OXY USA Inc. - Mesa Verde BS Unit #3H – Amended Drilling Plan

OXY USA Inc. respectfully requests to amend the original APD due to changes in well design to a slim-hole casing design, an increase in lateral length from 5k to 10k and change in the target formation from the 1st Bone Spring to the Avalon. An amended C-102 plat and directional plan/plot are attached.

1. Geologic Formations

TVD of Target	9,225ft	Pilot Hole Depth	N/A	
MD at TD:	19,380ft	Deepest Expected fresh Water		869ft

Delaware Basin

Formation Name	TVD (ft)	Expected Fluids
Rustler	869	Brine
Salado	1200	Losses
Lamar/Delaware	4644	
Bell Canyon	4751	
Cherry Canyon	5501	Water
Brushy Canyon	6891	Oil/Gas
Bone Spring	**8524**	**Oil/Gas**

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

Hole Size	Casing Interval From (ft)	Casing Interval To (ft)	Csg. Size (in)	Weight (lbs/ft)	Grade	Conn.	Safety Factor Collapse	Safety Factor Burst	Safety Factor Body Tension	Safety Factor Joint Tension
17.5	0	920	13.375	54.5	J-55	BTC	> 1.125	> 1.2	> 1.4	> 1.4
9.875	0	8,600	7.625	26.4	L-80	BTC	> 1.125	> 1.2	> 1.4	> 1.4
6.75	0	19,380	5.5	20	P-110	DQX	> 1.125	> 1.2	> 1.4	> 1.4
							Designs will meet or exceed			

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h
*OXY requests the option to set casing shallower yet still below the salts if losses or hole conditions require this. Cement volumes may be adjusted if casing is set shallower and a DV tool may be run in case hole conditions merit pumping a second stage cement job to comply with permitted top of cement. If cement circulated to surface during first stage we will drop a cancelation cone and not pump the second stage.

OXY would like to request a variance for annular clearance around production tubular couplings in the open hole interval comprised of the curve and lateral portions of the well. The production string clearance inside the intermediate string meets the requirements for >0.422in clearance as shown in the table below. The clearances for the production string are as follows:

Description	Csg/Hole ID	Coupl. OD	Clearance
DQX Coupling in 7-5/8" Casing	6.969	6.05	0.4595
DQX Coupling in 6.75in OH	6.75	6.05	0.35

3. Cementing Program

Casing	Slurry	#Sks	Wt. (Lb/gal)	Yld ft3/sack	H20 gal/sk	500# Comp. Strength	Slurry Description
Surface	Surface already set by spudder rig						
1st Stage Intermediate	Lead	300	10.2	2.58	11.568	6:59	Pozzolan Cement, Retarder
	Tail	160	13.2	1.61	7.804	7:11	Class H Cement, Retarder, Dispersant, Salt
DV/ECP Tool @ 4694ft							
2nd Stage Intermediate	Tail	1,517	13.6	1.67	8.765	7:32	Class C Cement, Accelerator, Dispersant
Production Casing	Tail	786	13.2	1.38	6.686	3:49	Class H Cement, Retarder, Dispersant, Salt

Casing String	Top of Lead (ft)	Bottom of Lead (ft)	Top of Tail (ft)	Bottom of Tail (ft)	% Excess Lead	% Excess Tail
Surface	N/A	N/A	0	920	N/A	100%
1st Stage Intermediate Casing	4594	7600	7600	8600	20%	20%
2nd Stage Intermediate Casing	N/A	N/A	0	4694	N/A	150%
Production Casing	N/A	N/A	8100	19380	N/A	15%

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size	Min. Required WP	Type		Tested to:
9.875" Hole	13-5/8"	5M	Annular	x	70 % of working Pressure
			Blind Ram	x	250/5000 psi
			Pipe Ram		
			Double Ram	x	
			Other*		

***Updated Hole Size, still same chart information**

BOP Break Testing Request

As per the agreement reached in the OXY/BLM meeting on Feb 22, 2018, Oxy requests permission to allow BOP Break Testing under the following conditions:

1. Only after a full BOP is conducted to the first well on the pad.
2. Only when skidding from an intermediate to another intermediate section. Exception will be an intermediate followed by a production hole. In that case a full BOP test will be conducted.
3. Only applicable for intermediates that do not penetrate into the Wolfcamp.

