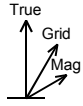


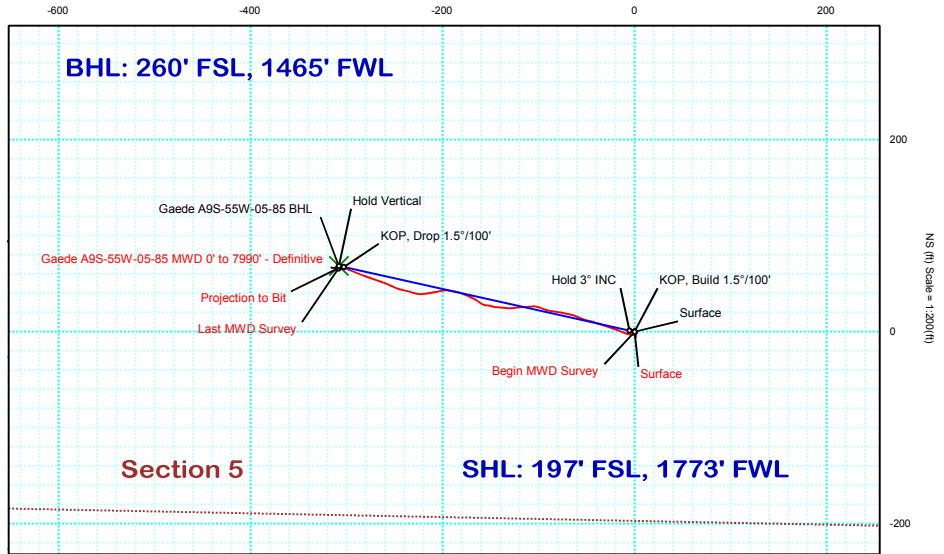
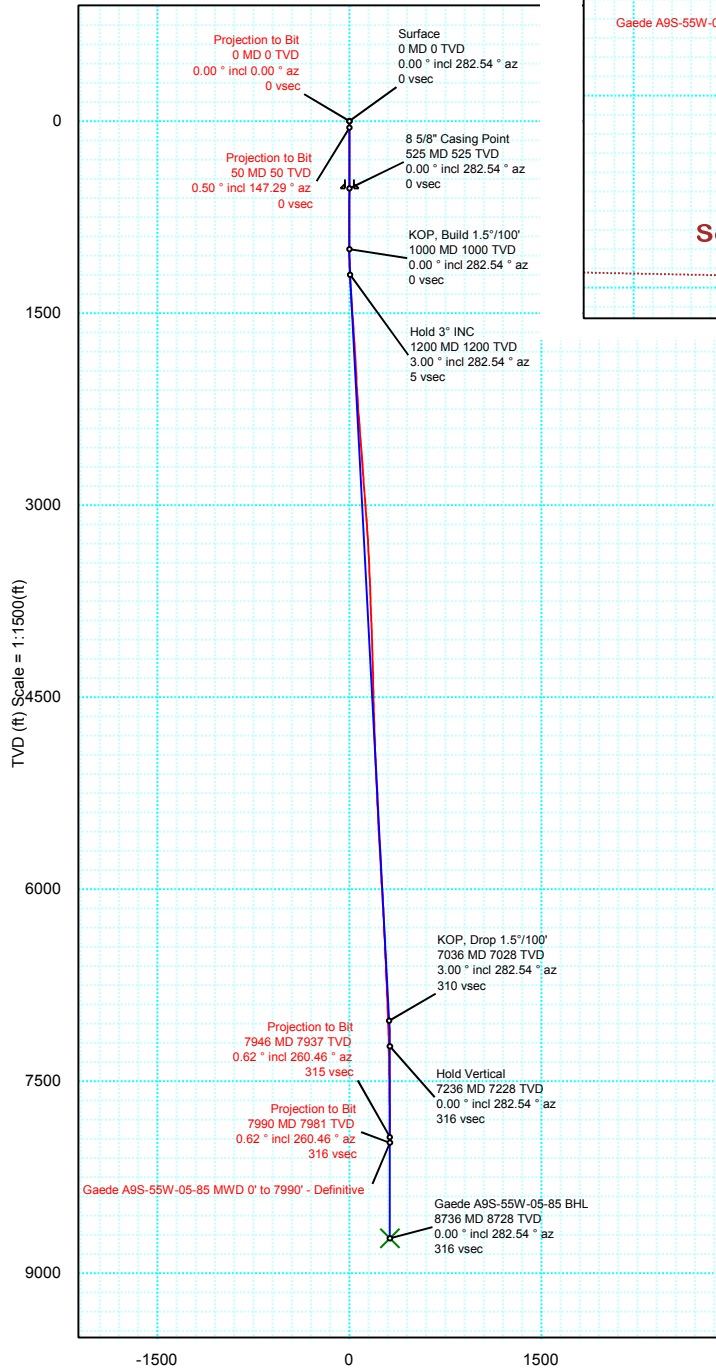
Borehole: Original Hole	Well: Gaede A9S-55W-05-85	Field: CO, Lincoln County (NAD 83 CZ)	Structure: 5-9S-55W (Gaede A9S-55W-05-85)
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Gravity & Magnetic Parameters	Surface Location	Miscellaneous
Model: BGGM 2014 Dip: 66.221° Date: 24-Nov-2014 MagDec: 7.794° FS: 52170.789nT Gravity FS: 998.912mgn (9.80665 Based)	NAD83 Colorado State Plane, Central Zone, US Feet Lat: N 39 17 17.27 Northing: 1535586.07ftU Lon: W 103 34 42.42 Easting: S 3543823.21ftU Grid Conv: 1.2119° Scale Fact: 0.99994123	Slot: Gaede A9S-55W-05-85 TVD Ref: KB 15.5ft(5606.5ft above MSL) Plan: Gaede A9S-55W-05-85 MWD 0' to 7990' - Definitive

PvA



True North
Tot Corr (M->T 7.794°)
Mag Dec (7.794°)
Grid Conv (1.212°)





Gaede A9S-55W-05-85 MWD 0' to 7990' - Definitive Survey Geodetic Report (Def Survey)



Report Date: November 24, 2014 - 03:34 PM
Client: Cascade Petroleum, LLC
Field: CO, Lincoln County (NAD 83 CZ)
Structure / Slot: Cascade Petroleum, LLC 5-9S-55W (Gaede A9S-55W-05-85) / Gaede A9S-55W-05-85
Well: Gaede A9S-55W-05-85
Borehole: Original Hole
UWI / API#: Unknown / Unknown
Survey Name: Gaede A9S-55W-05-85 MWD 0' to 7990' - Definitive
Survey Date: November 24, 2014
Tort / AHD / DDI / ERD Ratio: 35.739 ° / 332.831 ft / 4.076 / 0.042
Coordinate Reference System: NAD83 Colorado State Plane, Central Zone, US Feet
Location Lat / Long: N 39° 17' 17.26900", W 103° 34' 42.42000"
Location Grid N/E Y/X: N 1535586.066 ftUS, E 3543823.206 ftUS
CRS Grid Convergence Angle: 1.2119 °
Grid Scale Factor: 0.99994123
Version / Patch: 2.8.572.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 282.539 ° (True North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB 15.5ft
TVD Reference Elevation: 5606.500 ft above MSL
Seabed / Ground Elevation: 5591.000 ft above MSL
Magnetic Declination: 7.794 °
Total Gravity Field Strength: 998.9121mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 52170.789 nT
Magnetic Dip Angle: 66.221 °
