

NGL WATER SOLUTIONS DJ

Location DJ Basin
Field Wattenberg
Installation Roy SWD

Slot ROY SWD 2
Well W ROY SWD 2
Wellbore W ROY SWD 2 (PWB)

N
GRID

Jul-10-2018
EMMA-2015 [2000.0-2020.0] Dip: 66.42 deg Field: 52040.6 mT
Lat: N40 1 42.8880 Long: W104 46 48.5400 Elev: 9948.01 ft
Magnetic North is 8.15 deg East of True North
GRID North is 0.47 deg East of True North
To correct azimuth from True to GRID subtract 0.47 deg
To correct azimuth from Magnetic to GRID add 7.69 deg

Created by admin
Date plotted 29-Aug-2018

Plot reference is W ROY SWD 2 (PWB).
Ref wellpath is W ROY SWD 2 (PWP#1).
Coordinates are in Feet reference ROY SWD 2.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum.
Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 5063.00 ft.
Plot North is aligned to GRID North.

Scale 1 cm = 200 ft

East (Feet) ->
-800 -400 -0 400

Tie on - 0.00 Inc, 16.00 MD, 16.00 TVD, 0.00 VS

3DS Kick off Point - 0.00 Inc, 1016.00 MD, 1016.00 TVD, 0.00 VS

ROY SWD 2 - LY

ROY SWD 2 - BHL

W ROY SWD 2 (PWB)

WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	16.00	0.00	0.00	16.00	S 0.00	W 0.00		0.00
KOP	1016.00	0.00	355.91	1016.00	S 0.00	W 0.00	0.00	0.00
End of Build	2608.35	31.85	355.91	2527.61	N 430.17	W 30.73	2.00	431.27
End of Hold	8451.79	31.85	355.91	7491.39	N 3505.64	W 250.43	0.00	3514.58
Target ROY SWD 2 - LY	10044.14	0.00	355.91	9003.00	N 3935.81	W 281.16	2.00	3945.84
T.D. & Target ROY...BHL	12164.14	0.00	0.00	11123.00	N 3935.81	W 281.16	0.00	3945.84

