



**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

December 10, 2014

**WELL WORK PLUGGING PERMIT**

**Plugging**

This permit, API Well Number: 47-7700503, issued to CHEVRON APPALACHIA, 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.

Upon completion of the plugging well work, the above named operator will reclaim the site according to the provisions of WV Code 22-6-30. The above named operator will also file, as required in WV Code 22-6-23, an affidavit on form WR-38 by two experienced persons in the operator's employment and the Oil and Gas inspector that the work authorized under this permit was performed and a description given. Failure to abide by all statutory and regulatory provisions governing all duties and operations here under may result in suspensions or revocation of this permit and in addition may result in civil and/or criminal penalties being imposed upon the operator.

This permit will expire in two (2) years from date of issue. If there are any questions, please free to contact me at (304) 926-0499 ext. 1654.



James Martin  
Chief

Operator's Well No: LANCO 1H  
Farm Name: SMITH, DAVID J. & SANDRA  
**API Well Number: 47-7700503**  
**Permit Type: Plugging**  
Date Issued: 12/10/2014

## 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

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1. All pits must be lined with a minimum of 20 mil thickness synthetic liner.
2. 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.
3. Well work activities shall not constitute a hazard to the safety of persons.

1) Date \_\_\_\_\_, 20\_\_\_\_  
2) Operator's  
Well No. Lanco 1H  
3) API Well No. 47-77 - 00503

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

APPLICATION FOR A PERMIT TO PLUG AND ABANDON

4) Well Type: Oil \_\_\_\_ / Gas X / Liquid injection \_\_\_\_ / Waste disposal \_\_\_\_ /  
(If "Gas, Production \_\_\_\_ or Underground storage \_\_\_\_) Deep \_\_\_\_ / Shallow \_\_\_\_

5) Location: Elevation 1975.21' Watershed Piney Run  
District Grant County Preston Quadrangle Brandonville, WV

6) Well Operator Chevron Appalachia, LLC 7) Designated Agent \_\_\_\_\_  
Address 800 Mountain View Drive Address \_\_\_\_\_  
Smithfield, PA 15478

8) Oil and Gas Inspector to be notified 9) Plugging Contractor  
Name Gayne Knitowski Name see attached  
Address PO Box 108 Address \_\_\_\_\_  
Gorman, WV 26720

10) Work Order: The work order for the manner of plugging this well is as follows:  
see attached

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*gwm 12/1/14*

Notification must be given to the district oil and gas inspector 24 hours before permitted work can commence.

Work order approved by inspector *Gayne J Knitowski* Date *9/24/2014*

12/12/14

# Lanco 1H

## Plug and Abandonment Procedure

Expected Start Date: October 2014

	1H
AFE Number	
API Number	47-077-00503

Service Rig Company	Nabors	County	Preston
Wellhead	Weatherford	Township	Brandonville, WV
Downhole Tools	Baker Hughes	Latitude	N 39° 40' 29.6"
		Longitude	W 79° 32' 19.1"

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### Objective:

Plug and abandonment of Lanco 1H in accordance West Virginia's DEP requirements.

### Completion Design Review:

Listed below are the members of the well team who were in attendance and agreement with the completion procedure as discussed.

Revised by:	Tony Raphael – Well Abandonment Engineer	9/8/14
Review by:	Garland Bledsoe – Project Manger	9/8/14
Revised by:	Derek Steele – Completion Engineer	4/9/14
Reviewed by:	Shawn Davis– Completion Engineer Team Lead	
Reviewed by:	Ken Ditty – Completion Superintendent	

12/12/14

## IFO: Incident Free Operations

Chevron is committed to providing a safe working environment for all personnel through the tenets we live by such as **Do it safely or not at all. Stop Work Authority** means all personnel not only have the right but the responsibility to stop any potentially unsafe job.

**Report all injuries, no matter how minor, 24/7 to Axiom Medical at 1-877-502-9466**

### 911 Address

1135 Hanlin Road  
Bruceon Mills, WV 26525

### Directions to Location

From I 68 West, take exit 29 (Hazelton Road), make a Right off the ramp and go (0.1 mi.); make a Left onto East End/Moyers Road (6/7), go (0.2 mi.), make a Right onto Hanlin Road and go (1.0 mi.) to the location on the Left.

### Well Information

**Table 1-1**

	Top Perf.		RKB	Marker Joint	PBTD
	MD	TVD	MD	MD	MD
1H	10,265'	8,570'	22'		10,694'

Dimensions and Pressure Data					
Size	Depth	Weight	Grade	Burst	Collapse
20"	110'				
13 3/8"	476'	54.5 lbs/ft	J-55		
9 5/8"	2495'	36 lbs/ft	K-55		
5 1/2"	10,698'	20 lbs/ft	P-110	12,640 psi	11,080 psi

Capacity	
5 1/2" 20# Casing	0.0222 bbl/ft

### Current Status

Well was perforated on August 23, 2011 with 90 shots between 10,265' and 10,631'. Well was never frac'd and has been inactive since being perforated. It is reasonable to assume that while there may be pressure on the 5 1/2" casing, it is unlikely that injection of fluid into the perforated zone is possible without initiating a breakdown into formation.

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Site Photos



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# Lanco 1H Wellbore Schematic (Current)

CHIEF OIL & GAS LLC

WELLBORE DATA AND SKETCH

<b>Well: Lanco #1H</b>	<b>Quad 7.5: Brandonville, Grant District</b>	<b>Updated: 10/18/11</b>
<b>County: Preston</b>	<b>State: West Virginia</b>	<b>Status: SD 9/10/11 per Chevron</b>
Directions: See Prognosis	Location: 12236' S Lat 39° 42' 30"	Survey: Refer to Plat
Well Type: Horizontal Well W/ No Pilot Hole	11183' W Long 79° 30' 00"	API # 47-7700503 Drlg Permit
Elevation: GL: 1975'	<b>Completed Well</b>	
DF: 1996'	<b>Note: All depths MD unless noted</b>	
KB: 1997'	Build Location: Start: 4/12/10 End: 6/18/10	
20" Conductor @ 110' - Sanded-in	Spud: 7/2/10	
17 1/2" Hole @ 500'	Release Rig: 7/28/10	
13 3/8" 54.5# Surface Csg @ 476'	Completed:	
Cemented w/ 380 sxs - Circ	First Production:	
12 1/4" Hole @ 2495'	Air Drilling Method - Rotary	
9 5/8" 36# Intermediate Csg @ 2495'	Rig - Patterson Drlg LP #255 (KB: 22')	
Cemented w/ 805 sxs	Ziegenfuss Set Conductor & Surf Hole 6/28/10	
TOC @ 3400' by Field Calc (3200' by CBL)	<b>Bottom Hole Location (Scaled)</b>	
Sidetrack @ 8128'	Survey: 2324' N 10° W FSHL	
8 3/4" Hole @ 8993' MD	True Lat: 39° 42' 53.104 N	
7 7/8" Hole @ 10739' MD (8544' TVD)	True Long: 79° 30' 4.706 W	
KOP: 8141' Sidetrack KO 8302'	DV Tool Set @ 5691' Cmt'd w/ 1037 sxs Drilled Out	
Target Centerline - 8588' TVD	(TOC @ 7716' by CBL)	
Pen. Marcellus - 8515' MD (8424' TVD) VS 195'	(CIBP @ 10656')	
Maximum Deflection - 13.9 degree @ 8408'	FD: 10634'	
Maximum Angle - 95.2 degree @ 10404'	TD: 10739'	
Displacement - 2366' N 15.3 W	(Marcellus top @ 8515')	
Landing Point - 8947' MD (8589' TVD) VS 580'	5 1/2" 20# P-110 Csg @ 10698'	
MWD Gamma run.	Cemented w/ 678 sxs	
	(1st Stg Perfs: 10263' - 10633' Never Frac'd)	

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Fourteen days prior to the anticipated handoff date, meet on location with Operations, Facilities, and Completions to determine specific location needs for workover and what condition facilities need to be in for workover operations.

