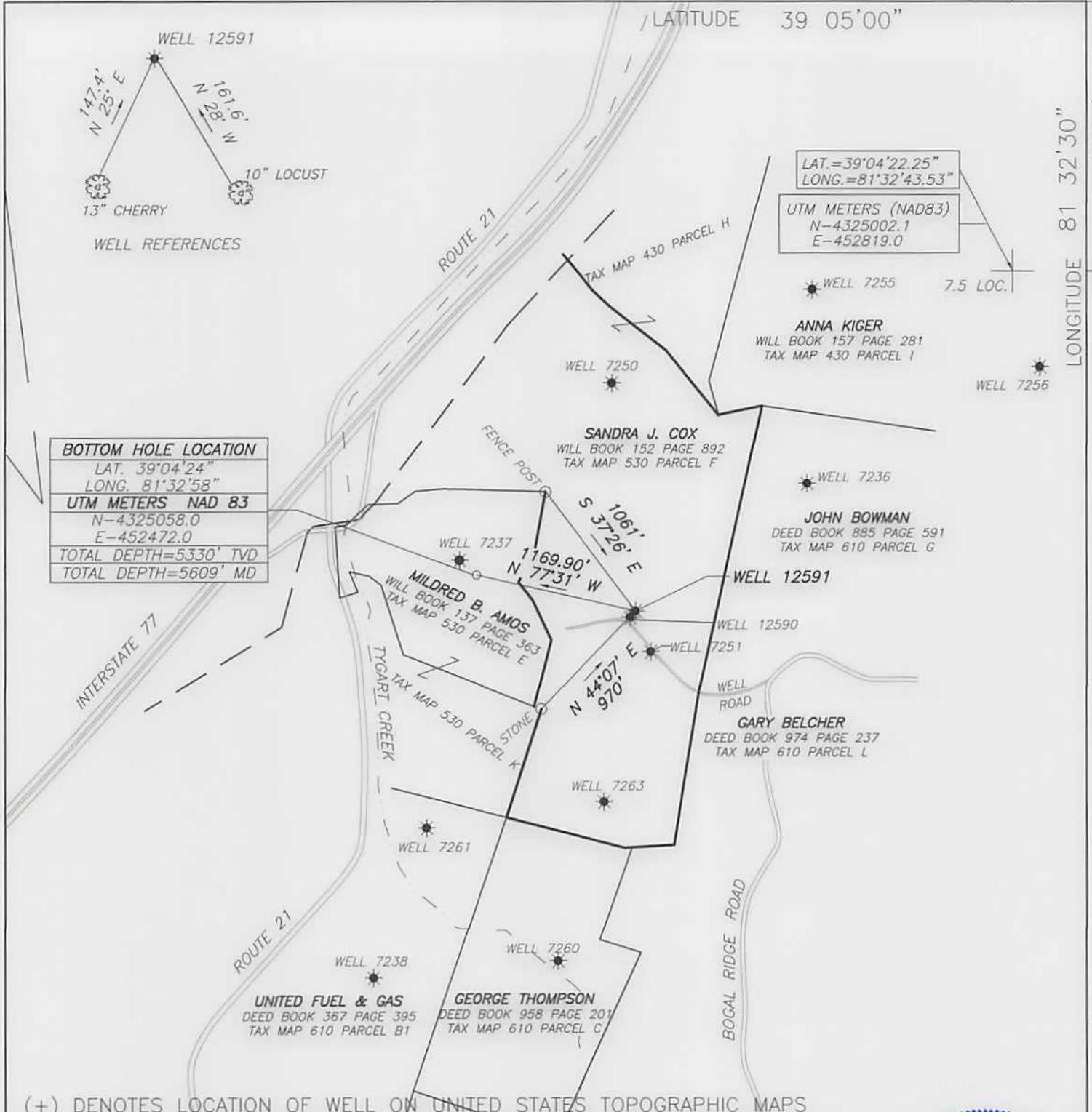
LONGITUDE 81 32'30"

3,820'



LAT. = 39°04'22.25"
 LONG. = 81°32'43.53"
 UTM METERS (NAD83)
 N-4325002.1
 E-452819.0

BOTTOM HOLE LOCATION
 LAT. 39°04'24"
 LONG. 81°32'58"
 UTM METERS NAD 83
 N-4325058.0
 E-452472.0
 TOTAL DEPTH=5330' TVD
 TOTAL DEPTH=5609' MD



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS

FILE No 14-100-018
 DRAWING No. 14-100-018
 SCALE 1"=1000'
 MINIMUM DEGREE OF ACCURACY 1:200
 PROVEN SOURCE OF ELEVATION TRIMBLE PRO XH GPS UNIT

