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

PERMIT MODIFICATION APPROVAL

July 22, 2014

NORTHEAST NATURAL ENERGY LLC
707 VIRGINIA STREET EAST, SUITE 1200
CHARLESTON, WV 25301

Re: Permit Modification Approval for API Number 6101668 , Well #: BEACH 6H
Shortened intermediate casing

Oil and Gas Operator:
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.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Sincerely,

for Gene Smith
Assistant Chief of Permitting
Office of Oil and Gas

07/25/2014

WW-6B
(9/13)

4706101668

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

1) Well Operator: Northeast Natural Energy LLC | 494498281 (Operator ID) | Monongalia (County) | Clay (District) | Blacksville, WV (Quadrangle)

2) Operator's Well Number: Beach 6H Well Pad Name: Beach

3) Farm Name/Surface Owner: Russell C. Beach Public Road Access: County Route 29

4) Elevation, current ground: 1,380' Elevation, proposed post-construction: 1,358.7

5) Well Type (a) Gas ■ Oil _____ Underground Storage _____
Other _____
(b)If Gas Shallow ■ Deep _____
Horizontal ■

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s): 2/27/14
Marcellus Shale, 8,215 TVD, 80', 3,600 PSI Formation Pressure

8) Proposed Total Vertical Depth: 8,215'

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 17,447'

11) Proposed Horizontal Leg Length: 8,587'

12) Approximate Fresh Water Strata Depths: 300'-1,150'

13) Method to Determine Fresh Water Depths: Driller's Log From Offset Wells

14) Approximate Saltwater Depths: 1,800' - 2,400'

15) Approximate Coal Seam Depths: 450' - 1,000'

16) Approximate Depth to Possible Void (coal mine, karst, other): NA

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: _____
Depth: _____
Seam: _____
Owner: _____

RECEIVED
Office of Oil and Gas
MAR 20 2014
WV Department of
Environmental Protection

07/25/2014

61-01668 MOD

WW-6B
(9/13)

18) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	24"	New	NA	63.41	60'	60'	GTS
Fresh Water	13-3/8"	New	J-55	54.5	1,330'	1,300'	CTS
Coal							
Intermediate	9-5/8"	New	J-55	40	2,380'	2,350'	CTS
Production	5-1/2"	New	P-110	20	17,447'	17,442'	4,190 ft3
Tubing	2-7/8"	New	J-55	6.5	NA	8,650'	NA
Liners							

HJK 7-21-14

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	24"	28"	0.25"	1,300	Grout	N/A
Fresh Water	13-3/8"	17-1/2"	0.38"	2,730	Class A	1.23
Coal						
Intermediate	9-5/8"	12-1/4"	0.395"	3,950	Type 1	1.3
Production	5-1/2"	8-3/4"	0.361"	12,530	50:50 Poz	1.21
Tubing	2-7/8"	NA	0.217"	7,260	NA	NA
Liners						

PACKERS

Kind:				
Sizes:				
Depths Set:				

WW-6B
(9/13)

4706101668

2/27/14

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

Drilling and completion of a horizontal Marcellus well. The well will be drilled on air to an approximate depth of 7,100' TVD/MD. The well will then be horizontally drilled from KOP to approximately 8,215' TVD / 17,447' MD along a 144.51 degree azimuth.

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

Multi-stage / high-rate slickwater fracture treatment using various size sands as proppant. First stage will be initiated via pressurization against a burst disc ran in the production casing string or perforated with coiled tubing. Subsequent stages will be perforated with pumped down guns ran on wireline. Individual stages will be isolated with composite frac plugs. Maximum pump rate during any stage will be 100 BPM with a maximum allowable surface pressure of 9,500 PSI. Composite bridge plugs will be set at the end of the last stage to isolate the treated formation. After fracture treatment, composite frac plugs will be drilled out using a service rig and/or snubbing unit.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 33.6

22) Area to be disturbed for well pad only, less access road (acres): 15.3

23) Describe centralizer placement for each casing string:

Surface and intermediate casing strings will have bow spring centralizers placed every third joint (~120') from shoe joint to surface. Production casing will have rigid body centralizers placed every fourth joint (~160') from TD to surface.