**Maximum Working Pressure: MASP = 3,970 psi (0.58 psi/ft pore pressure gradient)**

**Site Prep**

1. Review WV DEP list of Oil and Gas Inspector contact points (see attachment in Appendix A)
2. Hold Tailgate Safety Meeting and review JSA
3. Excavate cellar around wellhead to expose casing head
4. MIRU containment (per site layout and needs) and surface rental equipment
5. MIRU frac tanks, flowback tanks, auxiliary equipment
6. RU flowback lines. Plumb lines to both the tubing head (5 ½) and casing head (5 ½" annulus)
7. Obtain shut in pressure on 5 ½" casing and 5 ½" X 9 5/8" annulus (record pressures)
  - Bleed down pressure to flowback tank on 5 ½" casing and 5 ½" annulus
  - Observe if pressure builds again on either once closed (call engineer if pressure does build up)
8. Mobilize wellhead company to function test and pressure test valves to 5000 psi (grease if necessary)
  - Casing spool valves and tubing spool valves
  - Frac valve and mudcross valves
9. Monitor surface CSG pressure/flow during circulating & pumping operations
10. **Monitor pressure on the annulus throughout the job and leave open during the working hours.** Call engineer if it changes.
11. With the flowcross open, fill the well with fresh water to surface through the tubing spool

**Set 5 ½" Cmt Retainer/1<sup>st</sup> Cmt Plug**

12. Mobilize workover rig and cementing unit to location
13. Spot rig and cement unit in place
14. Layout flowback iron from tubing spool to flowback tank
15. Remove flowcross from wellhead
16. NU 7-1/16" 5M Class 3 BOP combo, equipped with stripper head, 2 3/8" Pipe rams, Blind Rams (Blinds on bottom), and an Annular
17. Accumulator test per Chevron Well Control Manual (attachment in Appendix A)
  - *System must be able to have sufficient capacity to supply 1.5 times the volume of fluid necessary to close and hold closed all BOP equipment with a minimum pressure of 200 psi above precharge pressure without assistance from the charging system*
  - *Document bottle volumes and times during test and enter into Wellview.*
18. Psi test BOP combo against closed frac valve to 250 psi low for 5 minutes and 5,000 psi high for 10 minutes, chart and record data and keep on file on location. (test requires less than 10% drop in 15 minutes)

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19. PSI test Annular to 250 psi low for 5 minutes and 3,500 psi high for 10 minutes, chart and record data and keep on file on location. (no more than 10% drop in 15 minutes)
20. RU Rig Floor & TBG handling equipment. Check elevators for proper TBG size and verify inspections are complete.
21. Ensure that a properly functioning, fully open, 2 3/8" Full Opening Safety Valve (TIW valve) with appropriate threads and key is on the rig floor.
22. MU 4.5" gauge ring onto 2 3/8" tubing joint
23. RIH with gauge ring to 8700' (verify ID is unobstructed as workstring is RIH)
24. POOH with gauge ring while standing pipe back in doubles
25. MU and inspect 5 1/2" Baker 2AA Cast Iron Cement Retainer and K-1 setting tool onto 2 3/8" tubing joint
  - 10,000 psi differential pressure rating
  - 4.312 max OD on retainer
26. RIH and set cement retainer at 8650'
  - After reaching setting depth, pickup two feet at the tool
  - Rotate ten turns to the right, at the tool
  - Lower back to setting depth, then pickup (slips should bite casing)
  - Shear lock screws with ten turns to the right (pipe will release from tool)
  - (Setting Procedure Attached)
27. Sting out of retainer
  - 8-10K tension required to sting out
  - 3-5K set down required to sting into the tool
28. With 2 3/8" Pipe rams closed, pressure test cement retainer to 1000 psi (test requires less than 10% drop in 15 minutes)
29. Circulate hole full of fresh water ✓
30. Spot 15.6 lb/gal Class A cement to end of workstring and sting back into retainer (~33 bbls)
31. Pump 15.6 lb/gal, Class A cement into retainer. Do not exceed max working pressure. (verify volume between Cmt retainer and top perf at 10,263')
32. When max working pressure is reached, sting out of retainer and cement up to depth of 7650' (pump entire plug before pulling tubing)
  - Estimated thickening time of cement is 3 hrs
  - WOC 8 hrs before tagging or pressure testing
33. TOOH 2 joints above TOC and break circulation
  - Stand back enough joints on rig to tag on following day
34. Secure well with 2 3/8" Pipe rams engaged and TIW valve installed in tubing at surface
35. SD while WOC overnight

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Pump Gel Pill/Balanced Cmt Plug

36. Bleed pressure from well and perform negative pressure test for 30 minutes (contact engineer if test fails)

37. Perform positive pressure test against cement plug at 1000 psi (test requires less than 10% drop in 15 minutes)
38. Open Pipe rams and TIH with tubing to determine top of cement
39. Gently tag cement plug (2000 - 3000 lbs force), record depth
40. PU 1 tubing joint and circulate 8% bentonite gel from TOC to depth of 6200' (~32 bbls)
41. TOOH to 1 joint above 6200' (top of gel pill)
42. Circulate 15.6 lb/gal balanced cement plug up to depth of 5200' (this 1000' plug should be done in two stages, pulling pipe out of hole after spotting every 500' of cement)
  - Estimated thickening time of cement is 3 hrs
  - WOC 8 hrs before tagging or pressure testing
43. TOOH 2 joints above TOC and break circulation
  - Stand back enough joints on rig to tag on following day
44. Secure well with 2 3/8" Pipe rams engaged and TIW valve installed in tubing at surface
45. SD while WOC overnight

**Reconfigure Wellhead/Cut and Pull Casing**

46. Mobilize Wire Line unit to location
47. Bleed pressure from well and perform negative pressure test for 30 minutes (contact engineer if test fails)
48. Perform same negative test for 5 1/2" x 9 5/8" annulus
49. Perform positive pressure test against cement plug at 1000 psi (test requires less than 10% drop in 15 minutes)
50. Open Pipe rams and TIH with tubing to determine top of cement
51. Gently tag cement plug (2000 - 3000 lbs force), record depth
52. POOH with workstring (stand back in doubles)
53. RD 7 1/16" BOP stack, frac valve and tubing spool
54. Pick up casing spear and remove casing slips
55. NU 11" 5M Class 3 BOP combo, equipped with stripper head, 5 1/2" Casing rams, Blind Rams (Blinds on bottom), and an Annular
  - *Request Closure Chart for Annular BOP and ensure that accumulator closure pressure is appropriate for 5 1/2" casing so as not to collapse casing*
56. Accumulator test per Chevron Well Control Manual (attachment in Appendix A)
  - *System must be able to have sufficient capacity to supply 1.5 times the volume of fluid necessary to close and hold closed all BOP equipment with a minimum pressure of 200 psi above precharge pressure without assistance from the charging system*
  - *Document bottle volumes and times during test and enter into Wellview.*
57. Note: Will not be able to pressure test 11" BOP stack without casing slips or frac valve in place...
58. PSI test Annular to 250 psi low for 5 minutes and 3,500 psi high for 10 minutes, chart and record data and keep on file on location.
59. Spot Wire Line unit in place
60. RU Rig Floor & TBG handling equipment. Check elevators for pulling 5 1/2" casing and verify

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inspections are complete.