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 DIVISION OF ENVIRONMENTAL PROTECTION.
 (SIGNED) Richard J. Prine
 RICHARD J. PRINE PS #851



STATE OF WEST VIRGINIA
 DIVISION OF ENVIRONMENTAL PROTECTION
 OFFICE OF OIL AND GAS
 NITRO, WV



DATE JUNE 19 20 14
 OPERATOR'S WELL No. 12591
 API WELL No. 47

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION: ELEVATION 1048 WATER SHED TYGART CREEK
 DISTRICT STEELE COUNTY WOOD
 QUADRANGLE ROCKPORT

SURFACE OWNER SANDRA COX ACREAGE 135.45
 OIL & GAS ROYALTY OWNER FRANK GILMORE, ET UX (SURFACE)
H.C. MCPHERSON, ET UX (BOTTOM HOLE) LEASE ACREAGE 35 (BOTTOM HOLE)
 LEASE No. 1050684 (SURFACE) 1050607 (BOTTOM HOLE)

PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PLUG OFF OLD FORMATION PERFORATE NEW FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

PLUG AND ABANDON CLEAN OUT AND REPLUG
 TARGET FORMATION ORISKANY ESTIMATED DEPTH 5330 (TVD) 5609 (MD)
 WELL OPERATOR COLUMBIA GAS TRANSMISSION, LLC DESIGNATED AGENT PAUL AMICK
 ADDRESS PO BOX 1273, CHARLESTON, WV 25325-1273 ADDRESS P.O. BOX 1273, CHARLESTON W.V. 25325-1273

FORM IV-6 (8-78)

**WV DEP OFFICE OF OIL & GAS
DEEP WELL DRILLING PROCEDURES and SITE SAFETY PLAN**

COLUMBLA GAS TRANSMISSION CORPORATION

WV Operator ID 307032

Rockport Storage Well 12591
API Permit No. 47 - 107 - XXXXXX - 00 - 00
Surface: Sandra J Cox
Lease: Frank Gilmore
Steele District - Wood County, WV

The following Deep Well Drilling Procedure and Site Safety Plan prepared by:

By: James E. Amos Date: _____

Signature: _____

Title: Senior Storage Engineer - Columbia Gas Transmission, LLC

Received

JUN 30 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

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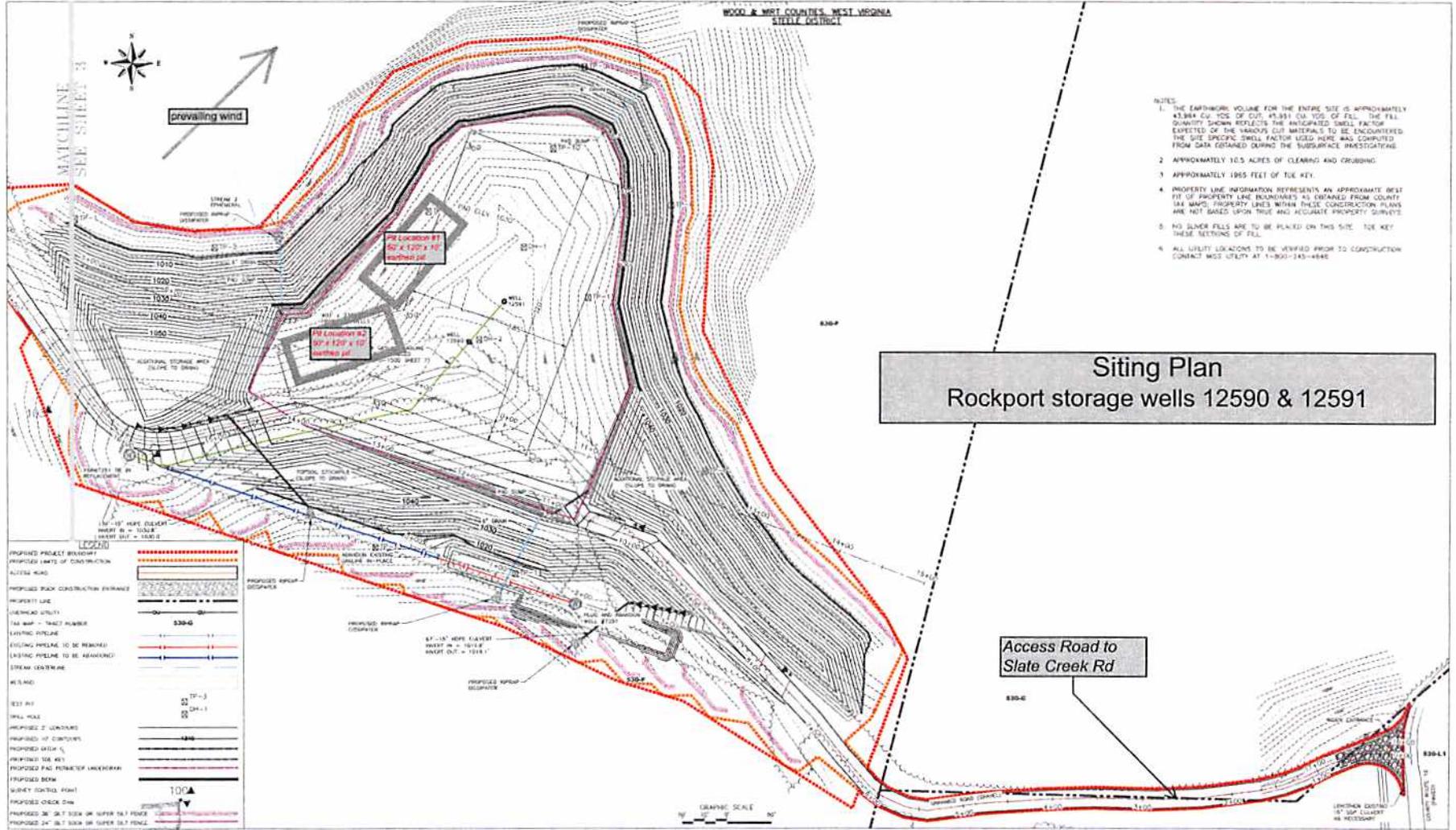
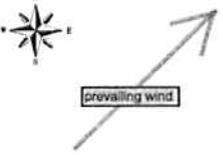
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Received

