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 25, 2013

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-9502107, issued to JAY-BEE OIL & GAS, 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: W701-6 / KETEL SIX
Farm Name: PHYLLIS KAY STEVENS ET AL
API Well Number: 47-9502107
Permit Type: Horizontal 6A Well
Date Issued: 07/25/2013

95-2107

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) 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 § 22-6A-5a (12), 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. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the fill material shall be within plus or minus 2% (unless soil test results show a greater range of moisture content is appropriate and 95% compaction can still be achieved) of the optimum moisture content as determined by the standard proctor density test, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. Each lift must meet 95 % compaction of the optimum density based on results from the standard proctor density test of the actual soils used in specific engineered fill sites. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.

3. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.

4. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations,* 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.

5. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.

6. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.

7. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

95-2107

WW - 6B
(1/12)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: Jay-Bee Oil & Gas, Inc | 24610 (Operator ID) | 095-Tyler (County) | 02-McElroy (District) | Centerpoint 7.5' (Quadrangle)

2) Operator's Well Number: W701-6 / Ketel Six Well Pad Name: W701 / Ketel

3 Elevation, current ground: 805' Elevation, proposed post-construction: 805'

4) Well Type: (a) Gas ■ Oil ■
Other
(b) If Gas: Shallow ■ Deep
Horizontal ■

5) Existing Pad? Yes or No: Yes

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):
Marcellus, Target Depth 7,250', Total Depth 13,500', 41-60' thick, .25-.30 pressure gradient.

7) Proposed Total Vertical Depth: 7,250'
8) Formation at Total Vertical Depth: Marcellus
9) Proposed Total Measured Depth: 13,500'
10) Approximate Fresh Water Strata Depths: 60'
11) Method to Determine Fresh Water Depth: Previous Drilled Well TYL-132-P
12) Approximate Saltwater Depths: 1348'
13) Approximate Coal Seam Depths: 400-402'
14) Approximate Depth to Possible Void (coal mine, karst, other): None
15) Does land contain coal seams tributary or adjacent to, active mine? No
16) Describe proposed well work: Drill and Stimulate a new Horizontal Well.

17) Describe fracturing/stimulating methods in detail:
300-350' per stage 8,500bbls of water (7732-18-5), 150,000-400,000lbs of sand (14808-60-7),
friction reducer (64742-47-8) 1# per gallon, scale inhibitor (107-21-1 & 10043-52-4) ,
bacteria prevention (111-30-8, 7173-51-5, 68424-85-1, & 64-17-5) 1/4# per gallon, and 2000 gallons 15% vol acid (7647-01-0).
CAS Numbers are in parentheses.

18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 2.75 acres

19) Area to be disturbed for well pad only, less access road (acres): .28 acres

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(1/12)

20) **CASING AND TUBING PROGRAM**

TYPE	Size	New or Used	Grade	Weight per ft.	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill -up (Cu. Ft.)
Conductor	16	New	J55	40	30	30	10 SKS
Fresh Water	11 3/4	New	J55	32	300	300	CTS +25%
Coal							
Intermediate	8 5/8	New	J55	24	2,000	2,000	CTS +15%
Production	5 1/2	New	P110	17	13,500	13,500	Cement up to 1000' From Surface
Tubing							
Liners							

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	16	17 1/2	.495	3,000#	Class A Cement	1.19CF per Sack
Fresh Water	11 3/4	15	.333	1,500#	Class A Cement	1.19CF per Sack
Coal						
Intermediate	8 5/8	11	.264	2,500#	Class A Cement	1.19CF per Sack
Production	5 1/2	7 7/8	.304	15,000#	Type 1 Cement	1.19CF per Sack
Tubing						
Liners						

PACKERS

Kind:	N/A			
Sizes:				
Depths Set:				

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(1/12)

21) Describe centralizer placement for each casing string.

Vertical - Every 500' Bow Centralizer, and 50' from top of ground. Horizontal every 42' Spiral Centralizer, Curve - Every 84' Spiral Centralizer.

Surface Casing 11 3/4", 1st joint from bottom, 200', & 50' Bow Centralizers.

22) Describe all cement additives associated with each cement type.

Superior Well Services - 15" hole for the 11 3/4 fresh water case, Class A Cement, 2% Calcium Chloride, 1/4# flake.