61. Ensure that a properly functioning, fully open, 5 ½" Full Opening Safety Valve (TIW valve) with appropriate threads and key is on the rig floor.
62. Stab into 5 ½" casing with casing spear
63. PU WL freepoint tool and RIH to determine 5 ½" free point
64. POOH with freepoint tool
65. **STOP** – hold JSA meeting around use of a Cutting tool
66. PU cutting tool and RIH – cut casing approx 50' above free point. (~3200')
67. POOH with cutting tool
68. RU 5 ½" casing handler
69. Stab into 5 ½" casing
70. TOOH with free 5 ½" casing keeping the well full of fresh water
71. Secure well with Blind rams for night
72. Clear 5 ½" casing off pipe racks (will be laying down 2 3/8" workstring on following day)

### Cmt Across Cut Casing

73. Bleed pressure from well and perform negative pressure test for 30 minutes (contact engineer if test fails)
74. Close BOP blind rams and change out 5 ½" pipe rams with 2 3/8" pipe rams
75. Verify flowback is plumbed to casing spool to take returns
76. MU notch collar to 1<sup>st</sup> joint of tubing
77. Open Blind rams and TIH with tubing to determine top of cement
78. Gently tag cement plug (2000 - 3000 lbs force), record depth (~5200')
79. TOOH to 1 joint above tag depth, break circulation
80. Circulate 15.6 lb/gal balanced cement plug up to depth of 2000' (this 3200' plug should be done in multiple stages, pulling pipe out of hole after spotting every 500' of cement)
  - Estimated thickening time of cement is 3 hrs
  - WOC 8 hrs before tagging or pressure testing
81. TOOH 2 joints above TOC and circulate well with fresh water from depth of 2000' to surface
82. POOH with workstring
83. Secure well by closing Blind rams and WOC 8 hrs

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### Set 9 5/8" CIBP/Cmt to Surface

84. MU 8.5" gauge ring onto 2 3/8" tubing joint
85. Open Blind rams and RIH with gauge ring slowing speed before reaching TOC (~2000')
86. Gently tag TOC (2,000 - 3,000 lbs force), record depth
87. POOH with gauge ring while standing pipe back in doubles
88. MU and inspect 9 5/8" Cast Iron Bridge Plug and K-1 setting tool onto 2 3/8" tubing joint
  - 8,000 psi differential pressure
  - 8.129 max OD on CIBP
89. RIH and set CIBP just above TOC (~2000')

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- After reaching setting depth, pickup two feet at the tool
  - Rotate ten turns to the right, at the tool
  - Lower back to setting depth, then pickup (slips should bite casing)
  - Shear lock screws with ten turns to the right (pipe will release from tool)
  - (Setting Procedure Attached)
90. TOOH to 1 joint above CIBP
91. Circulate 15.6 lb/gal cement plug up to surface (this 2000' plug should be done in multiple stages, pulling pipe out of hole after spotting every 500' of cement)
- Estimated thickening time of cement is 3 hrs
92. POOH with tubing and SD while WOC overnight
93. RDMO workover rig and cement unit
94. Verify with DEP wellhead removal and proceed as instructed.

**Set Surface Marker**





95. Upon the completion of plugging and filling of any abandoned well, permanent monument or marker consisting of a length of pipe (min diameter of 6") filled with concrete shall be erected over the well; the marker shall extend no less than 30" above the surface and not less than 10' below the surface, and shall be filled with concrete for the purpose of making the marker permanent. The API well identification number, which consists of the state (47), county (001 through 109), and permit number shall be attached or stamped in a permanent manner to said monument; and such numbering shall be no less than 1/2" in height and shall be detectable by any interested person approaching the marker.
96. RDMO all BPs.

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**APPENDIX A – Attachments**

<b>Risk Assessment</b>	
<b>Directional Survey</b>	 Lanco 1H - Surveys.xls
<b>Boresight</b>	 Lanco 1H Boresight.pdf
<b>Wellhead (picture)</b>	 Lanco 1H Well Head.JPG
<b>BOP Closing Systems – CVX Well Control Manual</b>	 Accumulator Test Sheet.xlsx  BOP Closing Systems_Chevron Wi
<b>BOP Configuration</b>	 Revisec KES BOP Front drawing.pdf  Revised KES BOP Side Drawing.pdf
<b>WV DEP</b>	 When to Contact Plugging.docx

**APPENDIX B – Bottom Hole Assemblies (BHA)**

<b>Baker Tools</b>	 NC-1 and N-1.pdf  30852.Pipe Recovery Guidelines_Cutter_PO.1210.pdf  30850.Chemical Recovery Guidelines_Cutter_PO.1210.pdf   Procedure for setting N1 and K1.pdf
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**APPENDIX C - Contacts****Chevron Contacts**

Company	Contact Name	Title	Mobile	E-mail
Chevron, AMBU	Ditty, Ken	Completions Superintendent	(724) 462-9839	<a href="mailto:kditty@chevron.com">kditty@chevron.com</a>
Chevron, AMBU	Davis, Shawn	Completion Team Lead	(661) 337-0039	<a href="mailto:Shawn.Davis@chevron.com">Shawn.Davis@chevron.com</a>
Chevron, AMBU	Steele, Derek	Completion Engineer	(412) 432-9857	<a href="mailto:derek.steele@chevron.com">derek.steele@chevron.com</a>

**Business Partners**

Company		Mobile
Baker (Jason Zollars)	WL unit, Chemical cutter, 5.5" Cmt retainer w/set tool, 9.625" CIBP w/set tool, gauge rings for both casing sizes	(281) 658-8675
Schlumberger (Tom Compton)	Cement unit, 8% Bentonite Gel and mixing equipment	(607) 259-0954
Chevron (Smithfield)	2 3/8" N-80, 4.7 lb/ft, 8 round workstring	
Key Energy (Jeff Cottrill)	7 1/16" and 11" BOP assemblies	304-533-6889

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7700503A

VR-35  
Rev (8-10)

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

DATE: 10-20-10  
API #: 47-7700503

Farm name: Lanco \_\_\_\_\_ Operator Well No.: 1H

LOCATION: Elevation: 1975.21 \_\_\_\_\_ Quadrangle: Brandonville 7.5

District: Grant \_\_\_\_\_ County: Preston  
Latitude: 12,236 Feet South of 39 Deg. 42 Min. 30 Sec.  
Longitude: 11,183 Feet West of 79 Deg. 30 Min. 00 Sec.  
Company: Chief Oil & Gas LLC

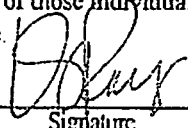
Address: 5956 Sherry Lane STE 1500 Dallas, TX 75225	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
	20"	110'	110'	Sanded In
Agent: Chad Lovejoy	13 3/8"	476'	476'	380
Inspector: Brian Harris	9 5/8"	2495'	2495'	805
Date Permit Issued: 5-29-09	5 1/2"	10698'	10698'	678
Date Well Work Commenced: 7-2-10				
Date Well Work Completed: 7-28-10				
Verbal Plugging:				
Date Permission granted on:				
Rotary X Cable Rig				
Total Vertical Depth (ft): 8614				
Total Measured Depth (ft): 10739				
Fresh Water Depth (ft.): N/A				
Salt Water Depth (ft.): N/A				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): N/A				
Void(s) encountered (N/Y) Depth(s) N				

OPEN FLOW DATA (If more than two producing formations please include additional data on separate sheet)

Producing formation N/A \_\_\_\_\_ Pay zone depth (ft) \_\_\_\_\_  
Gas: Initial open flow \_\_\_\_\_ MCF/d Oil: Initial open flow \_\_\_\_\_ Bbl/d  
Final open flow \_\_\_\_\_ MCF/d Final open flow \_\_\_\_\_ Bbl/d  
Time of open flow between initial and final tests \_\_\_\_\_ Hours  
Static rock Pressure \_\_\_\_\_ psig (surface pressure) after \_\_\_\_\_ Hours

Second producing formation N/A \_\_\_\_\_ Pay zone depth (ft) \_\_\_\_\_  
Gas: Initial open flow \_\_\_\_\_ MCF/d Oil: Initial open flow \_\_\_\_\_ Bbl/d  
Final open flow \_\_\_\_\_ MCF/d Final open flow \_\_\_\_\_ Bbl/d  
Time of open flow between initial and final tests \_\_\_\_\_ Hours  
Static rock Pressure \_\_\_\_\_ psig (surface pressure) after \_\_\_\_\_ Hours

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete.