JUN 30 2014

Office of Oil and Gas
MD Dept. of Environmental Protection

WOOD & MINT COUNTIES, WEST VIRGINIA
STEELY DISTRICT



- NOTES:
1. THE EARTHWORK VOLUME FOR THE ENTIRE SITE IS APPROXIMATELY 43,300 CU YDS OF CUT, 49,800 CU YDS OF FILL. THE PAQ QUANTITY SHOWN REFLECTS THE ANTICIPATED SMELL FACTOR EXPECTED OF THE VARIOUS CUT MATERIALS TO BE ENCOUNTERED. THE SITE SPECIFIC SMELL FACTOR USED HERE WAS COMPUTED FROM DATA OBTAINED DURING THE SUBSURFACE INVESTIGATION.
 2. APPROXIMATELY 10.5 ACRES OF CLEARING AND GRUBBING.
 3. APPROXIMATELY 1865 FEET OF TIE KEY.
 4. PROPERTY LINE INFORMATION REPRESENTS AN APPROXIMATE BEST FIT OF PROPERTY LINE INFORMATION AS OBTAINED FROM COUNTY 184 MAPS. PROPERTY LINES, NEAR FINAL CONSTRUCTION PLANS ARE NOT BASED UPON TRUE AND ACCURATE PROPERTY SURVEYS.
 5. NO SLURRY PILLS ARE TO BE PLACED ON THIS SITE. TIE KEY THESE SECTIONS OF FILL.
 6. ALL UTILITY LOCATIONS TO BE VERIFIED PRIOR TO CONSTRUCTION. CONTACT W&M UTILTY AT 1-800-749-4444.