Superior Well Services - 11" hole for the 8 5/8 intermediate base, Class A Cement, 2% Calcium Chloride, 1/4# Super Flake, No Foam, Bentonite Super Flake

Baker Hughes - 7 7/8" hole for the 5 1/2 production case, Type 1 Cement, Fly Ash, Barite, Finetol 300L, R-3 Celio Flake, Sugar, CD-32, FL-62

23) Proposed borehole conditioning procedures.

Air Hole

15" hole for the 11 3/4 fresh water case - Circulate until clean with air. If soaping, slug then dry.

11" hole for the 8 5/8 intermediate base - Circulate until clean with air. If soaping, slug then dry.

7 7/8" hole for the 5 1/2 production case - Circulate with mud and sweeps for two times bottoms up.

If needed weight up mud until no cuttings retrieved, then circulate with mud and sweeps for two times bottoms up.

*Note: Attach additional sheets as needed.

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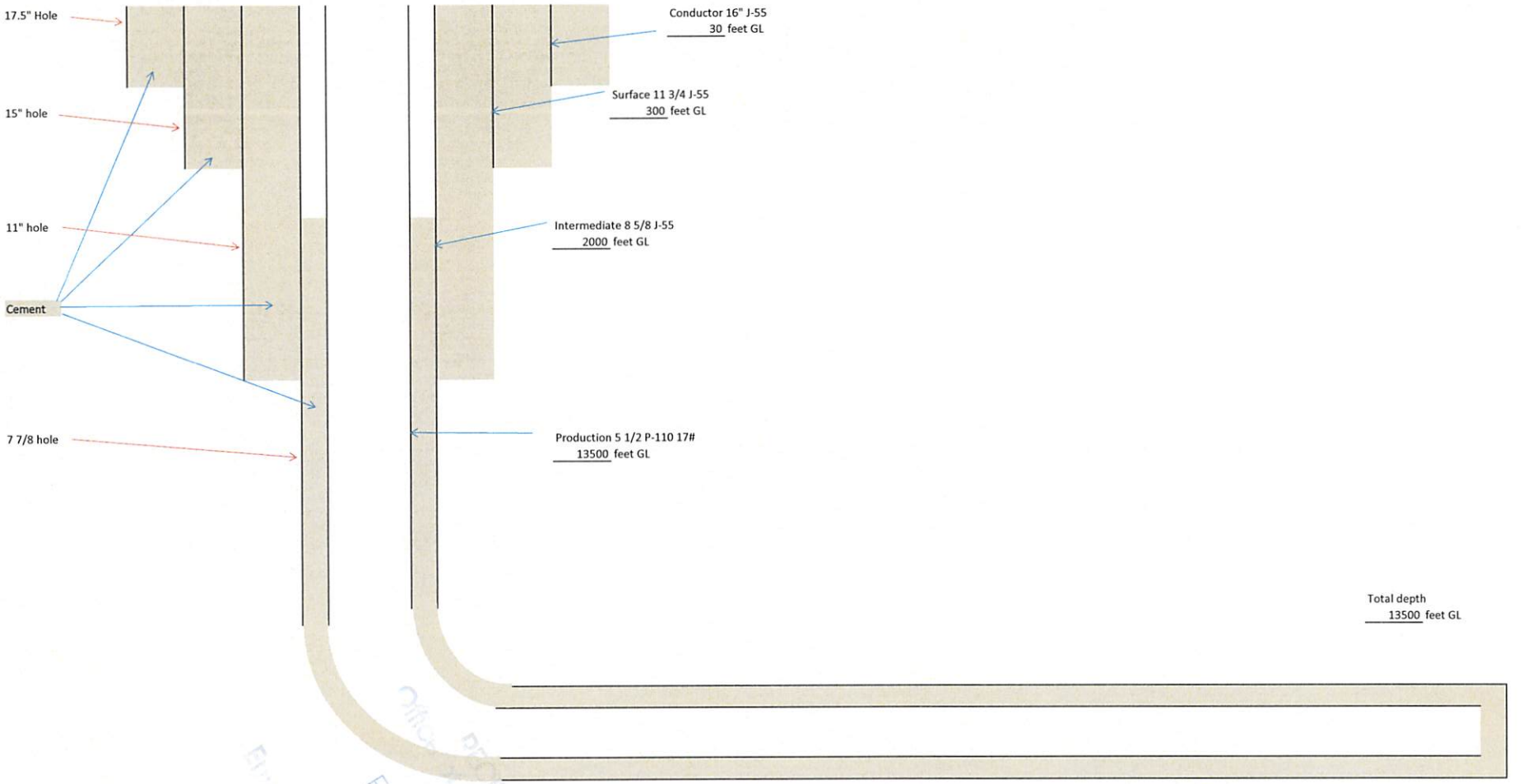
Jay-Bee Oil & Gas Inc.
Well Name W701-6 / Ketel Six
GL Elevation 805
KB 14 feet