  
\_\_\_\_\_  
Signature  
LINDA RAY

11-8-10  
\_\_\_\_\_  
Date

12/12/14





Formations Encountered:                      Top Depth                      /                      Bottom Depth  
Surface:

## DRILLERS LOG:

Sandstone	0	479
Lime Sand	479	728
Sandstone	728	980
Limestone	980	1040
Sandstone	1040	2450
Shale	2450	2480
Sandstone	2480	2198
Sandstone	2198	4730
Sandy Shale	4730	4760
Sandstone	4760	4907
Sandy Shale	4907	5484
Sandstone	5484	5540
Sandy Shale	5540	5607
Shale	5607	5630
Sandy Shale	5630	5660
Sandstone	5660	5720
Shale	5720	5806
Sandy Shale	5806	6130
Shale	6130	6282
Sandy Shale	6282	6417
Shale	6417	6671
Sandy Shale	6671	6725
Shale	6725	6850
Sandy Shale	6850	6980
Sandstone	6980	7054
Sandy Shale	7054	7333
Shale	7333	7600
Carb Shale	7600	7687
Limestone	7687	7727
Shale	7727	7850
Carb Shale	7850	8128
Shale	8128	8162
Carb Shale	8162	8350
Shale	8350	8394
Carb Shale	8394	8426
Shale	8426	8550
Carb Shale	8550	8750
Shale	8750	8940
Carb Shale	8940	9050
Hvy Carb Shale	9050	9469
Limestone	9469	9500
Hvy Carb Shale	9500	9680
Limestone	9680	9710
Hvy Carb Shale	9710	9766
TD Hole		

**Side Track**

<b>Marcellus</b>	<b>8492</b>	<b>8686</b>
<b>Purcell Lime</b>	<b>8686</b>	<b>8820</b>
<b>Lower Marcellus</b>	<b>8820</b>	<b>9407</b>
<b>Limestone</b>	<b>9407</b>	<b>9560</b>
<b>Carb Shale</b>	<b>9560</b>	<b>10100</b>
<b>Limestone</b>	<b>10100</b>	<b>10220</b>
<b>Carb Shale</b>	<b>10220</b>	<b>10640</b>
<b>Limestone</b>	<b>10640</b>	<b>10739</b>



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## LANCO 1H – Sidetrack Technical Write Up

The Lanco 1H well was landed high and steered down to the Lower Marcellus at 75° Inc. The bedding dip changed from 8 to 2 degrees (down dip) and we could not stay in the target zone.

We penetrated 7' TVD into the Onondaga and started the open-hole sidetrack.



## Chief Oil & Gas - AP

Preston County, WV  
David & Sandra Smith  
Lanco #1H

Wellbore #1

Survey: MWD Surveys

## DDC Survey Report

28 July, 2010



7700503 P



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project:	Preston 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:	David & Sandra Smith				
Site Position:	Northing:	440,111.17 usft	Latitude:	39° 42' 30.000 N	
From:	Lat/Long	Easting:	1,968,500.00 usft	Longitude:	79° 30' 0.000 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.00 "

Well:	Lanco #1H					
Well Position	+N/-S	0.0 usft	Northing:	440,111.17 usft	Latitude:	39° 42' 30.000 N
	+E/-W	0.0 usft	Easting:	1,968,500.00 usft	Longitude:	79° 30' 0.000 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	usft	Ground Level:	1,975.2 usft

Wellbore:	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/10/2010	-9.34	57.35	52,824

Design:	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	350.00	

Survey Program	Date 7/28/2010			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
200.0	5,600.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro
5,645.0	9,766.0	MWD Surveys (Wellbore #1)	MWD default	MWD - Standard

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Buid Rate (°/100usft)	Turn Rate (°/100usft)
Tie-in									
5,600.0	4.99	118.91	5,592.7	-22.5	72.8	-34.8	0.00	0.00	0.00
5,645.0	5.10	118.70	5,637.5	-24.4	76.3	-37.3	0.25	0.24	-0.47
5,740.0	3.10	102.30	5,732.3	-27.0	82.5	-40.9	2.42	-2.11	-17.26
5,835.0	4.30	100.40	5,827.1	-28.2	88.5	-43.2	1.27	1.26	-2.00
5,930.0	6.20	106.30	5,921.7	-30.3	97.0	-46.7	2.08	2.00	6.21
6,025.0	8.30	108.20	6,015.9	-33.9	108.4	-52.2	2.22	2.21	2.00
6,120.0	6.90	114.00	6,110.1	-38.3	120.1	-58.6	1.68	-1.47	6.11
6,215.0	4.30	111.60	6,204.6	-42.0	128.6	-63.7	2.75	-2.74	-2.53
6,309.0	2.40	152.30	6,298.4	-45.0	132.3	-67.4	3.12	-2.02	43.30



DDC  
Survey Report



Company: Chief Oil & Gas - AP  
 Project: Preston County, WV  
 Site: David & Sandra Smith  
 Well: Lanco #1H  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Lanco #1H  
 TVD Reference: WELL @ 1997.2usft (Patterson #255)  
 MD Reference: WELL @ 1997.2usft (Patterson #255)  
 North Reference: Grid  
 Survey Calculation Method: Minimum Curvature  
 Database: EDM 5000.1 Single User Db

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)
6,404.0	3.50	131.20	6,393.3	-48.7	135.9	-71.6	1.61	1.16	-22.21
6,499.0	2.50	120.20	6,488.2	-51.6	139.8	-75.0	1.39	-1.26	-11.58
6,594.0	1.50	86.40	6,583.2	-52.4	142.7	-76.4	1.41	-0.84	-35.58
6,690.0	3.20	102.50	6,679.1	-52.9	146.5	-77.6	1.88	1.77	16.77
6,785.0	2.10	133.00	6,774.0	-54.7	150.4	-80.0	1.84	-1.16	32.11
6,880.0	1.80	136.00	6,868.9	-57.0	152.7	-82.6	0.33	-0.32	3.16
6,975.0	2.00	116.00	6,963.9	-58.8	155.2	-84.8	0.72	0.21	-21.05
7,070.0	3.40	118.10	7,058.8	-60.8	159.2	-87.5	1.48	1.47	2.21
7,165.0	3.50	117.80	7,153.6	-63.5	164.3	-91.0	0.11	0.11	-0.32
7,260.0	3.80	135.30	7,248.4	-67.1	169.0	-95.4	1.21	0.32	18.42
7,355.0	1.10	100.90	7,343.3	-69.5	172.1	-98.3	3.11	-2.84	-36.21
7,451.0	3.00	105.40	7,438.2	-70.3	175.5	-99.7	1.98	1.98	4.69
7,546.0	3.70	139.60	7,534.1	-73.3	179.9	-103.4	2.19	0.74	36.00
7,641.0	4.40	134.80	7,628.8	-78.2	184.4	-109.1	0.82	0.74	-5.05
7,673.0	5.00	129.90	7,660.7	-80.0	186.4	-111.1	2.25	1.88	-15.31
7,713.0	5.40	127.90	7,700.6	-82.3	189.2	-113.9	1.10	1.00	-5.00
7,745.0	3.60	92.10	7,732.5	-83.2	191.4	-115.2	10.16	-5.83	-111.88
7,777.0	4.90	24.40	7,764.4	-82.0	193.0	-114.3	15.17	4.06	-211.56
7,808.0	9.70	2.50	7,795.2	-78.2	193.6	-110.6	17.63	15.48	-70.65
7,840.0	14.80	355.20	7,826.4	-71.4	193.4	-103.9	16.63	15.94	-22.81
7,871.0	18.60	352.40	7,856.1	-62.6	192.4	-95.0	12.53	12.26	-9.03
7,902.0	19.30	351.10	7,885.4	-52.6	191.0	-85.0	2.64	2.26	-4.19
7,933.0	18.80	350.20	7,914.7	-42.6	189.3	-74.9	1.87	-1.61	-2.50
7,965.0	18.10	349.70	7,945.1	-32.7	187.6	-64.7	2.24	-2.19	-1.56
7,997.0	17.80	349.50	7,975.5	-23.0	185.8	-54.9	0.96	-0.94	-0.63
8,028.0	17.60	349.50	8,005.1	-13.7	184.1	-45.4	0.65	-0.65	0.00
8,060.0	17.10	348.40	8,035.6	-4.3	182.2	-35.9	1.87	-1.56	-3.44
8,092.0	19.40	347.40	8,066.0	5.5	180.1	-25.9	7.25	7.19	-3.13
8,123.0	24.40	347.90	8,094.7	16.8	177.7	-14.3	16.14	16.13	1.61
8,155.0	29.90	350.50	8,123.2	31.1	175.0	0.2	17.58	17.19	8.13
8,186.0	35.10	352.30	8,149.3	47.6	172.5	16.9	17.06	16.77	5.81
8,218.0	40.40	352.30	8,174.6	67.0	169.9	36.5	16.56	16.56	0.00
8,250.0	44.60	353.40	8,198.2	88.4	167.2	58.0	13.33	13.13	3.44
8,282.0	46.90	352.20	8,220.6	111.2	164.3	80.9	7.67	7.19	-3.75
8,313.0	49.20	352.00	8,241.3	134.0	161.1	104.0	7.43	7.42	-0.65
8,345.0	50.00	350.80	8,262.0	158.1	157.5	128.3	3.80	2.50	-3.75
8,377.0	52.00	349.40	8,282.2	182.6	153.2	153.2	7.11	6.25	-4.38
8,409.0	55.40	348.60	8,301.1	207.9	148.3	179.0	10.81	10.63	-2.50
8,440.0	57.00	348.60	8,318.3	233.1	143.2	204.7	5.16	5.16	0.00
8,472.0	59.40	348.10	8,335.2	259.8	137.7	231.9	7.62	7.50	-1.56
8,504.0	62.40	348.10	8,350.8	287.1	131.9	259.9	9.38	9.38	0.00
8,535.0	63.40	348.40	8,364.3	314.2	126.3	287.4	3.34	3.23	0.97
8,567.0	65.70	347.90	8,378.6	342.4	120.4	316.3	7.32	7.19	-1.56