Siting Plan
Rockport storage wells 12590 & 12591

Access Road to
Slate Creek Rd

Dwelling

Dwelling

FOR PERMITTING
6/12/2014

Hatch Mott
Max Electric

Columbia Gas
TRANSMISSION

COLUMBIA GAS TRANSMISSION
ROCKPORT EFFICIENCY
WELL PAD PLAN - #12590 & #12591

DATE: 06/12/2014
DRAWING NUMBER: 0-101
SHEET: 02 OF 06

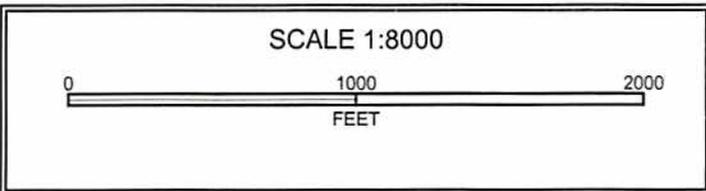
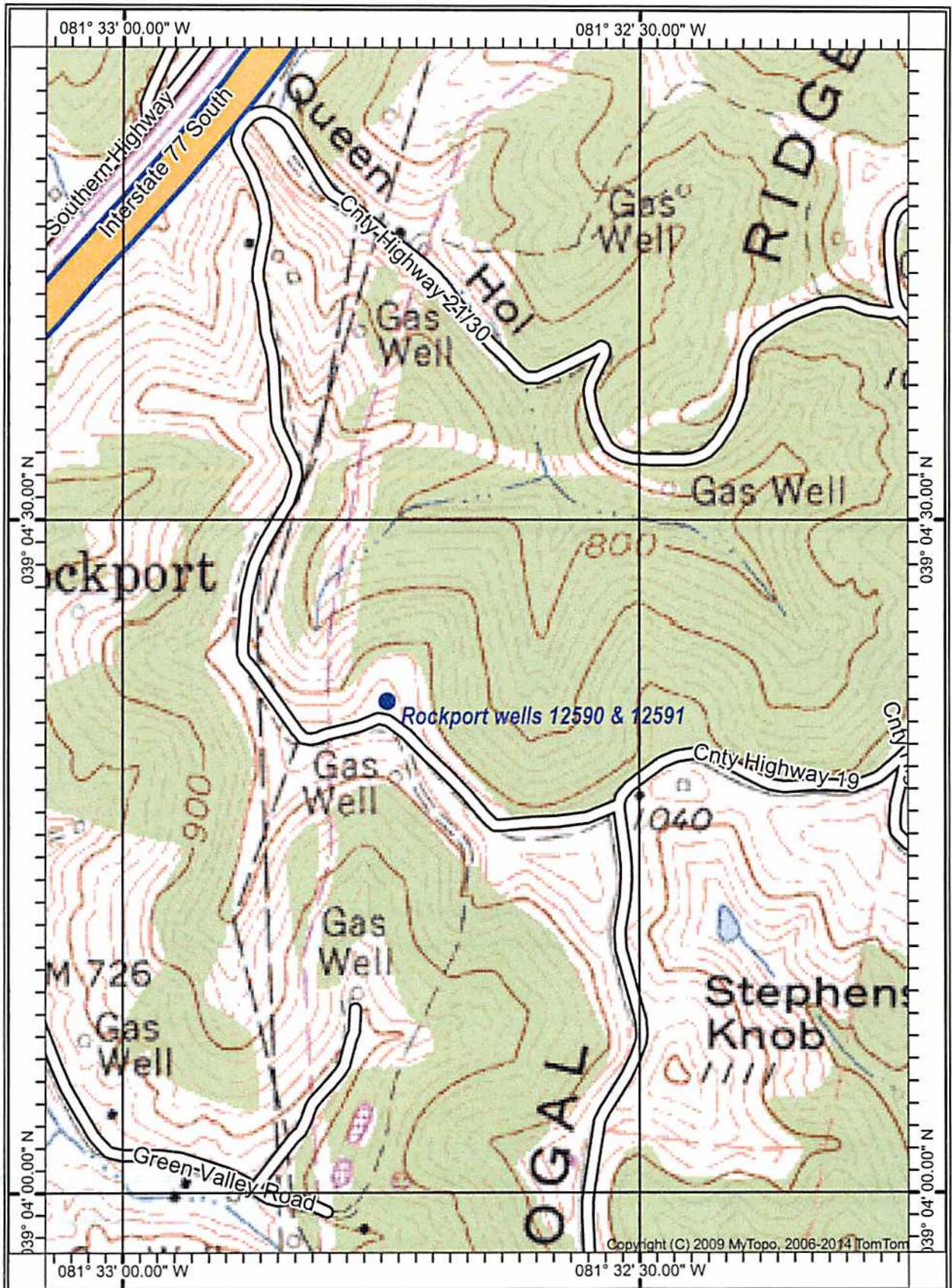
No.	REVISIONS	APPROVAL	DATE	No.	REVISIONS	APPROVAL	DATE	Dwg. No.	REFERENCE

