

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Wellbore Name ORIGINAL HOLE	Parent Wellbore ORIGINAL HOLE	Vertical Section Direction (°) 140.03
---------------------------------------	----------------------------------	--

Date	Point or Interval	Type	Top Depth (ftKB)	Depth Top (TVD) (ftKB)	Bottom Depth (ftKB)	Depth Bottom (TVD) (ftKB)	Length (ft)
7/24/2014		Kick Off					

Date	Definitive?	Description	Proposed?
1/15/2014	No	ORIGINAL	No

MD Tie In (ftKB)	TVD Tie In (ftKB)	Inclination Tie In (°)	Azimuth Tie In (°)	NSTie In (ft)	EW Tie In (ft)
0.00	0.00	0.00	0.00	0.00	0.00

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/24/2014	26.00	0.00	38.61	26.00	0.00	0.00	0.00	0.00	0.00	148.50	0.00	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	100.00	0.38	38.61	100.00	-0.05	0.19	0.15	0.51	0.51	0.00	0.25	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	200.00	0.36	30.27	200.00	-0.22	0.72	0.52	0.06	-0.02	-8.34	0.89	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	300.00	0.33	36.15	300.00	-0.40	1.23	0.85	0.05	-0.03	5.88	1.49	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	400.00	0.44	55.90	399.99	-0.43	1.67	1.33	0.17	0.11	19.75	2.15	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	500.00	0.36	62.44	499.99	-0.32	2.03	1.93	0.09	-0.08	6.54	2.85	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	510.00	0.47	53.91	509.99	-0.31	2.07	1.99	1.26	1.10	-85.30	2.92	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	570.00	0.61	53.89	569.99	-0.27	2.41	2.45	0.23	0.23	-0.03	3.49	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	671.00	0.79	48.69	670.98	-0.25	3.18	3.41	0.19	0.18	-5.15	4.72	GYRO MS	GYRODATA SERVICES CANADA INC.
7/24/2014	719.00	0.97	68.51	718.97	-0.13	3.55	4.03	0.73	0.38	41.29	5.45	MWD	BAKER HUGHES INTEQ
7/24/2014	813.00	0.96	307.68	812.97	-0.65	4.32	4.15	1.79	-0.01	254.44	6.23	MWD	BAKER HUGHES INTEQ
7/24/2014	909.00	3.86	291.07	908.87	-4.26	5.98	0.50	3.08	3.02	-17.30	10.24	MWD	BAKER HUGHES INTEQ
7/24/2014	1,005.00	6.31	289.26	1,004.49	-11.62	8.88	-7.50	2.56	2.55	-1.89	18.74	MWD	BAKER HUGHES INTEQ
7/24/2014	1,101.00	6.85	278.56	1,099.86	-20.45	11.47	-18.14	1.39	0.56	-11.15	29.70	MWD	BAKER HUGHES INTEQ
7/25/2014	1,196.00	6.39	258.20	1,194.24	-27.19	11.23	-28.92	2.50	-0.48	-21.43	40.48	MWD	BAKER HUGHES INTEQ
7/25/2014	1,292.00	5.17	244.63	1,289.75	-30.80	8.29	-38.06	1.90	-1.27	-14.14	50.08	MWD	BAKER HUGHES INTEQ
7/25/2014	1,387.00	4.80	227.53	1,384.40	-31.71	3.77	-44.86	1.61	-0.39	-18.00	58.24	MWD	BAKER HUGHES INTEQ

