

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: 6/18/2018

Well information;

Operator 2KR, Well Name and Number EIK 3014

API# 30-039-31370, Section 36 Township 24N/S, Range 5 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.

NMOCD Approved by Signature

1/23/20

Date

HPadual

NOG: 0
ADOP: 5
MP: 5
SMA: JIC-BIA
BOND: B010611
DATE: 06/18/2018

10400031202
ATS-F010-18-109

Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a Type of work: ☒ DRILL ☐ REENTER		5 Lease Serial No. JICARILLA 40	
1b Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6 If Indian, Allottee or Tribe Name JICARILLA APACHE	
2 Name of Operator DJR OPERATING LLC		7 If Unit or CA Agreement, Name and No.	
3a Address 1600 Broadway #1960 Denver CO 80202		8 Lease Name and Well No. ELK 301H	
3b Phone No. (include area code) (303)407-7397		9 API Well No. 30-039-31370	
4 Location of Well (Report location clearly and in accordance with any State requirements *) At surface NWSW / 1866 FSL / 921 FWL / LAT 36.2651536 / LONG -107.3190347 At proposed prod. zone SWSW / 1260 FSL / 642 FWL / LAT 36.2790079 / LONG -103.3375207		10 Field and Pool or Exploratory BASIN MANCOS GAS POOL	
11 Sec., T. R. M. or Blk. and Survey or Area SEC 36 / T24N / R5W / NMP		12 County or Parish RIO ARriba	
13 State NM		14 Distance in miles and direction from nearest town or post office* 8 miles	
15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drg. unit line, if any) 1061 feet		16 No. of acres in lease 2579	
17 Spacing Unit dedicated to this well 1280		18 Distance from proposed location* to nearest well, drilling, completed, 20 feet applied for, on this lease, ft 5653 feet / 13444 feet	
19 Proposed Depth 5653 feet / 13444 feet		20 BLM/BIA Bond No. on file IND: B010611	
21 Elevations (Show whether DF, KDB, RT, GL, etc.) 6730 feet		22 Approximate date work will start* 08/01/2018	
23 Estimated duration 90 days		24 Attachments	

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, must be attached to this form.

1. Well plat certified by a registered surveyor
2. A Drilling Plan.
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)
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM

25. Signature (Electronic Submission) Name (Printed/Typed) Date
Brian Wood / Ph (505)466-8120 06/18/2018

Title
President

Approved by (Signature) Name (Printed/Typed) Date
AFM FARMINGTON 12/11/19

Title
Office
FARMINGTON

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.

(Continued on page 2)

DRILLING OPERATIONS
AUTHORIZED ARE SUBJECT TO
COMPLIANCE WITH ATTACHED
"GENERAL REQUIREMENTS"

BLM'S APPROVAL OR ACCEPTANCE OF
THIS ACTION DOES NOT RELIEVE THE
LESSEE AND OPERATOR FROM
OBTAINING ANY OTHER AUTHORIZATION
REQUIRED FOR OPERATIONS ON
FEDERAL AND INDIAN LANDS

This action is subject to technical
and procedural review pursuant to
43 CFR 3165.3 and appeal
pursuant to 43 CFR 3165.4

FARMINGTON

NMOC

DEC 13 2019

DISTRICT III

See new C-102
in change of plans

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, N.M. 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, N.M. 87505
Phone: (505) 476-3480 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, N.M. 87505

Form C-102

Revised August 1, 2011

Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31370	² Pool Code 97232	³ Pool Name BASIN MANCOS
⁴ Property Code 326978	⁵ Property Name ELK	⁶ Well Number 30IH
⁷ GRID No. 371838	⁸ Operator Name DJR OPERATING	⁹ Elevation 6730

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	36	24 N	5 W		1866	SOUTH	921	WEST	RIO ARRIBA

¹¹ Bottom 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
M	26	24 N	5 W		1260	SOUTH	642	WEST	RIO ARRIBA

¹² Dedicated Acres 1280	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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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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LEGEND:
○ = SURFACE LOCATION
● = BOTTOM HOLE LOCATION
+ = LANDING POINT
⊙ = FOUND 1 1/8" IRON PIPE
⊙ = FOUND MARKED CEDAR POST
(M) = MEASURED
(C) = CALCULATED

BOTTOM HOLE LOCATION
1260' FSL, 642' FWL
SEC. 26, T24N, R5W
LAT: 36.2790079° N
LONG: 107.3375207° W
NAD 83
LAT: 36.2789949° N
LONG: 107.3369191° W
NAD 27