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

Surface string cement will be a Class A + 3% bwoc Calcium Chloride + Fresh Water blend. Intermediate string cement will be a Type I Cement + 0.5% bwoc EC-1 + 0.75 gals/100 sack FP-12L + 0.25 lbs/sack Cello Flake + 0.5% bwoc Sodium Metasilicate + 0.5% bwoc BA-10A + 50.9% Fresh Water. Production string cement will be a (50:50) Poz (Fly Ash):Type I Cement with a gas migration additive.

25) Proposed borehole conditioning procedures:

Surface string will use a 35.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite + 80 lbs Fed Seal @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Intermediate string will use a 35.0 bbls Gel Pill + LCM + 25 lbs Cello Flake + 20 lbs/bbl Bentonite + 80 lbs Fed Seal @ 8.4 ppg & 10 bbls fresh water spacer prior to cement. Production string will use a 50.0 bbls SealBond 25 + 1 gal/bbl US-40 + 275 lbs/bbl Barite, Bulk + 1 gal/bbl SS-2 @ 13.5 ppg spacer prior to cement.

*Note: Attach additional sheets as needed.

07/25/2014

Beech 6H
47-61-01668 MOD

1.0 Wellbore Casing and Cementing Standards

Anticipated Depths:

Freshwater	1,150'
Saltwater	1,800' - 2,400'
Oil and Gas	7,780' – 8,230'
Hydrogen Sulfide	N/A*
Thief Zones	N/A*
High Pressure	N/A*
High Volume	N/A*

These depths are not applicable to this well site based on existing wells on this well pad.

Casing and Cementing Program:

Type	Size	New or Used	Grade	Weight Per Foot	Footage: For Drilling	Intervals: Left in Well	Cement: Fill-Up (Cu. Ft.)
Conductor	24"	New	N/A	63.41	60'	60'	GTS
Freshwater	13 3/8"	New	J-55	54.5	1,330'	1,300'	CTS
Coal							
Intermediate	9 5/8"	New	J-55	40	2,380'	2,350'	CTS
Production	5 ½"	New	P-110	20	17,447'	17,442'	4,190 ft3

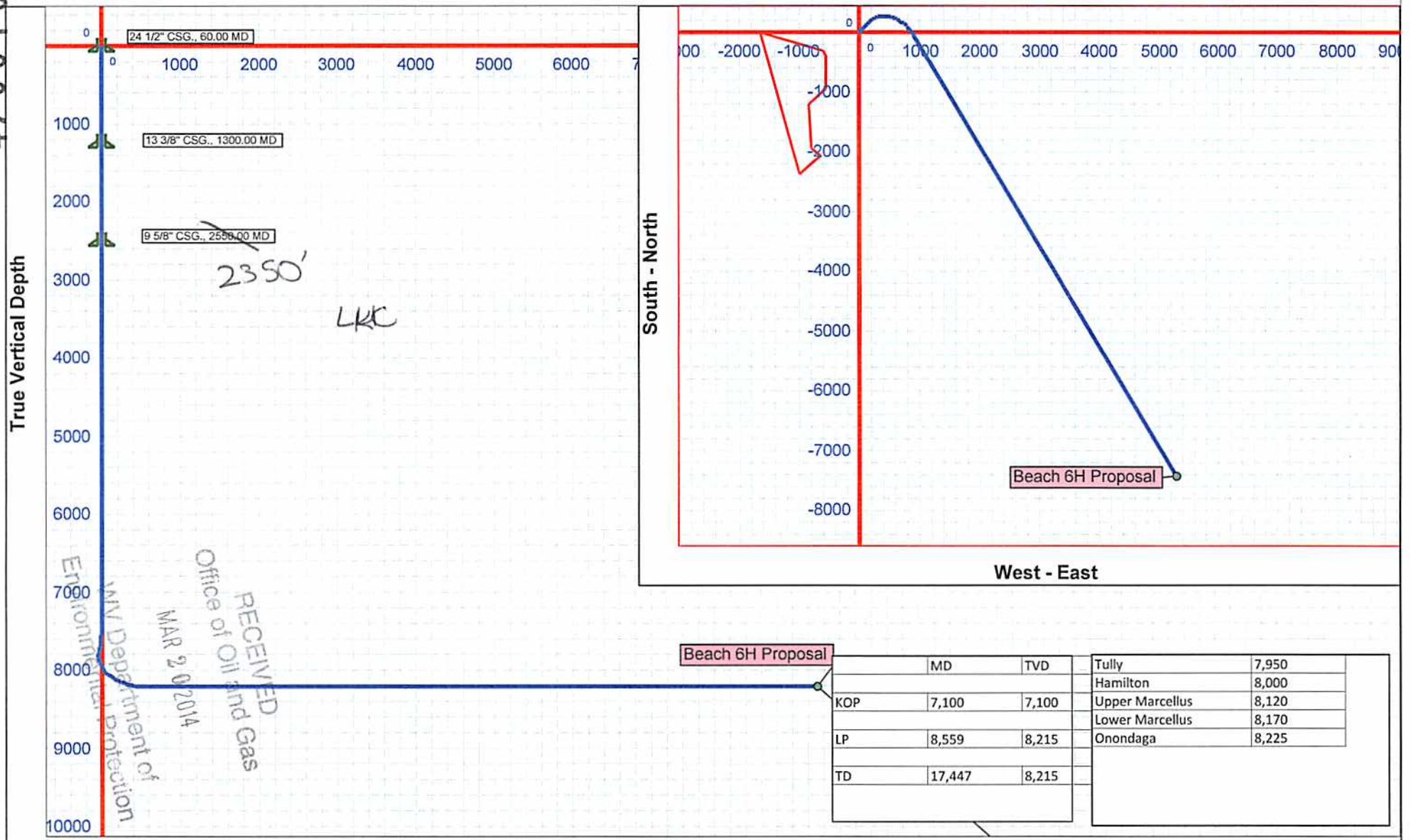
Applicable casing string depths and cement properties are highlighted below.