SEP 18 2017

RECEIVED
Office of Oil and Gas



Directional Survey

SEP 18 2017

Well Name: PENS2AHS

WV Department of
Environmental Protection

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data													
Date	MD (ftKB)	Inc (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/25/2014	1,483.00	3.67	218.38	1,480.14	-30.91	-1.35	-49.73	1.37	-1.18	-9.53	65.31	MWD	BAKER HUGHES INTEQ
7/25/2014	1,578.00	2.71	207.52	1,574.99	-29.44	-5.73	-52.65	1.19	-1.01	-11.43	70.58	MWD	BAKER HUGHES INTEQ
7/25/2014	1,674.00	2.58	200.95	1,670.89	-27.52	-9.76	-54.48	0.34	-0.14	-6.84	75.00	MWD	BAKER HUGHES INTEQ
7/25/2014	1,769.00	3.17	193.01	1,765.77	-24.90	-14.31	-55.83	0.75	0.62	-8.36	79.75	MWD	BAKER HUGHES INTEQ
7/25/2014	1,865.00	1.62	191.43	1,861.68	-22.45	-18.23	-56.70	1.62	-1.61	-1.65	83.76	MWD	BAKER HUGHES INTEQ
7/25/2014	1,960.00	0.68	115.03	1,956.66	-21.10	-19.78	-56.45	1.69	-0.99	-80.42	85.34	MWD	BAKER HUGHES INTEQ
7/25/2014	2,055.00	0.51	47.87	2,051.66	-20.61	-19.74	-55.63	0.71	-0.18	-70.69	86.16	MWD	BAKER HUGHES INTEQ
7/25/2014	2,150.00	0.90	28.52	2,146.65	-20.90	-18.80	-54.96	0.48	0.41	-20.37	87.32	MWD	BAKER HUGHES INTEQ
7/26/2014	2,246.00	0.63	52.15	2,242.64	-21.15	-17.81	-54.18	0.43	-0.28	24.61	88.57	MWD	BAKER HUGHES INTEQ
7/26/2014	2,342.00	0.91	196.14	2,338.64	-20.71	-18.22	-53.98	1.53	0.29	149.99	89.03	MWD	BAKER HUGHES INTEQ
7/26/2014	2,438.00	0.41	175.17	2,434.63	-20.00	-19.30	-54.16	0.57	-0.52	-21.84	90.12	MWD	BAKER HUGHES INTEQ
7/26/2014	2,531.00	0.81	209.02	2,527.63	-19.50	-20.20	-54.45	0.56	0.43	36.40	91.07	MWD	BAKER HUGHES INTEQ
7/26/2014	2,627.00	0.28	336.50	2,623.63	-19.48	-20.58	-54.87	1.05	-0.55	132.79	91.64	MWD	BAKER HUGHES INTEQ
7/26/2014	2,722.00	0.33	41.76	2,718.63	-19.74	-20.16	-54.78	0.35	0.05	-310.25	92.06	MWD	BAKER HUGHES INTEQ
7/26/2014	2,817.00	0.41	8.61	2,813.62	-20.00	-19.62	-54.55	0.24	0.08	-34.89	92.65	MWD	BAKER HUGHES INTEQ
7/27/2014	2,913.00	0.55	5.93	2,909.62	-20.55	-18.83	-54.45	0.15	0.15	-2.79	93.46	MWD	BAKER HUGHES INTEQ
7/27/2014	3,009.00	0.74	354.53	3,005.61	-21.38	-17.75	-54.46	0.24	0.20	363.13	94.53	MWD	BAKER HUGHES INTEQ
7/27/2014	3,104.00	0.37	348.83	3,100.61	-22.16	-16.84	-54.58	0.39	-0.39	-6.00	95.45	MWD	BAKER HUGHES INTEQ
7/27/2014	3,200.00	0.63	4.06	3,196.61	-22.81	-16.01	-54.60	0.30	0.27	-359.14	96.28	MWD	BAKER HUGHES INTEQ
7/27/2014	3,296.00	0.91	329.31	3,292.60	-23.94	-14.83	-54.96	0.55	0.29	338.80	97.52	MWD	BAKER HUGHES INTEQ
7/27/2014	3,390.00	0.77	341.94	3,386.59	-25.26	-13.58	-55.53	0.25	-0.15	13.44	98.88	MWD	BAKER HUGHES INTEQ