SURFACE LOCATION
1866' FSL, 921' FWL
SEC. 36, T24N, R5W
LAT: 36.2651536° N
LONG: 107.3190347° W
NAD 83
LAT: 36.2651404° N
LONG: 107.3184334° W
NAD 27

LANDING POINT
1905' FSL, 906' FWL
SEC. 36, T24N, R5W
LAT: 36.2652629° N
LONG: 107.3190874° W
NAD 83
LAT: 36.2652497° N
LONG: 107.3184861° W
NAD 27

17 OPERATOR CERTIFICATION
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Mike Deutsch
Signature
6/12/2018
Date
Mike Deutsch
Printed Name
mike@permitswest.com
E-mail Address

18 SURVEYOR CERTIFICATION
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

3/29/18
Date of Survey
Signature and Seal of Professional Surveyor
MARSHALL W. LINBEEN
NEW MEXICO
17078
PROFESSIONAL SURVEYOR
17078
Certificate Number

DRILLING PLAN Elk 301H Rio Arriba County, New Mexico

Surface Location

921-ft FWL & 1866-ft FSL
 Sec 36 T24N R5W
 Graded Elevation 6727' MSL
 RKB Elevation 6747' (20' KB)

SHL Geographical Coordinates (NAD-83)

Slot A-8
 Latitude 36.2651536° N
 Longitude 107.3190347° W

Kick Off Point for Horizontal Build Curve

5057-ft MD
 4996-ft TVD

Local Coordinates (from SHL)

351-ft South
 487-ft East

Heel Location (Pay zone entry)

906-ft FWL & 1905-ft FSL
 Sec 36 T24N R5W

Heel Geographical Coordinates (NAD-83)

Latitude 36.26526288° N
 Longitude 107.31908740° W

Bottom Hole Location (TD)

642-ft FWL & 1260-ft FSL
 Sec 26 T24N R5W

BHL Geographical Coordinates (NAD-83)

Latitude 36.27900786° N
 Longitude 107.3375207° W

First Take Point (FTP)

6118-ft MD
 Gallup B Sand

FTP Geographical Coordinates (NAD-83)

Latitude 36.2788963° N
 Longitude 107.3373710° W

Last Take Point (LTP)

13385-ft MD
 Gallup B Sand

LTP Geographical Coordinates (NAD-83)

Latitude 36.2653745° N
 Longitude -107.3192370° W

Well objectives

A deviated 'S'-shaped pilot hole will be drilled to 7101-ft MD (7060-ft TVD), reaching TD 100-ft into the Morrison formation. Approximately 380-ft of core will be cut in the Mancos formation, and a suite of wireline logs will be run. The well will be plugged back with cement to 5057-ft MD (5016-ft TVD), and then 7" casing will be run and cemented back to surface. After securing the wellbore, the rig will move off for approximately 60-days. During this period the core and wireline logs will be analyzed. A rig will then return to the well, drill out the 7" casing, land a build curve and drill a planned 7386-ft lateral in the Gallup B sand.

Bottom hole temperature and pressure

The temperature in the Gallup B horizontal objective is 148°F. Bottom hole pressure in the Gallup B is forecast to be 2500 psi.

Pilot Hole 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)
Kirtland	-	G.L.	Sh	W	8.3	8.4 - 8.8
Fruitland	2101	2087	C	G	8.3	9.0 - 9.5
Picture Cliffs	2385	2368	Sd	G	8.3	9.0 - 9.5
Lewis	2489	2471	Sh	-		9.0 - 9.5
Chacra	3192	3167	Sd	-	8.3	9.0 - 9.5
Menefee	3981	3948	Sd, C	G	8.3	9.0 - 9.5
Point Lookout	4576	4538	Sd	-	8.3	9.0 - 9.5
Mancos	4707	4667	Sh	-		9.0 - 9.5
Mancos Silt	5358	5306	Slt	O/G	8.5	9.0 - 9.5
Gallup A	5807	5604	Slt	O/G	8.5	9.0 - 9.5
Gallup B	6058	5653	Sd	O/G	8.5	8.8 - 9.0
Gallup C	5801	5760	Sd	O/G	8.5	8.8 - 9.0
Lower Mancos	5942	5901	Sh	-	8.5	8.8 - 9.0

Juana Lopez	6389	6348	Sh	-		8.8 -9.0
Greenhorn	6605	6564	Carbonate	O/G	8.5	8.8 -9.0
Graneros	6674	6633	Sd			8.8 -9.0
Dakota A	6717	6676	Sd	O/G	8.5	8.8 -9.0
Dakota B	6771	6730	Sd	O/G	8.5	8.8 -9.0
Dakota C	6813	6772	Sd	O/G	8.5	8.8 -9.0
Burro Canyon	6917	6876	Sd	W	8.5	8.8 -9.0
Morrison	7001	6960	Sh	-		8.8 -9.0