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From (ft)	To (ft)				
0	920	Water-Based Mud	8.4-8.6	40-60	N/C
920	4694	WBM or OBM	9.8 - 10	35-45	N/C
4694	8,600	WBM or OBM	8.8-9.6	38-50	N/C
8,600	19,380	OBM	8.3 - 10	35-50	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times. The following is a general list of products: Barite, Bentonite, Gypsum, Lime, Soda Ash, Caustic Soda, Nut Plug, Cedar Fiber, Cotton Seed Hulls, Drilling Paper, Salt Water Clay, CACL2. Oxy will use a closed mud system.

What will be used to monitor the loss or gain of fluid?	PVT/MD Totco/Visual Monitoring

7. Drilling Conditions

BH Pressure and Temperature have been updated to reflect the increased potential MW window for the Production Hole Section and the change in deepest TVD.

Condition	Specify what type and where?
BH Pressure at deepest TVD	4797 psi
Abnormal Temperature	No
BH Temperature at deepest TVD	154°F

Schlumberger

Oxy Mesa Verde BS Unit 3 Rev0 APS 30Mar18 Proposal Geodetic Report

(Def Plan)

Report Date:	March 30, 2018 - 10:40 PM	**Survey / DLS Computation:**	Minimum Curvature / Lubinski
Client:	OXY	**Vertical Section Azimuth:**	356.136 ° (Grid North)
Field:	NM Lea County (NAD 83)	**Vertical Section Origin:**	0.000 ft, 0.000 ft
Structure / Slot:	Oxy Mesa Verde BS Unit 3 / Oxy Mesa Verde BS Unit 3	**TVD Reference Datum:**	RKB=26.5'
Well:	Oxy Mesa Verde BS Unit 3	**TVD Reference Elevation:**	3584.200 ft above MSL
Borehole:	Original Borehole	**Seabed / Ground Elevation:**	3557.700 ft above MSL
UWI / API#:	Unknown / 30-025-44183	**Magnetic Declination:**	6.829 °
Survey Name:	Oxy Mesa Verde BS Unit 3 Rev0 APS 30Mar18	**Total Gravity Field Strength:**	998.4322mgn (9.80665 Based)
Survey Date:	March 30, 2018	**Gravity Model:**	GARM
Tort / AHD / DDI / ERD Ratio:	106.871 ° / 10900.378 ft / 6.389 / 1.182	**Total Magnetic Field Strength:**	48018.455 nT
Coordinate Reference System:	NAD83 New Mexico State Plane, Eastern Zone, US Feet	**Magnetic Dip Angle:**	59.927 °
Location Lat / Long:	N 32° 12' 39.21437", W 103° 41' 36.60955"	**Declination Date:**	March 30, 2018
Location Grid N/E Y/X:	N 441045.880 ftUS, E 739223.840 ftUS	**Magnetic Declination Model:**	HDGM 2018
CRS Grid Convergence Angle:	0.3411 °	**North Reference:**	Grid North
Grid Scale Factor:	0.99995394	**Grid Convergence Used:**	0.3411 °
Version / Patch:	2.10.715.0	**Total Corr Mag North->Grid North:**	6.4881 °
		Local Coord Referenced To:	Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	100.00	0.00	248.22	100.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	200.00	0.00	248.22	200.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	300.00	0.00	248.22	300.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	400.00	0.00	248.22	400.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	500.00	0.00	248.22	500.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	600.00	0.00	248.22	600.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	700.00	0.00	248.22	700.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	800.00	0.00	248.22	800.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	900.00	0.00	248.22	900.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1000.00	0.00	248.22	1000.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1100.00	0.00	248.22	1100.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1200.00	0.00	248.22	1200.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1300.00	0.00	248.22	1300.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1400.00	0.00	248.22	1400.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1500.00	0.00	248.22	1500.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1600.00	0.00	248.22	1600.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1700.00	0.00	248.22	1700.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1800.00	0.00	248.22	1800.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	1900.00	0.00	248.22	1900.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2000.00	0.00	248.22	2000.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2100.00	0.00	248.22	2100.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2200.00	0.00	248.22	2200.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2300.00	0.00	248.22	2300.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2400.00	0.00	248.22	2400.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2500.00	0.00	248.22	2500.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2600.00	0.00	248.22	2600.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2700.00	0.00	248.22	2700.