End of Build - 31.85 Inc, 2608.35 MD, 2527.61 TVD, 431.27 VS

Surface 0.00 N 0.00 E

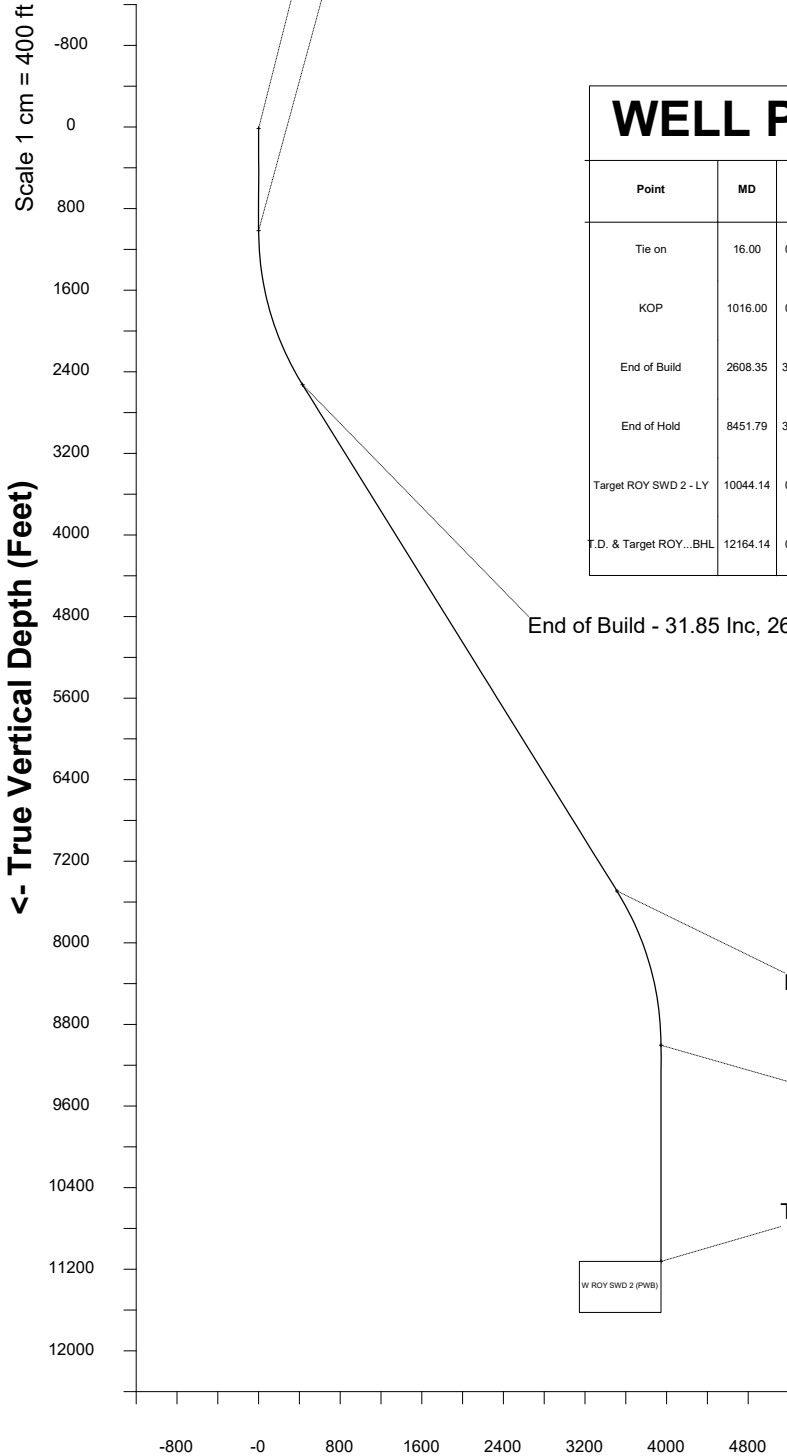
Jer Yarbrough Property Boundary

End of Hold - 31.85 Inc, 8451.79 MD, 7491.39 TVD, 3514.58 VS

Target - 0.00 Inc, 10044.14 MD, 9003.00 TVD, 3945.84 VS

T.D. & Target - 11123.00 TVD, 3935.81 N 281.16 W

W ROY SWD 2 (PWB)



<- North(Feet)

Scale 1 cm = 200 ft

Vertical Section (Feet) ->

Scale 1 cm = 400 ft

Azimuth 355.91 with reference 0.00 N, 0.00 E from ROY SWD 2



SYSDRILL
Well Design Combined Report
Wellbore: W ROY SWD 2 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
ROY SWD 2	40.02865000	-104.78015000	1254101.5013	3201581.6266	25.50N	0.21W	0.00

Declination		
Date	Source	Time
Jul-10-2018	EMM-2015 [2000.0-2020.0]	10:02

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Roy SWD	40.02858000	-104.78015000	1254076.0029	3201581.8336	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	Vertical Depth SS	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
16.00	0.00	0.000	16.00	-5047.00	0.00N	0.00E		0.00
1016.00	0.00	355.910	1016.00	-4047.00	0.00N	0.00E	==>	0.00
2608.35	31.85	355.910	2527.61	-2535.39	430.17N	30.73W	2.00	431.27
8451.79	31.85	355.910	7491.39	2428.39	3505.64N	250.43W	==>	3514.58
10044.14	0.00	355.910	9003.00	3940.00	3935.81N	281.16W	2.00	3945.84
12164.14	0.00	0.000	11123.00	6060.00	3935.81N	281.16W	==>	3945.84