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
8,599.0	68.30	347.80	8,391.1	371.2	114.2	345.8	8.13	8.13	-0.31
8,630.0	71.40	347.20	8,401.8	399.6	107.9	374.8	10.16	10.00	-1.94
8,661.0	74.80	346.60	8,410.8	428.5	101.2	404.4	11.12	10.97	-1.94
8,693.0	75.60	346.70	8,419.0	458.6	94.0	435.3	2.52	2.50	0.31
8,725.0	75.90	346.50	8,426.9	488.8	86.8	466.3	1.12	0.94	-0.63
8,757.0	76.70	348.30	8,434.5	519.1	80.0	497.3	6.01	2.50	5.63
8,788.0	76.90	349.30	8,441.5	548.7	74.2	527.5	3.21	0.65	3.23
8,820.0	77.00	348.40	8,448.8	579.3	68.2	558.7	2.76	0.31	-2.81
8,852.0	76.90	348.60	8,456.0	609.9	61.9	589.8	0.68	-0.31	0.63
8,883.0	76.70	348.30	8,463.1	639.4	55.9	620.0	1.14	-0.65	-0.97
8,915.0	76.70	348.00	8,470.4	669.9	49.5	651.1	0.91	0.00	-0.94
8,947.0	76.60	347.70	8,477.8	700.4	42.9	682.3	0.96	-0.31	-0.94
8,978.0	76.70	347.80	8,485.0	729.8	36.5	712.4	0.45	0.32	0.32
9,010.0	76.70	347.60	8,492.3	760.3	29.9	743.5	0.61	0.00	-0.63
9,042.0	76.70	347.60	8,499.7	790.7	23.2	774.6	0.00	0.00	0.00
9,073.0	76.70	347.80	8,506.8	820.1	16.8	804.8	0.63	0.00	0.65
9,105.0	76.90	348.00	8,514.1	850.6	10.3	835.9	0.87	0.63	0.63
9,137.0	76.70	348.10	8,521.4	881.1	3.8	867.0	0.70	-0.63	0.31
9,168.0	76.90	347.90	8,528.5	910.6	-2.5	897.2	0.90	0.65	-0.65
9,200.0	77.10	348.50	8,535.7	941.1	-8.8	928.4	1.93	0.63	1.88
9,232.0	77.00	347.90	8,542.9	971.7	-15.2	959.5	1.85	-0.31	-1.88
9,264.0	75.80	348.30	8,550.4	1,002.1	-21.6	990.6	3.94	-3.75	1.25
9,295.0	75.90	347.90	8,558.0	1,031.5	-27.8	1,020.7	1.29	0.32	-1.29
9,327.0	75.70	347.60	8,565.8	1,061.8	-34.4	1,051.7	1.10	-0.63	-0.94
9,359.0	75.80	347.50	8,573.7	1,092.1	-41.1	1,082.7	0.44	0.31	-0.31
9,390.0	75.80	347.30	8,581.3	1,121.4	-47.6	1,112.7	0.63	0.00	-0.65
9,422.0	75.40	347.40	8,589.3	1,151.7	-54.4	1,143.6	1.29	-1.25	0.31
9,454.0	75.30	347.50	8,597.4	1,181.9	-61.2	1,174.6	0.43	-0.31	0.31
9,485.0	75.10	347.90	8,605.3	1,211.2	-67.5	1,204.5	1.40	-0.65	-1.29
9,517.0	75.10	347.20	8,613.5	1,241.4	-74.2	1,235.4	2.11	0.00	-2.19
9,548.0	74.80	346.90	8,621.5	1,270.6	-80.9	1,265.3	1.35	-0.97	-0.97
9,580.0	74.90	346.90	8,629.9	1,300.6	-87.9	1,296.1	0.31	0.31	0.00
9,612.0	77.30	346.50	8,637.6	1,330.9	-95.1	1,327.2	7.60	7.50	-1.25
9,643.0	78.60	346.30	8,644.1	1,360.3	-102.2	1,357.4	4.24	4.19	-0.65
9,675.0	78.60	346.00	8,650.4	1,390.8	-109.7	1,388.7	0.92	0.00	-0.94
9,707.0	80.60	346.80	8,656.2	1,421.4	-117.1	1,420.1	6.72	6.25	2.50
Bit Projection									
9,766.0	83.30	346.80	8,664.5	1,478.2	-130.4	1,478.4	4.58	4.58	0.00



7700503P



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,600.0	5,592.7	-22.5	72.8	Tie-In
9,766.0	8,664.5	1,478.2	-130.4	Bit Projection

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



## Chief Oil & Gas - AP

Preston County, WV  
David & Sandra Smith  
Lanco #1H

Side-Track #1

Survey: MWD Sidetrack #1

## DDC Survey Report

27 July, 2010





DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Side-Track #1	Survey Calculation Method:	Minimum Curvature
Design:	Side-Track #1	Database:	EDM 5000.1 Single User Db

Project	Preston 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	David & Sandra Smith				
Site Position:	From:	Northing:	440,111.17 usft	Latitude:	39° 42' 30.000 N
	Lat/Long	Easting:	1,968,500.00 usft	Longitude:	79° 30' 0.000 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.00 "

Well	Lanco #1H					
Well Position	+N/-S	0.0 usft	Northing:	440,111.17 usft	Latitude:	39° 42' 30.000 N
	+E/-W	0.0 usft	Easting:	1,968,500.00 usft	Longitude:	79° 30' 0.000 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	1,975.2 usft	

Wellbore	Side-Track #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/20/2010	-9.34	67.34	52,821

Design	Side-Track #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	8,123.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	350.00
	0.0	0.0	0.0		

Survey Program	Date 7/27/2010				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.0	5,600.0	Gyro (Wellbore #1)	Good_gyro	Good Gyro	
5,645.0	8,123.0	MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	
8,155.0	10,739.0	MWD Sidetrack #1 (Side-Track #1)	MWD default	MWD - Standard	

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)
Tie-In	8,123.0	24.40	347.90	8,094.7	16.8	177.7	-14.3	0.00	0.00	0.00
	8,155.0	25.70	349.30	8,123.7	30.0	175.0	-0.8	4.46	4.06	4.38
	8,187.0	26.10	349.10	8,152.5	43.8	172.4	13.2	1.28	1.25	-0.63
	8,218.0	26.30	348.70	8,180.3	57.2	169.7	26.9	0.86	0.65	-1.29
	8,250.0	25.60	343.30	8,209.1	70.8	166.4	40.8	7.70	-2.19	-16.88
	8,282.0	25.10	340.40	8,238.0	83.8	162.1	54.4	4.18	-1.56	-9.06
	8,313.0	27.50	336.90	8,265.8	96.7	157.3	67.9	8.03	7.74	-4.84
	8,345.0	31.60	337.00	8,293.6	111.3	151.4	83.3	13.14	12.81	-5.94



