

JUL 29 2021



American Petroleum Partners



WV Department of
Environmental Protection
H&P 471

Borehole: **ST01** Well: **CRN-2UH** Field: **WV Marshall County (NAD 83 UTM Zone 17N)**

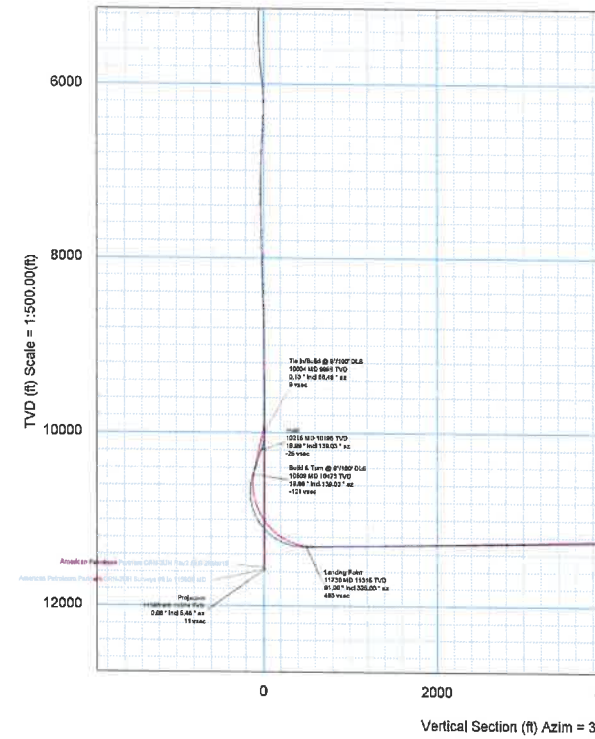
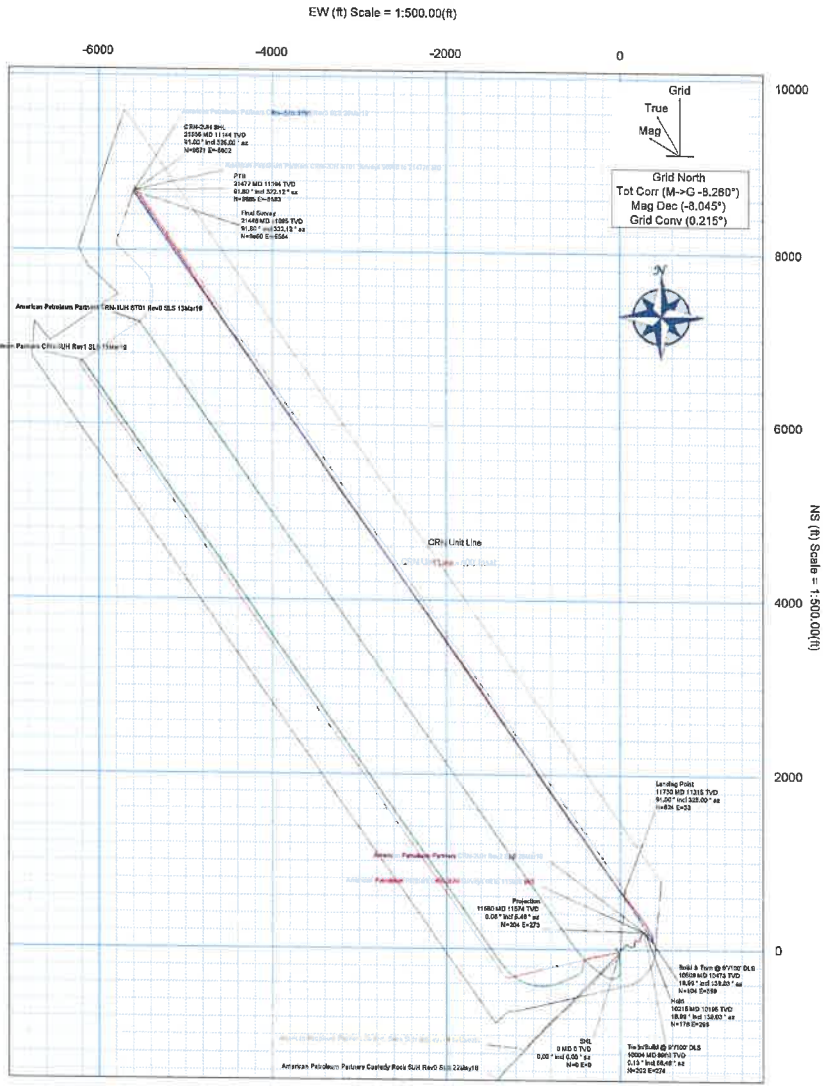
Gravity & Magnetic Parameters
Model: HDGM 2019 Dip: 67.075° Date: 28-Mar-2019 Surface Location: MADE3 UTM Zone 17N, US Feet
MagDec: -8.045° FS: 62488.367m Gravity FS: 998.337mgal (9.80665 Based) Lat: N 38 67 59.11 Northing: 14514681.11RUS Grid Conv: 0.216° MiscEneome Slot: CRN-2UH TVD Ref: RKR(1362.89M above MSL)
Lon: W 80 38 54.97 Easting: 1734204.56RUS Scale Fact: 0.89961006 Plan: American Petroleum Partners CRN-2UH 6701 Surveys 9696R to 21477R MD