MJK 7-21-14

4706101668

Job Number:
Company: Northeast Natural Energy
Lease/Well: Beach 6H
Location: Beach
Rig Name: Pioneer 63
State/County: WV/ Mon
Country: US
API Number:

Elevation (To MSL): 1358.70 ft
RKB: 18.00 ft
Projection System: US State Plane 1983
Projection Group: West Virginia Northern Zone
Projection Datum: GRS80
Magnetic Declination: -8.90
Grid Convergence: -0.41615 W
Date: Thursday, January 09, 2014



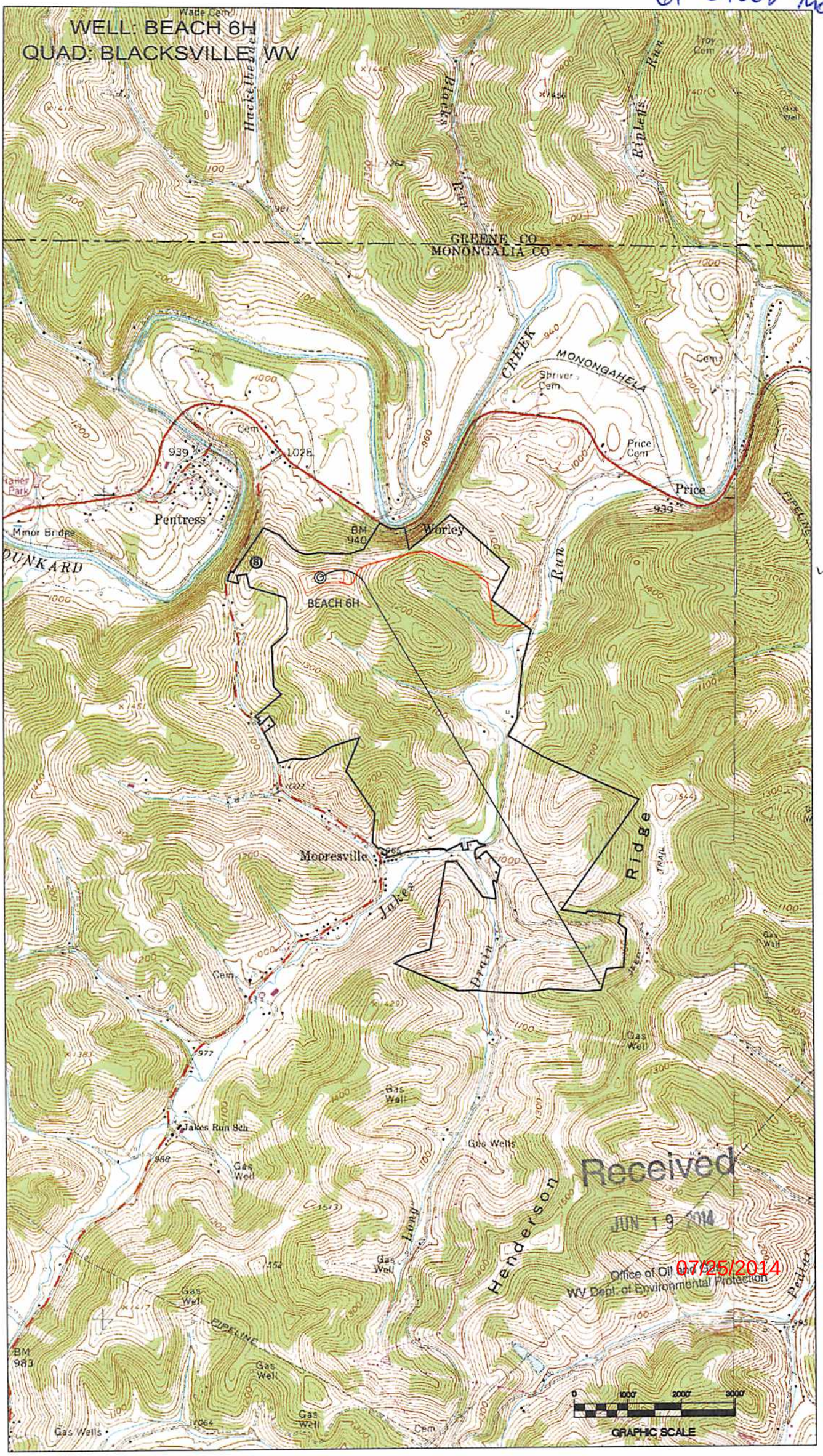
	MD	TVD
KOP	7,100	7,100
LP	8,559	8,215
TD	17,447	8,215

Tully	7,950
Hamilton	8,000
Upper Marcellus	8,120
Lower Marcellus	8,170
Onondaga	8,225

Vertical Section (1000 Ft/Div) VSP: 144.51°

61-01668 HGA MOD

WELL: BEACH 6H
QUAD: BLACKSVILLE, WV



SURFACE HOLE DEC. LONG: 80.152467
SURVEYED LONG: 80° 09' 08.9"

7,730'

1,470'

Latitude: 39° 42' 30" (NAD 27)

Longitude: 80° 07' 30" (NAD 27)

SURFACE HOLE DEC. LAT: 39.704294