Declination Date: November 24, 2014
Magnetic Declination Model: BGGM 2014
North Reference: True North
Grid Convergence Used: 0.0000 °
Total Corr Mag North->True North: 7.7941 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (%/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Surface	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	1535586.07	3543823.21	N 39 17 17.27	W 103 34 42.42
Marker MudLine	15.50	0.16	147.29	15.50	-0.01	-0.02	0.01	1.00	1535586.05	3543823.22	N 39 17 17.27	W 103 34 42.42
Begin MWD Survey	50.00	0.50	147.29	50.00	-0.15	-0.18	0.12	1.00	1535585.89	3543823.33	N 39 17 17.27	W 103 34 42.42
	100.00	0.57	152.89	100.00	-0.47	-0.59	0.35	0.17	1535585.49	3543823.57	N 39 17 17.26	W 103 34 42.42
	150.00	0.25	136.46	150.00	-0.72	-0.89	0.54	0.68	1535585.19	3543823.76	N 39 17 17.26	W 103 34 42.41
	200.00	0.29	113.99	200.00	-0.93	-1.02	0.73	0.22	1535585.06	3543823.96	N 39 17 17.26	W 103 34 42.41
	250.00	0.35	173.42	249.99	-1.11	-1.22	0.86	0.64	1535584.86	3543824.09	N 39 17 17.26	W 103 34 42.41
	300.00	0.18	183.93	299.99	-1.17	-1.45	0.87	0.35	1535584.63	3543824.11	N 39 17 17.25	W 103 34 42.41
	350.00	0.36	173.22	349.99	-1.23	-1.69	0.89	0.37	1535584.40	3543824.13	N 39 17 17.25	W 103 34 42.41
	400.00	0.41	215.18	399.99	-1.21	-1.99	0.80	0.56	1535584.09	3543824.05	N 39 17 17.25	W 103 34 42.41
	440.00	0.49	181.21	439.99	-1.19	-2.28	0.72	0.68	1535583.80	3543823.97	N 39 17 17.25	W 103 34 42.41
	628.41	0.79	167.56	628.39	-1.90	-4.35	0.98	0.18	1535581.74	3543824.28	N 39 17 17.22	W 103 34 42.41
	734.00	1.01	186.55	733.97	-2.30	-5.99	1.03	0.35	1535580.10	3543824.36	N 39 17 17.21	W 103 34 42.41
	825.00	0.62	345.28	824.96	-2.16	-6.31	0.81	1.76	1535579.78	3543824.15	N 39 17 17.21	W 103 34 42.41
	916.00	0.79	11.65	915.96	-1.93	-5.22	0.81	0.40	1535580.87	3543824.13	N 39 17 17.22	W 103 34 42.41
	1008.00	0.62	19.86	1007.95	-1.98	-4.13	1.11	0.21	1535581.96	3543824.40	N 39 17 17.23	W 103 34 42.41
	1039.00	0.48	347.87	1038.95	-1.95	-3.84	1.14	1.07	1535582.25	3543824.43	N 39 17 17.23	W 103 34 42.41
	1081.00	1.71	277.78	1080.94	-1.25	-3.59	0.48	3.84	1535582.49	3543823.77	N 39 17 17.23	W 103 34 42.41