Office of Oil and Gas
WV Dept. of Environmental Protection

JUN 30 2014

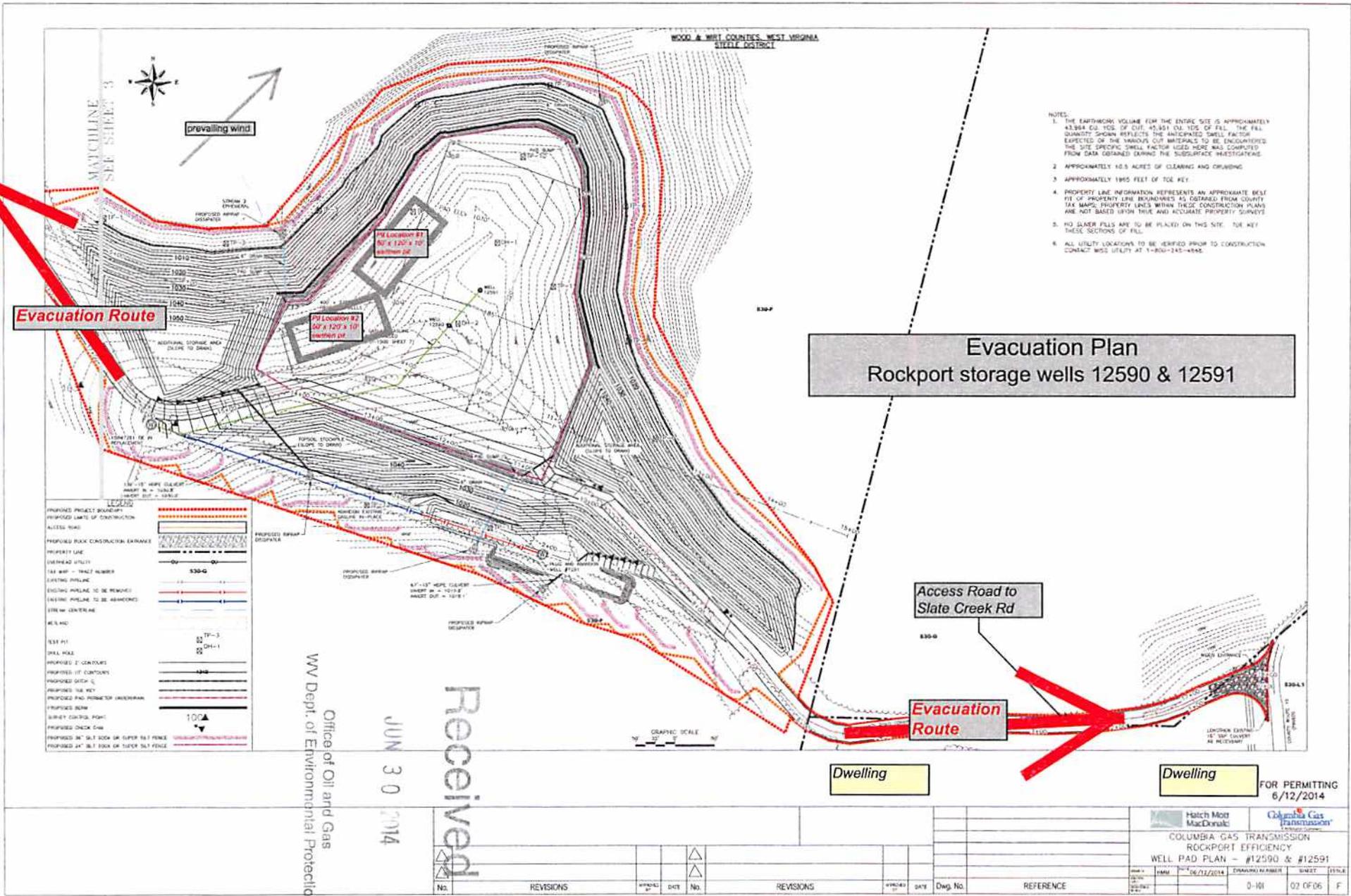
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JUN 30 2014



- NOTES:
1. THE EARTHWORK VOLUME FOR THE ENTIRE SITE IS APPROXIMATELY 43,984 CU YDS OF CUT, 45,851 CU YDS OF FILL. THE PAQUANTITY SHOWN REFLECTS THE ANTICIPATED SWELL FACTOR EXPECTED OF THE VARIOUS CUT MATERIALS TO BE ENCOUNTERED. THE SITE SPECIFIC SWELL FACTOR USED HERE WAS COMPUTED FROM DATA OBTAINED DURING THE SUBSURFACE INVESTIGATIONS.
 2. APPROXIMATELY 142.5 ACRES OF CLEARING AND GRUBBING.
 3. APPROXIMATELY 1865 FEET OF TIE KEY.
 4. PROPERTY LINE INFORMATION REPRESENTS AN APPROXIMATE BEST FIT OF PROPERTY LINE BOUNDARIES AS OBTAINED FROM COUNTY TAX MAPS. PROPERTY LINES WITHIN THESE CONSTRUCTION PLANS ARE NOT BASED UPON THIN AND ACCURATE PROPERTY SURVEYS.
 5. NO SLIDER FILLS ARE TO BE PLACED ON THIS SITE. TIE KEY THESE SECTIONS OF FILL.
 6. ALL UTILITY LOCATIONS TO BE IDENTIFIED PRIOR TO CONSTRUCTION. CONTACT MISS UTILITY AT 1-800-245-4848.