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	40.02865000	-104.78015000
16.00	0.00	0.000	16.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
1016.00	0.00	355.910	1016.00	0.00N	0.00E	==>	0.00	40.02865000	-104.78015000
1116.00	2.00	355.910	1115.98	1.74N	0.12W	2.00	1.75	40.02865478	-104.78015039
1216.00	4.00	355.910	1215.84	6.96N	0.50W	2.00	6.98	40.02866912	-104.78015157
1316.00	6.00	355.910	1315.45	15.65N	1.12W	2.00	15.69	40.02869299	-104.78015354
1416.00	8.00	355.910	1414.70	27.81N	1.99W	2.00	27.88	40.02872638	-104.78015629
1516.00	10.00	355.910	1513.47	43.41N	3.10W	2.00	43.52	40.02876923	-104.78015982
1616.00	12.00	355.910	1611.62	62.44N	4.46W	2.00	62.60	40.02882151	-104.78016412
1716.00	14.00	355.910	1709.06	84.88N	6.06W	2.00	85.10	40.02888313	-104.78016919
1816.00	16.00	355.910	1805.64	110.69N	7.91W	2.00	110.98	40.02895403	-104.78017503
1916.00	18.00	355.910	1901.27	139.86N	9.99W	2.00	140.21	40.02903413	-104.78018162
2016.00	20.00	355.910	1995.82	172.33N	12.31W	2.00	172.77	40.02912331	-104.78018896
2116.00	22.00	355.910	2089.17	208.07N	14.86W	2.00	208.60	40.02922149	-104.78019704
2216.00	24.00	355.910	2181.21	247.04N	17.65W	2.00	247.67	40.02932853	-104.78020586
2316.00	26.00	355.910	2271.84	289.20N	20.66W	2.00	289.93	40.02944430	-104.78021539
2416.00	28.00	355.910	2360.94	334.48N	23.89W	2.00	335.33	40.02956867	-104.78022562
2516.00	30.00	355.910	2448.39	382.83N	27.35W	2.00	383.81	40.02970148	-104.78023656
2616.00	31.85	355.910	2534.11	434.20N	31.02W	==>	435.30	40.02984255	-104.78024817
2716.00	31.85	355.910	2619.06	486.83N	34.78W	==>	488.07	40.02998711	-104.78026007
2816.00	31.85	355.910	2704.00	539.46N	38.54W	==>	540.83	40.03013166	-104.78027197
2916.00	31.85	355.910	2788.95	592.09N	42.30W	==>	593.60	40.03027622	-104.78028387

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5063.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 355.910 degrees
Bottom hole distance is 3945.84 Feet on azimuth 355.91 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 29-Aug-2018