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Preston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Side-Track #1	Survey Calculation Method:	Minimum Curvature
Design:	Side-Track #1	Database:	EDM 5000.1 Single User Db

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)
8,377.0	35.90	336.40	8,320.3	127.6	144.3	100.6	13.48	13.44	-1.88
8,408.0	40.20	335.80	8,344.7	145.1	136.6	119.1	13.92	13.87	-1.94
8,440.0	43.40	335.20	8,368.5	164.5	127.7	139.8	10.08	10.00	-1.88
8,472.0	44.20	337.80	8,391.6	184.8	118.9	161.3	6.15	2.50	8.13
8,503.0	46.80	339.70	8,413.3	205.4	110.9	183.0	9.46	8.39	6.13
8,535.0	49.80	340.20	8,434.6	227.8	102.7	206.5	9.45	9.38	1.56
8,567.0	51.70	339.80	8,454.9	251.1	94.2	230.9	6.02	5.94	-1.25
8,598.0	55.10	340.30	8,473.3	274.5	85.8	255.4	11.04	10.97	1.61
8,630.0	58.60	342.70	8,490.8	299.9	77.3	281.9	12.61	10.94	7.50
8,661.0	59.90	345.00	8,506.7	325.5	69.9	308.4	7.63	4.19	7.42
8,693.0	63.10	345.50	8,522.0	352.7	62.7	336.4	10.09	10.00	1.56
8,725.0	67.10	345.00	8,535.4	380.8	55.3	365.4	12.58	12.50	-1.56
8,756.0	70.90	344.30	8,546.5	408.7	47.7	394.2	12.44	12.26	-2.26
8,788.0	72.20	344.30	8,556.7	437.9	39.4	424.4	4.05	4.06	0.00
8,820.0	74.20	345.70	8,565.9	467.5	31.5	454.9	7.52	6.25	4.38
8,852.0	77.50	347.50	8,573.7	497.6	24.3	485.9	11.67	10.31	5.63
8,883.0	80.00	348.30	8,579.8	527.4	18.0	516.2	8.45	8.06	2.58
8,915.0	82.20	347.90	8,584.7	558.3	11.4	547.8	6.99	6.88	-1.26
8,947.0	83.20	347.90	8,588.8	589.3	4.8	579.6	3.13	3.13	0.00
8,978.0	83.60	347.80	8,592.4	619.4	-1.7	610.3	1.33	1.29	-0.32
9,010.0	83.10	347.90	8,596.1	650.5	-8.4	642.1	1.59	-1.56	0.31
9,042.0	82.20	347.00	8,600.2	681.5	-15.3	673.8	3.96	-2.81	-2.81
9,073.0	82.10	346.70	8,604.4	711.4	-22.3	704.5	1.01	-0.32	-0.97
9,105.0	83.90	348.60	8,608.3	742.4	-29.1	736.2	8.15	5.63	5.94
9,137.0	85.00	348.90	8,611.4	773.7	-35.3	768.0	3.56	3.44	0.94
9,168.0	87.70	349.50	8,613.4	804.0	-41.1	799.0	8.92	8.71	1.94
9,200.0	89.10	350.20	8,614.3	835.5	-46.7	831.0	4.89	4.38	2.19
9,263.0	92.10	351.10	8,613.6	897.7	-56.9	893.9	4.97	4.76	1.43
9,369.0	91.50	350.70	8,610.6	992.4	-72.1	989.9	0.75	-0.63	-0.42
9,453.0	91.60	350.10	8,608.0	1,085.1	-87.8	1,083.8	0.65	0.11	-0.64
9,548.0	88.90	347.20	8,607.6	1,178.2	-106.5	1,178.8	4.17	-2.84	-3.05
9,643.0	92.00	346.80	8,606.9	1,270.8	-127.8	1,273.6	3.29	3.26	-0.42
9,738.0	93.50	347.30	8,602.3	1,363.2	-149.1	1,368.4	1.66	1.58	0.53
9,833.0	92.10	348.40	8,597.7	1,456.0	-169.1	1,463.2	1.87	-1.47	1.16
9,928.0	92.00	348.30	8,594.3	1,549.0	-188.3	1,558.1	0.15	-0.11	-0.11
10,023.0	91.40	347.90	8,591.5	1,641.9	-207.8	1,653.0	0.76	-0.63	-0.42
10,118.0	92.90	349.40	8,587.9	1,735.0	-226.5	1,747.9	2.23	1.58	1.58
10,213.0	92.70	348.70	8,583.3	1,828.1	-244.5	1,842.8	0.77	-0.21	-0.74
10,308.0	93.60	348.80	8,578.0	1,921.1	-263.0	1,937.6	0.95	0.95	0.11
10,404.0	95.20	347.90	8,570.7	2,014.9	-282.4	2,039.3	1.91	1.67	-0.94
10,499.0	94.40	344.50	8,562.7	2,106.6	-305.0	2,127.8	3.68	-0.84	-3.58
10,594.0	94.60	345.00	8,555.3	2,198.2	-329.9	2,222.1	0.57	0.21	0.53
10,689.0	94.40	344.70	8,547.8	2,289.5	-354.6	2,316.4	0.38	-0.21	-0.32



DDC  
Survey Report



Company:	Chief Oil & Gas - AP	Local Co-ordinate Reference:	Well Lanco #1H
Project:	Proston County, WV	TVD Reference:	WELL @ 1997.2usft (Patterson #255)
Site:	David & Sandra Smith	MD Reference:	WELL @ 1997.2usft (Patterson #255)
Well:	Lanco #1H	North Reference:	Grid
Wellbore:	Side-Track #1	Survey Calculation Method:	Minimum Curvature
Design:	Side-Track #1	Database:	EDM 5000.1 Single User Db

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)
TD									
10,739.0	94.40	344.70	8,544.0	2,337.7	-367.8	2,366.0	0.00	0.00	0.00

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
8,123.0	8,094.7	15.8	177.7	Tie-In
10,739.0	8,544.0	2,337.7	-367.8	TD

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_

7700503#P

WW-4A  
Revised 6-07

1) Date: 10/28/14  
2) Operator's Well Number  
Lanco 1H  
3) API Well No.: 47 - 077 - 00503

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
NOTICE OF APPLICATION TO PLUG AND ABANDON A WELL

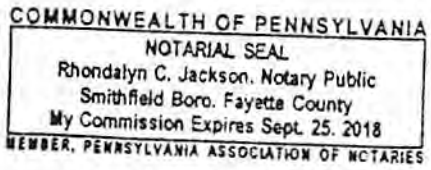
4) Surface Owner(s) to be served: (a) Name David Smith & Sandra Smith, Address 895 Shaffer Lane Morgantown, WV 26508  
5) (a) Coal Operator Name, Address  
(b) Coal Owner(s) with Declaration Name FSS Coal Holdings Inc, Address PO Box 121 Friedens, PA 15541  
(c) Coal Lessee with Declaration Name David Smith & Sandra Smith, Address 895 Shaffer Lane Morgantown, WV 26508  
6) Inspector Name Gayne Knitowski, Address PO Box 108 Gormanla, WV 26720, Telephone

TO THE PERSONS NAMED ABOVE: You should have received this Form and the following documents:

- (1) The application to Plug and Abandon a Well on Form WW-4B, which sets out the parties involved in the work and describes the well its and the plugging work order; and
- (2) The plat (surveyor's map) showing the well location on Form WW-6.

The reason you received these documents is that you have rights regarding the application which are summarized in the instructions on the reverses side. However, you are not required to take any action at all.