Horizontal Well 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)
Kirtland	-	G.L.	Sh	W	8.3	8.4 – 8.8
Fruitland	2101	2087	C	G	8.3	9.0 - 9.5
Picture Cliffs	2385	2368	Sd	G	8.3	9.0 - 9.5
Lewis	2489	2471	Sh	-		9.0 - 9.5
Chacra	3192	3167	Sd	-	8.3	9.0 - 9.5
Menefee	3981	3948	Sd, C	G	8.3	9.0 - 9.5
Point Lookout	4576	4538	Sd	-	8.3	9.0 - 9.5
Mancos	4707	4667	Sh	-		9.0 - 9.5
Mancos Silt	5358	5306	Slt	O/G	8.5	9.0 - 9.5
Gallup A	5807	5604	Slt	O/G	8.5	9.0 - 9.5
Gallup B (objective)	6058	5653	Sd	O/G	8.5	8.8 -9.0
Gallup C	NP	NP	Sd	O/G	8.5	8.8 -9.0
Lower Mancos	NP	NP	Sh	-	8.5	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"	23	K-55	LTC	surf	5037	surf	4996	surface
4-1/2"	6-1/8"	11.6	P-110	LTC	4837	13445	4796	5653	4837

Note: all casing will be new

Casing Design Load Cases

Description	Casing String		
	9-5/8" Surface	7" Intermediate	4-1/2" Production Liner
Collapse	Full internal evacuation ¹	✓	✓
	Cementing	✓	✓
Burst	Pressure test	✓ 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

Casing string	Casing OD	Design Factors			
		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
Halliburton Name	HALCEM
Type	Class G
Additives	A
Planned top	Surface
Density (ppg)	15.80
Yield (cf/sx)	1.17
Mix water (gal/sx)	5.15
Volume (sx)	205
Volume (bbls)	42

7" Intermediate Casing

	Lead	Tail
Halliburton Name	HALCEM	VARICEM
Type	Poz/G	Poz/G
Additives	Ex, L, SA	Ex, FI, SA, L, THX
Planned top	Surface	4207-ft
Density (ppg)	12.30	13.50
Yield (cf/sx)	1.95	1.30
Mix water (gal/sx)	10.14	5.64
Volume (sx)	534	170
Volume (bbls)	186	39

4-1/2" Production Liner	Lead
Halliburton Name	EXTENDACEM
Type	Poz/G
Additives	B, De, Di, Fl, Re, V
Planned top	4837-ft
Density (ppg)	13.3
Yield (cf/sx)	1.36
Mix water (gal/sx)	5.94
Volume (sx)	880
Volume (bbls)	213

Wellhead & Pressure Control

The well head will be an 11" 5M multi-bowl system. The BOP will consist of, at a minimum, two 5M pipe rams, a 5M annular preventer, a low pressure rotating head, a 3" 5M choke manifold plumbed to a gas buster and a flare stack and a 2" 5M kill line. Diagrams of the wellhead, BOP equipment and choke manifold are provided. All systems will conform to Onshore Order #2 and 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 at all times to maintain adequate pit volumes.

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 – 5037	9.0 – 9.5	38 – 45	8 – 14	<20
Production	Low solids, non-dispersed	5037 – 13445	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.

Coring: Approximately 380-ft of 8-3/4" x 4" core will be cut in the pilot hole, in the Mancos interval.

Electric logging: A triple combo wireline run will be made in the vertical pilot hole, from TD to the base of surface casing. A cased hole CBL will be run in the 7" casing from the 4-1/2" liner top to surface.

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" gas lift tubing string with packer. The stimulation and completion plan will be scheduled at a later date.

PLUGBACK PLAN **Elk 301 Pilot Hole** **Rio Arriba County, New Mexico**

Surface Location

921-ft FWL & 1866-ft FSL
 Sec 36 T24N R5W
 Graded Elevation 6727' MSL
 RKB Elevation 6747' (20' KB)

SHL Geographical Coordinates (NAD-83)

Slot A-8
 Latitude 36.2651536° N
 Longitude 107.3190347° W

Bottom Hole Location (TD)

1408-ft FWL & 1547-ft FSL
 Sec 36 T24N R5W

BHL Geographical Coordinates (NAD-83)

Latitude 36.26418866° N
 Longitude 107.3173833° W

Plugback Objectives

Abandon the lower pilot hole from 7101-ft MD to 5037-ft MD with three balanced cement plugs.