	1167.00	1.89	275.98	1166.90	1.44	-3.26	0.22	1535582.76	3543821.08	N 39 17 17.24	W 103 34 42.45	
	1209.00	2.59	275.45	1208.87	3.07	-3.10	-3.83	1.67	1535582.88	3543819.44	N 39 17 17.24	W 103 34 42.47
	1252.00	3.69	286.26	1251.80	5.41	-2.62	-6.13	2.89	1535583.32	3543817.14	N 39 17 17.24	W 103 34 42.50
	1295.00	3.78	289.56	1294.71	8.20	-1.76	-8.79	0.54	1535584.12	3543814.45	N 39 17 17.25	W 103 34 42.53
	1337.00	4.09	290.87	1336.61	11.06	-0.76	-11.50	0.77	1535585.06	3543811.73	N 39 17 17.26	W 103 34 42.57
	1423.00	4.09	291.27	1422.39	17.12	1.44	-17.22	0.03	1535587.14	3543805.96	N 39 17 17.28	W 103 34 42.64
	1508.00	4.00	290.35	1507.18	23.05	3.57	-22.82	0.13	1535589.16	3543800.31	N 39 17 17.30	W 103 34 42.71
	1594.00	3.91	286.57	1592.98	28.95	5.45	-28.45	0.32	1535590.92	3543794.65	N 39 17 17.32	W 103 34 42.78
	1679.00	3.38	286.88	1677.80	34.34	7.01	-33.62	0.62	1535592.36	3543789.45	N 39 17 17.34	W 103 34 42.85
	1765.00	3.12	290.96	1763.66	39.18	8.58	-38.23	0.40	1535593.83	3543784.80	N 39 17 17.35	W 103 34 42.91
	1850.00	3.21	286.35	1848.53	43.85	10.08	-42.68	0.32	1535595.24	3543780.33	N 39 17 17.37	W 103 34 42.96
	1935.00	3.30	284.24	1933.40	48.67	11.35	-47.33	0.18	1535596.41	3543775.65	N 39 17 17.38	W 103 34 43.02
	2021.00	3.38	285.86	2019.25	53.67	12.65	-52.17	0.14	1535597.61	3543770.78	N 39 17 17.39	W 103 34 43.08
	2109.00	3.60	292.85	2107.09	58.98	14.43	-57.21	0.54	1535599.28	3543765.71	N 39 17 17.41	W 103 34 43.15
	2194.00	3.69	293.95	2191.92	64.29	16.58	-62.17	0.13	1535601.33	3543760.70	N 39 17 17.43	W 103 34 43.21
	2280.00	4.39	280.15	2277.70	70.29	18.28	-67.94	1.39	1535602.91	3543754.90	N 39 17 17.45	W 103 34 43.28
	2365.00	4.31	281.07	2362.46	76.73	19.47	-74.28	0.12	1535603.96	3543748.54	N 39 17 17.46	W 103 34 43.36
	2451.00	4.31	278.35	2448.22	83.18	20.56	-80.64	0.24	1535604.91	3543742.15	N 39 17 17.47	W 103 34 43.45
	2536.00	4.39	279.45	2532.97	89.62	21.56	-87.01	0.14	1535605.78	3543735.76	N 39 17 17.48	W 103 34 43.53
	2622.00	4.39	289.34	2618.72	96.17	23.19	-93.37	0.88	1535607.27	3543729.38	N 39 17 17.50	W 103 34 43.61