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2800.00	0.00	248.22	2800.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	2900.00	0.00	248.22	2900.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3000.00	0.00	248.22	3000.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3100.00	0.00	248.22	3100.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3200.00	0.00	248.22	3200.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3300.00	0.00	248.22	3300.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3400.00	0.00	248.22	3400.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3500.00	0.00	248.22	3500.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3600.00	0.00	248.22	3600.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3700.00	0.00	248.22	3700.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3800.00	0.00	248.22	3800.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	3900.00	0.00	248.22	3900.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4000.00	0.00	248.22	4000.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4100.00	0.00	248.22	4100.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4200.00	0.00	248.22	4200.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4300.00	0.00	248.22	4300.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4400.00	0.00	248.22	4400.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4500.00	0.00	248.22	4500.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4600.00	0.00	248.22	4600.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4700.00	0.00	248.22	4700.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4800.00	0.00	248.22	4800.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	4900.00	0.00	248.22	4900.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5000.00	0.00	248.22	5000.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5100.00	0.00	248.22	5100.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5200.00	0.00	248.22	5200.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5300.00	0.00	248.22	5300.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5400.00	0.00	248.22	5400.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5500.00	0.00	248.22	5500.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5600.00	0.00	248.22	5600.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5700.00	0.00	248.22	5700.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5800.00	0.00	248.22	5800.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
Build 2°/100'	5840.00	0.00	248.22	5840.00	0.00	0.00	0.00	0.00	441045.88	739223.84	N 32 12 39.21	W 103 41 36.61
	5900.00	1.20	248.22	5900.00	-0.19	-0.23	-0.58	2.00	441045.65	739223.26	N 32 12 39.21	W 103 41 36.62
	6000.00	3.20	248.22	5999.92	-1.37	-1.66	-4.15	2.00	441044.22	739219.69	N 32 12 39.20	W 103 41 36.66
	6100.00	5.20	248.22	6099.64	-3.63	-4.37	-10.95	2.00	441041.51	739212.89	N 32 12 39.17	W 103 41 36.74
	6200.00	7.20	248.22	6199.05	-6.95	-8.38	-20.98	2.00	441037.50	739202.86	N 32 12 39.13	W 103 41 36.85
	6300.00	9.20	248.22	6298.03	-11.34	-13.67	-34.22	2.00	441032.21	739189.62	N 32 12 39.08	W 103 41 37.01
	6400.00	11.20	248.22	6396.44	-16.78	-20.24	-50.66	2.00	441025.64	739173.18	N 32 12 39.02	W 103 41 37.20
Hold Tangent	6440.10	12.00	248.22	6435.72	-19.27	-23.24	-58.15	2.00	441022.64	739165.69	N 32 12 38.99	W 103 41 37.29
	6500.00	12.00	248.22	6494.31	-23.10	-27.86	-69.72	0.00	441018.02	739154.12	N 32 12 38.94	W 103 41 37.42
	6600.00	12.00	248.22	6592.13	-29.49	-35.57	-89.03	0.00	441010.31	739134.81	N 32 12 38.87	W 103 41 37.65
	6700.00	12.00	248.22	6689.94	-35.89	-43.29	-108.34	0.00	441002.59	739115.51	N 32 12 38.79	W 103 41 37.87
	6800.00	12.00	248.22	6787.75	-42.29	-51.01	-127.65	0.00	440994.88	739096.20	N 32 12 38.72	W 103 41 38.10
	6900.00	12.00	248.22	6885.57	-48.69	-58.72	-146.96	0.00	440987.16	739076.89	N 32 12 38.64	W 103 41 38.32
	7000.00	12.00	248.22	6983.38	-55.08	-66.44	-166.27	0.00	440979.44	739057.58	N 32 12 38.57	W 103 41 38.55
	7100.00	12.00	248.22	7081.20	-61.48	-74.16	-185.58	0.00	440971.73	739038.27	N 32 12 38.49	W 103 41 38.77
	7200.00	12.00	248.22	7179.01	-67.88	-81.87	-204.89	0.00	440964.01	739018.96	N 32 12 38.42	W 103 41 39.00
	7300.00	12.00	248.22	7276.82	-74.27	-89.59	-224.20	0.00	440956.30	738999.65	N 32 12 38.34	W 103 41 39.23
	7400.00	12.00	248.22	7374.64	-80.67	-97.30	-243.51	0.00	440948.58	738980.34	N 32 12 38.27	W 103 41 39.45
	7500.00	12.00	248.22	7472.45	-87.07	-105.02	-262.82	0.00	440940.87	738961.03	N 32 12 38.19	W 103 41 39.68
	7600.00	12.00	248.22	7570.27	-93.47	-112.74	-282.13	0.00	440933.15	738941.72	N 32 12 38.12	W 103 41 39.90