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)
Kirtland	-	G.L.	Sh	W	8.3	8.4 - 8.8
Fruitland	2101	2087	C	G	8.3	9.0 - 9.5
Picture Cliffs	2385	2368	Sd	G	8.3	9.0 - 9.5
Lewis	2489	2471	Sh	-		9.0 - 9.5
Chacra	3192	3167	Sd	-	8.3	9.0 - 9.5
Menefee	3981	3948	Sd, C	G	8.3	9.0 - 9.5
Point Lookout	4576	4538	Sd	-	8.3	9.0 - 9.5
Mancos	4707	4667	Sh	-		9.0 - 9.5
Mancos Silt	5358	5306	Slt	O/G	8.5	9.0 - 9.5
Gallup A	5807	5604	Slt	O/G	8.5	9.0 - 9.5
Gallup B	6058	5653	Sd	O/G	8.5	8.8 - 9.0
Gallup C	5801	5760	Sd	O/G	8.5	8.8 - 9.0
Lower Mancos	5942	5901	Sh	-	8.5	8.8 - 9.0
Juana Lopez	6389	6348	Sh	-		8.8 - 9.0
Greenhorn	6605	6564	Carbonate	O/G	8.5	8.8 - 9.0
Graneros	6674	6633	Sd			8.8 - 9.0
Dakota A	6717	6676	Sd	O/G	8.5	8.8 - 9.0
Dakota B	6771	6730	Sd	O/G	8.5	8.8 - 9.0
Dakota C	6813	6772	Sd	O/G	8.5	8.8 - 9.0
Burro Canyon	6917	6876	Sd	W	8.5	8.8 - 9.0
Morrison	7001	6960	Sh	-		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	20	350	20	350	surface
	8-3/4"				350	7101	350	7060	

Note: all casing will be new

Slurry	:	Halliburton Class "G" + 0.10% HR-5 retarder
Density	:	15.8 ppg
Yield	:	1.15 cf/sx
Water	:	4.98 gal/sx
Hole size	:	8-3/4"
OH Capacity	:	0.0744 bbl/ft
Est % Excess	:	40% (actual excess to be determined after reviewing open hole logs)

	Plug #1	Plug #2	Plug #3
Bottom of plug	7101-ft MD	6351-ft MD	5601-ft MD
Top of plug	6351-ft MD	5601-ft MD	5037-ft MD
Fill	750-ft	750-ft	564-ft
Planned volume	78 bbls	78 bbls	59 bbls
Planned sacks	381 sacks	381 sacks	287 sacks

Snapshot Procedure

1. After rigging down wireline loggers, pick up and run in hole with 1000-ft of 2-7/8" tubing stinger on drill pipe.
2. Trip in hole, tag bottom. Circulate and condition mud until mud weight in = mud weight out and gas readings reach background levels.
3. Space out drill string to put cementing head at rig floor, rig up cementers.
4. Plug #1: Pump 15 bbls of freshwater, following by 381 sacks (78 bbls) of 15.8 ppg slurry. Displace with water and mud to balance cement.
5. Rig down cement head, pull out of hole slowly to 6351-ft MD. Pipe should pull dry. Circulate out cement while working pipe, treat out cement contamination and condition mud.
6. Space out drill string to put cementing head at rig floor, rig up cementers.
7. Plug #2: Pump 15 bbls of freshwater, following by 381 sacks (78 bbls) of 15.8 ppg slurry. Displace with water and mud to balance cement.
8. Rig down cement head, pull out of hole slowly to 5601-ft MD. Pipe should pull dry. Circulate out cement while working pipe, treat out cement contamination and condition mud.
9. Plug #3: Pump 15 bbls of freshwater, following by 287 sacks (59 bbls) of 15.8 ppg slurry. Displace with water and mud to balance cement.
10. Rig down cement head, pull out of hole slowly to 5037-ft MD. Pipe should pull dry. Circulate out cement while working pipe, treat out cement contamination and condition mud.
11. Pull out of hole and lay down tubing stinger.

Rig up to run 7" casing to 5037-ft MD.