SEP 18 2017

WV Department of
Environmental Protection



Directional Survey

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data													
Date	MD (ftKB)	Inc (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/28/2014	3,485.00	0.43	20.11	3,481.58	-26.03	-12.64	-55.61	0.53	-0.36	-338.77	99.83	MWD	BAKER HUGHES INTEQ
7/29/2014	3,581.00	1.02	16.42	3,577.57	-26.69	-11.49	-55.24	0.62	0.61	-3.84	101.04	MWD	BAKER HUGHES INTEQ
7/29/2014	3,677.00	0.39	244.41	3,673.57	-27.24	-10.81	-55.30	1.37	-0.66	237.49	101.72	MWD	BAKER HUGHES INTEQ
7/29/2014	3,772.00	0.78	236.36	3,768.56	-27.39	-11.30	-56.13	0.42	0.41	-8.47	102.69	MWD	BAKER HUGHES INTEQ
7/29/2014	3,868.00	1.25	208.54	3,864.55	-27.08	-12.59	-57.17	0.70	0.49	-28.98	104.35	MWD	BAKER HUGHES INTEQ
7/29/2014	3,964.00	2.14	211.84	3,960.51	-26.14	-15.03	-58.62	0.93	0.93	3.44	107.18	MWD	BAKER HUGHES INTEQ
7/29/2014	4,059.00	2.71	223.45	4,055.42	-25.33	-18.17	-61.10	0.79	0.60	12.22	111.18	MWD	BAKER HUGHES INTEQ
7/29/2014	4,154.00	4.95	234.71	4,150.21	-25.40	-22.16	-65.99	2.48	2.36	11.85	117.50	MWD	BAKER HUGHES INTEQ
7/29/2014	4,249.00	8.98	236.62	4,244.48	-26.59	-28.61	-75.53	4.25	4.24	2.01	129.02	MWD	BAKER HUGHES INTEQ
7/29/2014	4,345.00	12.86	240.35	4,338.73	-29.36	-38.03	-91.07	4.11	4.04	3.89	147.19	MWD	BAKER HUGHES INTEQ
7/30/2014	4,440.00	16.52	245.08	4,430.61	-34.77	-48.95	-112.52	4.05	3.85	4.98	171.26	MWD	BAKER HUGHES INTEQ
7/30/2014	4,535.00	19.27	245.68	4,521.01	-42.50	-61.10	-139.06	2.90	2.89	0.63	200.45	MWD	BAKER HUGHES INTEQ
7/30/2014	4,631.00	22.12	248.01	4,610.81	-52.36	-74.39	-170.26	3.09	2.97	2.43	234.36	MWD	BAKER HUGHES INTEQ
7/30/2014	4,726.00	24.38	248.90	4,698.09	-64.22	-88.15	-205.14	2.41	2.38	0.94	271.86	MWD	BAKER HUGHES INTEQ
7/30/2014	4,822.00	24.60	252.52	4,785.45	-78.27	-101.29	-242.69	1.58	0.23	3.77	311.64	MWD	BAKER HUGHES INTEQ
7/30/2014	4,917.00	23.63	254.63	4,872.16	-93.76	-112.27	-279.91	1.37	-1.02	2.22	350.44	MWD	BAKER HUGHES INTEQ
7/30/2014	5,013.00	26.92	249.40	4,958.97	-108.99	-125.02	-318.82	4.14	3.43	-5.45	391.39	MWD	BAKER HUGHES INTEQ
7/30/2014	5,108.00	31.09	245.89	5,042.04	-122.83	-142.62	-361.36	4.74	4.39	-3.69	437.43	MWD	BAKER HUGHES INTEQ
7/30/2014	5,204.00	35.86	242.10	5,122.11	-135.49	-165.92	-408.87	5.42	4.97	-3.95	490.34	MWD	BAKER HUGHES INTEQ
7/30/2014	5,300.00	41.97	239.96	5,196.77	-146.92	-195.17	-461.56	6.52	6.36	-2.23	550.61	MWD	BAKER HUGHES INTEQ
7/30/2014	5,395.00	46.71	235.37	5,264.71	-155.62	-230.75	-517.55	6.02	4.99	-4.83	616.95	MWD	BAKER HUGHES INTEQ

