

Well Name: PENS2KHS

API 4708510075	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 25.50	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/12/2014 10:00	Rig Release Date 5/7/2014 18:00

Wellbore Name Original Hole	Parent Wellbore	Vertical Section Direction (°) 310.92
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Kick Offs & Key Depths							
Date	Point or Interval	Type	Top Depth (ftKB)	Depth Top (TVD) (ftKB)	Bottom Depth (ftKB)	Depth Bottom (TVD) (ftKB)	Length (ft)
4/22/2014		Kick Off	0.0	0.0			

Deviation Surveys							
Date	Definitive?	Description	Proposed?				
1/12/2014	No	ORIGINAL	No				
MD Tie In (ftKB) 0.00	TVD Tie In (ftKB) 0.00	Inclination Tie In (°) 0.00	Azimuth Tie In (°) 0.00	NSTie In (ft) 0.00	EWTie In (ft) 0.00		

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
4/21/2014	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	INCL	VAUGHN ENERGY SERVICES
4/21/2014	100.00	0.17	347.15	100.00	0.12	0.14	-0.03	0.17	0.17	347.15	0.15	GYRO SS	VAUGHN ENERGY SERVICES
4/21/2014	200.00	0.39	325.29	200.00	0.57	0.57	-0.26	0.24	0.22	-21.86	0.63	GYRO SS	VAUGHN ENERGY SERVICES
4/21/2014	300.00	0.31	2.96	300.00	1.07	1.12	-0.44	0.24	-0.08	-322.33	1.21	GYRO SS	VAUGHN ENERGY SERVICES
4/21/2014	400.00	0.50	73.85	399.99	0.99	1.51	-0.01	0.49	0.19	70.89	1.79	GYRO SS	VAUGHN ENERGY SERVICES
4/21/2014	500.00	0.55	71.45	499.99	0.51	1.78	0.87	0.05	0.05	-2.40	2.71	GYRO SS	VAUGHN ENERGY SERVICES
4/22/2014	600.00	0.49	74.34	599.99	0.03	2.05	1.73	0.07	-0.06	2.89	3.62	GYRO SS	VAUGHN ENERGY SERVICES
4/22/2014	631.00	0.40	76.17	630.99	-0.10	2.11	1.97	0.29	-0.29	5.90	3.86	GYRO SS	VAUGHN ENERGY SERVICES
4/22/2014	747.00	0.23	8.76	746.98	-0.21	2.44	2.40	0.33	-0.15	-58.11	4.40	MWD	ANADRILL SCHLUMBER GER
4/22/2014	809.00	1.01	322.24	808.98	0.39	3.00	2.08	1.40	1.26	505.61	5.03	MWD	ANADRILL SCHLUMBER GER
4/22/2014	905.00	1.97	318.86	904.95	2.85	4.91	0.48	1.00	1.00	-3.52	7.53	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,002.00	3.49	322.14	1,001.83	7.40	8.49	-2.43	1.57	1.57	3.38	12.15	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,097.00	4.17	320.94	1,096.62	13.64	13.46	-6.38	0.72	0.72	-1.26	18.49	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,193.00	4.53	319.83	1,192.34	20.82	19.07	-11.03	0.39	0.38	-1.16	25.77	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,289.00	4.68	313.97	1,288.04	28.48	24.68	-16.29	0.51	0.16	-6.10	33.47	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,384.00	4.03	309.19	1,382.76	35.69	29.48	-21.67	0.78	-0.68	-5.03	40.68	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,479.00	2.78	294.82	1,477.59	41.24	32.56	-26.35	1.58	-1.32	-15.13	46.28	MWD	ANADRILL SCHLUMBER GER