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"	23	K-55	LTC	surf	3950	surf	3950	surface
4-1/2"	6-1/8"	11.6	P-110	LTC	3750	11974	3750	4667	3750

Note: all casing will be new

Casing 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



Pad name : Four Corners Pad 1
Well name : Elk 301H
S36 T24N R5W

SHL Latitude : 36.26515360
SHL Longitude : -107.31903470

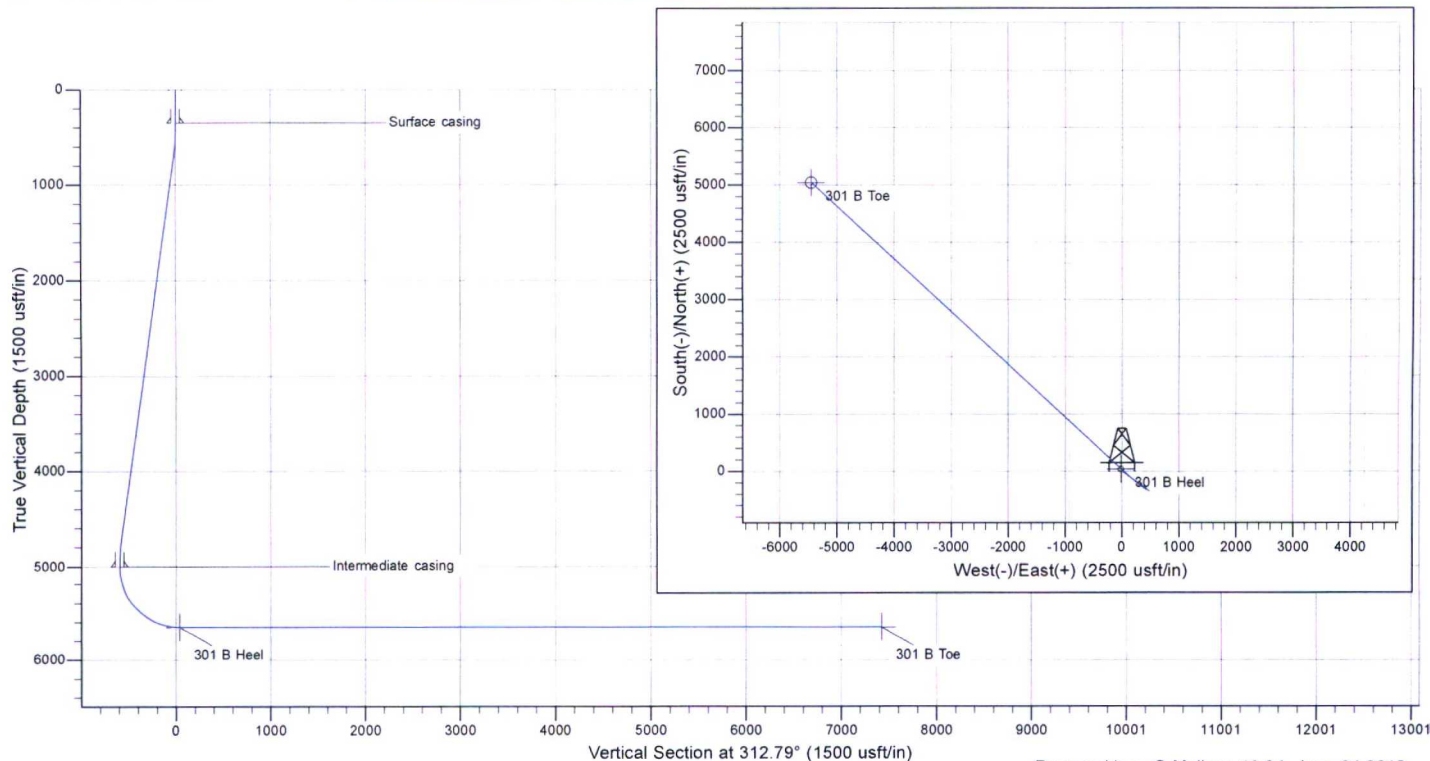
US State Plane 1983
North American Datum 1983
New Mexico Western Zone

TRAJECTORY DETAILS									
Pad elevation : 6727.0 Rig @ 6747.0usft (Rig TBD 20-ft KB)									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
5057.3	0.00	0.00	5016.4	-351.3	486.8	0.00	0.00	-595.9	
5340.6	25.75	299.83	5290.2	-320.1	432.5	9.09	299.83	-534.9	
6058.0	90.00	312.65	5653.0	39.8	-15.5	9.05	14.18	38.4	301 B Heel
13444.6	90.00	312.65	5653.0	5043.9	-5448.7	0.00	0.00	7425.0	301 B Toe

TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
301 B Heel	5653.0	39.8	-15.5	1916257	2874689	36.26526288	-107.31908740
301 B Toe	5653.0	5043.9	-5448.7	1921232	2869229	36.27900786	-107.33752070