Date 2/21/2013
District McElroy
County Tyler
State West Virginia

Input by: Shane Dowell



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WW-9
Rev. 1/12

API No. 47 - 095 - 02107
Operator's Well No. W701-6 / Ketel Six

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

CONSTRUCTION AND RECLAMATION PLAN AND SITE REGISTRATION APPLICATION FORM
GENERAL PERMIT FOR OIL AND GAS PIT WASTE DISCHARGE

Operator Name Jay-Bee Oil & Gas, Inc OP Code 24610

Watershed Indian Creek Quadrangle Centerpoint 7.5'

Elevation 805' County 095-Tyler District 02-McElroy

Description of anticipated Pit Waste: Drill Water and Various Formation Cuttings

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

Will a synthetic liner be used in the pit? Yes . If so, what mil.? 60Mil

Proposed Disposal Method For Treated Pit Wastes:

_____ Land Application
■ Underground Injection (UIC Permit Number 2d0857652, drilling fluid)
■ Reuse (at API Number other wells on same location)
_____ Off Site Disposal (Supply form WW-9 for disposal location)
_____ Other (Explain _____

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Brine Base Drilling Mud
-If oil based, what type? Synthetic, petroleum, etc. _____
Additives to be used? Bentonite 1302-78-9, Salt 7647-14-5, Soda Ash 497-19-8
Will closed loop system be used ? No Air Drilling/Yes on Marcellus (Centrifuge)
Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Remove to land fill
-If left in pit and plan to solidify what medium will be used? Cement, lime, and sawdust. Removed to landfill
-Landfill or offsite name/permit number? Waste Management Meadowfill/Permit 101219WV

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 _____

Company Official (Typed Name) Shane Dowell

Company Official Title Office Manager

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Subscribed and sworn before me this 19th day of February, 2013

Danielle L. Butler Notary Public

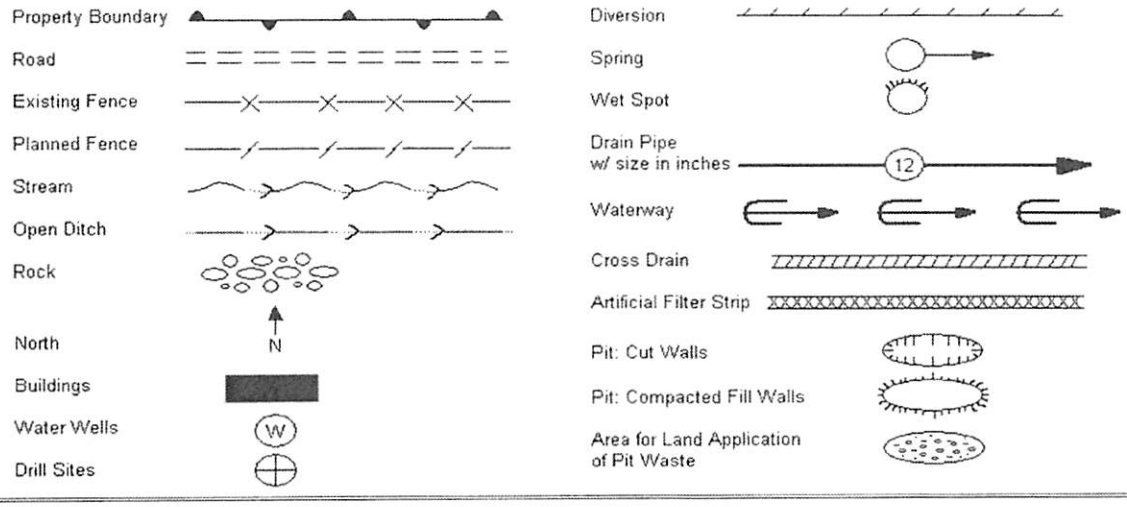
My commission expires October 23, 2020

OFFICIAL SEAL
Danielle L. Butler
Notary Public
State of West Virginia
My Commission Expires
October 23, 2020
126 Ash Tree Lane
St. Mary's, WV 26170