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Survey Data

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4/22/2014	1,575.00	2.66	289.75	1,573.48	45.55	34.29	-30.56	0.28	-0.13	-5.28	50.83	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,670.00	2.06	295.62	1,668.40	49.25	35.77	-34.17	0.68	-0.63	6.18	54.74	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,766.00	0.53	317.33	1,764.38	51.36	36.85	-36.03	1.65	-1.59	22.61	56.88	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,861.00	0.26	62.77	1,859.38	51.71	37.27	-36.14	0.68	-0.28	-267.96	57.32	MWD	ANADRILL SCHLUMBER GER
4/22/2014	1,956.00	0.61	104.64	1,954.37	51.18	37.24	-35.45	0.47	0.37	44.07	58.00	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,052.00	0.33	111.09	2,050.37	50.46	37.01	-34.70	0.30	-0.29	6.72	58.78	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,147.00	0.56	108.28	2,145.37	49.78	36.77	-34.01	0.24	0.24	-2.96	59.52	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,243.00	0.66	139.68	2,241.36	48.80	36.20	-33.20	0.36	0.10	32.71	60.51	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,276.00	0.56	108.28	2,274.36	48.46	36.00	-32.93	1.04	-0.30	-95.15	60.84	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,339.00	0.45	156.55	2,337.36	47.95	35.68	-32.54	0.67	-0.17	76.62	61.35	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,528.00	0.34	219.71	2,526.35	47.27	34.57	-32.60	0.22	-0.06	33.42	62.46	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,624.00	0.30	202.90	2,622.35	47.19	34.11	-32.88	0.11	-0.04	-17.51	63.00	MWD	ANADRILL SCHLUMBER GER
4/23/2014	2,718.00	0.17	141.32	2,716.35	46.98	33.78	-32.89	0.28	-0.14	-65.51	63.33	MWD	ANADRILL SCHLUMBER GER
4/24/2014	2,814.00	0.27	174.55	2,812.35	46.67	33.44	-32.78	0.16	0.10	34.61	63.68	MWD	ANADRILL SCHLUMBER GER
4/24/2014	2,910.00	0.12	195.67	2,908.35	46.47	33.12	-32.78	0.17	-0.16	22.00	64.01	MWD	ANADRILL SCHLUMBER GER
4/24/2014	3,005.00	0.51	249.01	3,003.35	46.62	32.87	-33.20	0.47	0.41	56.15	64.50	MWD	ANADRILL SCHLUMBER GER
4/24/2014	3,101.00	0.67	261.93	3,099.34	47.19	32.64	-34.16	0.22	0.17	13.46	65.48	MWD	ANADRILL SCHLUMBER GER
4/24/2014	3,197.00	2.09	244.74	3,195.31	48.27	31.82	-36.30	1.52	1.48	-17.91	67.77	MWD	ANADRILL SCHLUMBER GER
4/24/2014	3,292.00	3.75	241.59	3,290.19	50.06	29.60	-40.60	1.75	1.75	-3.32	72.61	MWD	ANADRILL SCHLUMBER GER
4/24/2014	3,387.00	5.01	235.91	3,384.91	52.23	25.80	-46.76	1.40	1.33	-5.98	79.85	MWD	ANADRILL SCHLUMBER GER
4/25/2014	3,482.00	6.70	234.60	3,479.41	54.62	20.26	-54.72	1.78	1.78	-1.38	89.55	MWD	ANADRILL SCHLUMBER GER