T M Azimuths to True North
Magnetic North: 8.93°

Magnetic Field
Strength: 49723.7nT
Dip Angle: 63.00°
Date: 5/15/2018
Model: IGRF2015



Prepared by : C Mallary 10:24, June 04 2018



DJR Operating

**Proposed Elk Unit
Four Corners Pad 1
Slot 8**

Elk 301H

Plan: Lateral plan

Standard Planning Report

04 June, 2018

Planning Report

Database: EDM
Company: DJR Operating
Project: Proposed Elk Unit
Site: Four Corners Pad 1
Well: Slot 8
Wellbore: Elk 301H
Design: Lateral plan

Local Co-ordinate Reference: Well Slot 8
TVD Reference: Rig @ 6747.0usft (Rig TBD 20-ft KB)
MD Reference: Rig @ 6747.0usft (Rig TBD 20-ft KB)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	Proposed Elk 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	Four Corners Pad 1, Rio Arriba County			
Site Position:		Northing:	1,916,217 usft	Latitude: 36.26515360
From:	Lat/Long	Easting:	2,874,704 usft	Longitude: -107.31903470
Position Uncertainty:	0.0 usft	Slot Radius:	16.000 in	Grid Convergence: 0.30 °

Well	Slot 8			
Well Position	+N/-S	0.0 usft	Northing:	1,916,217 usft
	+E/-W	0.0 usft	Easting:	2,874,704 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	Ground Level: 6,727.0 usft

Wellbore	Elk 301H				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/15/2018	8.93	63.00	49,723.72650352

Design	Lateral plan			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	5,057.3
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	312.79

Plan Survey Tool Program	Date	6/4/2018		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	5,057.3	13,444.6	Lateral plan (Elk 301H)	MWD+IGRF OWSG MWD + IGRF or WMM

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
5,057.3	0.00	0.00	5,016.4	-351.3	486.8	0.00	0.00	0.00	0.00	
5,340.6	25.75	299.83	5,290.2	-320.1	432.5	9.09	9.09	0.00	299.83	
6,058.0	90.00	312.65	5,653.0	39.8	-15.5	9.05	8.96	1.79	14.18	301 B Heel
13,444.6	90.00	312.65	5,653.0	5,043.9	-5,448.7	0.00	0.00	0.00	0.00	301 B Toe