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	7700.00	12.00	248.22	7668.08	-99.86	-120.45	-301.44	0.00	440925.43	738922.41	N 32 12 38.04	W 103 41 40.13
	7800.00	12.00	248.22	7765.89	-106.26	-128.17	-320.75	0.00	440917.72	738903.10	N 32 12 37.97	W 103 41 40.35
	7900.00	12.00	248.22	7863.71	-112.66	-135.88	-340.06	0.00	440910.00	738883.80	N 32 12 37.89	W 103 41 40.58
	8000.00	12.00	248.22	7961.52	-119.05	-143.60	-359.37	0.00	440902.29	738864.49	N 32 12 37.81	W 103 41 40.80
	8100.00	12.00	248.22	8059.34	-125.45	-151.32	-378.68	0.00	440894.57	738845.18	N 32 12 37.74	W 103 41 41.03
	8200.00	12.00	248.22	8157.15	-131.85	-159.03	-397.99	0.00	440886.86	738825.87	N 32 12 37.66	W 103 41 41.25
	8300.00	12.00	248.22	8254.96	-138.25	-166.75	-417.30	0.00	440879.14	738806.56	N 32 12 37.59	W 103 41 41.48
	8400.00	12.00	248.22	8352.78	-144.64	-174.46	-436.61	0.00	440871.42	738787.25	N 32 12 37.51	W 103 41 41.70
	8500.00	12.00	248.22	8450.59	-151.04	-182.18	-455.92	0.00	440863.71	738767.94	N 32 12 37.44	W 103 41 41.93
Turn 2°/100'	8576.39	12.00	248.22	8525.31	-155.93	-188.07	-470.67	0.00	440857.81	738753.19	N 32 12 37.38	W 103 41 42.10
	8600.00	11.96	250.49	8548.41	-157.34	-189.80	-475.26	2.00	440856.09	738748.60	N 32 12 37.36	W 103 41 42.15
Build/Turn 10°/100'	8698.66	12.00	260.00	8644.93	-161.20	-195.00	-495.00	2.00	440850.89	738728.86	N 32 12 37.31	W 103 41 42.38
	8700.00	11.98	260.84	8646.24	-161.23	-195.05	-495.27	10.00	440850.84	738728.59	N 32 12 37.31	W 103 41 42.39
	8800.00	14.35	304.49	8743.84	-154.52	-189.71	-515.78	10.00	440856.18	738708.09	N 32 12 37.37	W 103 41 42.63
	8900.00	21.57	327.51	8839.02	-130.64	-167.13	-535.91	10.00	440878.76	738687.95	N 32 12 37.59	W 103 41 42.86
	9000.00	30.36	338.56	8928.89	-90.31	-128.01	-555.07	10.00	440917.88	738668.80	N 32 12 37.98	W 103 41 43.08
	9100.00	39.69	344.90	9010.72	-34.76	-73.52	-572.67	10.00	440972.37	738651.20	N 32 12 38.52	W 103 41 43.28
	9200.00	49.24	349.13	9082.02	34.33	-5.32	-588.17	10.00	441040.56	738635.70	N 32 12 39.20	W 103 41 43.46
	9300.00	58.91	352.27	9140.63	114.84	74.50	-601.10	10.00	441120.38	738622.77	N 32 12 39.99	W 103 41 43.60
	9400.00	68.65	354.83	9184.76	204.35	163.54	-611.07	10.00	441209.41	738612.80	N 32 12 40.87	W 103 41 43.71
	9500.00	78.42	357.07	9213.08	300.12	259.08	-617.79	10.00	441304.95	738606.08	N 32 12 41.81	W 103 41 43.78
	9600.00	88.20	359.16	9224.72	399.26	358.22	-621.03	10.00	441404.08	738602.84	N 32 12 42.80	W 103 41 43.81
Landing Point	9622.90	90.44	359.63	9225.00	422.11	381.11	-621.27	10.00	441426.97	738602.60	N 32 12 43.02	W 103 41 43.81
	9700.00	90.44	359.63	9224.40	499.07	458.21	-621.78	0.00	441504.07	738602.09	N 32 12 43.78	W 103 41 43.81
	9800.00	90.44	359.63	9223.63	598.88	558.20	-622.43	0.00	441604.06	738601.44	N 32 12 44.77	W 103 41 43.82
	9900.00	90.44	359.63	9222.87	698.69	658.20	-623.08	0.00	441704.05	738600.79	N 32 12 45.76	W 103 41 43.82
	10000.00	90.44	359.63	9222.10	798.50	758.19	-623.73	0.00	441804.04	738600.14	N 32 12 46.75	W 103 41 43.82