2-25-13

WW-9
Rev. 1/12

API No. 47 - 095 - 02107
Operator's Well No. W701-6 / Ketel Six



Proposed Revegetation Treatment: Acres Disturbed 2.75 Acres Prevegetation pH _____

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer (10-20-20 or equivalent) 1/3 ton lbs/acre (500 lbs minimum)

Mulch hay/2 Tons/acre

Seed Mixtures

Area I		Area II	
Seed Type	lbs/acre	Seed Type	lbs/acre
KY-31	40	Orchard Grass	15
Alsike Clover	5	Alsike Clover	5
Annual Rye Grass	15		

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: OOG Inspector Date: 2-25-13

Field Reviewed? (X) Yes ( ) No

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9502107

JAY –BEE OIL & GAS INC
3570 SHIELDS HILL RD
CAIRO, WV 26337
OFFICE (304) 628-3111
FAX (304) 628-3107

WELL SITE DRILLING PROCEDURES AND SITE SAFETY PLAN
Per 35CSR8/§22-6A
(Any changes or modifications to previously approved plans must be approved by the West Virginia Department of Environmental Protection - Office of Oil and Gas)

A copy of this plan will be provided to the local emergency planning committee or county emergency services offices at least 7 days prior to land disturbance from well work.

SITING STANDARDS

Well Name	W701-6/ Ketel Six
Well Pad	Ketel Pad
Latitude/Longitude	NAD83- Lat. 39.4386856683933 Long. -80.72090966428
Location of Access Road	7.6 miles east on County Route 13, Indian Creek Road, on right side of County Route 13, Indian Creek.
Detail of Actual Well Work	Drill and Stimulate a New Horizontal Well.
Detail of Completion and Production Activities	**Fracturing/ Stimulating Methods** 300-350' per stage 8,500bbls of water, 150,000 – 400,000lbs of sand, friction reducer, 1# per gallon, scale inhibitor, and bacteria prevention ¼# per gallon 2000 gallons 15% vol acid.
Directions to Well	Starting from West Union, WV travel west on State Route 18 for 18.8 miles, Turn right onto County Route 13, Indian Creek Road for 7.6 miles to a Jay-Bee Oil & Gas Lease Road on the right of County Route 13.
Prevailing Wind Direction	South/ South West

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Water Management Plan:
Secondary Water Sources

WMP-01102 | API/ID Number 047-095-02107 | Operator: Jay-Bee Oil & Gas, Inc.

W701-6 / Ketel Six

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Multi-site impoundment

Source ID: 14157 Source Name: W701 Fresh Water Centralized Impoundment

Source start date: 8/1/2013

Source end date: 8/1/2014

Source Lat: 39.438678 Source Long: -80.720864 County: Tyler

Max. Daily Purchase (gal):

Total Volume from Source (gal): 5,000,000

DEP Comments:

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted.

Reference: WMP-577

APPROVED APR 2 2 2013

Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

Recycled Frac Water

Source ID: 14158 Source Name McIntyre; Ash; Schulberg; Horner; T1213

Source start date: 8/1/2013

Source end date: 8/1/2014

Source Lat: Source Long: County

Max. Daily Purchase (gal) Total Volume from Source (gal): 210,000

DEP Comments:

9502107 ✓spotted

Form WW-9

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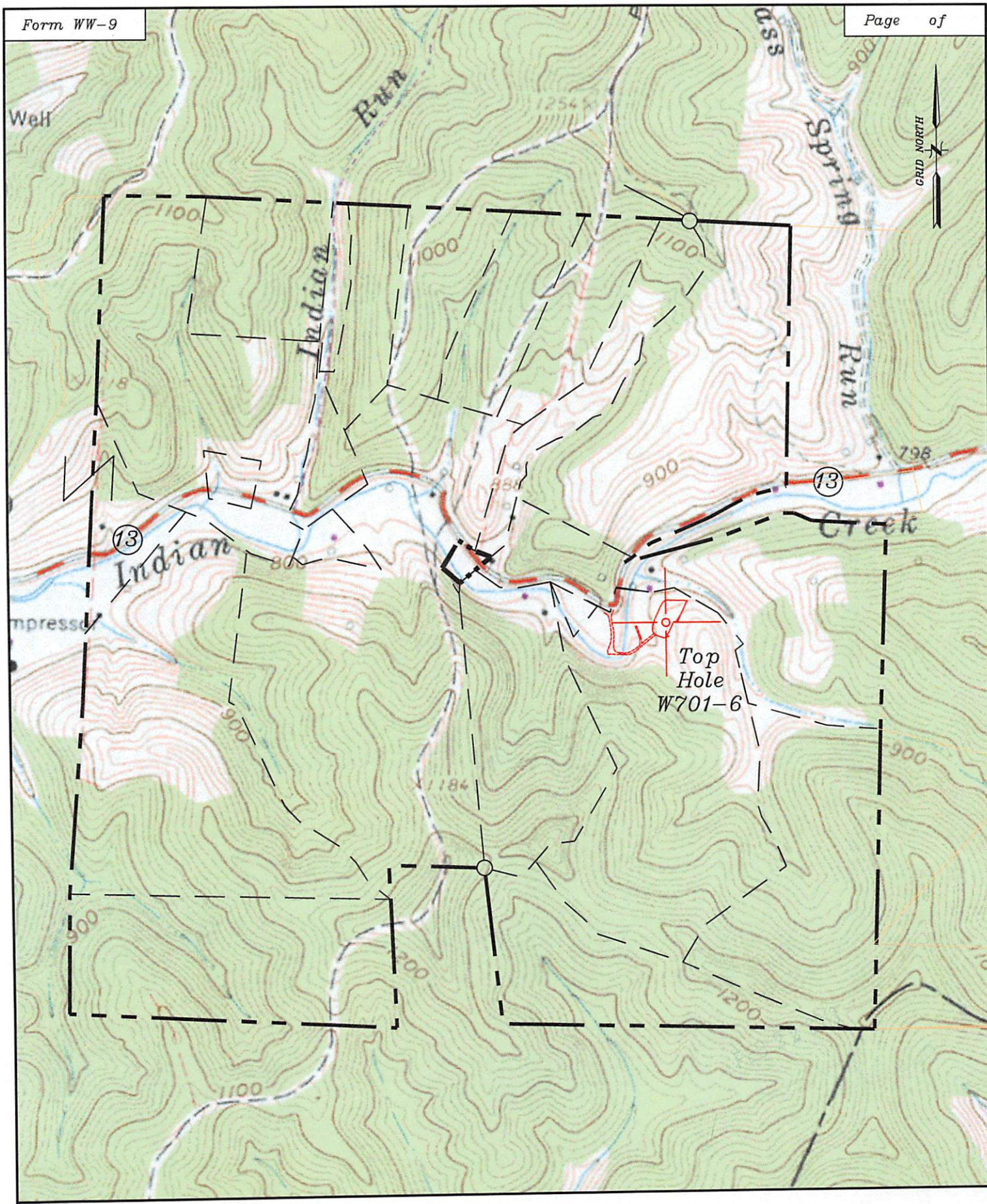
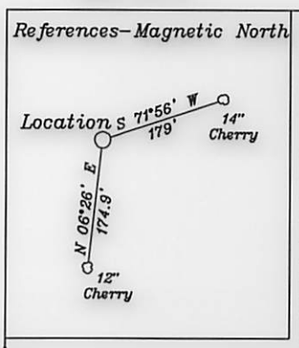


Well: W701-6
Quad: Center Point 7 1/2'
District: McElroy
County: Tyler

0 500' 1,000' 2,000'
Scale: 1"=1,000'

FORM WW-6

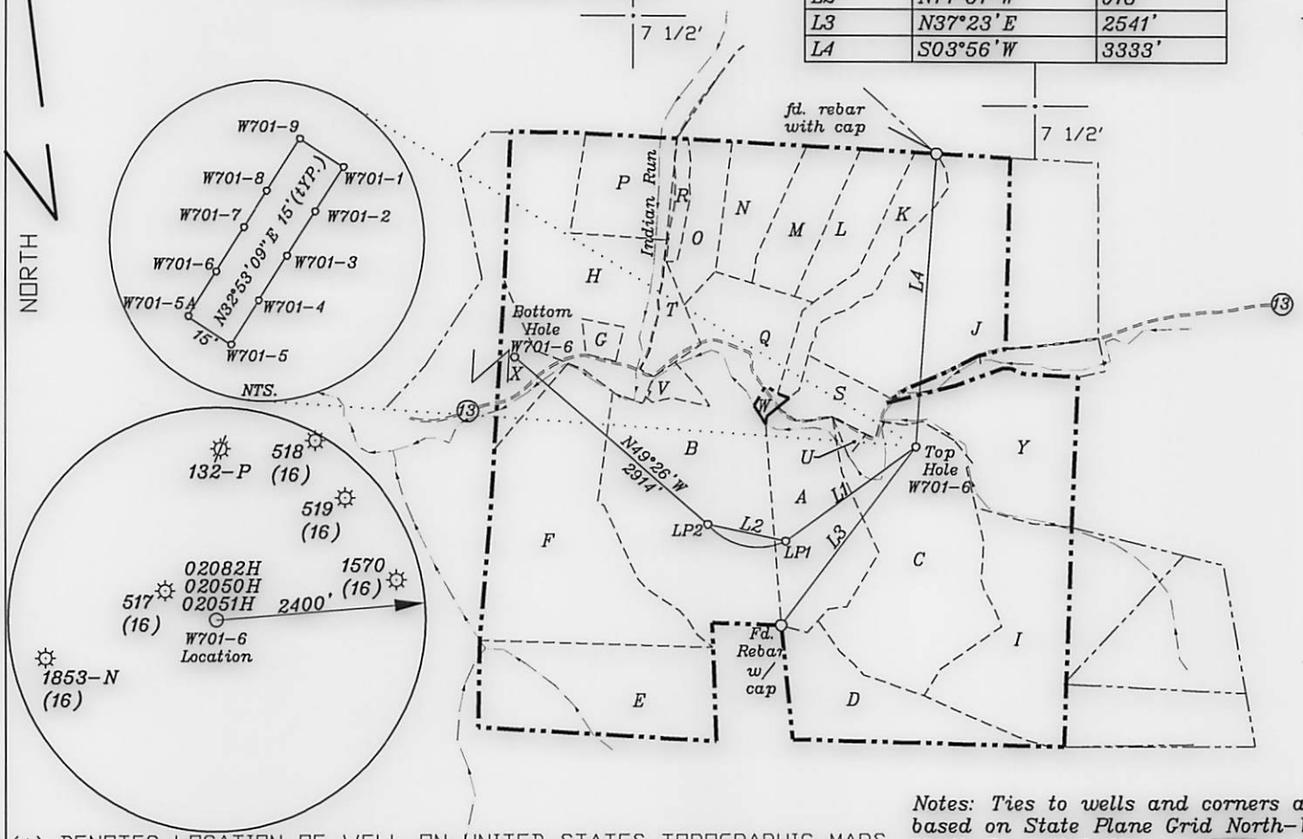


A– Stevens TM. 12/35 45 Ac.
B– Lancaster TM. 12/37 115.81 Ac.
C– Stevens TM. 12/34 98.38 Ac.
D– Walters TM. 12/33 50 Ac.
E– Coastal Lumber Inc. TM. 12/39 97.57 Ac.
F– Higginbotham TM. 12/38 111.09 Ac.
G– B Doak TM. 12/10.1 3.812 Ac.
H– Doak TM. 12/10 93.3 Ac.
I– Stevens p/o TM. 12/29 127.84 Ac.
J– Rover TM. 12/20 80 Ac.
K– White TM. 12/16 21.7 Ac.
L– Walters TM. 12/15 20.5 Ac.
M– Walters TM. 12/14.1 23.02 Ac.
N– Walters TM. 12/14 23.4 Ac.
O– Doak TM. 12/13 25.088 Ac.
P– Braucher TM. 12/11 30 Ac.
Q– Walters TM. 12/17 30.02 Ac.
R– Braucher TM. 12/13.1 4.912 Ac.
S– White TM. 12/19 14.75 Ac.
T– D. Doak TM. 12/10.2 9.158 Ac.
U– Walters TM. 12/34.1 1.64 Ac.
V– R.Lancaster TM. 12/37.1 4.19 Ac.
W– White TM. 12/18 1.42 Ac.
X– Robinson p/o TM. 12/9 63.51 Ac.
Y – Stevens p/o TM 12/30 95.7 Ac.