	2707.00	4.31	290.96	2703.48	102.56	25.41	-99.42	0.17	1535609.36	3543723.28	N 39 17 17.52	W 103 34 43.68
	2792.00	4.09	267.54	2788.25	108.65	26.42	-105.43	2.02	1535610.25	3543717.25	N 39 17 17.53	W 103 34 43.76
	2878.00	4.61	264.86	2874.01	114.91	25.98	-111.94	0.65	1535609.67	3543710.75	N 39 17 17.52	W 103 34 43.84
	2963.00	4.70	265.65	2958.73	121.49	25.41	-118.81	0.13	1535608.95	3543703.89	N 39 17 17.52	W 103 34 43.93
	3049.00	4.61	264.07	3044.44	128.14	24.78	-125.76	0.18	1535608.18	3543696.96	N 39 17 17.51	W 103 34 44.02
	3134.00	4.00	272.86	3129.20	134.31	24.58	-132.12	1.06	1535607.84	3543690.60	N 39 17 17.51	W 103 34 44.10
	3219.00	3.60	276.94	3214.02	139.88	25.05	-137.73	0.57	1535608.20	3543684.99	N 39 17 17.52	W 103 34 44.17
	3304.00	3.30	270.97	3298.86	144.94	25.41	-142.83	0.55	1535608.45	3543679.88	N 39 17 17.52	W 103 34 44.24
	3390.00	2.68	288.28	3384.75	149.36	26.09	-147.21	1.27	1535609.03	3543675.49	N 39 17 17.53	W 103 34 44.29
	3477.00	2.68	279.45	3471.65	153.42	27.06	-151.15	0.47	1535609.92	3543671.53	N 39 17 17.54	W 103 34 44.34
	3562.00	2.59	274.88	3556.56	157.30	27.55	-155.02	0.27	1535610.33	3543667.65	N 39 17 17.54	W 103 34 44.39
	3648.00	2.11	302.34	3642.49	160.72	28.56	-158.30	1.41	1535611.27	3543664.35	N 39 17 17.55	W 103 34 44.43
	3733.00	2.20	302.48	3727.43	163.73	30.27	-160.99	0.11	1535612.93	3543661.62	N 39 17 17.57	W 103 34 44.47
	3819.00	2.20	308.14	3813.37	166.77	32.18	-163.68	0.25	1535614.77	3543658.89	N 39 17 17.59	W 103 34 44.50
	3904.00	2.50	295.44	3898.30	170.04	33.98	-166.64	0.70	1535616.51	3543655.89	N 39 17 17.60	W 103 34 44.54
	3990.00	2.02	297.55	3984.23	173.34	35.49	-169.68	0.57	1535617.96	3543652.82	N 39 17 17.62	W 103 34 44.58
	4076.00	1.89	293.16	4070.18	176.19	36.75	-172.33	0.23	1535619.16	3543650.15	N 39 17 17.63	W 103 34 44.61
	4161.00	1.71	291.75	4155.14	178.82	37.77	-174.79	0.22	1535620.13	3543647.66	N 39 17 17.64	W 103 34 44.64
	4246.00	1.58	292.68	4240.10	181.23	38.69	-177.05	0.16	1535621.00	3543645.39	N 39 17 17.65	W 103 34 44.67