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WellView

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4/25/2014	3,575.00	9.68	233.21	3,571.45	57.56	12.43	-65.40	3.21	3.20	-1.49	102.79	MWD	ANADRILL SCHLUMBER GER
4/25/2014	3,670.00	11.31	230.18	3,664.86	60.76	1.68	-78.96	1.81	1.72	-3.19	120.09	MWD	ANADRILL SCHLUMBER GER
4/25/2014	3,766.00	12.65	227.92	3,758.77	63.56	-11.39	-93.99	1.48	1.40	-2.35	140.01	MWD	ANADRILL SCHLUMBER GER
4/25/2014	3,862.00	14.43	226.77	3,852.09	66.06	-26.63	-110.51	1.88	1.85	-1.20	162.49	MWD	ANADRILL SCHLUMBER GER
4/26/2014	3,958.00	15.99	223.52	3,944.73	67.87	-44.41	-128.33	1.85	1.63	-3.39	187.66	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,053.00	17.53	222.37	4,035.69	68.83	-64.47	-146.98	1.66	1.62	-1.21	215.05	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,148.00	20.26	223.99	4,125.57	70.07	-86.88	-168.05	2.93	2.87	1.71	245.81	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,208.00	22.00	223.99	4,181.53	71.23	-102.44	-183.07	2.90	2.90	0.00	267.44	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,244.00	21.22	224.56	4,215.00	72.00	-111.93	-192.33	2.24	-2.17	1.58	280.70	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,339.00	22.49	226.45	4,303.17	74.84	-136.70	-217.56	1.53	1.34	1.99	316.06	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,434.00	25.50	225.24	4,389.95	78.13	-163.63	-245.26	3.21	3.17	-1.27	354.68	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,530.00	26.28	223.51	4,476.32	80.65	-193.59	-274.56	1.13	0.81	-1.80	396.60	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,625.00	27.41	226.53	4,561.08	83.73	-223.89	-304.92	1.86	1.19	3.18	439.48	MWD	ANADRILL SCHLUMBER GER
4/26/2014	4,720.00	28.72	226.65	4,644.91	88.15	-254.61	-337.38	1.38	1.38	0.13	484.18	MWD	ANADRILL SCHLUMBER GER
4/27/2014	4,816.00	28.88	225.66	4,729.03	92.36	-286.64	-370.74	0.52	0.17	-1.03	530.42	MWD	ANADRILL SCHLUMBER GER
4/27/2014	4,911.00	28.13	224.30	4,812.52	95.58	-318.71	-402.79	1.04	-0.79	-1.43	575.76	MWD	ANADRILL SCHLUMBER GER
4/27/2014	5,007.00	28.04	224.50	4,897.21	98.32	-351.00	-434.41	0.14	-0.09	0.21	620.95	MWD	ANADRILL SCHLUMBER GER
4/27/2014	5,103.00	29.32	224.88	4,981.43	101.35	-383.75	-466.81	1.35	1.33	0.40	667.02	MWD	ANADRILL SCHLUMBER GER
4/27/2014	5,198.00	29.56	225.90	5,064.17	104.99	-416.54	-500.05	0.59	0.25	1.07	713.72	MWD	ANADRILL SCHLUMBER GER
4/27/2014	5,294.00	28.40	224.83	5,148.15	108.60	-449.21	-533.15	1.32	-1.21	-1.11	760.23	MWD	ANADRILL SCHLUMBER GER
4/27/2014	5,389.00	28.19	225.39	5,231.80	111.88	-480.99	-565.06	0.36	-0.22	0.59	805.26	MWD	ANADRILL SCHLUMBER GER



Directional Survey

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4/27/2014	5,484.00	28.10	225.16	5,315.56	115.28	-512.52	-596.90	0.15	-0.09	-0.24	850.07	MWD	ANADRILL SCHLUMBER GER
4/27/2014	5,552.00	27.82	224.93	5,375.63	117.57	-535.05	-619.46	0.44	-0.41	-0.34	881.95	MWD	ANADRILL SCHLUMBER GER
4/30/2014	5,654.00	26.13	224.38	5,466.53	120.59	-567.96	-651.98	1.67	-1.66	-0.54	928.22	MWD	ANADRILL SCHLUMBER GER
4/30/2014	5,701.00	27.56	221.85	5,508.48	121.39	-583.45	-666.47	3.89	3.04	-5.38	949.44	MWD	ANADRILL SCHLUMBER GER
4/30/2014	5,797.00	27.38	221.62	5,593.64	122.02	-616.50	-695.95	0.22	-0.19	-0.24	993.72	MWD	ANADRILL SCHLUMBER GER
4/30/2014	5,892.00	26.37	221.77	5,678.38	122.60	-648.57	-724.52	1.07	-1.06	0.16	1,036.66	MWD	ANADRILL SCHLUMBER GER
4/30/2014	5,939.00	28.45	223.36	5,720.10	123.23	-664.49	-739.16	4.69	4.43	3.38	1,058.30	MWD	ANADRILL SCHLUMBER GER
4/30/2014	5,988.00	28.44	232.04	5,763.20	125.98	-680.16	-756.38	8.43	-0.02	17.71	1,081.58	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,035.00	28.77	242.47	5,804.49	132.29	-692.28	-775.24	10.64	0.70	22.19	1,104.00	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,083.00	29.38	251.92	5,846.46	142.60	-701.28	-796.69	9.64	1.27	19.69	1,127.26	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,130.00	30.37	259.69	5,887.23	155.99	-706.99	-819.35	8.49	2.11	16.53	1,150.63	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,178.00	31.74	266.89	5,928.37	172.67	-709.84	-843.90	8.24	2.85	15.00	1,175.35	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,225.00	32.48	268.58	5,968.18	190.88	-710.83	-868.86	2.48	1.57	3.60	1,200.33	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,273.00	36.60	273.74	6,007.72	211.82	-710.21	-896.05	10.52	8.58	10.75	1,227.52	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,320.00	40.85	279.41	6,044.39	236.11	-706.78	-925.21	11.77	9.04	12.06	1,256.88	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,369.00	44.31	284.56	6,080.47	265.12	-699.86	-957.61	10.02	7.06	10.51	1,290.01	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,416.00	47.98	290.00	6,113.04	296.16	-689.75	-989.92	11.42	7.81	11.57	1,323.87	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,464.00	52.67	295.42	6,143.69	331.24	-675.45	-	13.07	9.77	11.29	1,360.78	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,511.00	57.45	298.96	6,170.61	368.65	-657.82	-	11.90	10.17	7.53	1,399.29	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,560.00	62.09	302.11	6,195.28	410.28	-636.30	-	10.98	9.47	6.43	1,441.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,607.00	66.36	304.16	6,215.71	452.20	-613.16	-	9.90	9.09	4.36	1,483.92	MWD	ANADRILL SCHLUMBER GER