Take notice that under Chapter 22-6 of the West Virginia Code, the undersigned well operator proposes to file or has filed this Notice and Application and accompanying documents for a permit to plug and abandon a well with the Chief of the Office of Oil and Gas, West Virginia Department of Environmental Protection, with respect to the well at the location described on the attached Application and depicted on the attached Form WW-6. Copies of this Notice, the Application, and the plat have been mailed by registered or certified mail or delivered by hand to the person(s) named above (or by publication in certain circumstances) on or before the day of mailing or delivery to the Chief.



Well Operator Chevron Appalachia, LLC  
By: Anna Shumaker  
Its: Anna Shumaker, Permitting Coordinator  
Address 800 Mountain View Dr, Smithfield, PA 15478  
Telephone 724-564-3700

Subscribed and sworn before me this 28th day of October 2014  
Rhondalyn C. Jackson Notary Public  
My Commission Expires Sept. 25, 2018

Received  
Office of Oil & Gas  
OCT 31 2014

Oil and Gas Privacy Notice

The Office of Oil and Gas processes your personal information, such as name, address and phone number, as a 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](mailto:depprivacyofficer@wv.gov).

12/12/14

7700503 P

**SURFACE OWNER WAIVER**

Operator's Well  
Number

Lanco 1H

**INSTRUCTIONS TO SURFACE OWNERS NAMED ON PAGE WW4-A**

The well operator named on page WW-4A is applying for a permit from the State to plug and abandon a well. (Note: If the surface tract is owned by more than three persons, then these materials were served on you because your name appeared on the Sheriff's tax ticket on the land or because you actually occupy the surface tract. In either case, you may be the only owner who will actually receive these materials.) See Chapter 22 of the West Virginia Code. Well work permits are valid for 24 months. If you do not own any interest in the surface tract, please forward these materials to the true owner immediately if you know who it is. Also, please notify the well operator and the Office of Oil and Gas.

**NOTE: YOU ARE NOT REQUIRED TO FILE ANY COMMENT.**

**WHERE TO FILE COMMENTS AND OBTAIN ADDITIONAL INFORMATION:**

Chief, Office of Oil and Gas  
Department of Environmental Protection  
601 57<sup>th</sup> St. SE  
Charleston, WV 25304  
(304) 926-0450

Received  
**Office of Oil & Gas**  
OCT 31 2014

**Time Limits and methods for filing comments.** The law requires these materials to be served on or before the date the operator files his Application. You have **FIVE (5) DAYS** after the filing date to file your comments. Comments must be filed in person or received in the mail by the Chief's office by the time stated above. You may call the Chief's office to be sure of the date. Check with your postmaster to ensure adequate delivery time or to arrange special expedited handling. If you have been contacted by the well operator and you have signed a "voluntary statement of no objection" to the planned work described in these materials, then the permit may be issued at any time.

**Comments must be in writing.** Your comments must include your name, address and telephone number, the well operator's name and well number and the approximate location of the proposed well site including district and county from the application. You may add other documents, such as sketches, maps or photographs to support your comments.

The Chief has the power to deny or condition a well work permit based on comments on the following grounds:

- 1) The proposed well work will constitute a hazard to the safety of persons.
- 2) The soil erosion and sediment control plan is not adequate or effective;
- 3) Damage would occur to publicly owned lands or resources;
- 4) The proposed well work fails to protect fresh water sources or supplies;
- 5) The applicant has committed a substantial violation of a previous permit or a substantial violation of one or more of the rules promulgated under Chapter 22, and has failed to abate or seek review of the violation..."

If you want a copy of the permit as it is issued or a copy of the order denying the permit, you should request a copy from the Chief.

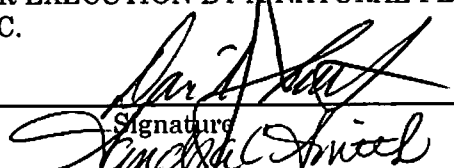
**VOLUNTARY STATEMENT OF NO OBJECTION**

I hereby state that I have read the instructions to surface owners and that I have received copies of a Notice and Application For A Permit To Plug And Abandon on Forms WW-4A and WW-4B, and a survey plat.

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.

FOR EXECUTION BY A NATURAL PERSON  
ETC.

FOR EXECUTION BY A CORPORATION,

  
Signature

Date 9/22/2014 Name \_\_\_\_\_  
By \_\_\_\_\_  
Its \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
Date  
**12/12/14**  
Date  
Signature

API No. 47-77-00503 P  
Farm Name Lanco  
Well No. 1H

**INSTRUCTIONS TO COAL OPERATORS  
OWNERS AND LESSEE**

The well operator named on the obverse side of WW-4 (B) is about to abandon the well described in the enclosed materials and will commence the work of plugging and abandoning said well on the date the inspector is notified. Which date shall not be less than five days after the day on which this notice and application so mailed is received, or in due course should be received by the Department of Environmental Protection Office of Oil & Gas.

This notice and application is given to you in order that your respective representatives may be present at the plugging and filling of said well. You are further notified that whether you are represented or not the operator will proceed to plug and fill said well in the manner required by Section 24, Article 6, Chapter 22 of the Code and given in detail on obverse side of this application.

NOTE: If you wish this well to be plugged according to 22-6-24(d) then as per Regulation 35CSR4-13.9 you must complete and return to this office on form OB-16 "Request by Coal Operator, Owner, or Lessee for plugging" prior to the issuance of this plugging permit.

**WAIVER**

The undersigned coal operator \_\_\_\_ / owner ~~\_\_\_\_\_~~ / lessee \_\_\_\_ / of the coal under this well location has examined this proposed plugging work order. The undersigned has no objection to the work proposed to be done at this location, provided, the well operator has complied with all applicable requirements of the West Virginia Code and the governing regulations.

Date: 9/22/2014

*Handwritten signature: Sandra E. Smith*  
*Handwritten signature: David Smith (owner)*  
By: \_\_\_\_\_  
Its \_\_\_\_\_

**Received  
Office of Oil & Gas  
OCT 31 2014**



7700503P

**SENDER: COMPLETE THIS SECTION**

**COMPLETE THIS SECTION ON DELIVERY**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

A. Signature  Agent  
*Sandra Smith*  Addressee

B. Received by (Printed Name) C. Date of Delivery  
 9/19/14

D. Is delivery address different from item 1?  Yes  
 If YES, enter delivery address below:  No

1. Article Addressed to:

David Smith & Sandra Smith  
 895 Shaffer Lane  
 Morgantown, WV 26508

3. Service Type  
 Certified Mail®  Priority Mail Express™  
 Registered  Return Receipt for Merchandise  
 Insured Mail  Collect on Delivery

4. Restricted Delivery? (Extra Fee)  Yes

2. Article Number (Transfer from service label) **7013 2630 0002 1058 4804**

PS Form 3811, July 2013 Domestic Return Receipt

**SENDER: COMPLETE THIS SECTION**

**COMPLETE THIS SECTION ON DELIVERY**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

A. Signature  Agent  
 X *Maret Beal*  Addressee

B. Received by (Printed Name) C. Date of Delivery  
 MARET BEAL 9-23-2014

D. Is delivery address different from item 1?  Yes  
 If YES, enter delivery address below:  No

1. Article Addressed to:

FSS Coal Holdings, Inc  
 PO Box 121  
 Friedens, PA 15541

3. Service Type  
 Certified Mail®  Priority Mail Express™  
 Registered  Return Receipt for Merchandise  
 Insured Mail  Collect on Delivery

4. Restricted Delivery? (Extra Fee)  Yes

2. Article Number (Transfer from service label) **7013 2630 0002 1058 4811**

PS Form 3811, July 2013 Domestic Return Receipt

Received  
 Office of Oil & Gas  
 OCT 31 2014

12/12/14

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Chevron Appalachia, LLC OP Code 49449935

Watershed (HUC 10) Piney Run Quadrangle Brandonville, WV-PA 7.5'

Elevation 1975' County Preston District Grant

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

Will a pit be used? Yes  No

If so, please describe anticipated pit waste: \_\_\_\_\_

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? \_\_\_\_\_

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number \_\_\_\_\_)
- Reuse (at API Number \_\_\_\_\_)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

