

State of New Mexico
Energy, Minerals and Natural Resources Department

Michelle Lujan Grisham
Governor

Sarah Cottrell Propst
Cabinet Secretary

Todd E. Leahy, JD, PhD
Deputy Secretary

Adrienne Sandoval, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-3 APD form.

Operator Signature Date: 6/5/2019

Well information;

Operator DJR, Well Name and Number North Alamo Unit 528H

API# 30-043-2133⁴, Section 3, Township 23 N/S, Range 7 E/W

Conditions of Approval: (See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ If cement doesn't circulate on any casing string or stage tool a CBL will be required. Contact the regulatory agencies prior to proceeding.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☐ Hold C-104 for: NSL, NSP, DHC, 5.9 Compliance
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ☐ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ☐ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ☐ Submit Gas Capture Plan form prior to spudding or initiating recompletion operations
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ☒ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.

-File Sundry to BLM for API # Change.

B.A. P.M.
NMOCD Approved by Signature

1/24/20
Date

- See Change of Plans
next document

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM006681
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☒ Multiple Zone		7. If Unit or CA Agreement, Name and No. /1/NORTH ALAMITO UNIT / NMNM13522
2. Name of Operator DJR OPERATING LLC		8. Lease Name and Well No. NORTH ALAMITO UNIT 528H
3a. Address 1600 Broadway #1960 Denver CO 80202	3b. Phone No. (include area code) (303)595-7430	9. API Well No. 30-043-21335
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NWSE / 2229 FSL / 2517 FEL / LAT 36.182129 / LONG -107.615051 At proposed prod. zone SWNE / 2311 FNL / 2416 FEL / LAT 36.169592 / LONG -107.59708		10. Field and Pool, or Exploratory ALAMITO MANCOS N (OIL)
11. Sec., T. R. M. or Blk. and Survey or Area SEC 31 / T23N / R7W / NMP		
14. Distance in miles and direction from nearest town or post office* 47 miles		12. County or Parish SANDOVAL
13. State NM		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 329 feet	16. No of acres in lease 642.56	17. Spacing Unit dedicated to this well 440.89
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 20 feet	19. Proposed Depth 5118 feet / 12181 feet	20. BLM/BIA Bond No. in file FED: NMB001464
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6981 feet	22. Approximate date work will start* 09/30/2019	23. Estimated duration 10 days
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification. |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be requested by the BLM. |

25. Signature (Electronic Submission)	Name (Printed/Typed) Shaw-Marie N. Ford / Ph: (505)632-3476	Date 06/05/2019
Title Regulatory Specialist		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Dave Mankiewicz / Ph: (505)564-7761	Date 12/23/2019
Title AFM-Minerals		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

APPROVED WITH CONDITIONS
Approval Date: 12/23/2019

NMOCO

DEC 26 2019

DISTRICT III

*(Instructions on page 2)

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30.043-21334	¹ Pool Code 98174	¹ Pool Name NORTH ALAMITO UNIT MANCOS OIL POOL
• Property Code 325267	"Property Name NORTH ALAMITO UNIT	
⁷ OGRID No. 371838	• operator Name DJR OPERATING, LLC	• Well Number 528H • Elevation 6981'

¹⁰ Surface Location

UL or lot no	Section	To/From	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
J	31	23N	7W		2229'	SOUTH	2517'	EAST	SANDOVAL

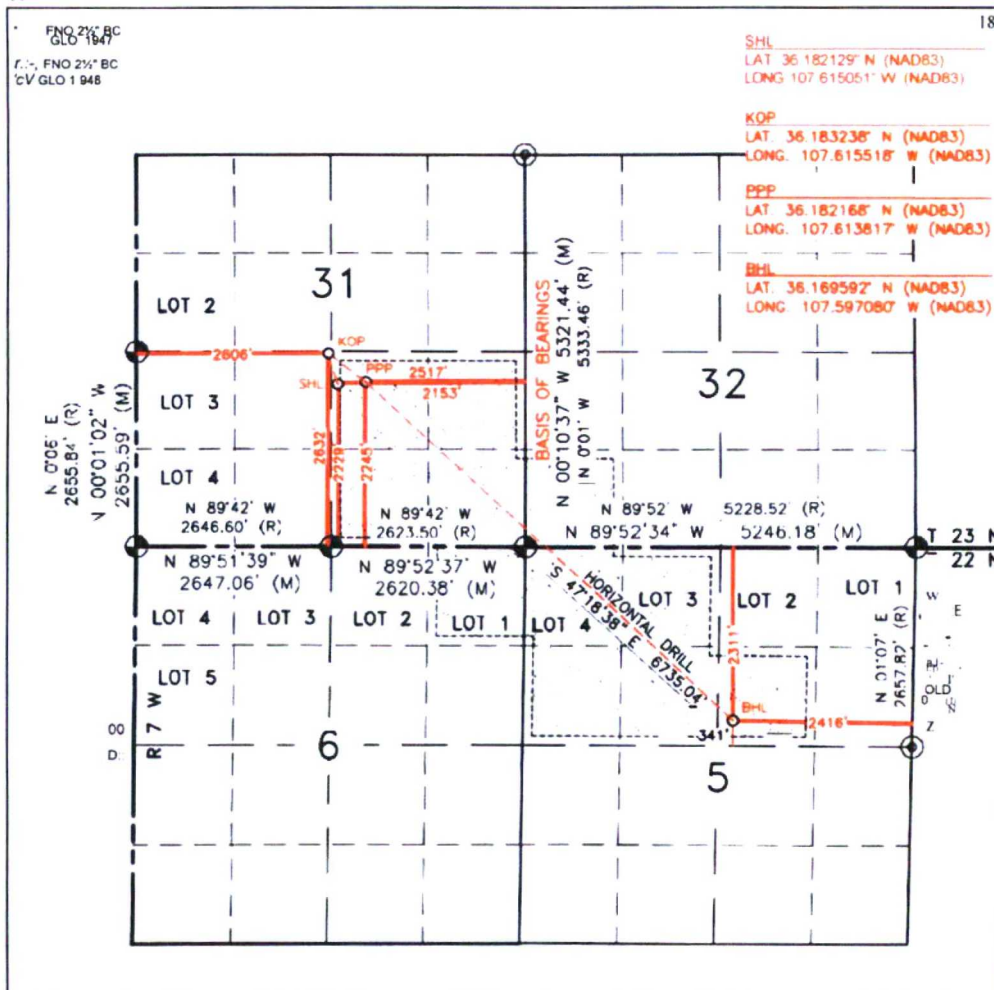
¹¹Bottom Hole Location If Different From Surface

UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	5	22N	7W		2311'	NORTH	2416'	EAST	SANDOVAL

R-14081, R-14081A

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

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11 OPERATOR CERTIFICATION

SURVEYOR CERTIFICATION



Certificate Number 11393

PENETRATED SPACING UNIT;
 SEC 31: SE/4 (160 AC.); SEC 32: SW/SW (40 AC.);
 SEC 6: LOT 1 (40.21 AC) SEC 5: LOT 3, LOT 4, SW/NW, SE/NW
 & SW/NE (200.68 AC.) = 440.89 ACRES TOTAL
 TOTAL 14,262.78 ACRES: T23N R7W SEC. 19-23, 25, 26-34 (ALL), 35 (NW/4),
 T22N R7W SEC. 3 & 4 (N/2); 5 (N/2, SW/4); 6 (ALL); 7 (N/2); 8 (NW/4);
 T23N RBW SEC. 25, 36 (ALL), T22N RBW SEC. 1 (ALL), SEC. 12 (N/2) -
 UNDIVIDED UNIT

DRILLING PLAN **North Alamito Unit 528H** **Sandoval County, New Mexico**

Surface Location

2517-ft FEL & 2229-ft FSL
 Sec 31 T23N R7W
 Graded Elevation 6979' MSL
 RKB Elevation 6993' (14' KB)

SHL Geographical Coordinates (NAD-83)

Latitude 36.1821290° N
 Longitude 107.6150510° W

Kick Off Point for Horizontal Build Curve

4443-ft MD
 4420-ft TVD

Local Coordinates (from SHL)

403-ft North
 139-ft West

Heel Location (Pay zone entry)

2153-ft FEL & 2245-ft FSL
 Sec 31 T23N R7W

Heel Geographical Coordinates (NAD-83)

Latitude 36.1821681° N
 Longitude 107.61381710° W

Bottom Hole Location (TD)

2416-ft FEL & 2311-ft FNL
 Sec 5 T22N R7W

BHL Geographical Coordinates (NAD-83)

Latitude 36.1695915° N
 Longitude 107.5970795° W

First Take Point (FTP)

5566-ft MD
 Gallup C Sand

FTP Geographical Coordinates (NAD-83)

Latitude 36.1820560° N
 Longitude 107.6136679° W

Last Take Point (LTP)

12181-ft MD
 Gallup C Sand

LTP Geographical Coordinates (NAD-83)

Latitude 36.1697036° N
 Longitude 107.5972286° W

Well objectives

This well is planned as a 6730-ft lateral in the Gallup C sand.

Bottom Hole temperature and pressure

The temperature in the Gallup C horizontal objective is 139°F. Bottom hole pressure in the Gallup C is forecast to be 1985 psi.

Formation Tops (Sd = Sand; Sh = Shale; Siltstone = Slt, Coal = C; W = water; O = oil; G = gas; NP = no penetration)

Name	MD (ft)	TVD (ft)	Lithology	Pore fluid	Expected Pore Pressure (ppg)	Planned Mud Weight (ppg)
Ojo Alamo	877	875	Sd	W	8.3	8.4 – 8.8
Kirtland	931	929	Sh	-	8.3	8.4 – 8.8
Fruitland	1175	1172	C	G	8.3	9.0 - 9.5
Picture Cliffs	1461	1456	Sd	W	8.3	9.0 - 9.5
Lewis	1630	1624	Sh	-		9.0 - 9.5
Chacra	2232	2222	Sd	-	8.3	9.0 - 9.5
Menefee	2961	2947	Sd, C	G	8.3	9.0 - 9.5
Point Lookout	3866	3846	Sd	-	8.3	9.0 - 9.5
Mancos	4047	4026	Sh	-		9.0 - 9.5
Mancos Silt	4383	4360	Slt	O/G	6.6	9.0 - 9.5
Gallup A	4880	4835	Slt	O/G	6.6	9.0 - 9.5
Gallup B	4922	4869	Sd	O/G	6.6	8.8 - 9.0
Gallup C	5064	4971	Sd	O/G	6.6	8.8 - 9.0
Target	5506	5118	Sd	O/G	6.6	8.8 - 9.0

Casing Program

Casing OD	Hole Size	Weight (#/ft)	Grade	Coupling	MD Top	MD Bottom	TVD Top	TVD Bottom	Top of Cement
9-5/8"	12-1/4"	36	K-55	STC	surf	350	surf	350	surface
7"	8-3/4"	26	K-55	LTC	surf	5596	surf	5118	surface
4-1/2"	6-1/8"	11.6	P-110	BTC	5386	12241	5084	5118	5386