SEP 18 2017

WV Department of
Environmental Protection



Directional Survey

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/30/2014	5,426.00	46.88	231.27	5,285.94	-156.92	-244.25	-535.66	9.66	0.55	-13.23	639.53	MWD	BAKER HUGHES INTEQ
7/30/2014	5,559.00	51.31	241.83	5,373.15	-168.61	-299.24	-619.47	6.86	3.33	7.94	739.77	MWD	BAKER HUGHES INTEQ
7/30/2014	5,654.00	52.43	245.00	5,431.81	-185.92	-332.66	-686.28	2.88	1.18	3.34	814.48	MWD	BAKER HUGHES INTEQ
7/30/2014	5,749.00	52.47	239.16	5,489.74	-201.63	-367.90	-752.78	4.87	0.04	-6.15	889.74	MWD	BAKER HUGHES INTEQ
7/30/2014	5,845.00	52.54	241.71	5,548.18	-215.38	-405.47	-819.02	2.11	0.07	2.66	965.89	MWD	BAKER HUGHES INTEQ
7/30/2014	5,940.00	52.52	240.78	5,605.98	-230.05	-441.74	-885.12	0.78	-0.02	-0.98	1,041.29	MWD	BAKER HUGHES INTEQ
7/30/2014	6,036.00	51.52	239.85	5,665.06	-243.56	-479.21	-950.86	1.29	-1.04	-0.97	1,116.96	MWD	BAKER HUGHES INTEQ
7/30/2014	6,131.00	51.59	240.89	5,724.12	-256.92	-516.00	-	0.86	0.07	1.09	1,191.36	MWD	BAKER HUGHES INTEQ
7/30/2014	6,227.00	51.38	240.43	5,783.91	-270.77	-552.80	-	0.43	-0.22	-0.48	1,266.48	MWD	BAKER HUGHES INTEQ
7/30/2014	6,321.00	51.55	240.20	5,842.47	-283.90	-589.22	-	0.26	0.18	-0.24	1,340.00	MWD	BAKER HUGHES INTEQ
7/30/2014	6,417.00	51.45	238.08	5,902.23	-295.80	-627.75	-	1.73	-0.10	-2.21	1,415.13	MWD	BAKER HUGHES INTEQ
7/30/2014	6,512.00	53.23	236.09	5,960.28	-305.02	-668.62	-	2.50	1.87	-2.09	1,490.32	MWD	BAKER HUGHES INTEQ
7/30/2014	6,608.00	56.60	224.80	6,015.57	-305.42	-718.63	-	10.24	3.51	-11.76	1,568.66	MWD	BAKER HUGHES INTEQ
7/30/2014	6,703.00	62.81	215.92	6,063.54	-291.47	-781.14	-	10.38	6.54	-9.35	1,650.52	MWD	BAKER HUGHES INTEQ
7/30/2014	6,799.00	64.22	213.83	6,106.35	-269.00	-851.63	-	2.44	1.47	-2.18	1,736.44	MWD	BAKER HUGHES INTEQ
7/30/2014	6,894.00	68.21	208.77	6,144.68	-241.05	-925.90	-	6.43	4.20	-5.33	1,823.31	MWD	BAKER HUGHES INTEQ
7/30/2014	6,989.00	73.29	196.79	6,176.09	-199.96	-	-	13.04	5.35	-12.61	1,912.77	MWD	BAKER HUGHES INTEQ
7/30/2014	7,085.00	73.34	184.56	6,203.75	-141.78	-	-	12.20	0.05	-12.74	2,004.53	MWD	BAKER HUGHES INTEQ
7/30/2014	7,180.00	76.36	175.91	6,228.62	-71.79	-	-	9.34	3.18	-9.11	2,096.12	MWD	BAKER HUGHES INTEQ
7/30/2014	7,276.00	80.07	168.16	6,248.25	7.84	-	-	8.80	3.86	-8.07	2,190.00	MWD	BAKER HUGHES INTEQ
7/30/2014	7,371.00	81.85	158.63	6,263.21	93.87	-	-	10.08	1.87	-10.03	2,283.70	MWD	BAKER HUGHES INTEQ

SEP 18 2017

WV Department of
Environmental Protection

WellView

Directional Survey

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data													
Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/30/2014	7,466.00	84.36	148.39	6,274.65	185.45	-1,457.23	-1,449.81	11.02	2.64	-10.78	2,377.88	MWD	BAKER HUGHES INTEQ
7/30/2014	7,562.00	88.83	142.12	6,280.35	280.82	-1,535.91	-1,395.22	8.01	4.66	-6.53	2,473.64	MWD	BAKER HUGHES INTEQ
7/30/2014	7,657.00	90.49	140.42	6,280.92	375.79	-1,610.01	-1,335.79	2.50	1.75	-1.79	2,568.63	MWD	BAKER HUGHES INTEQ
7/30/2014	7,753.00	91.29	136.68	6,279.43	471.72	-1,681.94	-1,272.26	3.98	0.83	-3.90	2,664.60	MWD	BAKER HUGHES INTEQ
7/30/2014	7,849.00	90.49	134.75	6,277.93	567.43	-1,750.65	-1,205.24	2.18	-0.83	-2.01	2,760.58	MWD	BAKER HUGHES INTEQ
7/30/2014	7,944.00	89.05	132.36	6,278.32	661.82	-1,816.11	-1,136.40	2.94	-1.52	-2.52	2,855.57	MWD	BAKER HUGHES INTEQ
7/30/2014	8,040.00	89.20	137.51	6,279.78	757.40	-1,883.88	-1,068.48	5.37	0.16	5.36	2,951.53	MWD	BAKER HUGHES INTEQ
7/30/2014	8,135.00	89.63	139.59	6,280.75	852.35	-1,955.08	-1,005.60	2.24	0.45	2.19	3,046.52	MWD	BAKER HUGHES INTEQ
7/30/2014	8,231.00	89.75	141.14	6,281.27	948.35	-2,029.01	-944.36	1.62	0.13	1.61	3,142.51	MWD	BAKER HUGHES INTEQ
7/30/2014	8,327.00	90.86	137.47	6,280.76	1,044.32	-2,101.78	-881.78	3.99	1.16	-3.82	3,238.50	MWD	BAKER HUGHES INTEQ
7/30/2014	8,422.00	89.97	139.88	6,280.07	1,139.28	-2,173.11	-819.05	2.70	-0.94	2.54	3,333.48	MWD	BAKER HUGHES INTEQ
7/30/2014	8,518.00	89.88	146.19	6,280.20	1,235.10	-2,249.78	-761.36	6.57	-0.09	6.57	3,429.44	MWD	BAKER HUGHES INTEQ
7/30/2014	8,614.00	90.18	147.50	6,280.15	1,330.42	-2,330.15	-708.85	1.40	0.31	1.36	3,525.43	MWD	BAKER HUGHES INTEQ
7/30/2014	8,709.00	89.72	142.43	6,280.23	1,425.04	-2,407.91	-654.34	5.36	-0.48	-5.34	3,620.40	MWD	BAKER HUGHES INTEQ
7/30/2014	8,805.00	89.91	138.87	6,280.54	1,521.02	-2,482.13	-593.48	3.71	0.20	-3.71	3,716.39	MWD	BAKER HUGHES INTEQ
7/30/2014	8,901.00	89.94	139.45	6,280.67	1,617.01	-2,554.76	-530.70	0.60	0.03	0.60	3,812.39	MWD	BAKER HUGHES INTEQ
7/30/2014	8,997.00	89.38	136.61	6,281.24	1,712.94	-2,626.13	-466.51	3.02	-0.58	-2.96	3,908.37	MWD	BAKER HUGHES INTEQ
7/30/2014	9,092.00	89.11	137.00	6,282.49	1,807.78	-2,695.38	-401.49	0.50	-0.28	0.41	4,003.37	MWD	BAKER HUGHES INTEQ
7/30/2014	9,188.00	89.54	139.65	6,283.62	1,903.72	-2,767.07	-337.67	2.80	0.45	2.76	4,099.35	MWD	BAKER HUGHES INTEQ
7/30/2014	9,283.00	89.85	143.45	6,284.13	1,998.67	-2,841.46	-278.60	4.01	0.33	4.00	4,194.33	MWD	BAKER HUGHES INTEQ
7/30/2014	9,379.00	90.80	143.96	6,283.58	2,094.47	-2,918.83	-221.78	1.12	0.99	0.53	4,290.33	MWD	BAKER HUGHES INTEQ