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4/30/2014	6,655.00	70.49	307.83	6,233.36	496.66	-586.92	1,166.13	11.16	8.60	7.65	1,528.53	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,702.00	73.40	311.49	6,247.93	541.32	-558.40	1,200.51	9.65	6.19	7.79	1,573.20	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,751.00	76.15	314.03	6,260.80	588.57	-526.30	1,235.21	7.52	5.61	5.18	1,620.48	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,798.00	79.24	315.19	6,270.82	634.39	-494.05	1,267.90	7.00	6.57	2.47	1,666.39	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,846.00	84.10	316.85	6,277.77	681.68	-459.89	1,300.86	10.69	10.13	3.46	1,713.87	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,893.00	88.80	318.64	6,280.68	728.24	-425.18	1,332.40	10.70	10.00	3.81	1,760.76	MWD	ANADRILL SCHLUMBER GER
4/30/2014	6,941.00	89.79	320.19	6,281.27	775.71	-388.73	1,363.62	3.83	2.06	3.23	1,808.76	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,038.00	88.52	318.40	6,282.70	871.66	-315.21	1,426.87	2.26	-1.31	-1.85	1,905.74	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,133.00	91.13	320.02	6,282.99	965.65	-243.29	1,488.92	3.23	2.75	1.71	2,000.73	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,228.00	91.31	319.12	6,280.97	1,059.55	-170.99	1,550.52	0.97	0.19	-0.95	2,095.71	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,324.00	90.69	318.88	6,279.29	1,154.58	-98.55	1,613.49	0.69	-0.65	-0.25	2,191.69	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,419.00	90.55	319.10	6,278.26	1,248.64	-26.87	1,675.83	0.27	-0.15	0.23	2,286.69	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,514.00	90.93	319.30	6,277.04	1,342.64	45.04	1,737.89	0.45	0.40	0.21	2,381.68	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,610.00	90.96	319.31	6,275.45	1,437.60	117.82	1,800.48	0.03	0.03	0.01	2,477.66	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,705.00	90.69	319.16	6,274.09	1,531.59	189.76	1,862.51	0.33	-0.28	-0.16	2,572.65	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,801.00	89.86	318.94	6,273.62	1,626.63	262.27	1,925.42	0.89	-0.86	-0.23	2,668.65	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,897.00	89.79	318.81	6,273.92	1,721.70	334.58	1,988.56	0.15	-0.07	-0.14	2,764.65	MWD	ANADRILL SCHLUMBER GER
4/30/2014	7,993.00	90.48	319.79	6,273.69	1,816.68	407.36	2,051.16	1.25	0.72	1.02	2,860.65	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,088.00	90.21	318.74	6,273.12	1,910.67	479.34	2,113.15	1.14	-0.28	-1.11	2,955.65	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,184.00	90.27	318.97	6,272.72	2,005.75	551.63	2,176.32	0.25	0.06	0.24	3,051.65	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,279.00	90.31	319.88	6,272.24	2,099.70	623.79	2,238.11	0.96	0.04	0.96	3,146.64	MWD	ANADRILL SCHLUMBER GER