	10100.00	90.44	359.63	9221.33	898.32	858.19	-624.38	0.00	441904.03	738599.49	N 32 12 47.74	W 103 41 43.82
	10200.00	90.44	359.63	9220.56	998.13	958.18	-625.03	0.00	442004.02	738598.84	N 32 12 48.73	W 103 41 43.82
	10300.00	90.44	359.63	9219.79	1097.94	1058.18	-625.68	0.00	442104.01	738598.19	N 32 12 49.72	W 103 41 43.82
	10400.00	90.44	359.63	9219.02	1197.75	1158.17	-626.33	0.00	442204.00	738597.54	N 32 12 50.71	W 103 41 43.82
	10500.00	90.44	359.63	9218.25	1297.56	1258.17	-626.98	0.00	442303.99	738596.89	N 32 12 51.70	W 103 41 43.82
	10600.00	90.44	359.63	9217.49	1397.37	1358.16	-627.63	0.00	442403.98	738596.24	N 32 12 52.69	W 103 41 43.82
	10700.00	90.44	359.63	9216.72	1497.18	1458.16	-628.28	0.00	442503.97	738595.59	N 32 12 53.68	W 103 41 43.82
	10800.00	90.44	359.63	9215.95	1597.00	1558.15	-628.93	0.00	442603.96	738594.94	N 32 12 54.67	W 103 41 43.82
	10900.00	90.44	359.63	9215.18	1696.81	1658.15	-629.58	0.00	442703.95	738594.29	N 32 12 55.66	W 103 41 43.82
	11000.00	90.44	359.63	9214.41	1796.62	1758.14	-630.23	0.00	442803.94	738593.64	N 32 12 56.65	W 103 41 43.82
	11100.00	90.44	359.63	9213.64	1896.43	1858.14	-630.88	0.00	442903.93	738592.99	N 32 12 57.64	W 103 41 43.82
	11200.00	90.44	359.63	9212.87	1996.24	1958.13	-631.53	0.00	443003.92	738592.34	N 32 12 58.63	W 103 41 43.82
	11300.00	90.44	359.63	9212.10	2096.05	2058.13	-632.18	0.00	443103.91	738591.69	N 32 12 59.62	W 103 41 43.83
	11400.00	90.44	359.63	9211.34	2195.86	2158.12	-632.83	0.00	443203.90	738591.04	N 32 13 0.61	W 103 41 43.83
	11500.00	90.44	359.63	9210.57	2295.68	2258.12	-633.48	0.00	443303.89	738590.39	N 32 13 1.60	W 103 41 43.83
	11600.00	90.44	359.63	9209.80	2395.49	2358.11	-634.13	0.00	443403.88	738589.74	N 32 13 2.59	W 103 41 43.83
	11700.00	90.44	359.63	9209.03	2495.30	2458.11	-634.79	0.00	443503.87	738589.09	N 32 13 3.57	W 103 41 43.83
	11800.00	90.44	359.63	9208.26	2595.11	2558.10	-635.44	0.00	443603.86	738588.43	N 32 13 4.56	W 103 41 43.83
	11900.00	90.44	359.63	9207.49	2694.92	2658.10	-636.09	0.00	443703.85	738587.78	N 32 13 5.55	W 103 41 43.83
	12000.00	90.44	359.63	9206.72	2794.73	2758.09	-636.74	0.00	443803.84	738587.13	N 32 13 6.54	W 103 41 43.83
	12100.00	90.44	359.63	9205.96	2894.54	2858.09	-637.39	0.00	443903.83	738586.48	N 32 13 7.53	W 103 41 43.83
	12200.00	90.44	359.63	9205.19	2994.36	2958.08	-638.04	0.00	444003.82	738585.83	N 32 13 8.52	W 103 41 43.83
	12300.00	90.44	359.63	9204.42	3094.17	3058.08	-638.69	0.00	444103.81	738585.18	N 32 13 9.51	W 103 41 43.83
	12400.00	90.44	359.63	9203.65	3193.98	3158.07	-639.34	0.00	444203.80	738584.53	N 32 13 10.50	W 103 41 43.83
	12500.00	90.44	359.63	9202.88	3293.79	3258.07	-639.99	0.00	444303.79	738583.88	N 32 13 11.49	W 103 41 43.83
	12600.00	90.44	359.63	9202.11	3393.60	3358.06	-640.64	0.00	444403.78	738583.23	N 32 13 12.48	W 103 41 43.83
	12700.00	90.44	359.63	9201.34	3493.41	3458.06	-641.29	0.00	444503.77	738582.58	N 32 13 13.47	W 103 41 43.83