SURVEYED LAT: 39° 42' 15.5"

TOP HOLE (UTM 83)
N) 4395289.8
E) 572674.5

BOTTOM HOLE (UTM 83)
N) 4393022.0
E) 574287.4

NO DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF WELL PAD
NO WATER WELLS WERE FOUND WITHIN 250' OF THE CENTER OF WELL PAD

SURFACE HOLE

Existing Wells within 3,000' NTS

3000'

WELL REFERENCE (API#,DISTANCE TO LATERAL)
1. 061-00125
2. 061-30121
3. 061-00126
4. 061-00134
5. 061-30187
6. 061-71252
7. 061-71251 N 41°14'10" W 1,333'
8. 061-70273 N 82°43'40" W 685'
9. 061-70075
10. 061-71226
11. 061-30151 N 66°15'00" E 936'
12. 061-71250 S 65°11'36" E 1,401'
13. 061-71256
14. 061-00766
15. 061-71260
16. 061-71254 S 69°20'45" W 1,213'
17. 061-71253
18. 061-71255 S 49°56'35" W 1,174'
19. 061-00101
20. 061-30280
21. 061-71259
22. 061-30559
23. 061-30531
24. 061-71257
25. 061-30338
26. 061-00148
27. 061-71258
28. 061-30186 S 22°33'49" W 588'