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
3016.00	31.85	355.910	2873.90	644.72N	46.06W	==>	646.36	40.03042077	-104.78029577
3116.00	31.85	355.910	2958.84	697.35N	49.82W	==>	699.13	40.03056533	-104.78030767
3216.00	31.85	355.910	3043.79	749.98N	53.58W	==>	751.89	40.03070988	-104.78031957
3316.00	31.85	355.910	3128.73	802.61N	57.34W	==>	804.66	40.03085444	-104.78033147
3416.00	31.85	355.910	3213.68	855.24N	61.10W	==>	857.42	40.03099899	-104.78034337
3516.00	31.85	355.910	3298.63	907.88N	64.86W	==>	910.19	40.03114355	-104.78035527
3616.00	31.85	355.910	3383.57	960.51N	68.62W	==>	962.95	40.03128811	-104.78036717
3716.00	31.85	355.910	3468.52	1013.14N	72.38W	==>	1015.72	40.03143266	-104.78037907
3816.00	31.85	355.910	3553.46	1065.77N	76.13W	==>	1068.49	40.03157722	-104.78039097
3916.00	31.85	355.910	3638.41	1118.40N	79.89W	==>	1121.25	40.03172177	-104.78040287
4016.00	31.85	355.910	3723.36	1171.03N	83.65W	==>	1174.02	40.03186633	-104.78041477
4116.00	31.85	355.910	3808.30	1223.66N	87.41W	==>	1226.78	40.03201088	-104.78042668
4216.00	31.85	355.910	3893.25	1276.29N	91.17W	==>	1279.55	40.03215544	-104.78043858
4316.00	31.85	355.910	3978.19	1328.93N	94.93W	==>	1332.31	40.03229999	-104.78045048
4416.00	31.85	355.910	4063.14	1381.56N	98.69W	==>	1385.08	40.03244455	-104.78046238
4516.00	31.85	355.910	4148.09	1434.19N	102.45W	==>	1437.84	40.03258911	-104.78047428
4616.00	31.85	355.910	4233.03	1486.82N	106.21W	==>	1490.61	40.03273366	-104.78048618
4716.00	31.85	355.910	4317.98	1539.45N	109.97W	==>	1543.37	40.03287822	-104.78049808
4816.00	31.85	355.910	4402.92	1592.08N	113.73W	==>	1596.14	40.03302277	-104.78050998
4916.00	31.85	355.910	4487.87	1644.71N	117.49W	==>	1648.90	40.03316733	-104.78052188
5016.00	31.85	355.910	4572.82	1697.34N	121.25W	==>	1701.67	40.03331188	-104.78053378
5116.00	31.85	355.910	4657.76	1749.97N	125.01W	==>	1754.43	40.03345644	-104.78054568
5216.00	31.85	355.910	4742.71	1802.61N	128.77W	==>	1807.20	40.03360099	-104.78055759
5316.00	31.85	355.910	4827.65	1855.24N	132.53W	==>	1859.96	40.03374555	-104.78056949
5416.00	31.85	355.910	4912.60	1907.87N	136.29W	==>	1912.73	40.03389010	-104.78058139
5516.00	31.85	355.910	4997.55	1960.50N	140.05W	==>	1965.50	40.03403466	-104.78059329
5616.00	31.85	355.910	5082.49	2013.13N	143.81W	==>	2018.26	40.03417922	-104.78060519
5716.00	31.85	355.910	5167.44	2065.76N	147.57W	==>	2071.03	40.03432377	-104.78061709
5816.00	31.85	355.910	5252.38	2118.39N	151.33W	==>	2123.79	40.03446833	-104.78062899
5916.00	31.85	355.910	5337.33	2171.02N	155.09W	==>	2176.56	40.03461288	-104.78064090
6016.00	31.85	355.910	5422.28	2223.66N	158.85W	==>	2229.32	40.03475744	-104.78065280
6116.00	31.85	355.910	5507.22	2276.29N	162.61W	==>	2282.09	40.03490199	-104.78066470
6216.00	31.85	355.910	5592.17	2328.92N	166.37W	==>	2334.85	40.03504655	-104.78067660
6316.00	31.85	355.910	5677.11	2381.55N	170.13W	==>	2387.62	40.03519110	-104.78068850
6416.00	31.85	355.910	5762.06	2434.18N	173.89W	==>	2440.38	40.03533566	-104.78070040
6516.00	31.85	355.910	5847.01	2486.81N	177.65W	==>	2493.15	40.03548021	-104.78071231
6616.00	31.85	355.910	5931.95	2539.44N	181.41W	==>	2545.91	40.03562477	-104.78072421
6716.00	31.85	355.910	6016.90	2592.07N	185.17W	==>	2598.68	40.03576933	-104.78073611
6816.00	31.85	355.910	6101.84	2644.70N	188.93W	==>	2651.44	40.03591388	-104.78074801
6916.00	31.85	355.910	6186.79	2697.34N	192.69W	==>	2704.21	40.03605844	-104.78075991
7016.00	31.85	355.910	6271.74	2749.97N	196.45W	==>	2756.97	40.03620299	-104.78077182
7116.00	31.85	355.910	6356.68	2802.60N	200.21W	==>	2809.74	40.03634755	-104.78078372
7216.00	31.85	355.910	6441.63	2855.23N	203.97W	==>	2862.51	40.03649210	-104.78079562
7316.00	31.85	355.910	6526.57	2907.86N	207.73W	==>	2915.27	40.03663666	-104.78080752
7416.00	31.85	355.910	6611.52	2960.49N	211.49W	==>	2968.04	40.03678121	-104.78081943
7516.00	31.85	355.910	6696.47	3013.12N	215.25W	==>	3020.80	40.03692577	-104.78083133
7616.00	31.85	355.910	6781.41	3065.75N	219.01W	==>	3073.57	40.03707032	-104.78084323
7716.00	31.85	355.910	6866.36	3118.39N	222.77W	==>	3126.33	40.03721488	-104.78085513
7816.00	31.85	355.910	6951.30	3171.02N	226.53W	==>	3179.10	40.03735944	-104.78086704
7916.00	31.85	355.910	7036.25	3223.65N	230.29W	==>	3231.86	40.03750399	-104.78087894
8016.00	31.85	355.910	7121.20	3276.28N	234.05W	==>	3284.63	40.03764855	-104.78089084
8116.00	31.85	355.910	7206.14	3328.91N	237.81W	==>	3337.39	40.03779310	-104.78090274
8216.00	31.85	355.910	7291.09	3381.54N	241.57W	==>	3390.16	40.03793766	-104.78091465
8316.00	31.85	355.910	7376.03	3434.17N	245.33W	==>	3442.92	40.03808221	-104.78092655
8416.00	31.85	355.910	7460.98	3486.80N	249.09W	==>	3495.69	40.03822677	-104.78093845
8516.00	30.56	355.910	7546.30	3538.82N	252.80W	2.00	3547.84	40.03836964	-104.78095022
8616.00	28.56	355.910	7633.28	3588.03N	256.32W	2.00	3597.18	40.03850480	-104.78096135
8716.00	26.56	355.910	7721.92	3634.18N	259.61W	2.00	3643.45	40.03863156	-104.78097178