SL#	Surf	Survey Tool	Vendor/Tool	Hole Size	Depth	MD From	MD To	Survey	EQI Elev	EQI Elev	Comments/Contingency
		Survey Tool Code		(in)	(ft)	(ft)	(ft)	Frequency (ft)	(ft)	(ft)	
1		NAL_NSO+MHOI-Depth Only		30	30	0	25	180.425	1.23	1.25	
2		NAL_NSO+MHOI-Depth Only		30	30	25	25	Alt Str	1.23	1.25	
3		NAL_NSO+MHOI		30	30	25	2410	Alt Str	5.247	5.272	
4		NAL_NSO+NOI_SLS		30	30	2410	9508	Alt Str	8.732	8.828	
5		NAL_NSO+NOI_DEG		30	30	9960	21477	Alt Str	303.96	11.158	

Critical Point	MD	INCL	AZIM	TVD	VSIC	R(+)/L(-)	R(+)/W(-)	SLB
Initial Point @ #1707 DLS	9880.00	2.88	55.26	6880.23	8.33	195.19	385.54	
Final Survey	21468.00	91.80	322.12	11885.21	10295.23	8550.18	-4563.71	3.00
PTS	21477.00	91.80	322.12	11884.23	10294.16	8554.64	-4362.73	0.00

Surface Location	
Northings: 14514681.08153	Easting: 1734204.5542282
Latitude: N 38 57 59.11	Longitude: W 80 38 54.97
VSIC Azimuth: 325.00	

Target Description	Grid Coord	Local Coord								
Target Name	Shape	Dimension	Latitude	Longitude	Northings	Easting	TVD	VSIC	R(+)/L(-)	R(+)/W(-)
CRN Unit Line - 407 Inset	Polyline	N/A	38 57 38.51	W 80 38 55.25	14514675.54	1734175.08	1362.89	13.36	5.58	-20.48
CRN Unit Line	Polyline	N/A	38 57 38.51	W 80 38 55.25	14514675.54	1734175.08	1362.89	13.36	5.58	-20.48
CRN-2UH SLS	Point	N/A	38 58 25.20	W 80 38 4.52	14522468.84	1728804.71	11448.50	12316.14	8071.14	-801.87



Survey	Start	End	Tool	Vendor	Depth	MD	VSIC	R(+)/L(-)	R(+)/W(-)	SLB
CRN-2UH SLS	9880.00	11885.21	30	NAL_NSO+MHOI	30	25	180.425	1.23	1.25	
CRN-2UH SLS	11885.21	11885.21	30	NAL_NSO+MHOI	30	25	Alt Str	1.23	1.25	
CRN-2UH SLS	11885.21	2410	30	NAL_NSO+MHOI	30	2410	Alt Str	5.247	5.272	
CRN-2UH SLS	2410	9508	30	NAL_NSO+NOI_SLS	30	2410	9508	Alt Str	8.732	8.828
CRN-2UH SLS	9508	21477	30	NAL_NSO+NOI_DEG	30	9508	21477	Alt Str	303.96	11.158