SEP 18 2017

WV Department of
Environmental Protection

WellView

Directional Survey

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/30/2014	9,474.00	91.51	138.30	6,281.66	2,189.39	-2,992.75	-162.20	6.00	0.75	-5.96	4,385.27	MWD	BAKER HUGHES INTEQ
7/30/2014	9,569.00	89.42	133.05	6,280.89	2,284.07	-3,060.68	-95.85	5.95	-2.20	-5.53	4,480.23	MWD	BAKER HUGHES INTEQ
7/30/2014	9,664.00	88.52	133.74	6,282.60	2,378.42	-3,125.93	-26.83	1.19	-0.95	0.73	4,575.21	MWD	BAKER HUGHES INTEQ
7/30/2014	9,760.00	89.78	135.91	6,284.03	2,474.01	-3,193.60	41.25	2.61	1.31	2.26	4,671.19	MWD	BAKER HUGHES INTEQ
7/30/2014	9,855.00	90.09	137.26	6,284.13	2,568.83	-3,262.60	106.54	1.46	0.33	1.42	4,766.19	MWD	BAKER HUGHES INTEQ
7/30/2014	9,951.00	89.45	140.24	6,284.52	2,664.80	-3,334.77	169.83	3.17	-0.67	3.10	4,862.18	MWD	BAKER HUGHES INTEQ
7/30/2014	10,045.00	89.72	143.26	6,285.20	2,758.74	-3,408.58	228.01	3.23	0.29	3.21	4,956.17	MWD	BAKER HUGHES INTEQ
7/30/2014	10,141.00	89.97	145.85	6,285.46	2,854.43	-3,486.78	283.68	2.71	0.26	2.70	5,052.16	MWD	BAKER HUGHES INTEQ
7/30/2014	10,235.00	89.23	141.99	6,286.12	2,948.20	-3,562.73	339.03	4.18	-0.79	-4.11	5,146.14	MWD	BAKER HUGHES INTEQ
7/30/2014	10,330.00	89.17	142.34	6,287.44	3,043.12	-3,637.76	397.29	0.37	-0.06	0.37	5,241.13	MWD	BAKER HUGHES INTEQ
7/30/2014	10,425.00	90.18	144.83	6,287.98	3,137.93	-3,714.20	453.68	2.83	1.06	2.62	5,336.12	MWD	BAKER HUGHES INTEQ
7/30/2014	10,521.00	90.71	138.36	6,287.23	3,233.84	-3,789.38	513.28	6.76	0.55	-6.74	5,432.06	MWD	BAKER HUGHES INTEQ
7/30/2014	10,616.00	89.51	138.03	6,287.05	3,328.79	-3,860.20	576.61	1.31	-1.26	-0.35	5,527.06	MWD	BAKER HUGHES INTEQ
7/30/2014	10,710.00	90.03	139.27	6,287.43	3,422.76	-3,930.76	638.71	1.43	0.55	1.32	5,621.06	MWD	BAKER HUGHES INTEQ
7/30/2014	10,805.00	90.34	139.25	6,287.12	3,517.75	-4,002.74	700.71	0.33	0.33	-0.02	5,716.06	MWD	BAKER HUGHES INTEQ
7/30/2014	10,900.00	89.82	138.31	6,286.99	3,612.72	-4,074.20	763.31	1.13	-0.55	-0.99	5,811.05	MWD	BAKER HUGHES INTEQ
7/30/2014	10,994.00	90.09	138.24	6,287.06	3,706.68	-4,144.35	825.87	0.30	0.29	-0.07	5,905.05	MWD	BAKER HUGHES INTEQ
7/30/2014	11,089.00	91.48	138.81	6,285.75	3,801.64	-4,215.52	888.78	1.58	1.46	0.60	6,000.04	MWD	BAKER HUGHES INTEQ
7/30/2014	11,184.00	90.18	135.28	6,284.39	3,896.48	-4,285.03	953.50	3.96	-1.37	-3.72	6,095.02	MWD	BAKER HUGHES INTEQ
7/30/2014	11,280.00	90.06	137.86	6,284.18	3,992.30	-4,354.74	1,019.49	2.69	-0.13	2.69	6,191.01	MWD	BAKER HUGHES INTEQ
7/30/2014	11,375.00	90.62	140.41	6,283.62	4,087.27	-4,426.58	1,081.64	2.75	0.59	2.68	6,286.00	MWD	BAKER HUGHES INTEQ