Note: all casing will be new

Casing Design Load Cases

		Casing String		
	Description	9-5/8" Surface	7" Intermediate	4-1/2" Production Liner
Collapse	Full internal evacuation ¹	✓	✓	✓
	Cementing	✓	✓	✓
Burst	Pressure test	✓ ²	✓ ²	✓
	Gas kick		✓ ³	
	Fracture at shoe, 1/3 BHP at surface		✓ ⁴	
	Injection down casing			✓ ⁵
Axial	Dynamic load on casing coupling ⁶	✓	✓	✓
Axial	Overpull ⁷	✓	✓	✓

Note

- 1 Fluid level at shoe, air column to surface, pore pressure outside
- 2 Tested to 80% of minimum internal yield with freshwater inside, pore pressure outside
- 3 50 bbl kick at TD, 0.50 ppg intensity, 4" drill pipe, 9.0 ppg mud, fracture gradient at shoe
- 4 2060 psi BHP, 687 psi surface pressure, 12.5 ppg EMW shoe integrity
- 5 Surface stimulation pressure of 8000 psi on 8.3 ppg fluid column. Stimulation will be down frac string, so load does not apply to 7" intermediate casing.
- 6 Shock load from abrupt pipe deceleration, evaluated against coupling rating
- 7 Overpull values as follows: Surface casing 20,000 lbs, Intermediate & Production 100,000 lbs

Casing Design Factors

		Design Factors			
Casing string	Casing OD	Burst	Collapse	Axial	Triaxial
Surface	9-5/8"	1.25	13.38	8.16	1.56
Intermediate	7"	1.25	1.50	1.68	1.34
Production liner	4-1/2"	1.37	3.68	1.88	1.69

Cement Design

Additives: A=Accelerator; B=Bond Enhancer; De=Defoamer; Di=Dispersant; Ex=Extender; FI=Fluid Loss L=Lost Circulation; R=Retarder; SA=Suspending Agent; THX=Thixotropic Additive; V=Viscosifier

9-5/8" Surface Casing	Lead
Name	Redi-Mix
Type	I-II
Additives	20% Fly Ash
Planned top	Surface
Density (ppg)	14.50
Yield (cf/sx)	1.61
Mix water (gal/sx)	7.41
Volume (sx)	114
Volume (bbls)	33

<u>7" Intermediate Casing</u>	<u>Lead</u>	<u>Tail</u>
Halliburton Name	HALCEM	VARICEM
Type	Poz/G	Poz/G
Additives	Ex, L, SA	Ex, FI, SA, L, THX
Planned top	Surface	3547-ft
Density (ppg)	12.30	13.50
Yield (cf/sx)	1.95	1.30
Mix water (gal/sx)	10.14	5.64
Volume (sx)	448	409
Volume (bbls)	156	95

<u>4-1/2" Production Liner</u>	<u>Lead</u>
Halliburton Name	EXTENDACEM
Type	Poz/G
Additives	B, De, Di, FI, Re, V
Planned top	5386-ft
Density (ppg)	13.3
Yield (cf/sx)	1.36
Mix water (gal/sx)	5.94
Volume (sx)	707
Volume (bbls)	171

Wellhead & Pressure Control

The well head will be an 11" 5M multi-bowl system. A 2M BOPE conforming to Onshore Order #2 will be installed on the surface casing. The BOP and accumulator will meet API 16D and 16E respectively.

A PVT mud monitoring system and a trip tank will be rigged up and operational for all hole intervals. An electronic geograph will be employed to monitor and record drilling data (ROP, WOB, SPM, Pressure, RPM and torque).

Mud Program

Surface hole will be drilled with a fresh water, native mud system. In intermediate hole, a low weight 7% KCl LSND drilling fluid will be used, with KCl providing chemical stability for the young shales and clays present in the interval. In production hole a LSND system with polymer and lubricant additives is programmed. Sufficient drill water and mud additives will be on hand to maintain adequate pit volumes and maintain well control.

Hole Section	Fluid type	Interval (MD)	Density (ppg)	Funnel Viscosity	Yield Point	Fluid Loss (cc/30 min)
Surface	Fresh water spud mud	0 – 350	8.4 – 8.8	32 – 44	2 – 12	NC
Intermediate	7% KCl Low solids, non-dispersed	350 – 5596	9.0 – 9.5	38 – 45	8 – 14	<20
Production	Low solids, non-dispersed	5596 – 12241	8.8 – 9.2	34 – 38	6 – 8	6 – 8

Cores, tests and logs

Wellbore surveying: Drift (inclination only) surveys will be obtained in surface hole. MWD directional surveys will be taken in intermediate and production hole.

Logging while drilling: None in surface hole. MWD GR in intermediate and production hole.

Mud logging: a two-person mud logging unit with C1 – C4 gas analysis will be operational in intermediate and production hole.

Electric logging: No open hole electric logs are programmed. A cased hole GR/CCL will be run during completions for perforating depth control.

Cuttings and drilling fluids management

A closed loop, steel tank-based circulating system will be used. In addition to the rig solids control equipment, a dewatering centrifuge and chemical flocculation system will be operational to strip solids from the whole mud. All solids will be collected in 3-sided bins and will then be put into transports with a bucket loader. Drying agents will be

used if necessary. The solids will be taken to a licensed commercial disposal facility. Whole mud will be dewatered back to drill water and used as make up for subsequent wells or hauled off for disposal. A diagram of the closed loop system is included.

Completion

It is envisioned that this well will be completed with a multi-stage sand frac, using the plug and perf technique. After drilling out the plugs, the current plan is to install a 2-7/8" plunger-assisted gas lift tubing string. The stimulation and completion plan will be sundried at a later date.