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Will closed loop system be used? If so, describe: N/A

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. N/A

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

Additives to be used in drilling medium? N/A

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. N/A

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

-Landfill or offsite name/permit number? \_\_\_\_\_

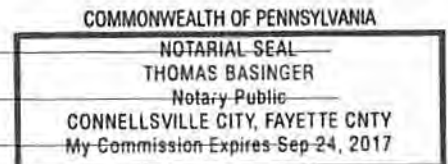
I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations 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 Anna Shumaker

Company Official (Typed Name) Anna Shumaker

Company Official Title Permitting Coordinator



Subscribed and sworn before me this 23 day of September, 2014

Thomas Basinger Notary Public

My commission expires 9/24/2017

12/12/14

Form WW-9

Operator's Well No. Lanco 1H

Chevron Appalachia, LLC

Proposed Revegetation Treatment: Acres Disturbed 3.55 Prevegetation pH \_\_\_\_\_

Lime Soil Test Tons/acre or to correct to pH 5.0-7.5

Fertilizer type 10-20-20

Fertilizer amount 1,000 lbs/acre

Mulch Straw 2 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type lbs/acre  
Winter Rye 170

Plant 8/15 - 2/28

Seed Type lbs/acre  
Birdsfoot Trefoil 15

Weeping Lovegrass 45

Perennial Ryegrass 10

Plant 3/1 - 6/15 8/15 - 9/15

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: Hayden J. Knittel

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Received  
Office of Oil & Gas

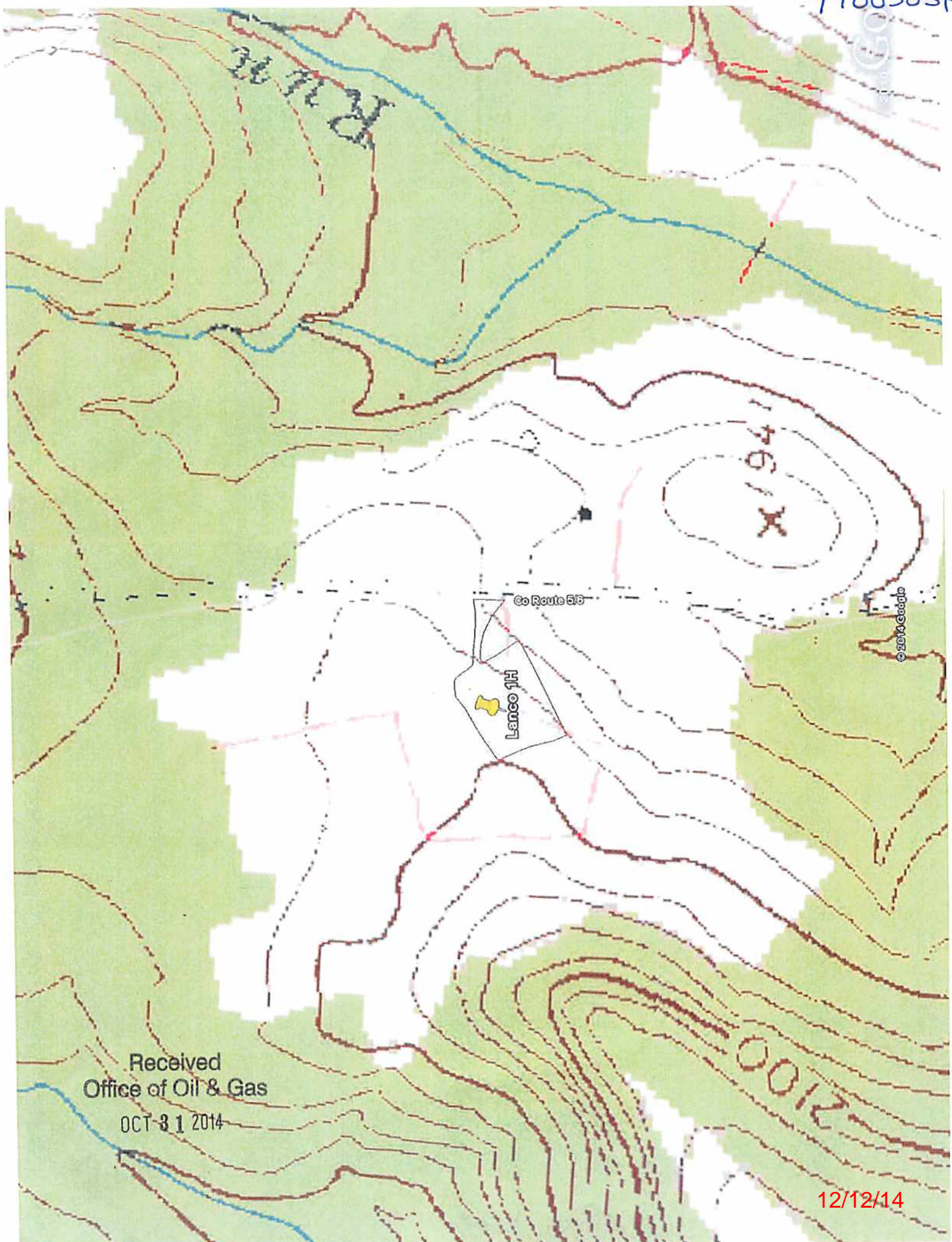
OCT 31 2014

Title: Inspector

Date: 7/24/2014

Field Reviewed? (  ) Yes (  ) No

7700503P



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Received  
Office of Oil & Gas  
OCT 31 2014

12/12/14

7700503 P

WW-7  
8-30-06



West Virginia Department of Environmental Protection  
Office of Oil and Gas

WELL LOCATION FORM: GPS

API: 47-77-00503 WELL NO.: 1H

FARM NAME: Lanco

RESPONSIBLE PARTY NAME: Chevron Appalachia, LLC

COUNTY: Preston DISTRICT: Grant

QUADRANGLE: Brandonville

SURFACE OWNER: David & Sandra Smith

ROYALTY OWNER: David & Sandra Smith

UTM GPS NORTHING: 4392678

UTM GPS EASTING: 625238 GPS ELEVATION: 1975'

BHL: 4393373N 625105E

The Responsible Party named above has chosen to submit GPS coordinates in lieu of preparing a new well location plat for a plugging permit or assigned API number on the above well. The Office of Oil and Gas will not accept GPS coordinates that do not meet the following requirements:

1. Datum: NAD 1983, Zone: 17 North, Coordinate Units: meters, Altitude: height above mean sea level (MSL) – meters.
2. Accuracy to Datum – 3.05 meters
3. Data Collection Method:  
Survey grade GPS ; Post Processed Differential   
Real-Time Differential   
Mapping Grade GPS ; Post Processed Differential   
Real-Time Differential

4. Letter size copy of the topography map showing the well location.

I the undersigned, hereby certify this data 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 Office of Oil and Gas.

David Hummer Permitting Coordinator 11-3-14  
Signature Title Date

RECEIVED  
Office of Oil and Gas

DEC 10 2014

7700503P



**Kristen Brooks**  
Permit Coordinator

**Appalachian/Michigan  
Strategic Business Unit**  
Chevron North America  
Exploration and Production  
A Division of Chevron U.S.A. Inc.  
800 Mountain View Drive  
Smithfield, PA 15478  
Tel 724-564-3781  
Fax 724-564-3894  
kristenbrooks@chevron.com

October 30, 2013

West Virginia D.E.P.  
Office of Oil & Gas  
601 57<sup>th</sup> Street SE  
Charleston, WV 25304-2345

RE: Plug & Abandon Application Lanco 1H (API #47-77-00503)

Dear Sir/Madam:

Enclosed is a P&A application for the Lanco 1H well (API #47-77-00503), in Grant District, Preston County.

Should you have any questions or problems, please contact me at (724) 564-3781 or kristenbrooks@chevron.com.

Sincerely,

Kristen Brooks  
Permit Coordinator  
Chevron Appalachia, LLC

Enclosure

Received  
Office of Oil & Gas  
OCT 31 2014

12/12/14