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Vertical Section is from 0.00N 0.00E on azimuth 355.910 degrees
Bottom hole distance is 3945.84 Feet on azimuth 355.91 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 29-Aug-2018



SYSDRILL
Well Design Combined Report
Wellbore: W ROY SWD 2 (PWB)



Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
8816.00	24.56	355.910	7812.13	3677.22N	262.69W	2.00	3686.59	40.03874977	-104.78098152
8916.00	22.56	355.910	7903.79	3717.09N	265.54W	2.00	3726.57	40.03885928	-104.78099053
9016.00	20.56	355.910	7996.79	3753.75N	268.16W	2.00	3763.32	40.03895996	-104.78099882
9116.00	18.56	355.910	8091.01	3787.15N	270.54W	2.00	3796.80	40.03905169	-104.78100638
9216.00	16.56	355.910	8186.34	3817.25N	272.69W	2.00	3826.97	40.03913435	-104.78101318
9316.00	14.56	355.910	8282.67	3844.01N	274.60W	2.00	3853.80	40.03920785	-104.78101924
9416.00	12.56	355.910	8379.88	3867.40N	276.27W	2.00	3877.25	40.03927209	-104.78102453
9516.00	10.56	355.910	8477.84	3887.39N	277.70W	2.00	3897.30	40.03932700	-104.78102905
9616.00	8.56	355.910	8576.45	3903.96N	278.89W	2.00	3913.91	40.03937251	-104.78103280
9716.00	6.56	355.910	8675.57	3917.09N	279.82W	2.00	3927.07	40.03940857	-104.78103577
9816.00	4.56	355.910	8775.10	3926.75N	280.51W	2.00	3936.76	40.03943513	-104.78103795
9916.00	2.56	355.910	8874.90	3932.95N	280.96W	2.00	3942.98	40.03945215	-104.78103935
10016.00	0.56	355.910	8974.86	3935.67N	281.15W	2.00	3945.70	40.03945962	-104.78103997
10116.00	0.00	355.910	9074.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10216.00	0.00	355.910	9174.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10316.00	0.00	355.910	9274.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10416.00	0.00	355.910	9374.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10516.00	0.00	355.910	9474.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10616.00	0.00	355.910	9574.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10716.00	0.00	355.910	9674.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10816.00	0.00	355.910	9774.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
10916.00	0.00	355.910	9874.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11016.00	0.00	355.910	9974.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11116.00	0.00	355.910	10074.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11216.00	0.00	355.910	10174.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11316.00	0.00	355.910	10274.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11416.00	0.00	355.910	10374.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11516.00	0.00	355.910	10474.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11616.00	0.00	355.910	10574.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11716.00	0.00	355.910	10674.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11816.00	0.00	355.910	10774.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
11916.00	0.00	355.910	10874.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
12016.00	0.00	355.910	10974.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
12116.00	0.00	355.910	11074.86	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000
12164.14	0.00	0.000	11123.00	3935.81N	281.16W	==>	3945.84	40.03946000	-104.78104000

All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5063.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 355.910 degrees
Bottom hole distance is 3945.84 Feet on azimuth 355.91 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 29-Aug-2018



SYSDRILL
Well Design Combined Report
Wellbore: W ROY SWD 2 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
ROY SWD 2 - BHL	3935.81N	281.16W	11123.00	40.03946000	-104.78104000	1258037.16	3201300.48
ROY SWD 2 - LY	3935.81N	281.16W	9003.00	40.03946000	-104.78104000	1258037.16	3201300.48

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
684019	Planned	1016.00	1016.00	WdW Rate Gyro	Standard	
684018	Planned	12164.14	11123.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes