

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 24, 2013

WELL WORK PERMIT

Rework/Horizontal 6A Well

This permit, API Well Number: 47-9703792, issued to CNX GAS COMPANY LLC , is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

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

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

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

James Marti

Chief

Operator's Well No: ALT8CHS

Farm Name: WOODY, D. J., ET AL

API Well Number: 47-9703792

Permit Type: Rework/Horizontal 6A Well

Date Issued: 07/24/2013

Promoting a healthy environment.

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. <u>Failure to adhere to the specified permit</u> 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.

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

<u>vv.</u>	VA. CODE §22-0A - WEI	L WORK PERM	II AFFLIC	ATTON	-10
			47	04	206
1) Well Operator: CNX	Gas Company LLC	494458046	Upshur	Washington	Alton
Control of the second		Operator ID	County	District	Quadrangle
2) Operator's Well Num	ber: ALT8CHS Drill Deeper - API	# 47-097-3792	Well Pad Nai	ne: ALT8HS	
3 Elevation, current gro	ound: 2460' E	Elevation, proposed	l post-constru	ction:	2460'
4) Well Type: (a) Gas Other					
(b) If Ga	S: Shallow Horizontal	Deep		5	
5) Existing Pad? Yes or	No: Yes				
	nation(s), Depth(s), Anticipa Thickness - 95', Pressure - 2500#	ated Thicknesses ar	nd Associated	l Pressure(s):	
7) Proposed Total Vertic					
8) Formation at Total Vo	The state of the s				
Proposed Total Meas	ured Depth: 17085				
Approximate Fresh	A 1984 - 1 - 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	None Reported			
 Method to Determin 	e Fresh Water Depth:	Offset Well (API# 47-097-01	(608)		
12) Approximate Saltwa	ter Depths: None Anticipate	ed			
Approximate Coal S	eam Depths: 105', 305'				
14) Approximate Depth	to Possible Void (coal mine	e, karst, other):	None Anticipa	ted	
15) Does land contain co	oal seams tributary or adjace	ent to, active mine?	No		
16) Describe proposed v	vell work: Drill and stimulate	new horizontal Marcellus we	ell. Well to be drilled	to a TMD of 17085'.	Well to be drilled to a
TVD of 7490', formation at TVD -	Marcellus. If an unexpected void is encoun				
approved Class A type cement.					
17) D 11 C	at the state of the state of				
	stimulating methods in detail		. In the work was the		
utilized on each stage using sand	ages divided over the lateral length of the we	ell. Stage spacing is depender	nt upon engineering o	lesign. Slickwater frac	turing technique will be
utilized on each stage using sand	i, water, and chemicals."				
				(3)	()
18) Total area to be distu	irbed, including roads, stock	cpile area, pits, etc,	(acres):	10 Acres	100
				9	-92
19) Area to be disturbed	for well pad only, less acce	ss road (acres):	10 Acres	F	

10

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	20"	N	L.S.	81.3#	40'	40'	CTS w/ 250sks Class A type cement
Fresh Water	13 3/8	Ν	J-55	54.5#	670'	670'	CTS w/ 440sks Class A Type Cement
Coal							
Intermediate	9 5/8	N	J-55	36#	2000'	2000'	CTS w/ approved Class A Type Cement
Production	5 1/2	N	P-110	20#	17085'	17085'	2200 cu. ft. w/ 50/50 POZ Lead & Class A Tail
Tubing	2 3/8	N	J-55	4.7#	7250'	7250'	
Liners							

Bill Natheld 3/26/13

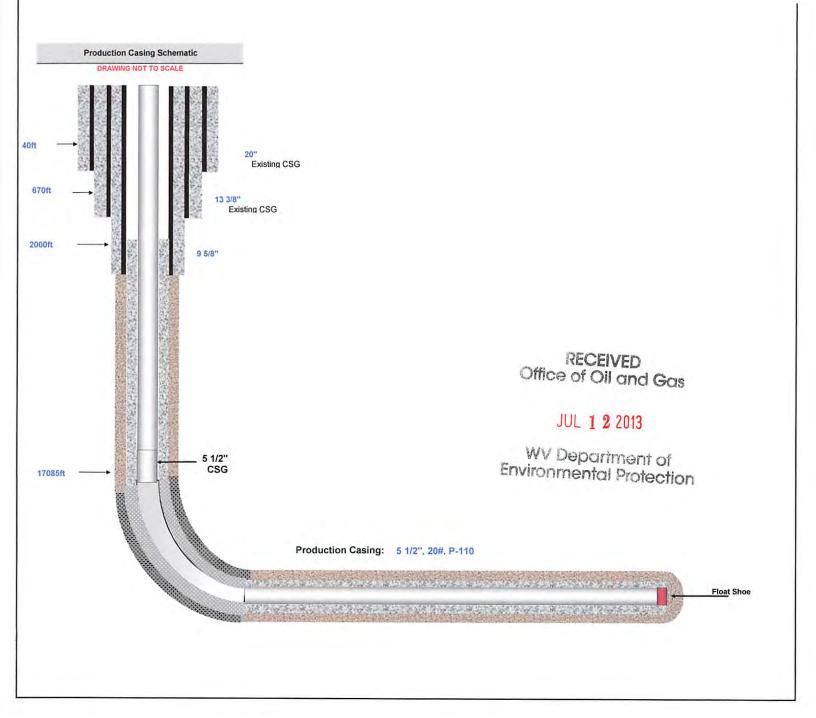
TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield
Conductor	20"	26"	0.438	2110	Class A Type	1.18
Fresh Water	13 3/8"	17 1/2"	0.380	2730	Class A Type	1.39
Coal						
Intermediate	9 5/8"	12 3/8"	0.352	3520	Class A Type	1.18
Production	5 1/2"	8 3/4" & 8 1/2"	0.361	12640	Class A Type	1.26
Tubing	2 3/8"	8 3/4" & 8 1/2"	0.190	7700		
Liners					- 3	636

PACKERS

Kind:	None		7
Sizes:	None		
Depths Set:	None	1/12 = =	40



ALT-8C-HS Casing Schematic



1) Describe centralizer placement for each casing string.	Conductor - No centralizers used. Fresh Water &
Coal - Bow spring centralizers on first joint then every fourth	joint to 100 feet from surface. Intermediate - Bow spring
centralizers one on the first two joints and every forth joint u	ntil inside surface casing. Production - Rigid bow spring
centralizer on first joint then every 2 casing joints (free floating	ng) through the lateral and the curve.
(Note: cementing the 5 1/2" casing completely in open hole	lateral and curve.)
2) Describe all cement additives associated with each cen	
Fresh Water/Coal - 2% CaCl2. Intermediate - 2% CaCl2. Pro	oduction - 2.6% Cement extender, 0.7% Fluid loss additive
0.5% High Temperature Retarder, 0.2% Friction Reducer	
	nductor - The hole is drilled w/ air and casing ran in air.
(3) Proposed borehole conditioning procedures. Co Apart from insuring the hole is clean via air circulation at TD, the	
Apart from insuring the hole is clean via air circulation at TD, the The hole is drilled w/ air and casing is ran in air. Once casing	ere are no other conditioning procedures. Fresh Water/Coat - ng is on bottom, the casing shoe will be cleared with fresh
Apart from insuring the hole is clean via air circulation at TD, the The hole is drilled w/ air and casing is ran in air. Once casing water and gel prior to cementing. Intermediate - The hole is	ere are no other conditioning procedures. Fresh Water/Coat - ng is on bottom, the casing shoe will be cleared with fresh s drilled w/ air and casing is ran in air. Once casing is on
Apart from insuring the hole is clean via air circulation at TD, the The hole is drilled w/ air and casing is ran in air. Once casin water and gel prior to cementing. Intermediate - The hole is bottom, the casing shoe will be cleared with fresh water and	ere are no other conditioning procedures. Fresh Water/Coat - ng is on bottom, the casing shoe will be cleared with fresh s drilled w/ air and casing is ran in air. Once casing is on gel prior to cementing. (Note: Drilling soap may be utilized
Apart from insuring the hole is clean via air circulation at TD, the The hole is drilled w/ air and casing is ran in air. Once casing water and gel prior to cementing. Intermediate - The hole is	ere are no other conditioning procedures. Fresh Water/Coat - ng is on bottom, the casing shoe will be cleared with fresh s drilled w/ air and casing is ran in air. Once casing is on gel prior to cementing. (Note: Drilling soap may be utilized
Apart from insuring the hole is clean via air circulation at TD, the The hole is drilled w/ air and casing is ran in air. Once casin water and gel prior to cementing. Intermediate - The hole is bottom, the casing shoe will be cleared with fresh water and	ere are no other conditioning procedures. Fresh Water/Coat - ng is on bottom, the casing shoe will be cleared with fresh s drilled w/ air and casing is ran in air. Once casing is on gel prior to cementing. (Note: Drilling soap may be utilized with the exception of the conductor). Production - The hole

*Note: Attach additional sheets as needed.

Cement Additives

- Conductor 2% CaCl2
- Freshwater/Coal 2% CaCl2
- Intermediate 2% CaCl2
- Production
 - o 2.6% Cement extender
 - o 0.7% Fluid Loss Additive
 - o 0.5% High Temperature Retarder
 - o 0.2% Friction Reducer



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 CNX Gas Company LLC		OP Code	494458046
Watershed_Panther Creek	Quad	rangle Alton	
Elevation 2,459.5'	County Upshur	District_	Washington
Description of anticipated Pit Waste: Water			
Do you anticipate using more than 5,000 b	bls of water to complete the p	roposed well work?	Yes X No
Will a synthetic liner be used in the pit?	Yes If so, who	at mil.? 60 mil	
Reuse (at API N	on ijection (UIC Permit Number	sposal location)	
Drilling medium anticipated for this well? -If oil based, what type? Syntheti Additives to be used? Bactericide, Polymers	ic, petroleum, etc. N/A	,_ Air and water based mu	nq
Will closed loop system be used ? No			
Drill cuttings disposal method? Leave in p -If left in pit and plan to solidify v -Landfill or offsite name/permit no	what medium will be used? C	ement, lime, N/A	îll
on August 1, 2005, by the Office of Oil an provisions of the permit are enforceable by or regulation can lead to enforcement actio	nd Gas of the West Virginia D y law. Violations of any term on. hat I have personally examin to and that, based on my inquation is true, accurate, and corresponding to the possibility of fine or imprisor	pepartment of Environment or condition of the general and am familiar value of those individual complete. I am aware nament.	neral permit and/or other applicable law with the information submitted on this s immediately responsible for obtaining
Subscribed and sworn before me this 19			20_13_
Helly Q. My commission expires Septem	<u>loldy</u> Joer 18, 2018	Notai	NOTARY PUBLIC OFFICIAL SEAL STATE OF WEST VIRGINIA KELLY A. EDDY RT 2 BOX 225A JANE LEW, WV 26378 MY COMMISSION EXPIRES SEPT. 18, 2018

Road	=====	=====	Spring	\bigcirc
Existing Fence	xx	-xx-	Wet Spot	Since of
Planned Fence	//-	-//-	Drain Pipe w/ size in inches —————	
Stream	~>~>	~~		12
Open Ditch	>>		Waterway	· — —
Rock	ರೈಲ್ಟಿಲ್ಲಿ		Cross Drain ZZZZZ	111111111111111111111111111111111111111
34-35	† N		Artificial Filter Strip XXXXX	XXXXXXXXXXXXXXXXXXX
North	N		Pit: Cut Walls	ELL TIME
Buildings			Pit: Compacted Fill Walls	Mary Mary
Water Wells	w		Area for Land Application of Pit Waste	
Drill Sites	\oplus		OI FIL VVASLE	
Lime according to ph	test Tons/acre or t	to correct to pH	7.0	on pH6.5
Fertilizer (10-20-20	or equivalent)	1bs/acre	e (500 lbs minimum)	
MulchHay or	Straw	2 Tons/acre		
		Seed M	lixtures	
A	and I			1
Are Seed Type	ea I lbs/acre		Seed Type	Area II lbs/acre
			Seed Type Orchard Grass	lbs/acre
Seed Type Orchard Grass	lbs/acre 25	· · ·	Orchard Grass	lbs/acre 25
Seed Type Orchard Grass Birdsfoot Trefoil	lbs/acre 25 15		Orchard Grass Birdsfoot Trefoi	lbs/acre 25
Seed Type Orchard Grass	lbs/acre 25		Orchard Grass	lbs/acre 25
Seed Type Orchard Grass Birdsfoot Trefoil Ladino Clover h: ing(s) of road, location, copied section of involved	lbs/acre 25 15 10 pit and proposed ar ved 7.5' topographic		Orchard Grass Birdsfoot Trefoil Ladino Clover	1bs/acre 25 1 15
Seed Type Orchard Grass Birdsfoot Trefoil Ladino Clover h: ing(s) of road, location, copied section of involvent	lbs/acre 25 15 10 pit and proposed ar ved 7.5' topographic		Orchard Grass Birdsfoot Trefoil Ladino Clover	lbs/acre 25 1 15 10
Seed Type Orchard Grass Birdsfoot Trefoil Ladino Clover h: ing(s) of road, location, copied section of involved section of involved by: Approved by:	lbs/acre 25 15 10 pit and proposed ar ved 7.5' topographic	c sheet.	Orchard Grass Birdsfoot Trefoil Ladino Clover	1bs/acre 25 1 15

west virginia department of environmental protection



Water Management Plan: Primary Water Sources



WMP-01214

API/ID Number:

047-097-03792

Operator:

Consol Energy - WV

ALT8CHS

Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- •Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- •Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- •Minimum flows required by the Army Corps of Engineers; and
- · Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

DEP is aware that some intake points will be used for mutiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interepreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at DEP.water.use@wv.gov.

APPROVED JUN 0 6 2013

Source Summary

WMP-01214

API Number:

047-097-03792

Operator:

Consol Energy - WV

ALT8CHS

Stream/River

Buckhannon River @ Consol Energy Withdrawal Site Source

Owner:

Consol Energy

Start Date

End Date

Total Volume (gal)

Max. daily purchase (gal)

Intake Latitude: Intake Longitude:

5/1/2013

5/1/2014

10,105,200

38.803115

-80.206603

Regulated Stream?

Ref. Gauge ID:

3052120

Buckhannon River at Alton WV

Max. Pump rate (gpm):

1,470

Min. Gauge Reading (cfs):

33.78

Min. Passby (cfs)

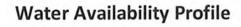
30.15

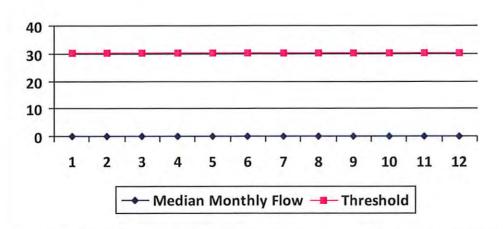
DEP Comments:

Source Detail

	WMP-012	14		API/ID Number:	047-097-03	3792	Operator:	Consol En	ergy - WV
					ALT8CHS				
ource ID:	17804 Source	Name	Buckhanr Consol Er		nsol Energy With	drawal Site		Latitude.	303115
□ Endang ☑ Trout S □ Regulat □ Proxima	UC-8 Code: rainage Area (sq. gered Species? Stream? ted Stream? ate PSD? d Stream?	□ мі	93.62 ussel Stream r 3?	County:	Upshur	Anticipa		al end date: Source (gal):	
	erence Gaug inage Area (sq. m	30521 ni.)	120 Bu 94.70	uckhannon Rive	er at Alton WV		Gauge Th	reshold (cfs):	30.5

Month	Median monthly flow (cfs)	Threshold (+ pump	Estimated Available water (cfs)
1	0.00	33.43	-
2	0.00	33.43	
3	0.00	33.43	1.5
4	0.00	33.43	10.0
5	0.00	33.43	
6	0.00	33.43	
7	0.00	33.43	66
8	0.00	33.43	1.0
9	0.00	33.43	
10	0.00	33.43	1.5
11	0.00	33.43	
12	0.00	33.43	-





Water Availability Assessment of Location

Min. Gauge Reading (cfs): Passby at Location (cfs):	33.78 30.15
Ungauged Stream Safety (cfs):	0.00
Headwater Safety (cfs):	0.00
Pump rate (cfs):	3.28
Downstream Demand (cfs):	0.00
Upstream Demand (cfs):	0.00
Base Threshold (cfs):	30.15

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

west virginia department of environmental protection



Water Management Plan: Secondary Water Sources



WMP-01214

API/ID Number

047-097-03792

Operator:

Consol Energy - WV

ALT8CHS

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: 17805 Source Name Alton 1 Freshwater Impoundment

Source start date: 5/1/2013

Source end date: 5/1/2014

Source Lat: 38.794961 Source Long: -80.184542 County Upshur

Max. Daily Purchase (gal) Total Volume from Source (gal): 10,105,200

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-194

WMP-01214 API/ID Number 047-097-03792 Operator: Consol Energy - WV

ALT8CHS

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.

Source ID: 17806 Source Name Alton 2 Freshwater Impoundment Source start date: 5/1/2013

Source end date: 5/1/2014

Source Lat: 38.806146 Source Long: -80.195108 County Upshur

Max. Daily Purchase (gal)

Total Volume from Source (gal): 10,105,200

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-195

Recycled Frac Water

Source ID: 17807 Source Name Various Source start date: 5/1/2013

Source end date: 5/1/2014

Source Lat: Source Long: County

Max. Daily Purchase (gal)

Total Volume from Source (gal): 10,105,200

DEP Comments:

97-3792

DEP33173 TRAIL 1608 2455 CNXALT8HS 1665 D100 × 2496 Run X 2462 1, 103904.680, 1810138.211, 2272.115, "n end pond" COORDINATE BASIS NAD27 WV N STATE PLANE CNX Gas Company LLC P. O. Box 1248 Jane Lew, WV 26378 PLAT SHOWING WATER PURVEYORS WITHIN 2,500 FEET OF THE ALT8HS PAD CENTER DISTRICT COUNTY STATE LAND SURVEYING SERVICES 21 Cedar Lane Bridgeport, WV 26330 304-842-2018 Upshur Washington WV DWG NO. DATE SCALE alt8wtrpur Oct. 22, 2012 1" = 733.33 ft.