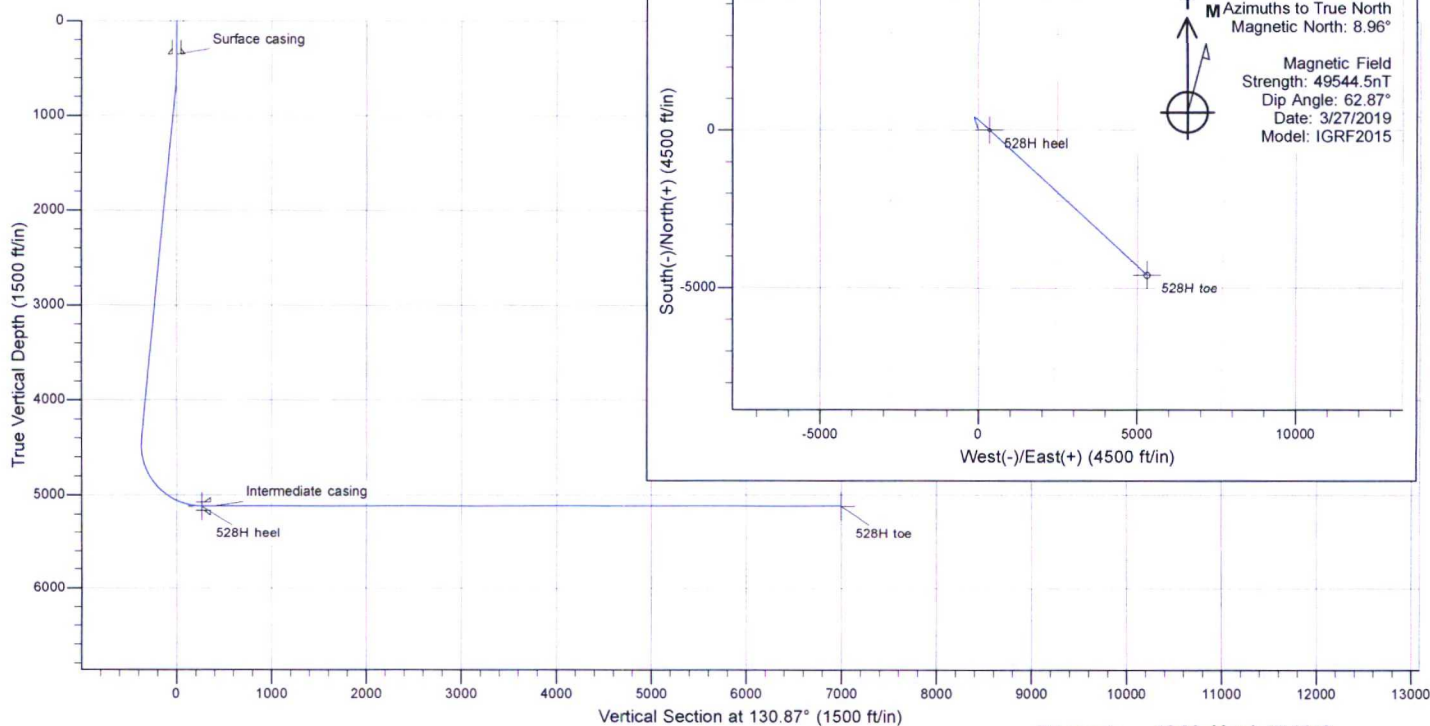
Pad name : J31 2307
Well name : NAU 528H

SHL Latitude : 36.18217000
SHL Longitude : -107.61500600

US State Plane 1983
North American Datum 1983
New Mexico Western Zone

TRAJECTORY DETAILS									
Pad elevation : 6979 RKB (copy) @ 6993ft (RIG TBD)									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0	0.00	0.00	0	0	0	0.00	0.00	0	
450	0.00	0.00	450	0	0	0.00	0.00	0	
769	6.38	340.98	768	17	-6	2.00	340.98	-15	
4443	6.38	340.98	4420	403	-139	0.00	0.00	-369	
5506	90.00	132.82	5118	-1	351	9.00	151.69	266	528H heel
12241	90.00	132.82	5118	-4578	5291	0.00	0.00	6997	528H toe

TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
528H heel	5118	-1	351	1885680	2787872	36.18216810	-107.61381710
528H toe	5118	-4578	5291	1881113	2792823	36.16959150	-107.59707950



Prepared : 16:26, March 28 2019

DJR Operating

North Alamito Unit

J31 2307

NAU 528H

Original drilling

Plan: APD

Standard Planning Report

28 March, 2019

Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well NAU 528H
Company:	DJR Operating	TVD Reference:	RKB (copy) @ 6993ft (RIG TBD)
Project:	North Alamito Unit	MD Reference:	RKB (copy) @ 6993ft (RIG TBD)
Site:	J31 2307	North Reference:	True
Well:	NAU 528H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original drilling		
Design:	APD		

Project	North Alamito Unit		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	J31 2307		
Site Position:		Northing:	1,885,650 usft
From:	Lat/Long	Easting:	2,787,495 usft
Position Uncertainty:	0 ft	Slot Radius:	13.200 in
		Latitude:	36.18208900
		Longitude:	-107.61509700
		Grid Convergence:	0.13 °

Well	NAU 528H		
Well Position	+N/-S	29 ft	Northing: 1,885,679 usft
	+E/-W	27 ft	Easting: 2,787,521 usft
Position Uncertainty	0 ft	Wellhead Elevation:	Latitude: 36.18217000
			Longitude: -107.61500600
			Ground Level: 6979 ft

Wellbore	Original drilling				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/27/2019	8.96	62.87	49,544.46089392

Design	APD			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0	0	0	130.87

Plan Survey Tool Program	Date	3/28/2019		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0	12,241	APD (Original drilling)	MWD+IGRF
				OWSG MWD + IGRF or WMM

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0	0.00	0.00	0	0	0	0.00	0.00	0.00	0.00	
450	0.00	0.00	450	0	0	0.00	0.00	0.00	0.00	
769	6.38	340.98	768	17	-6	2.00	2.00	0.00	340.98	
4443	6.38	340.98	4420	403	-139	0.00	0.00	0.00	0.00	
5506	90.00	132.82	5118	-1	351	9.00	7.87	14.29	151.69	528H heel
12,241	90.00	132.82	5118	-4578	5291	0.00	0.00	0.00	0.00	528H toe

Planning Report

Database: EDM
Company: DJR Operating
Project: North Alamo Unit
Site: J31 2307
Well: NAU 528H
Wellbore: Original drilling
Design: APD

Local Co-ordinate Reference: Well NAU 528H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0	0.00	0.00	0	0	0	0	0.00	0.00	0.00
100	0.00	0.00	100	0	0	0	0.00	0.00	0.00
200	0.00	0.00	200	0	0	0	0.00	0.00	0.00
300	0.00	0.00	300	0	0	0	0.00	0.00	0.00
350	0.00	0.00	350	0	0	0	0.00	0.00	0.00
Surface casing									
400	0.00	0.00	400	0	0	0	0.00	0.00	0.00
450	0.00	0.00	450	0	0	0	0.00	0.00	0.00
500	1.00	340.98	500	0	0	0	2.00	2.00	0.00
600	3.00	340.98	600	4	-1	-3	2.00	2.00	0.00
700	5.00	340.98	700	10	-4	-9	2.00	2.00	0.00
769	6.38	340.98	768	17	-6	-15	2.00	2.00	0.00
800	6.38	340.98	799	20	-7	-18	0.00	0.00	0.00
890	6.38	340.98	889	30	-10	-27	0.00	0.00	0.00
Ojo Alamo									
900	6.38	340.98	899	31	-11	-28	0.00	0.00	0.00
931	6.38	340.98	929	34	-12	-31	0.00	0.00	0.00
Kirtland									
1000	6.38	340.98	998	41	-14	-38	0.00	0.00	0.00
1100	6.38	340.98	1097	52	-18	-47	0.00	0.00	0.00
1175	6.38	340.98	1172	59	-20	-54	0.00	0.00	0.00
Fruitland									
1200	6.38	340.98	1197	62	-21	-57	0.00	0.00	0.00
1300	6.38	340.98	1296	73	-25	-66	0.00	0.00	0.00
1400	6.38	340.98	1395	83	-29	-76	0.00	0.00	0.00
1461	6.38	340.98	1456	89	-31	-82	0.00	0.00	0.00
Picture Cliffs									
1500	6.38	340.98	1495	94	-32	-86	0.00	0.00	0.00
1600	6.38	340.98	1594	104	-36	-95	0.00	0.00	0.00
1630	6.38	340.98	1624	107	-37	-98	0.00	0.00	0.00
Lewis									
1700	6.38	340.98	1694	115	-40	-105	0.00	0.00	0.00
1800	6.38	340.98	1793	125	-43	-114	0.00	0.00	0.00
1900	6.38	340.98	1892	136	-47	-124	0.00	0.00	0.00
2000	6.38	340.98	1992	146	-50	-134	0.00	0.00	0.00
2100	6.38	340.98	2091	157	-54	-143	0.00	0.00	0.00
2200	6.38	340.98	2190	167	-58	-153	0.00	0.00	0.00
2232	6.38	340.98	2222	170	-59	-156	0.00	0.00	0.00
Chacra									
2300	6.38	340.98	2290	178	-61	-163	0.00	0.00	0.00
2400	6.38	340.98	2389	188	-65	-172	0.00	0.00	0.00
2500	6.38	340.98	2489	199	-68	-182	0.00	0.00	0.00
2600	6.38	340.98	2588	209	-72	-191	0.00	0.00	0.00
2700	6.38	340.98	2687	220	-76	-201	0.00	0.00	0.00
2800	6.38	340.98	2787	230	-79	-211	0.00	0.00	0.00
2900	6.38	340.98	2886	241	-83	-220	0.00	0.00	0.00
2917	6.38	340.98	2903	242	-84	-222	0.00	0.00	0.00
Cliffhouse									
2961	6.38	340.98	2947	247	-85	-226	0.00	0.00	0.00
Menefee									
3000	6.38	340.98	2986	251	-87	-230	0.00	0.00	0.00
3100	6.38	340.98	3085	262	-90	-239	0.00	0.00	0.00
3200	6.38	340.98	3184	272	-94	-249	0.00	0.00	0.00

Planning Report

Database: EDM
Company: DJR Operating
Project: North Alamito Unit
Site: J31 2307
Well: NAU 528H
Wellbore: Original drilling
Design: APD

Local Co-ordinate Reference: Well NAU 528H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
3300	6.38	340.98	3284	283	-97	-259	0.00	0.00	0.00
3400	6.38	340.98	3383	293	-101	-268	0.00	0.00	0.00
3500	6.38	340.98	3482	304	-105	-278	0.00	0.00	0.00
3600	6.38	340.98	3582	314	-108	-288	0.00	0.00	0.00
3700	6.38	340.98	3681	325	-112	-297	0.00	0.00	0.00
3800	6.38	340.98	3781	335	-116	-307	0.00	0.00	0.00
3866	6.38	340.98	3846	342	-118	-313	0.00	0.00	0.00
Point Lookout									
3900	6.38	340.98	3880	346	-119	-316	0.00	0.00	0.00
4000	6.38	340.98	3979	356	-123	-326	0.00	0.00	0.00
4047	6.38	340.98	4026	361	-125	-331	0.00	0.00	0.00
Mancos									
4100	6.38	340.98	4079	367	-126	-336	0.00	0.00	0.00
4200	6.38	340.98	4178	377	-130	-345	0.00	0.00	0.00
4300	6.38	340.98	4277	388	-134	-355	0.00	0.00	0.00
4383	6.38	340.98	4360	397	-137	-363	0.00	0.00	0.00
Mancos Silt									
4400	6.38	340.98	4377	398	-137	-365	0.00	0.00	0.00
4443	6.38	340.98	4420	403	-139	-369	0.00	0.00	0.00
KOP									
4450	5.87	343.73	4427	404	-139	-369	9.01	-7.83	41.81
4500	3.07	32.85	4476	407	-139	-372	9.00	-5.60	98.24
4550	4.99	95.60	4526	408	-136	-370	9.00	3.84	125.50
4600	8.99	113.32	4576	406	-130	-365	9.00	8.00	35.46
4650	13.31	119.93	4625	402	-122	-355	9.00	8.64	13.20
4700	17.72	123.31	4673	395	-111	-342	9.00	8.82	6.77
4750	22.17	125.37	4720	385	-96	-325	9.00	8.89	4.13
4800	26.63	126.78	4766	373	-80	-304	9.00	8.93	2.80
4850	31.10	127.80	4809	358	-61	-280	9.00	8.95	2.05
4880	33.82	128.30	4835	348	-48	-264	9.00	8.96	1.65
Gallup A									
4900	35.58	128.59	4851	341	-39	-253	9.00	8.96	1.46
4922	37.57	128.88	4869	333	-29	-240	9.00	8.96	1.34
Gallup B									
4950	40.06	129.22	4891	322	-15	-222	9.00	8.97	1.21
5000	44.55	129.74	4928	301	11	-189	9.00	8.97	1.05
5050	49.04	130.19	4962	277	39	-152	9.00	8.98	0.89
5064	50.31	130.31	4971	270	47	-141	9.00	8.98	0.82
Gallup C									
5100	53.53	130.58	4993	252	68	-113	9.00	8.98	0.77
5150	58.02	130.93	5021	225	100	-72	9.00	8.98	0.69
5200	62.51	131.24	5046	197	132	-28	9.00	8.98	0.63
5250	67.00	131.53	5067	167	166	17	9.00	8.98	0.58
5296	71.13	131.78	5084	138	198	60	9.00	8.99	0.54
Top of liner									
5300	71.50	131.81	5085	136	201	63	9.00	8.99	0.53
5350	75.99	132.06	5099	103	237	111	9.00	8.99	0.52
5400	80.48	132.31	5109	71	273	160	9.00	8.99	0.50
5450	84.98	132.55	5116	37	310	210	9.00	8.99	0.48
5500	89.47	132.79	5118	3	347	260	9.00	8.99	0.48
5503	89.47	132.79	5118	1	349	263	0.00	0.00	0.00
Target									
5506	90.00	132.82	5118	-1	351	266	18.00	17.97	0.95

Planning Report

Database: EDM
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Well: NAU 528H
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Local Co-ordinate Reference: Well NAU 528H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5566	90.00	132.82	5118	-41	395	326	0.00	0.00	0.00
First take point									
5596	90.00	132.82	5118	-62	417	356	0.00	0.00	0.00
Intermediate casing									
5600	90.00	132.82	5118	-65	420	360	0.00	0.00	0.00
5700	90.00	132.82	5118	-133	493	460	0.00	0.00	0.00
5800	90.00	132.82	5118	-201	567	560	0.00	0.00	0.00
5900	90.00	132.82	5118	-269	640	660	0.00	0.00	0.00
6000	90.00	132.82	5118	-337	713	760	0.00	0.00	0.00
6100	90.00	132.82	5118	-404	787	860	0.00	0.00	0.00
6200	90.00	132.82	5118	-472	860	959	0.00	0.00	0.00
6300	90.00	132.82	5118	-540	933	1059	0.00	0.00	0.00
6400	90.00	132.82	5118	-608	1007	1159	0.00	0.00	0.00
6500	90.00	132.82	5118	-676	1080	1259	0.00	0.00	0.00
6600	90.00	132.82	5118	-744	1153	1359	0.00	0.00	0.00
6700	90.00	132.82	5118	-812	1227	1459	0.00	0.00	0.00
6800	90.00	132.82	5118	-880	1300	1559	0.00	0.00	0.00
6900	90.00	132.82	5118	-948	1373	1659	0.00	0.00	0.00
7000	90.00	132.82	5118	-1016	1447	1759	0.00	0.00	0.00
7100	90.00	132.82	5118	-1084	1520	1859	0.00	0.00	0.00
7200	90.00	132.82	5118	-1152	1593	1959	0.00	0.00	0.00
7300	90.00	132.82	5118	-1220	1667	2059	0.00	0.00	0.00
7400	90.00	132.82	5118	-1288	1740	2159	0.00	0.00	0.00
7500	90.00	132.82	5118	-1356	1814	2259	0.00	0.00	0.00
7600	90.00	132.82	5118	-1424	1887	2359	0.00	0.00	0.00
7700	90.00	132.82	5118	-1492	1960	2459	0.00	0.00	0.00
7800	90.00	132.82	5118	-1560	2034	2559	0.00	0.00	0.00
7900	90.00	132.82	5118	-1628	2107	2658	0.00	0.00	0.00
8000	90.00	132.82	5118	-1696	2180	2758	0.00	0.00	0.00
8100	90.00	132.82	5118	-1764	2254	2858	0.00	0.00	0.00
8200	90.00	132.82	5118	-1832	2327	2958	0.00	0.00	0.00
8300	90.00	132.82	5118	-1900	2400	3058	0.00	0.00	0.00
8400	90.00	132.82	5118	-1968	2474	3158	0.00	0.00	0.00
8500	90.00	132.82	5118	-2036	2547	3258	0.00	0.00	0.00
8600	90.00	132.82	5118	-2104	2620	3358	0.00	0.00	0.00
8700	90.00	132.82	5118	-2172	2694	3458	0.00	0.00	0.00
8800	90.00	132.82	5118	-2240	2767	3558	0.00	0.00	0.00
8900	90.00	132.82	5118	-2308	2840	3658	0.00	0.00	0.00
9000	90.00	132.82	5118	-2376	2914	3758	0.00	0.00	0.00
9100	90.00	132.82	5118	-2444	2987	3858	0.00	0.00	0.00
9200	90.00	132.82	5118	-2511	3061	3958	0.00	0.00	0.00
9300	90.00	132.82	5118	-2579	3134	4058	0.00	0.00	0.00
9400	90.00	132.82	5118	-2647	3207	4158	0.00	0.00	0.00
9500	90.00	132.82	5118	-2715	3281	4258	0.00	0.00	0.00
9600	90.00	132.82	5118	-2783	3354	4357	0.00	0.00	0.00
9700	90.00	132.82	5118	-2851	3427	4457	0.00	0.00	0.00
9800	90.00	132.82	5118	-2919	3501	4557	0.00	0.00	0.00
9900	90.00	132.82	5118	-2987	3574	4657	0.00	0.00	0.00
10,000	90.00	132.82	5118	-3055	3647	4757	0.00	0.00	0.00
10,100	90.00	132.82	5118	-3123	3721	4857	0.00	0.00	0.00
10,200	90.00	132.82	5118	-3191	3794	4957	0.00	0.00	0.00
10,300	90.00	132.82	5118	-3259	3867	5057	0.00	0.00	0.00
10,400	90.00	132.82	5118	-3327	3941	5157	0.00	0.00	0.00
10,500	90.00	132.82	5118	-3395	4014	5257	0.00	0.00	0.00