Planning Report

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North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
350.0	0.00	0.00	350.0	0.0	0.0	0.0	0.00	0.00	0.00
Surface casing									
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
407.8	0.00	0.00	407.8	0.0	0.0	0.0	0.00	0.00	0.00
500.0	2.30	125.81	500.0	-1.1	1.5	-1.8	2.50	2.50	0.00
600.0	4.80	125.81	599.8	-4.7	6.5	-8.0	2.50	2.50	0.00
700.0	7.30	125.81	699.2	-10.9	15.1	-18.5	2.50	2.50	0.00
727.8	8.00	125.81	726.8	-13.1	18.1	-22.1	2.50	2.50	0.00
800.0	8.00	125.81	798.3	-18.9	26.2	-32.1	0.00	0.00	0.00
900.0	8.00	125.81	897.3	-27.1	37.5	-45.9	0.00	0.00	0.00
1,000.0	8.00	125.81	996.3	-35.2	48.8	-59.7	0.00	0.00	0.00
1,100.0	8.00	125.81	1,095.3	-43.4	60.1	-73.5	0.00	0.00	0.00
1,200.0	8.00	125.81	1,194.4	-51.5	71.4	-87.4	0.00	0.00	0.00
1,300.0	8.00	125.81	1,293.4	-59.6	82.7	-101.2	0.00	0.00	0.00
1,400.0	8.00	125.81	1,392.4	-67.8	93.9	-115.0	0.00	0.00	0.00
1,500.0	8.00	125.81	1,491.4	-75.9	105.2	-128.8	0.00	0.00	0.00
1,600.0	8.00	125.81	1,590.5	-84.1	116.5	-142.6	0.00	0.00	0.00
1,700.0	8.00	125.81	1,689.5	-92.2	127.8	-156.4	0.00	0.00	0.00
1,800.0	8.00	125.81	1,788.5	-100.4	139.1	-170.2	0.00	0.00	0.00
1,900.0	8.00	125.81	1,887.6	-108.5	150.4	-184.1	0.00	0.00	0.00
2,000.0	8.00	125.81	1,986.6	-116.6	161.7	-197.9	0.00	0.00	0.00
2,100.0	8.00	125.81	2,085.6	-124.8	173.0	-211.7	0.00	0.00	0.00
2,200.0	8.00	125.81	2,184.6	-132.9	184.2	-225.5	0.00	0.00	0.00
2,300.0	8.00	125.81	2,283.7	-141.1	195.5	-239.3	0.00	0.00	0.00
2,400.0	8.00	125.81	2,382.7	-149.2	206.8	-253.1	0.00	0.00	0.00
2,500.0	8.00	125.81	2,481.7	-157.4	218.1	-266.9	0.00	0.00	0.00
2,600.0	8.00	125.81	2,580.7	-165.5	229.4	-280.8	0.00	0.00	0.00
2,700.0	8.00	125.81	2,679.8	-173.6	240.7	-294.6	0.00	0.00	0.00
2,800.0	8.00	125.81	2,778.8	-181.8	252.0	-308.4	0.00	0.00	0.00
2,900.0	8.00	125.81	2,877.8	-189.9	263.2	-322.2	0.00	0.00	0.00
3,000.0	8.00	125.81	2,976.8	-198.1	274.5	-336.0	0.00	0.00	0.00
3,100.0	8.00	125.81	3,075.9	-206.2	285.8	-349.8	0.00	0.00	0.00
3,200.0	8.00	125.81	3,174.9	-214.4	297.1	-363.6	0.00	0.00	0.00
3,300.0	8.00	125.81	3,273.9	-222.5	308.4	-377.5	0.00	0.00	0.00
3,400.0	8.00	125.81	3,373.0	-230.6	319.7	-391.3	0.00	0.00	0.00
3,500.0	8.00	125.81	3,472.0	-238.8	331.0	-405.1	0.00	0.00	0.00
3,600.0	8.00	125.81	3,571.0	-246.9	342.2	-418.9	0.00	0.00	0.00
3,700.0	8.00	125.81	3,670.0	-255.1	353.5	-432.7	0.00	0.00	0.00
3,800.0	8.00	125.81	3,769.1	-263.2	364.8	-446.5	0.00	0.00	0.00
3,900.0	8.00	125.81	3,868.1	-271.4	376.1	-460.3	0.00	0.00	0.00
4,000.0	8.00	125.81	3,967.1	-279.5	387.4	-474.2	0.00	0.00	0.00
4,100.0	8.00	125.81	4,066.1	-287.7	398.7	-488.0	0.00	0.00	0.00
4,200.0	8.00	125.81	4,165.2	-295.8	410.0	-501.8	0.00	0.00	0.00
4,300.0	8.00	125.81	4,264.2	-303.9	421.3	-515.6	0.00	0.00	0.00
4,400.0	8.00	125.81	4,363.2	-312.1	432.5	-529.4	0.00	0.00	0.00
4,500.0	8.00	125.81	4,462.3	-320.2	443.8	-543.2	0.00	0.00	0.00
4,600.0	8.00	125.81	4,561.3	-328.4	455.1	-557.0	0.00	0.00	0.00
4,700.0	8.00	125.81	4,660.3	-336.5	466.4	-570.9	0.00	0.00	0.00
4,720.9	8.00	125.81	4,681.0	-338.2	468.8	-573.8	0.00	0.00	0.00
4,800.0	6.02	125.81	4,759.5	-343.9	476.6	-583.3	2.50	-2.50	0.00

Planning Report

Database: EDM
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Project: Proposed Elk Unit
Site: Four Corners Pad 1
Well: Slot 8
Wellbore: Elk 301H
Design: Lateral plan