Evacuation Plan
Rockport storage wells 12590 & 12591

Access Road to Slate Creek Rd

Evacuation Route

Dwelling

Dwelling

FOR PERMITTING 6/12/2014

Office of Oil and Gas
WV Dept. of Environmental Protection

JUN 30 2014

Received

LEGEND

PROPOSED PROJECT BOUNDARY	---
PROPOSED LIMITS OF CONSTRUCTION	---
ACCESS ROAD	---
PROPOSED RUCK CONSTRUCTION ENTRANCE	---
PROPERTY LINE	---
OVERHEAD UTILITY	---
T&E W&P - TRACT NUMBER	---
EXISTING PIPELINE TO BE REMOVED	---
EXISTING PIPELINE TO BE ABANDONED	---
STEEL W/ CENTERLINE	---
WELL PAD	---
534 PIT	---
DRAW HOLE	---
PROPOSED 2" CONTOURS	---
PROPOSED 10' CONTOURS	---
PROPOSED 50' W	---
PROPOSED 100' W	---
PROPOSED 500' W	---
PROPOSED 1000' W	---
PROPOSED 10' SURFACE POINT	---
PROPOSED CHECK C&M	---
PROPOSED 10" S&T 1000' OR SUPER 10' PENCE	---
PROPOSED 24" S&T 500' OR SUPER 24' PENCE	---

No.	REVISIONS	APPROVAL	DATE	No.	REVISIONS	APPROVAL	DATE	Draw. No.	REFERENCE

Hatch Mott MacDonald | Columbia Gas Transmission

COLUMBIA GAS TRANSMISSION
ROCKPORT EFFICIENCY
WELL PAD PLAN - #12590 & #12591

DATE: 06/12/2014 | DRAWING NUMBER: 0-101 | SHEET: 02 OF 06 | FILE: F

CONTACTS and TELEPHONE NUMBERS

Emergency

<u>County/State</u>	<u>Fire</u>	<u>EMS</u>	<u>Police</u>
Wood Co, WV	911	911	911

Non-emergency

Pond Creek Volunteer Fire Dept	304-474-3111	
Camden Clark Memorial Hospital	304-424-2111	I-77 north to Rt 50 Exit Left (west) on Rt 50 Approx 0.5 mile right on 7 th Ave Exit Right on to 7 th Ave Approx 4 miles to hospital on left

Incident Reporting

Columbia Operations Monitoring Center	800-835-7191
---------------------------------------	--------------

Spill Reporting

Columbia Operations Monitoring Center	800-835-7191
WV DEP – Office of Oil & Gas	800-642-3074

Material Safety Data Sheets (MSDS)

Safetec Global Solutions (24 hour service)	800-704-9215
--	--------------

Columbia Personnel

<u>Name</u>	<u>Office</u>	<u>Cell</u>	<u>Home</u>
Paul Amick	304-357-3445	304-545-5052	304-755-5052
Jim Amos	304-373-2412	304-483-0073	304-489-3077
Rick Conley		330-464-8709	
Dave Reynolds		330-464-9038	330-427-2228
Steve Simmons	304-373-2413	304-590-5528	304-373-9997

Rig and Crew

WV DEP O&G State Inspector

Wood County	Jamie Stevens	cell: 304-206-7775
-------------	---------------	--------------------

Received

JUN 30 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

WELL CONSTRUCTION PROGRAM

General Well Information

Storage Well: Rockport 12591
API Permit: 47 - 107 - ~~?????~~ - 00 - 00
Surface Owner: Sandra J Cox
Lease: Frank Gilmore (surface)
H C McPherson (bottom-hole)
Location: Rockport Quad, Steele District, Wood Co, WV
Elevation: Pre Site Prep: 1048 ft GL
Post Site Prep: 1030 ft GL (per HMM)
Rig KB: 16 ft

Directions to well:

From North

I-77 to Rockport Exit (~10 miles south of Parkersburg)
Left on Rt 21 south
3 miles turn left on to Slate Creek Road at top of hill before church
(DO NOT PARK ON BLACK TOP PAVEMENT OF CHURCH)
0.9 miles continue straight on to Slate Creek Road
0.7 miles turn left at mail box #8466
Follow 0.2 miles to well site

From South

I-77 to Rockport Exit (~15 miles south of Parkersburg)
Right on Rt 21 south
1.6 miles turn left on to Slate Creek Road at top of hill before church
(DO NOT PARK ON BLACK TOP PAVEMENT OF CHURCH)
0.9 miles continue straight on to Slate Creek Road
0.7 miles turn left at mail box #8466
Follow 0.2 miles to well site

Received

JUN 30 2014

Concise Procedure

Office of Oil and Gas
WV Dept. of Environmental Protection

Spud and seat 20 ft of 20" conductor pipe. Drill 17-1/2" hole to +/- 400 ft GL. Run 13-3/8" casing and cement to surface. Drill 12-1/4" hole to +/- 2280 ft GL (50' below base of Salt Sand). Run 9-5/8" casing and cement to surface. Drill 8-3/4" hole to kick-off point at +/- 2340 ft GL. Directionally drill to a depth 20 ft above the top of Oriskany at +/- 5470 ft MD GL. Run 7" casing and cement bottom 1000 ft. Run cement bond log. Drill 6-1/8" hole to a total depth of +/- 5609 ft MD GL. Obtain electric logs. Install wellhead equipment. Fracture stimulate.