Planning Report

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Wellbore: Original drilling
Design: APD

Local Co-ordinate Reference: Well NAU 528H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,600	90.00	132.82	5118	-3463	4087	5357	0.00	0.00	0.00
10,700	90.00	132.82	5118	-3531	4161	5457	0.00	0.00	0.00
10,800	90.00	132.82	5118	-3599	4234	5557	0.00	0.00	0.00
10,900	90.00	132.82	5118	-3667	4307	5657	0.00	0.00	0.00
11,000	90.00	132.82	5118	-3735	4381	5757	0.00	0.00	0.00
11,100	90.00	132.82	5118	-3803	4454	5857	0.00	0.00	0.00
11,200	90.00	132.82	5118	-3871	4528	5957	0.00	0.00	0.00
11,300	90.00	132.82	5118	-3939	4601	6057	0.00	0.00	0.00
11,400	90.00	132.82	5118	-4007	4674	6156	0.00	0.00	0.00
11,500	90.00	132.82	5118	-4075	4748	6256	0.00	0.00	0.00
11,600	90.00	132.82	5118	-4143	4821	6356	0.00	0.00	0.00
11,700	90.00	132.82	5118	-4211	4894	6456	0.00	0.00	0.00
11,800	90.00	132.82	5118	-4279	4968	6556	0.00	0.00	0.00
11,900	90.00	132.82	5118	-4347	5041	6656	0.00	0.00	0.00
12,000	90.00	132.82	5118	-4415	5114	6756	0.00	0.00	0.00
12,100	90.00	132.82	5118	-4483	5188	6856	0.00	0.00	0.00
12,181	90.00	132.82	5118	-4538	5247	6937	0.00	0.00	0.00
Last take point									
12,200	90.00	132.82	5118	-4551	5261	6956	0.00	0.00	0.00
12,241	90.00	132.82	5118	-4578	5291	6997	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
528H heel - plan hits target center - Circle (radius 50)	0.00	0.00	5118	-1	351	1,885,680	2,787,872	36.18216810	-107.61381710
528H toe - plan hits target center - Circle (radius 100)	0.00	0.00	5118	-4578	5291	1,881,113	2,792,823	36.16959150	-107.59707950

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
350	350	Surface casing	9.625	12.250
5596	5118	Intermediate casing	7.000	8.750

Planning Report

Database: EDM
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Well: NAU 528H
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MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
890	889	Ojo Alamo		0.00	
931	929	Kirtland		0.00	
1175	1172	Fruitland		0.00	
1461	1456	Picture Cliffs		0.00	
1630	1624	Lewis		0.00	
2232	2222	Chacra		0.00	
2917	2903	Cliffhouse		0.00	
2961	2947	Menefee		0.00	
3866	3846	Point Lookout		0.00	
4047	4026	Mancos		0.00	
4383	4360	Mancos Silt		0.00	
4880	4835	Gallup A		0.00	
4922	4869	Gallup B		0.00	
5064	4971	Gallup C		0.00	
5503	5118	Target		0.00	

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
4443	4420	403	-139	KOP
5296	5084	138	198	Top of liner
5566	5118	-41	395	First take point
12,181	5118	-4538	5247	Last take point



DJR Operating

North Alamito Unit

J31 2307

NAU 528H

Original drilling

APD

Anticollision Report

28 March, 2019

Anticollision Report

Company: DJR Operating
Project: North Alamito Unit
Reference Site: J31 2307
Site Error: 0 ft
Reference Well: NAU 528H
Well Error: 0 ft
Reference Wellbore: Original drilling
Reference Design: APD

Local Co-ordinate Reference: Well NAU 528H
TVD Reference: RKB (copy) @ 6993ft (RIG TBD)
MD Reference: RKB (copy) @ 6993ft (RIG TBD)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM
Offset TVD Reference: Offset Datum

Reference	APD
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 10,000 ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Pedal Curve
Casing Method:	Not applied