CONTROLLED

Drawn By: [Signature]

Checked By: [Signature]

Date: 2021-07-29

Scale: 1:500

Origin: 0N-S, 0E-W

American Petroleum Partners CRN-2UH ST01 Surveys 9696ft to 21477ft MD Survey Geodetic Report (Def Survey)



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Report Date: April 08, 2019 - 03:50 PM
Client: American Petroleum Partners
Field: WV Marshall County (NAD 83 UTM Zone 17N)
Structure / Shot: American Petroleum Partners CRN-2UH ST01

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 325.000 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 1362.890 ft above MSL
Seabed / Ground Elevation: 1337.890 ft above MSL
Magnetic Declination: -8.045 °
Total Gravity Field Strength: 999.3373mgn (8.80665 Bessed)
Gravity Model: GARM
Total Magnetic Field Strength: 32488.387 nT
Magnetic Dip Angle: 87.075 °
Declination Date: March 28, 2019
Magnetic Declination Model: HDGM 2019
North Reference: Grid North
Grid Convergence Used: 0.2150 °
Total Corr Mag North-Grid North: -8.2599 °
Local Coord Referenced To: Well Head

Table with columns: Comments, MD (ft), Incl (°), Azim Grid, TVD (ft), TVDSS (ft), VSEC (ft), NS, EW, DLS (ft), TF, BR, TR, Northing, Easting, Latitude, Longitude, Directional. Contains multiple rows of survey data points.

Comments	MD (ft)	Incl °	Azim Grid °	TVD (ft)	TVDSS (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft)	TF *	BR (ft)	TR *	Northing (ft)	Easting (ft)	Latitude °	Longitude °	Directional Quality Index
	21195.00	90.78	324.49	11101.41	9736.52	10037.33	6456.44	-5415.95	0.54	58.56R	0.29	-0.79	14523136.22	1728787.02	39.96659184	-80.68449672	6.76
	21253.00	91.40	325.44	11099.60	9736.71	10132.32	6536.21	-5474.16	1.19	79.21L	0.65	1.00	14523213.95	1728732.52	39.96990565	-80.68469034	6.77
	21388.00	91.74	324.15	11097.00	9734.11	10227.28	6513.90	-5526.95	1.40	68.26L	0.36	-1.36	14523291.53	1728677.79	39.96011938	-80.68488474	6.78
Final Survey	21448.00	91.80	322.12	11095.21	9732.32	10285.22	6880.16	-5593.71	3.50	HS	0.10	-3.50	14523337.88	1728643.03	39.96024703	-80.68500827	6.78
PTB	21477.00	91.80	322.12	11094.23	9731.34	10316.16	6884.64	-5582.73	0.00		0.00	0.00	14523362.33	1728624.01	39.95931435	-80.68507585	6.78

Survey Type: Def Survey

Survey Error Model: ISOWSA Rev 0 *** 3-D 95.000% Confidence 2.7655 sigma

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	25.000	1/96.425	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / American Petroleum Partners CRN-2UH Surveys 0ft to 11500ft MD
	1	25.000	25.000	Act Strs	30.000	30.000	NAL_NSG+MSHOT-Depth Only	Original Borehole / American Petroleum Partners CRN-2UH Surveys 0ft to 11500ft MD
	1	25.000	2410.000	Act Strs	30.000	30.000	NAL_NSG+MSHOT	Original Borehole / American Petroleum Partners CRN-2UH Surveys 0ft to 11500ft MD
	1	2410.000	9699.000	Act Strs	30.000	30.000	NAL_MWD-NON_SLB	Original Borehole / American Petroleum Partners CRN-2UH Surveys 0ft to 11500ft MD
	1	9699.000	21477.000	Act Strs	30.000	30.000	NAL_MWD_1_0_DEG	Original Borehole / American Petroleum Partners CRN-2UH ST01 Surveys

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