WELL CONSTRUCTION PROGRAM

Casing Program					
Type	Planned Setting Depth	Size	Weight	Grade	Planned Cement Top
Conductor	20 ft GL	20"	0.281W 59 ppf	B-35	none
Surface	400 ft GL	13-3/8"	48 ppf	H-40 ERW	surface
Intermediate	2280 ft GL	9-5/8"	36 ppf	J-55 ERW	surface
Production	5470 ft GL	7"	23 ppf	N-80 ERW	1000 ft of coverage

Geologic Prognosis				
Formation	Lithology	TVD GL	MD GL	Comments
		Salt Sand KOP	sandstone shale	
Berea horizon	sandstone	2543 - 2545 ft	2544 - 2546 ft	storage reservoir
Marcellus	soft black shale	5090 - 5103 ft	5369 - 5382 ft	
Onondaga	limestone	5103 - 5215 ft	5382 - 5494 ft	
Oriskany	sandstone	5215 - 5265 ft	5494 - 5544 ft	
Helderberg TD	limestone	5265 - 5330 ft 5330 ft	5544 - 5609 ft 5609 ft	
<i>Gas/water contact</i>		???? ft	???? ft	

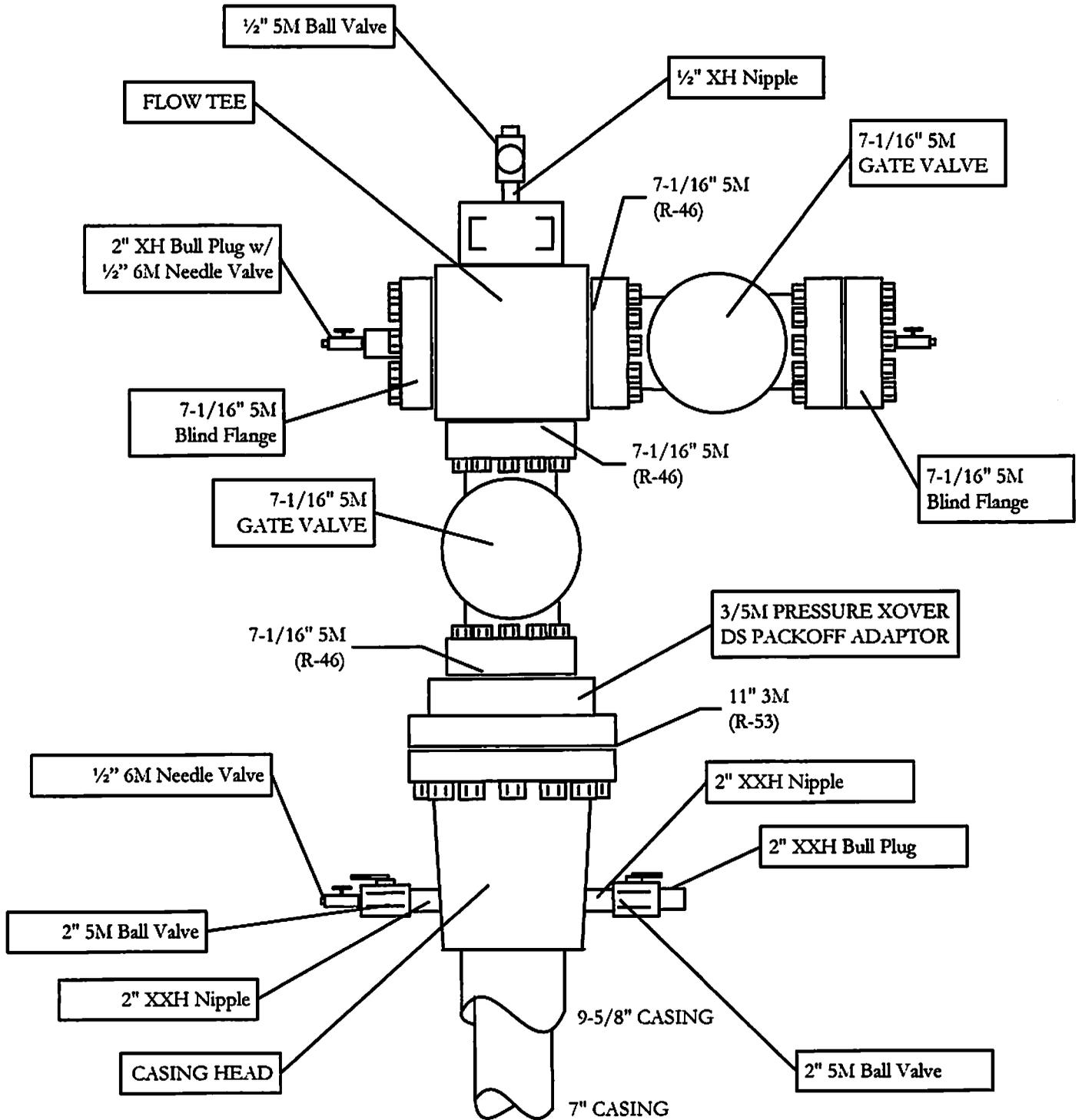
Received

JUN 30 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

WELLHEAD SCHEMATIC

9-5/8" x 7" x 7" x 7" API 3/5M



Received

JUN 30 2014

BOP REQUIREMENTS

Description of BOP's to be Installed on each Casing String

Casing – 13-3/8"	BOP Type: Annular Size: 13" Pressure Rating: 2000 psi	
Casing – 9-5/8"	BOP Type: Annular Size: 9" Pressure Rating: 3000 psi	BOP Type: Double Ram Size: 9" Pressure Rating: 3000 psi
Casing – 7"	BOP Type: Annular Size: 7-1/16" Pressure Rating: 3000 psi	BOP Type: Double Ram Size: 7-1/16" Pressure Rating: 3000 psi

BOP Installation and Pressure Testing

1. The 13" annular BOP will be installed when nipping up on the 13-3/8" casing. The head will be pressure tested to 500 psi or higher.
2. The 9" BOP stack will be installed when nipping up on the 9-5/8" casing. The rams will be pressure tested to a minimum of 2500 psi, and the annular to 2000 psi.
3. The 7-1/16" BOP stack will be installed when nipping up on the 7" casing. The rams will be pressure tested to a minimum of 2500 psi, and the annular to 2000 psi.
4. The in-line kelly cock will be pressure tested when each of the BOP stacks are tested.

Personnel with Well Control Certifications

Jim Amos (Columbia Gas Transmission)
Paul Arnick (Columbia Gas Transmission)
Rick Conley (Columbia Gas Transmission)
Dave Reynolds (Columbia Gas Transmission)
Steve Simmons (Columbia Gas Transmission)

Recording of Significant Drilling Events