	12800.00	90.44	359.63	9200.57	3593.22	3558.05	-641.94	0.00	444603.76	738581.93	N 32 13 14.46	W 103 41 43.84
	12900.00	90.44	359.63	9199.81	3693.04	3658.05	-642.59	0.00	444703.75	738581.28	N 32 13 15.45	W 103 41 43.84
	13000.00	90.44	359.63	9199.04	3792.85	3758.04	-643.24	0.00	444803.74	738580.63	N 32 13 16.44	W 103 41 43.84
	13100.00	90.44	359.63	9198.27	3892.66	3858.04	-643.89	0.00	444903.73	738579.98	N 32 13 17.43	W 103 41 43.84
	13200.00	90.44	359.63	9197.50	3992.47	3958.03	-644.54	0.00	445003.72	738579.33	N 32 13 18.42	W 103 41 43.84
	13300.00	90.44	359.63	9196.73	4092.28	4058.03	-645.19	0.00	445103.71	738578.68	N 32 13 19.41	W 103 41 43.84
	13400.00	90.44	359.63	9195.96	4192.09	4158.02	-645.84	0.00	445203.70	738578.03	N 32 13 20.40	W 103 41 43.84
	13500.00	90.44	359.63	9195.19	4291.90	4258.02	-646.49	0.00	445303.69	738577.38	N 32 13 21.39	W 103 41 43.84
	13600.00	90.44	359.63	9194.43	4391.72	4358.01	-647.15	0.00	445403.68	738576.73	N 32 13 22.37	W 103 41 43.84
	13700.00	90.44	359.63	9193.66	4491.53	4458.01	-647.80	0.00	445503.67	738576.08	N 32 13 23.36	W 103 41 43.84
	13800.00	90.44	359.63	9192.89	4591.34	4558.00	-648.45	0.00	445603.66	738575.42	N 32 13 24.35	W 103 41 43.84
	13900.00	90.44	359.63	9192.12	4691.15	4658.00	-649.10	0.00	445703.65	738574.77	N 32 13 25.34	W 103 41 43.84
	14000.00	90.44	359.63	9191.35	4790.96	4757.99	-649.75	0.00	445803.64	738574.12	N 32 13 26.33	W 103 41 43.84
	14100.00	90.44	359.63	9190.58	4890.77	4857.99	-650.40	0.00	445903.63	738573.47	N 32 13 27.32	W 103 41 43.84
	14200.00	90.44	359.63	9189.81	4990.58	4957.98	-651.05	0.00	446003.62	738572.82	N 32 13 28.31	W 103 41 43.84
	14300.00	90.44	359.63	9189.05	5090.40	5057.98	-651.70	0.00	446103.61	738572.17	N 32 13 29.30	W 103 41 43.85
	14400.00	90.44	359.63	9188.28	5190.21	5157.97	-652.35	0.00	446203.60	738571.52	N 32 13 30.29	W 103 41 43.85
	14500.00	90.44	359.63	9187.51	5290.02	5257.97	-653.00	0.00	446303.59	738570.87	N 32 13 31.28	W 103 41 43.85
	14600.00	90.44	359.63	9186.74	5389.83	5357.96	-653.65	0.00	446403.58	738570.22	N 32 13 32.27	W 103 41 43.85
	14700.00	90.44	359.63	9185.97	5489.64	5457.96	-654.30	0.00	446503.57	738569.57	N 32 13 33.26	W 103 41 43.85
	14800.00	90.44	359.63	9185.20	5589.45	5557.95	-654.95	0.00	446603.56	738568.92	N 32 13 34.25	W 103 41 43.85
	14900.00	90.44	359.63	9184.43	5689.26	5657.95	-655.60	0.00	446703.55	738568.27	N 32 13 35.24	W 103 41 43.85
	15000.00	90.44	359.63	9183.66	5789.08	5757.94	-656.25	0.00	446803.54	738567.62	N 32 13 36.23	W 103 41 43.85
	15100.00	90.44	359.63	9182.90	5888.89	5857.94	-656.90	0.00	446903.53	738566.97	N 32 13 37.22	W 103 41 43.85
	15200.00	90.44	359.63	9182.13	5988.70	5957.93	-657.55	0.00	447003.52	738566.32	N 32 13 38.21	W 103 41 43.85
	15300.00	90.44	359.63	9181.36	6088.51	6057.92	-658.20	0.00	447103.51	738565.67	N 32 13 39.20	W 103 41 43.85
	15400.00	90.44	359.63	9180.59	6188.32	6157.92	-658.85	0.00	447203.50	738565.02	N 32 13 40.19	W 103 41 43.85
	15500.00	90.44	359.63	9179.82	6288.13	6257.91	-659.50	0.00	447303.49	738564.37	N 32 13 41.18	W 103 41 43.85
	15600.00	90.44	359.63	9179.05	6387.94	6357.91	-660.16	0.00	447403.48	738563.72	N 32 13 42.16	W 103 41 43.85
	15700.00	90.44	359.63	9178.28	6487.76	6457.90	-660.81	0.00	447503.47	738563.07	N 32 13 43.15	W 103 41 43.85
	15800.00	90.44	359.63	9177.52	6587.57	6557.90	-661.46	0.00	447603.46	738562.42	N 32 13 44.14	W 103 41 43.86
	15900.00	90.44	359.63	9176.75	6687.38	6657.89	-662.11	0.00	447703.45	738561.76	N 32 13 45.13	W 103 41 43.86
	16000.00	90.44	359.63	9175.98	6787.19	6757.89	-662.76	0.00	447803.44	738561.11	N 32 13 46.12	W 103 41 43.86
	16100.00	90.44	359.63	9175.21	6887.00	6857.88	-663.41	0.00	447903.43	738560.46	N 32 13 47.11	W 103 41 43.86
	16200.00	90.44	359.63	9174.44	6986.81	6957.88	-664.06	0.00	448003.42	738559.81	N 32 13 48.10	W 103 41 43.86
	16300.00	90.44	359.63	9173.67	7086.62	7057.87	-664.71	0.00	448103.42	738559.16	N 32 13 49.09	W 103 41 43.86
	16400.00	90.44	359.63	9172.90	7186.44	7157.87	-665.36	0.00	448203.41	738558.51	N 32 13 50.08	W 103 41 43.86
	16500.00	90.44	359.63	9172.13	7286.25	7257.86	-666.01	0.00	448303.40	738557.86	N 32 13 51.07	W 103 41 43.86
	16600.00	90.44	359.63	9171.37	7386.06	7357.86	-666.66	0.00	448403.39	738557.21	N 32 13 52.06	W 103 41 43.86
	16700.00	90.44	359.63	9170.60	7485.87	7457.85	-667.31	0.00	448503.38	738556.56	N 32 13 53.05	W 103 41 43.86
	16800.00	90.44	359.63	9169.83	7585.68	7557.85	-667.96	0.00	448603.37	738555.91	N 32 13 54.04	W 103 41 43.86
	16900.00	90.44	359.63	9169.06	7685.49	7657.84	-668.61	0.00	448703.36	738555.26	N 32 13 55.03	W 103 41 43.86
	17000.00	90.44	359.63	9168.29	7785.30	7757.84	-669.26	0.00	448803.35	738554.61	N 32 13 56.02	W 103 41 43.86
	17100.00	90.44	359.63	9167.52	7885.12	7857.83	-669.91	0.00	448903.34	738553.96	N 32 13 57.01	W 103 41 43.86
	17200.00	90.44	359.63	9166.75	7984.93	7957.83	-670.56	0.00	449003.33	738553.31	N 32 13 58.00	W 103 41 43.86
	17300.00	90.44	359.63	9165.99	8084.74	8057.82	-671.21	0.00	449103.32	738552.66	N 32 13 58.99	W 103 41 43.86
	17400.00	90.44	359.63	9165.22	8184.55	8157.82	-671.86	0.00	449203.31	738552.01	N 32 13 59.98	W 103 41 43.87
	17500.00	90.44	359.63	9164.45	8284.36	8257.81	-672.52	0.00	449303.30	738551.36	N 32 14 0.96	W 103 41 43.87
	17600.00	90.44	359.63	9163.68	8384.17	8357.81	-673.17	0.00	449403.29	738550.71	N 32 14 1.95	W 103 41 43.87
	17700.00	90.44	359.63	9162.91	8483.98	8457.80	-673.82	0.00	449503.28	738550.06	N 32 14 2.94	W 103 41 43.87
	17800.00	90.44	359.63	9162.14	8583.80	8557.80	-674.47	0.00	449603.27	738549.41	N 32 14 3.93	W 103 41 43.87
	17900.00	90.44	359.63	9161.37	8683.61	8657.79	-675.12	0.00	449703.26	738548.76	N 32 14 4.92	W 103 41 43.87
	18000.00	90.44	359.63	9160.61	8783.42	8757.79	-675.77	0.00	449803.25	738548.10	N 32 14 5.91	W 103 41 43.87
	18100.00	90.44	359.63	9159.84	8883.23	8857.78	-676.42	0.00	449903.24	738547.45	N 32 14 6.90	W 103 41 43.87