SEP 18 2017

WV Department of
Environmental Protection

WellView

Directional Survey

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/30/2014	11,470.00	90.40	136.63	6,282.78	4,182.22	-4,497.74	1,144.55	3.99	-0.23	-3.98	6,380.98	MWD	BAKER HUGHES INTEQ
7/30/2014	11,566.00	89.69	135.61	6,282.70	4,278.00	-4,566.93	1,211.09	1.29	-0.74	-1.06	6,476.97	MWD	BAKER HUGHES INTEQ
7/30/2014	11,662.00	88.89	137.22	6,283.89	4,373.79	-4,636.46	1,277.27	1.87	-0.83	1.68	6,572.96	MWD	BAKER HUGHES INTEQ
7/30/2014	11,756.00	88.15	142.37	6,286.32	4,467.73	-4,708.20	1,337.91	5.53	-0.79	5.48	6,666.90	MWD	BAKER HUGHES INTEQ
7/30/2014	11,852.00	90.03	148.41	6,287.84	4,563.25	-4,787.16	1,392.40	6.59	1.96	6.29	6,762.84	MWD	BAKER HUGHES INTEQ
7/30/2014	11,947.00	90.43	145.43	6,287.46	4,657.55	-4,866.76	1,444.24	3.16	0.42	-3.14	6,857.83	MWD	BAKER HUGHES INTEQ
7/30/2014	12,042.00	91.26	141.42	6,286.06	4,752.35	-4,943.02	1,500.83	4.31	0.87	-4.22	6,952.80	MWD	BAKER HUGHES INTEQ
7/30/2014	12,138.00	89.66	140.16	6,285.29	4,848.34	-5,017.40	1,561.51	2.12	-1.67	-1.31	7,048.79	MWD	BAKER HUGHES INTEQ
7/30/2014	12,232.00	89.97	141.52	6,285.59	4,942.32	-5,090.29	1,620.87	1.48	0.33	1.45	7,142.79	MWD	BAKER HUGHES INTEQ
7/30/2014	12,326.00	90.86	140.85	6,284.91	5,036.30	-5,163.53	1,679.79	1.19	0.95	-0.71	7,236.78	MWD	BAKER HUGHES INTEQ
7/30/2014	12,421.00	88.98	145.59	6,285.05	5,131.12	-5,239.59	1,736.65	5.37	-1.98	4.99	7,331.75	MWD	BAKER HUGHES INTEQ
7/30/2014	12,516.00	90.18	146.33	6,285.74	5,225.61	-5,318.31	1,789.83	1.48	1.26	0.78	7,426.75	MWD	BAKER HUGHES INTEQ
7/30/2014	12,611.00	90.25	141.45	6,285.39	5,320.36	-5,395.03	1,845.80	5.14	0.07	-5.14	7,521.72	MWD	BAKER HUGHES INTEQ
7/30/2014	12,706.00	89.82	136.71	6,285.33	5,415.32	-5,466.80	1,908.00	5.01	-0.45	-4.99	7,616.69	MWD	BAKER HUGHES INTEQ
7/30/2014	12,801.00	89.57	135.81	6,285.83	5,510.12	-5,535.43	1,973.68	0.98	-0.26	-0.95	7,711.69	MWD	BAKER HUGHES INTEQ
7/30/2014	12,897.00	89.29	141.37	6,286.79	5,606.04	-5,607.40	2,037.16	5.80	-0.29	5.79	7,807.64	MWD	BAKER HUGHES INTEQ
7/30/2014	12,992.00	88.98	145.08	6,288.22	5,700.87	-5,683.47	2,094.01	3.92	-0.33	3.91	7,902.62	MWD	BAKER HUGHES INTEQ
7/30/2014	13,088.00	89.29	150.74	6,289.67	5,795.91	-5,764.76	2,144.99	5.90	0.32	5.90	7,998.57	MWD	BAKER HUGHES INTEQ
7/30/2014	13,183.00	90.80	149.76	6,289.60	5,889.40	-5,847.24	2,192.12	1.89	1.59	-1.03	8,093.56	MWD	BAKER HUGHES INTEQ
7/30/2014	13,279.00	91.42	144.21	6,287.74	5,984.64	-5,927.69	2,244.40	5.82	0.65	-5.78	8,189.51	MWD	BAKER HUGHES INTEQ
7/30/2014	13,374.00	89.91	139.45	6,286.64	6,079.56	-6,002.35	2,303.09	5.26	-1.59	-5.01	8,284.47	MWD	BAKER HUGHES INTEQ

RECEIVED
Office of Oil and Gas

SEP 18 2017

WV Department of
Environmental Protection



Directional Survey

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/30/2014	13,470.00	89.66	136.26	6,287.00	6,175.47	-6,073.52	2,367.50	3.33	-0.26	-3.32	8,380.46	MWD	BAKER HUGHES INTEQ
7/30/2014	13,565.00	89.42	134.72	6,287.76	6,270.17	-6,141.26	2,434.09	1.64	-0.25	-1.62	8,475.45	MWD	BAKER HUGHES INTEQ
7/30/2014	13,660.00	89.45	133.90	6,288.70	6,364.69	-6,207.62	2,502.07	0.86	0.03	-0.86	8,570.45	MWD	BAKER HUGHES INTEQ
7/30/2014	13,756.00	89.17	137.82	6,289.85	6,460.41	-6,276.49	2,568.90	4.09	-0.29	4.08	8,666.42	MWD	BAKER HUGHES INTEQ
7/30/2014	13,851.00	89.75	137.95	6,290.75	6,555.34	-6,346.96	2,632.61	0.63	0.61	0.14	8,761.41	MWD	BAKER HUGHES INTEQ
7/30/2014	13,947.00	89.63	136.80	6,291.27	6,651.23	-6,417.59	2,697.62	1.20	-0.13	-1.20	8,857.41	MWD	BAKER HUGHES INTEQ
7/30/2014	14,042.00	89.26	140.64	6,292.19	6,746.19	-6,488.97	2,760.28	4.06	-0.39	4.04	8,952.39	MWD	BAKER HUGHES INTEQ
7/30/2014	14,137.00	90.00	139.94	6,292.80	6,841.18	-6,562.05	2,820.97	1.07	0.78	-0.74	9,047.39	MWD	BAKER HUGHES INTEQ
7/30/2014	14,232.00	90.22	140.82	6,292.62	6,936.18	-6,635.22	2,881.55	0.95	0.23	0.93	9,142.39	MWD	BAKER HUGHES INTEQ
7/30/2014	14,327.00	90.74	138.09	6,291.82	7,031.16	-6,707.41	2,943.30	2.93	0.55	-2.87	9,237.37	MWD	BAKER HUGHES INTEQ
7/30/2014	14,423.00	89.85	135.87	6,291.33	7,127.02	-6,777.59	3,008.79	2.49	-0.93	-2.31	9,333.36	MWD	BAKER HUGHES INTEQ
7/30/2014	14,518.00	90.95	144.53	6,290.66	7,221.92	-6,850.50	3,069.54	9.19	1.16	9.12	9,428.27	MWD	BAKER HUGHES INTEQ
7/30/2014	14,613.00	90.22	143.07	6,289.69	7,316.71	-6,927.15	3,125.64	1.72	-0.77	-1.54	9,523.26	MWD	BAKER HUGHES INTEQ
7/30/2014	14,708.00	90.34	139.00	6,289.23	7,411.67	-7,001.00	3,185.37	4.29	0.13	-4.28	9,618.24	MWD	BAKER HUGHES INTEQ
7/30/2014	14,804.00	90.12	139.56	6,288.84	7,507.66	-7,073.76	3,248.00	0.63	-0.23	0.58	9,714.24	MWD	BAKER HUGHES INTEQ
7/30/2014	14,899.00	90.37	137.56	6,288.44	7,602.63	-7,144.97	3,310.87	2.12	0.26	-2.11	9,809.23	MWD	BAKER HUGHES INTEQ
7/30/2014	14,993.00	90.86	133.42	6,287.43	7,696.31	-7,211.99	3,376.74	4.43	0.52	-4.40	9,903.21	MWD	BAKER HUGHES INTEQ
7/30/2014	15,087.00	91.05	128.93	6,285.86	7,789.15	-7,273.85	3,447.47	4.78	0.20	-4.78	9,997.17	MWD	BAKER HUGHES INTEQ
7/30/2014	15,182.00	89.32	131.81	6,285.55	7,882.79	-7,335.38	3,519.84	3.54	-1.82	3.03	10,092.16	MWD	BAKER HUGHES INTEQ
7/30/2014	15,277.00	88.74	137.58	6,287.16	7,977.32	-7,402.15	3,587.33	6.10	-0.61	6.07	10,187.10	MWD	BAKER HUGHES INTEQ
7/30/2014	15,372.00	88.31	143.65	6,289.61	8,072.24	-7,475.52	3,647.56	6.40	-0.45	6.39	10,282.03	MWD	BAKER HUGHES INTEQ