Survey Tool Program		Date	3/28/2019		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0	12,241	APD (Original drilling)	MWD+IGRF	OWSG MWD + IGRF or WMM	

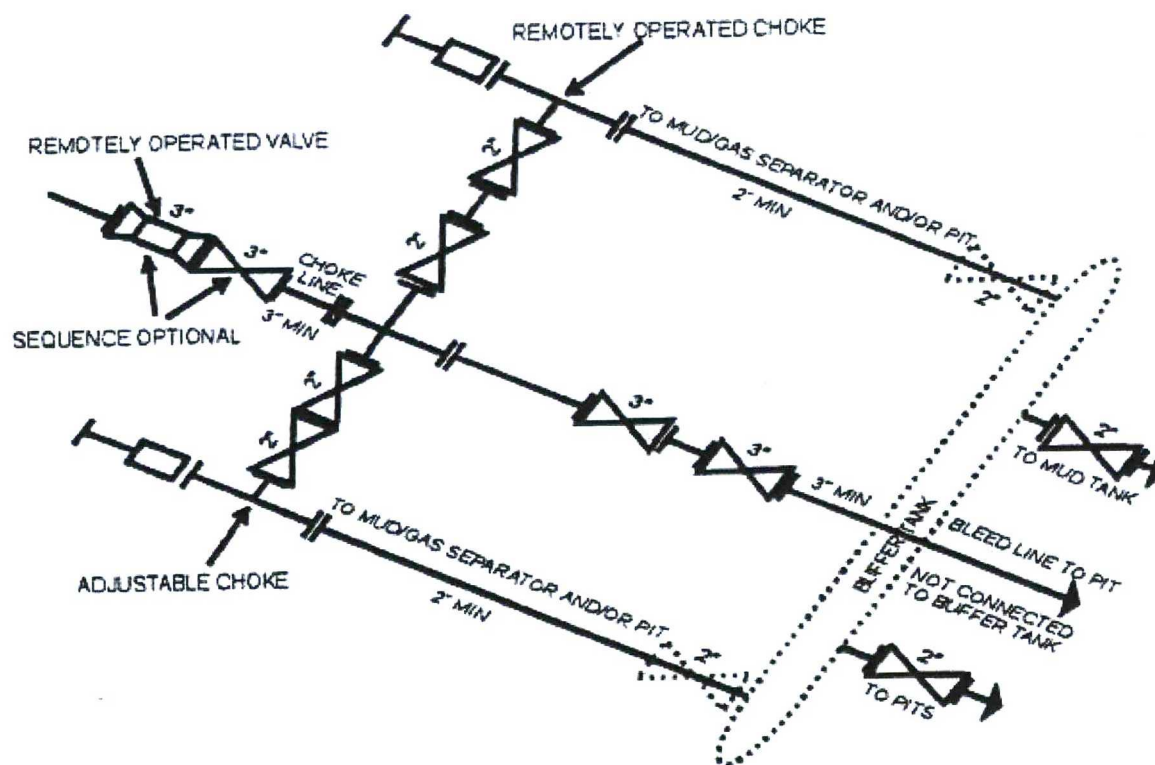
Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
J31 2307						
NAU 332H - Original drilling - APD	450	450	90	87	31.797	CC, ES
NAU 332H - Original drilling - APD	769	758	114	109	22.745	SF
NAU 333H - Original drilling - APD	450	450	40	37	14.155	CC
NAU 333H - Original drilling - APD	500	500	40	37	12.624	ES
NAU 333H - Original drilling - APD	12,241	12,269	860	498	2.378	SF
NAU 529H - Original drilling - APD	450	450	20	17	7.090	CC
NAU 529H - Original drilling - APD	500	500	20	17	6.359	ES
NAU 529H - Original drilling - APD	600	600	22	18	5.693	SF
NAU 559H - Original drilling - APD	698	702	65	60	14.123	CC
NAU 559H - Original drilling - APD	700	704	65	60	14.078	ES
NAU 559H - Original drilling - APD	900	902	74	68	12.063	SF

Offset Design														Offset Site Error:	
J31 2307 - NAU 332H - Original drilling - APD														0 ft	
Survey Program: 0-MWD+IGRF														Offset Well Error:	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0	0	0	0	0	0	-138.04	-67	-60	90						
100	100	100	100	0	0	-138.04	-67	-60	90	89	0.31	290.610			
200	200	200	200	1	1	-138.04	-67	-60	90	89	1.03	87.386			
300	300	300	300	1	1	-138.04	-67	-60	90	88	1.74	51.425			
400	400	400	400	1	1	-138.04	-67	-60	90	87	2.46	36.432			
450	450	450	450	1	1	-138.04	-67	-60	90	87	2.82	31.797	CC, ES		
500	500	499	499	2	2	-119.41	-67	-60	90	87	3.16	28.491			
600	600	596	596	2	2	-122.44	-70	-60	95	91	3.85	24.584			
700	700	692	692	2	2	-127.61	-77	-60	104	100	4.54	22.938			
769	768	758	758	3	2	-131.76	-83	-60	114	109	5.03	22.745	SF		
800	799	787	786	3	3	-133.67	-86	-60	120	115	5.24	22.849			
900	899	880	879	3	3	-139.08	-99	-61	140	134	5.93	23.652			
1000	998	972	969	3	3	-143.37	-114	-61	164	158	6.59	24.946			
1100	1097	1062	1057	4	4	-146.74	-132	-61	193	185	7.25	26.567			
1200	1197	1153	1146	4	4	-149.43	-152	-62	224	216	7.91	28.286			
1300	1296	1247	1238	5	5	-151.57	-174	-62	256	247	8.60	29.761			

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Choke Manifold

Actual system to conform with Onshore Order 2



Proposed BOP stack
11" 3M RRA



Double gate with integral choke/kill outlets