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	18200.00	90.44	359.63	9159.07	8983.04	8957.78	-677.07	0.00	450003.23	738546.80	N 32 14 7.89	W 103 41 43.87
	18300.00	90.44	359.63	9158.30	9082.85	9057.77	-677.72	0.00	450103.22	738546.15	N 32 14 8.88	W 103 41 43.87
	18400.00	90.44	359.63	9157.53	9182.67	9157.77	-678.37	0.00	450203.21	738545.50	N 32 14 9.87	W 103 41 43.87
	18500.00	90.44	359.63	9156.76	9282.48	9257.76	-679.02	0.00	450303.20	738544.85	N 32 14 10.86	W 103 41 43.87
	18600.00	90.44	359.63	9155.99	9382.29	9357.76	-679.67	0.00	450403.19	738544.20	N 32 14 11.85	W 103 41 43.87
	18700.00	90.44	359.63	9155.22	9482.10	9457.75	-680.32	0.00	450503.18	738543.55	N 32 14 12.84	W 103 41 43.87
	18800.00	90.44	359.63	9154.46	9581.91	9557.75	-680.97	0.00	450603.17	738542.90	N 32 14 13.83	W 103 41 43.87
	18900.00	90.44	359.63	9153.69	9681.72	9657.74	-681.62	0.00	450703.16	738542.25	N 32 14 14.82	W 103 41 43.88
	19000.00	90.44	359.63	9152.92	9781.53	9757.74	-682.27	0.00	450803.15	738541.60	N 32 14 15.81	W 103 41 43.88
	19100.00	90.44	359.63	9152.15	9881.35	9857.73	-682.92	0.00	450903.14	738540.95	N 32 14 16.80	W 103 41 43.88
	19200.00	90.44	359.63	9151.38	9981.16	9957.73	-683.57	0.00	451003.13	738540.30	N 32 14 17.79	W 103 41 43.88
	19300.00	90.44	359.63	9150.61	10080.97	10057.72	-684.22	0.00	451103.12	738539.65	N 32 14 18.78	W 103 41 43.88
Mesa Verde BS Unit 3 PBHL	19379.69	90.44	359.63	9150.00	10160.51	10137.41	-684.74	0.00	451182.80	738539.13	N 32 14 19.56	W 103 41 43.88

Survey Type: Def Plan

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)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	26.500	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG-Depth Only	Original Borehole / Oxy Mesa Verde BS Unit 3 Rev0 APS 30Mar18
	1	26.500	19379.689	1/100.000	30.000	30.000		NAL_MWD_PLUS_0.5_DEG	Original Borehole / Oxy Mesa Verde BS Unit 3 Rev0 APS