Well Name: PENS2AHS

API 4708510067	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,084.00	KB-Ground Distance (ft) 26.25	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/15/2014 03:30	Rig Release Date 8/13/2014 02:00

Survey Data

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
7/30/2014	15,468.0 0	89.97	148.33	6,291.05	8,167.68	-7,555.07	3,701.24	5.17	1.73	4.88	10,377.9 9	MWD	BAKER HUGHES INTEQ
7/30/2014	15,564.0 0	89.69	145.46	6,291.34	8,262.98	-7,635.47	3,753.66	3.00	-0.29	-2.99	10,473.9 7	MWD	BAKER HUGHES INTEQ
7/30/2014	15,660.0 0	89.75	139.69	6,291.81	8,358.85	-7,711.68	3,811.98	6.01	0.06	-6.01	10,569.9 3	MWD	BAKER HUGHES INTEQ
7/30/2014	15,756.0 0	89.66	139.41	6,292.30	8,454.84	-7,784.73	3,874.26	0.31	-0.09	-0.29	10,665.9 3	MWD	BAKER HUGHES INTEQ
7/30/2014	15,852.0 0	89.54	140.54	6,292.97	8,550.84	-7,858.24	3,936.00	1.18	-0.12	1.18	10,761.9 3	MWD	BAKER HUGHES INTEQ
7/30/2014	15,948.0 0	89.57	140.17	6,293.72	8,646.83	-7,932.16	3,997.25	0.39	0.03	-0.39	10,857.9 2	MWD	BAKER HUGHES INTEQ
7/30/2014	16,044.0 0	90.03	142.75	6,294.05	8,742.79	-8,007.24	4,057.06	2.73	0.48	2.69	10,953.9 2	MWD	BAKER HUGHES INTEQ
7/30/2014	16,139.0 0	89.54	142.57	6,294.41	8,837.69	-8,082.77	4,114.68	0.55	-0.52	-0.19	11,048.9 1	MWD	BAKER HUGHES INTEQ
7/30/2014	16,234.0 0	90.03	143.62	6,294.77	8,932.56	-8,158.73	4,171.72	1.22	0.52	1.11	11,143.9 1	MWD	BAKER HUGHES INTEQ
7/30/2014	16,329.0 0	89.54	138.72	6,295.12	9,027.51	-8,232.72	4,231.27	5.18	-0.52	-5.16	11,238.8 8	MWD	BAKER HUGHES INTEQ
7/30/2014	16,372.0 0	89.45	138.72	6,295.50	9,070.49	-8,265.03	4,259.64	0.21	-0.21	0.00	11,281.8 8	MWD	BAKER HUGHES INTEQ
7/30/2014	16,397.0 0	89.45	138.72	6,295.74	9,095.49	-8,283.82	4,276.13	0.00	0.00	0.00	11,306.8 8	INTERP.	BAKER HUGHES INTEQ

RECEIVED
Office of Oil and Gas
SEP 18 2017
WV Department of
Environmental Protection