Well Name: PENS2KHS

API 4708510075	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 25.50	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/12/2014 10:00	Rig Release Date 5/7/2014 18:00

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
4/30/2014	8,375.00	90.10	320.42	6,271.89	2,194.46	697.49	-2,299.62	0.60	-0.22	0.56	3,242.64	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,471.00	90.31	320.44	6,271.55	2,289.14	771.49	-2,360.78	0.22	0.22	0.02	3,338.64	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,566.00	90.31	320.45	6,271.04	2,382.83	844.74	-2,421.27	0.01	0.00	0.01	3,433.64	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,662.00	90.52	320.58	6,270.34	2,477.49	918.83	-2,482.32	0.26	0.22	0.14	3,529.64	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,758.00	90.27	320.45	6,269.68	2,572.14	992.92	-2,543.36	0.29	-0.26	-0.14	3,625.64	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,853.00	90.93	320.91	6,268.68	2,665.76	1,066.41	-2,603.55	0.85	0.69	0.48	3,720.63	MWD	ANADRILL SCHLUMBER GER
4/30/2014	8,949.00	90.96	320.95	6,267.10	2,760.29	1,140.93	-2,664.05	0.05	0.03	0.04	3,816.62	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,045.00	90.24	320.81	6,266.10	2,854.84	1,215.40	-2,724.62	0.76	-0.75	-0.15	3,912.61	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,140.00	90.41	321.12	6,265.56	2,948.38	1,289.19	-2,784.45	0.37	0.18	0.33	4,007.61	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,236.00	90.48	320.95	6,264.81	3,042.89	1,363.83	-2,844.81	0.19	0.07	-0.18	4,103.61	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,332.00	89.90	321.09	6,264.49	3,137.40	1,438.46	-2,905.20	0.62	-0.60	0.15	4,199.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,427.00	90.03	320.66	6,264.55	3,230.97	1,512.16	-2,965.15	0.47	0.14	-0.45	4,294.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,522.00	90.24	320.76	6,264.33	3,324.59	1,585.68	-3,025.31	0.24	0.22	0.11	4,389.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,616.00	90.17	321.00	6,263.99	3,417.17	1,658.61	-3,084.61	0.27	-0.07	0.26	4,483.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,712.00	90.10	320.73	6,263.76	3,511.73	1,733.07	-3,145.20	0.29	-0.07	-0.28	4,579.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,808.00	90.24	320.68	6,263.48	3,606.33	1,807.37	-3,206.00	0.15	0.15	-0.05	4,675.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,903.00	90.31	320.87	6,263.02	3,699.93	1,880.96	-3,266.08	0.21	0.07	0.20	4,770.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	9,998.00	90.21	320.45	6,262.59	3,793.56	1,954.43	-3,326.30	0.45	-0.11	-0.44	4,865.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,092.00	90.27	320.72	6,262.20	3,886.22	2,027.05	-3,385.98	0.29	0.06	0.29	4,959.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,187.00	90.31	321.07	6,261.72	3,979.79	2,100.77	-3,445.90	0.37	0.04	0.37	5,054.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,282.00	90.31	321.11	6,261.20	4,073.29	2,174.69	-3,505.57	0.04	0.00	0.04	5,149.60	MWD	ANADRILL SCHLUMBER GER



Directional Survey

SEP 18 2017

Well Name: PENS2KHS

WV Department of
Environmental Protection

API 4708510075	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 25.50	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/12/2014 10:00	Rig Release Date 5/7/2014 18:00