PRICE FARMS LIMITED LIABILITY COMPANY
112.51 TOTAL ACRES
LEASE NUMBER
(2) WV-061-001073-001
TAX MAP AND PARCEL
04-06-60

AARON C & CYNTHIA L COX
80.1 TOTAL ACRES
LEASE NUMBER
(3) WV-061-001107-000
TAX MAP AND PARCEL
04-06-61

NANCY K. BEACH DAVIS & RUSSELL C. BEACH
233.72 TOTAL ACRES
LEASE NUMBER
(1) WV-061-001014-001
TAX MAP AND PARCEL
04-06-33.1

JOHN W & BRENDA L HAAS
19.206 TOTAL ACRES
LEASE NUMBER
(4) WV-061-001064-001
TAX MAP AND PARCEL
04-06-62

DONALD R ELLIOTT
119.714 TOTAL ACRES
LEASE NUMBER
(5) L012628
TAX MAP AND PARCEL
04-06-63

ALBERT K STATLER
127 TOTAL ACRES
LEASE NUMBER
(6) WV-061-001064-001
TAX MAP AND PARCEL
04-06-64

DAVID, NICHOLAS, ADRIAN, NICOLE & JOHN SCHAUFFNER
9.363 TOTAL ACRES
LEASE NUMBER
(7) 1-249507-001
TAX MAP AND PARCEL
04-11-58

JOSEPH C. & LOUIE A. STATLER
124.6 TOTAL ACRES
LEASE NUMBER
(8) 1-249507-001
TAX MAP AND PARCEL
04-11-65

BOTTOM HOLE

8,960' SOUTH OF LATITUDE 39° 42' 30"
2,510' WEST OF LONGITUDE 80° 07' 30"

REFERENCES TO PROPOSED HORIZONTAL WELLS SURFACE LOCATIONS

N 65°35'05" E
40'
120'
10H
6H
4H
2H
NTS

REFERENCES

REBAR SET
N 78°02'37" W 299'
BEACH 6H
S 13°57'37" W 240'
REBAR SET

REFERENCE NOTES
Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records Ohio County, West Virginia OCTOBER 2013
State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
Drafted by: E.A.M.

FILE #: NNE009
DRAWING #: 2295
SCALE: PLAT = (1"=1600') TICK MARK = (1"=2000')
MINIMUM DEGREE OF ACCURACY: 1/200
PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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:

L.L.S. #2124 : Ernest J. Benchek III

ERNEST J. BENCHEK III
LICENSED
No. 2124
STATE OF WEST VIRGINIA
PROFESSIONAL SURVEYOR

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

WVDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304

DATE: JUNE 17, 2014

OPERATOR'S WELL #: BEACH 6H

API WELL #: 47 STATE 61 COUNTY 01668 PERMIT

H6A Mod

Well Type: ☐ Oil ☐ Waste Diposal ☐ Production ☐ Deep
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: DUNKARD CREEK
ELEVATION : 1380'

COUNTY/DISTRICT: MONONGALIA / CLAY
QUADRANGLE: BLACKSVILLE, WV.

SURFACE OWNER: NANCY K. BEACH DAVIS & RUSSELL C. BEACH
ACREAGE: 233.72 +/-

OIL & GAS ROYALTY OWNER: (SEE ATTACHMENT)
ACREAGE: 826.21 +/-

07/25/2014

LEASE NUMBERS:

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

TARGET FORMATION: MARCELLUS
ESTIMATED DEPTH: TVD: 8,215' TMD: 17,447'

WELL OPERATOR : NORTHEAST NATURAL ENERGY LLC
DESIGNATED AGENT : JOHN ADAMS

ADDRESS: 707 VIRGINIA STREET SUITE 1200
ADDRESS: 707 VIRGINIA STREET SUITE 1200

CITY: CHARLESTON STATE: WV ZIP CODE: 25301
CITY: CHARLESTON STATE: WV ZIP CODE: 25301