A detailed record of significant drilling events will be recorded in Columbia Gas Transmission's well log book or in their digital morning reporting system. The State inspector will be notified upon any significant events, including but not limited to: encountering hydrogen sulfide gas and well control events.

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WELL FLARING OPERATIONS

Flare Line Installation

1. Flaring operations are not planned. In the event of a well control situation that warrants flaring, a minimally rated 3000 psi double choke manifold with 4-1/2" panic line and 2-3/8" choke lines will be installed. The lines will be a minimum of 175 ft in length. They will be anchored with chains to pipe tubs or anchors and/or buried with dirt.

Ignition Methods and Notification

1. Primary – Burn barrel and/or propane torch.
2. Backup – Marine flare pistol.

* Local fire department will be notified prior to flaring operations.

Minimum Distance of Clearing of Flammable Material

All flammable material will be kept a minimum distance of 150 ft from flare.

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WELL KILLING OPERATIONS

In the event well killing operations are required, industry accepted best practices will be utilized. There will be at minimum one person on site at all times that holds a Well Control Certification.

Inventory of Materials to be used to Mix Kill Weight Fluid

Maximum surface pressure is 1800 psig for Rockport Storage. Maximum reservoir pore pressure is estimated to be less than 2100 psi. A column of fresh water (8.33 ppg) at reservoir depth will exert 2275 psi in hydrostatic pressure. This creates an overbalance of 175 psi.

There will be approximately 300 bbls of pre-mixed viscosified drilling fluid on site, and a minimum of 300 bbls of fresh water. Additives and chemicals sufficient to mix 200 bbls drilling fluid will be stored on site, and extra material available at Specialty Oilfield Services shop in PA if needed.

Mixing and Fluid Pumping

Either rig mud pumps or dispatched service company will be utilized for mud mixing and pumping in the event of a well control event.

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HYDROGEN SULFIDE OPERATIONS

Mobile monitors will be utilized to detect the presence of H₂S. A detector will be kept in the dog house for use by rig personnel to monitor rig floor and cellar area. Columbia Gas personnel will wear personal monitors at all times.

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