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
4/30/2014	10,378.00	90.24	320.81	6,260.74	4,167.82	2,249.26	3,566.04	0.32	-0.07	-0.31	5,245.60	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,473.00	89.90	319.16	6,260.63	4,261.64	2,322.01	3,627.12	1.77	-0.36	-1.74	5,340.59	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,568.00	89.62	319.50	6,261.02	4,355.61	2,394.07	3,689.03	0.46	-0.29	0.36	5,435.59	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,662.00	89.24	319.39	6,261.96	4,448.57	2,465.48	3,750.14	0.42	-0.40	-0.12	5,529.59	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,757.00	89.18	319.09	6,263.27	4,542.56	2,537.43	3,812.16	0.32	-0.06	-0.32	5,624.58	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,852.00	89.66	319.50	6,264.23	4,636.54	2,609.45	3,874.11	0.66	0.51	0.43	5,719.57	MWD	ANADRILL SCHLUMBER GER
4/30/2014	10,947.00	90.58	320.11	6,264.03	4,730.40	2,682.01	3,935.42	1.16	0.97	0.64	5,814.57	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,041.00	90.34	320.05	6,263.28	4,823.20	2,754.10	3,995.74	0.26	-0.26	-0.06	5,908.57	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,137.00	90.31	320.15	6,262.73	4,917.97	2,827.75	4,057.32	0.11	-0.03	0.10	6,004.57	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,232.00	90.45	319.95	6,262.10	5,011.77	2,900.57	4,118.32	0.26	0.15	-0.21	6,099.56	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,327.00	90.24	319.63	6,261.53	5,105.63	2,973.12	4,179.65	0.40	-0.22	-0.34	6,194.56	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,423.00	90.27	319.82	6,261.10	5,200.50	3,046.36	4,241.71	0.20	0.03	0.20	6,290.56	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,519.00	90.38	319.61	6,260.56	5,295.37	3,119.59	4,303.78	0.25	0.11	-0.22	6,386.56	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,614.00	90.58	320.26	6,259.76	5,389.19	3,192.30	4,364.93	0.72	0.21	0.68	6,481.55	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,709.00	90.21	319.90	6,259.11	5,482.98	3,265.15	4,425.89	0.54	-0.39	-0.38	6,576.55	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,804.00	90.31	319.80	6,258.68	5,576.83	3,337.77	4,487.14	0.15	0.11	-0.11	6,671.55	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,900.00	90.24	319.92	6,258.22	5,671.66	3,411.16	4,549.03	0.14	-0.07	0.13	6,767.55	MWD	ANADRILL SCHLUMBER GER
4/30/2014	11,995.00	90.07	319.62	6,257.96	5,765.53	3,483.68	4,610.39	0.36	-0.18	-0.32	6,862.55	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,090.00	89.83	319.34	6,258.04	5,859.47	3,555.90	4,672.11	0.39	-0.25	-0.29	6,957.55	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,184.00	90.31	319.93	6,257.93	5,952.39	3,627.52	4,732.99	0.81	0.51	0.63	7,051.55	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,279.00	90.69	319.70	6,257.10	6,046.24	3,700.10	4,794.28	0.47	0.40	-0.24	7,146.54	MWD	ANADRILL SCHLUMBER GER



Directional Survey

SEP 18 2017

Well Name: PENS2KHS

WV Department of
Environmental Protection

API 4708510075	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Configuration Type HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 25.50	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/12/2014 10:00	Rig Release Date 5/7/2014 18:00