	4332.00	1.49	292.06	4326.07	183.50	39.57	-179.18	0.11	1535621.83	3543643.24	N 39 17 17.66	W 103 34 44.70
	4417.00	1.32	291.45	4411.05	185.56	40.34	-181.12	0.20	1535622.57	3543641.29	N 39 17 17.67	W 103 34 44.72
	4502.00	1.19	282.26	4496.03	187.41	40.89	-182.89	0.28	1535623.07	3543639.50	N 39 17 17.67	W 103 34 44.75
	4588.00	1.58	283.75	4582.00	189.48	41.36	-184.92	0.46	1535623.50	3543637.47	N 39 17 17.68	W 103 34 44.77
	4673.00	2.20	280.85	4666.95	192.29	41.94	-187.66	0.74	1535624.03	3543634.72	N 39 17 17.68	W 103 34 44.81
	4759.00	1.89	277.16	4752.90	195.35	42.43	-190.69	0.39	1535624.45	3543631.68	N 39 17 17.69	W 103 34 44.85
	4849.00	1.89	280.15	4832.83	199.63	43.08	-194.92	0.08	1535625.01	3543627.43	N 39 17 17.69	W 103 34 44.90
	4927.00	2.50	262.57	4915.77	202.69	43.08	-198.06	1.09	1535624.95	3543624.95		

Comments	MD (ft)	Incl (°)	Azim True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	5998.00	3.60	293.25	5990.40	253.51	46.05	-249.47	0.51	1535626.82	3543572.84	N 39 17 17.72 W 103 34 45.59	
	6084.00	3.60	294.65	6076.23	258.81	48.24	-254.40	0.10	1535628.91	3543567.86	N 39 17 17.74 W 103 34 45.66	
	6169.00	3.21	291.75	6161.08	263.76	50.23	-259.04	0.50	1535630.81	3543563.18	N 39 17 17.76 W 103 34 45.71	
	6254.00	2.81	288.40	6245.96	268.19	51.77	-263.22	0.51	1535632.26	3543558.96	N 39 17 17.78 W 103 34 45.77	
	6340.00	2.50	290.04	6331.87	272.14	53.08	-266.99	0.37	1535633.49	3543555.17	N 39 17 17.79 W 103 34 45.82	
	6425.00	2.50	288.94	6416.79	275.82	54.32	-270.48	0.06	1535634.65	3543551.65	N 39 17 17.80 W 103 34 45.86	
	6511.00	2.50	289.38	6502.71	279.55	55.55	-274.02	0.02	1535635.80	3543548.08	N 39 17 17.82 W 103 34 45.91	
	6596.00	2.59	289.56	6587.62	283.30	56.81	-277.58	0.11	1535636.99	3543544.50	N 39 17 17.83 W 103 34 45.95	
	6681.00	2.50	288.94	6672.54	287.04	58.05	-281.15	0.11	1535638.16	3543540.91	N 39 17 17.84 W 103 34 46.00	
	6767.00	2.42	292.94	6758.46	290.69	59.37	-284.59	0.22	1535639.40	3543537.44	N 39 17 17.85 W 103 34 46.04	
	6852.00	2.42	291.36	6843.38	294.23	60.72	-287.92	0.08	1535640.68	3543534.09	N 39 17 17.87 W 103 34 46.08	