Top Hole 3,698'
Bottom Hole 8,298'
LATITUDE 39–27–30 N
LONGITUDE 80–42–30 N
Bottom Hole 6,114'
Top Hole 7,135'

Top Hole
NAD 27–39.438609 N, 80.721087 W
UTM NAD83(meters)–4365497.6 N. 524016.9 E
State Plane NAD 27–344204.5 N, 1655131.9 E
LP1–Landing Point 1
NAD 27–39.435629 N, 80.726306 W
UTM NAD83(meters)–4365165.5 N. 523568.7 E
State Plane NAD 27–343139 N, 1653643 E
LP2–Landing Point 2
NAD 27–39.436122 N, 80.729492 W
UTM NAD83(meters)–4365219.4 N. 523294.3 E
State Plane NAD 27–343331 N, 1652746 E
Bottom Hole
NAD 27–39.441240 N, 80.737420 W
UTM NAD83(meters)–4365785.3 N. 522610.4 E
State Plane NAD 27–345226 N, 1650532 E

NUMBER	DIRECTION	DISTANCE
L1	S54°25'W	1831'
L2	N77°57'W	918'
L3	N37°23'E	2541'
L4	S03°56'W	3333'



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

Notes: Ties to wells and corners are based on State Plane Grid North–WV North Zone NAD 27.

FILE NO.
DRAWING NO. 1
SCALE 1" = 2000'
MINIMUM DEGREE OF ACCURACY 1 in 200
PROVEN SOURCE OF ELEVATION GPS submeter 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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

(SIGNED) David L Jackson
R.P.E. _____ P.L.S. 708

DAVID JACKSON LICENSED No. 708 STATE OF WEST VIRGINIA PROFESSIONAL SURVEYOR

STATE OF WEST VIRGINIA
Division of Environmental Protection
OFFICE OF OIL AND GAS

DATE June 20, 2013
OPERATOR'S WELL NO. W701-6
API WELL NO.
47 — 095 — 2107 H6A
STATE COUNTY PERMIT

WELL TYPE: OIL__ GAS X LIQUID INJECTION__ WASTE DISPOSAL__
(IF "GAS") PRODUCTION X STORAGE__ DEEP__ SHALLOW X
LOCATION: ELEVATION 805' WATER SHED Indian Creek
DISTRICT McElroy COUNTY Tyler
QUADRANGLE Center Point 7 1/2'
SURFACE OWNER Phyllis Kay Stevens et al ACREAGE 98.38 ac.
OIL & GAS ROYALTY OWNER Mary Welch – 98.38 Ac.± & 45 Ac.±, Church of Christ of Alvy – 115.81 Ac.±, Eugene Conger et al – 111.09 Ac.±, & 63.51 Ac.±
LEASE NO. W701P3 (TM 12/34), W701P2 (TM 12/35), T3011B (TM 12/37), T3014 (TM. 12/38, 12/9)
PROPOSED WORK: DRILL X CONVERT__ DRILL DEEPER__ REDRILL__ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION__ PERFORATE NEW FORMATION X OTHER PHYSICAL CHANGE IN WELL (SPECIFY)__
PLUG AND ABANDON__ CLEAN OUT AND REPLUG__
TARGET FORMATION Marcellus ESTIMATED DEPTH TVD = 7250' + horizontal leg; TMD = 13,500'
WELL OPERATOR Jay Bee Oil & Gas, Inc. DESIGNATED AGENT Randy Broda
ADDRESS 1720 Rt. 22, East Union, NJ 07083 ADDRESS Route 1, Box 5, Cairo, WV 26337