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
4/30/2014	12,374.00	90.41	319.46	6,256.19	6,140.16	3,772.42	-4,855.88	0.39	-0.29	-0.25	7,241.54	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,469.00	90.58	319.29	6,255.37	6,234.12	3,844.52	-4,917.73	0.25	0.18	-0.18	7,336.54	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,563.00	91.51	320.37	6,253.65	6,326.97	3,916.33	-4,978.35	1.52	0.99	1.15	7,430.52	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,658.00	91.44	320.25	6,251.21	6,420.67	3,989.41	-5,039.00	0.15	-0.07	-0.13	7,525.49	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,754.00	90.96	319.82	6,249.20	6,515.43	4,062.97	-5,100.65	0.67	-0.50	-0.45	7,621.47	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,849.00	90.79	319.55	6,247.75	6,609.31	4,135.40	-5,162.11	0.34	-0.18	-0.28	7,716.45	MWD	ANADRILL SCHLUMBER GER
4/30/2014	12,945.00	90.34	319.69	6,246.80	6,704.20	4,208.53	-5,224.30	0.49	-0.47	0.15	7,812.45	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,040.00	90.27	319.95	6,246.29	6,798.06	4,281.11	-5,285.59	0.28	-0.07	0.27	7,907.45	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,136.00	90.62	321.50	6,245.55	6,892.65	4,355.42	-5,346.36	1.66	0.36	1.61	8,003.44	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,231.00	89.79	318.77	6,245.21	6,986.42	4,428.33	-5,407.25	3.00	-0.87	-2.87	8,098.43	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,327.00	90.27	317.13	6,245.16	7,081.69	4,499.61	-5,471.54	1.78	0.50	-1.71	8,194.43	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,422.00	90.24	319.49	6,244.73	7,175.90	4,570.55	-5,534.72	2.48	-0.03	2.48	8,289.42	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,517.00	91.20	323.50	6,243.54	7,269.26	4,644.87	-5,593.85	4.34	1.01	4.22	8,384.39	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,613.00	90.93	321.85	6,241.76	7,363.22	4,721.19	-5,652.05	1.74	-0.28	-1.72	8,480.37	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,709.00	90.48	319.23	6,240.57	7,457.86	4,795.30	-5,713.05	2.77	-0.47	-2.73	8,576.36	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,804.00	90.76	319.82	6,239.55	7,551.78	4,867.56	-5,774.71	0.69	0.29	0.62	8,671.35	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,899.00	91.07	319.55	6,238.03	7,645.66	4,939.99	-5,836.17	0.43	0.33	-0.28	8,766.34	MWD	ANADRILL SCHLUMBER GER
4/30/2014	13,995.00	91.34	319.58	6,236.01	7,740.55	5,013.04	-5,898.42	0.28	0.28	0.03	8,862.32	MWD	ANADRILL SCHLUMBER GER
4/30/2014	14,089.00	90.07	317.72	6,234.85	7,833.69	5,083.60	-5,960.51	2.40	-1.35	-1.98	8,956.30	MWD	ANADRILL SCHLUMBER GER
4/30/2014	14,185.00	91.13	319.09	6,233.85	7,928.86	5,155.38	-6,024.24	1.80	1.10	1.43	9,052.29	MWD	ANADRILL SCHLUMBER GER
4/30/2014	14,280.00	92.44	320.00	6,230.89	8,022.74	5,227.63	-6,085.85	1.68	1.38	0.96	9,147.25	MWD	ANADRILL SCHLUMBER GER

SEP 18 2017

Well Name: PENS2KHS

API 4708510075	Surface Legal Location	Field PENS	Permit Number	State West Virginia	Well Construction/Type of Environment HORIZONTAL
Ground Elevation (ft) 1,084.00	Casing Flange Elevation (ft) 1,083.25	KB-Ground Distance (ft) 25.50	KB-Casing Flange Distance (ft) 26.25	Spud Date (Conductor) 1/12/2014 10:00	Rig Release Date 5/7/2014 18:00

Survey Data													
Date	MD (RKE)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Build (°/100ft)	Turn (°/100ft)	Unwrap Displace (ft)	Method	Survey Company
4/30/2014	14,375.0 0	90.62	319.25	6,228.35	8,116.61	5,299.98	- 6,147.36	2.07	-1.92	-0.79	9,242.21	MWD	ANADRILL SCHLUMBER GER
4/30/2014	14,396.0 0	90.24	319.30	6,228.19	8,137.38	5,315.89	- 6,161.06	1.83	-1.81	0.24	9,263.21	MWD	ANADRILL SCHLUMBER GER
4/30/2014	14,474.0 0	90.24	319.30	6,227.87	8,214.55	5,375.02	- 6,211.92	0.00	0.00	0.00	9,341.21	MWD	ANADRILL SCHLUMBER GER