	6937.00	2.42	292.06	6928.31	297.77	62.05	-291.25	0.03	1535641.94	3543530.73	N 39 17 17.88 W 103 34 46.12	
	7023.00	2.11	292.46	7014.24	301.13	63.34	-294.40	0.36	1535643.16	3543527.55	N 39 17 17.89 W 103 34 46.16	
	7108.00	2.11	292.06	7099.18	304.21	64.52	-297.29	0.02	1535644.28	3543524.63	N 39 17 17.91 W 103 34 46.20	
	7194.00	1.10	288.37	7185.15	306.59	65.38	-299.54	1.18	1535645.09	3543520.31	N 39 17 17.91 W 103 34 46.23	
	7279.00	0.88	281.47	7270.14	308.06	65.76	-300.96	0.29	1535645.45	3543520.94	N 39 17 17.92 W 103 34 46.25	
	7364.00	0.88	275.14	7355.13	309.36	65.95	-302.25	0.11	1535645.61	3543519.65	N 39 17 17.92 W 103 34 46.26	
	7449.00	0.79	276.94	7440.12	310.59	66.08	-303.48	0.11	1535645.71	3543518.42	N 39 17 17.92 W 103 34 46.28	
	7535.00	0.70	275.05	7526.11	311.70	66.20	-304.59	0.11	1535645.80	3543517.30	N 39 17 17.92 W 103 34 46.29	
	7620.00	0.70	274.17	7611.10	312.73	66.28	-305.63	0.01	1535645.87	3543516.27	N 39 17 17.92 W 103 34 46.31	
	7705.00	0.40	279.84	7696.10	313.54	66.37	-306.44	0.36	1535645.94	3543515.45	N 39 17 17.92 W 103 34 46.32	
	7791.00	0.31	267.06	7782.10	314.06	66.41	-306.96	0.14	1535645.96	3543514.92	N 39 17 17.92 W 103 34 46.32	
	7876.00	0.40	262.44	7867.10	314.56	66.36	-307.49	0.11	1535645.90	3543514.40	N 39 17 17.92 W 103 34 46.33	
Last MWD Survey	7946.00	0.62	260.46	7937.09	315.14	66.26	-308.10	0.32	1535645.79	3543513.79	N 39 17 17.92 W 103 34 46.34	
Projection to Bit	7990.00	0.62	260.46	7981.09	315.58	66.18	-308.57	0.00	1535645.71	3543513.32	N 39 17 17.92 W 103 34 46.34	

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma
 Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	15.500	1/98.425	30.000	30.000	SLB_MWD-STD-Depth Only	Original Hole / Gaede A9S-55W-05-85 MWD 0' to 7990' - Definitive
	1	15.500	15.500	Act Stns	30.000	30.000	SLB_MWD-STD-Depth Only	Original Hole / Gaede A9S-55W-05-85 MWD 0' to 7990' - Definitive
	1	15.500	7946.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Hole / Gaede A9S-55W-05-85 MWD 0' to 7990' - Definitive
	1	7946.000	7990.000	Act Stns	30.000	30.000	SLB_BLIND+TREND	Original Hole / Gaede A9S-55W-05-85 MWD 0' to 7990' - Definitive