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North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,900.0	3.52	125.81	4,859.2	-348.7	483.3	-591.6	2.50	-2.50	0.00
5,000.0	1.02	125.81	4,959.1	-351.1	486.6	-595.5	2.50	-2.50	0.00
5,037.3	0.09	125.81	4,996.4	-351.3	486.8	-595.9	2.50	-2.50	0.00
Intermediate casing									
5,040.9	0.00	0.00	5,000.0	-351.3	486.8	-595.9	2.50	-2.50	0.00
5,057.3	0.00	0.00	5,016.4	-351.3	486.8	-595.9	0.00	0.00	0.00
KOP									
5,100.0	3.88	299.83	5,059.0	-350.5	485.6	-594.5	9.09	9.09	0.00
5,150.0	8.43	299.83	5,108.7	-347.9	480.9	-589.3	9.09	9.09	0.00
5,200.0	12.97	299.83	5,157.8	-343.3	472.9	-580.2	9.09	9.09	0.00
5,250.0	17.52	299.83	5,206.1	-336.7	461.5	-567.4	9.09	9.09	0.00
5,300.0	22.06	299.83	5,253.1	-328.3	446.8	-550.9	9.09	9.09	0.00
5,340.6	25.75	299.83	5,290.2	-320.1	432.5	-534.9	9.09	9.09	0.00
5,350.0	26.58	300.29	5,298.7	-318.1	429.0	-530.8	9.05	8.78	4.95
5,358.2	27.30	300.68	5,306.0	-316.2	425.7	-527.2	9.05	8.80	4.69
Mancos Silt									
5,400.0	30.99	302.38	5,342.5	-305.5	408.4	-507.2	9.05	8.83	4.08
5,450.0	35.43	303.99	5,384.3	-290.5	385.5	-480.3	9.05	8.88	3.22
5,500.0	39.89	305.29	5,423.9	-273.1	360.4	-450.0	9.05	8.91	2.59
5,550.0	44.35	306.36	5,460.9	-253.5	333.2	-416.7	9.05	8.94	2.15
5,600.0	48.83	307.28	5,495.3	-231.7	304.2	-380.6	9.05	8.95	1.83
5,650.0	53.31	308.07	5,526.7	-208.0	273.4	-341.9	9.05	8.97	1.59
5,700.0	57.80	308.78	5,555.0	-182.3	241.1	-300.8	9.05	8.98	1.42
5,750.0	62.29	309.42	5,579.9	-155.0	207.5	-257.6	9.05	8.98	1.28
5,800.0	66.79	310.02	5,601.4	-126.2	172.8	-212.5	9.05	8.99	1.18
5,806.6	67.38	310.09	5,604.0	-122.2	168.1	-206.4	9.05	8.99	1.14
Gallup A									
5,850.0	71.28	310.57	5,619.3	-96.0	137.2	-165.9	9.05	8.99	1.10
5,900.0	75.78	311.09	5,633.5	-64.6	100.9	-118.0	9.05	9.00	1.05
5,950.0	80.28	311.60	5,643.9	-32.3	64.2	-69.1	9.05	9.00	1.01
6,000.0	84.78	312.09	5,650.4	0.7	27.3	-19.5	9.05	9.00	0.98
6,050.0	89.28	312.57	5,652.9	34.3	-9.6	30.4	9.05	9.00	0.97
6,058.0	90.00	312.65	5,653.0	39.8	-15.5	38.4	9.05	9.00	0.96
Gallup B									
6,100.0	90.00	312.65	5,653.0	68.2	-46.4	80.4	0.00	0.00	0.00
6,118.0	90.00	312.65	5,653.0	80.4	-59.6	98.4	0.00	0.00	0.00
First take point									
6,200.0	90.00	312.65	5,653.0	136.0	-120.0	180.4	0.00	0.00	0.00
6,300.0	90.00	312.65	5,653.0	203.7	-193.5	280.4	0.00	0.00	0.00
6,400.0	90.00	312.65	5,653.0	271.5	-267.1	380.4	0.00	0.00	0.00
6,500.0	90.00	312.65	5,653.0	339.2	-340.6	480.4	0.00	0.00	0.00
6,600.0	90.00	312.65	5,653.0	406.9	-414.2	580.4	0.00	0.00	0.00
6,700.0	90.00	312.65	5,653.0	474.7	-487.7	680.4	0.00	0.00	0.00
6,800.0	90.00	312.65	5,653.0	542.4	-561.3	780.4	0.00	0.00	0.00
6,900.0	90.00	312.65	5,653.0	610.2	-634.9	880.4	0.00	0.00	0.00
7,000.0	90.00	312.65	5,653.0	677.9	-708.4	980.4	0.00	0.00	0.00
7,100.0	90.00	312.65	5,653.0	745.7	-782.0	1,080.4	0.00	0.00	0.00
7,200.0	90.00	312.65	5,653.0	813.4	-855.5	1,180.4	0.00	0.00	0.00
7,300.0	90.00	312.65	5,653.0	881.2	-929.1	1,280.4	0.00	0.00	0.00
7,400.0	90.00	312.65	5,653.0	948.9	-1,002.6	1,380.4	0.00	0.00	0.00
7,500.0	90.00	312.65	5,653.0	1,016.7	-1,076.2	1,480.4	0.00	0.00	0.00
7,600.0	90.00	312.65	5,653.0	1,084.4	-1,149.7	1,580.4	0.00	0.00	0.00
7,700.0	90.00	312.65	5,653.0	1,152.2	-1,223.3	1,680.4	0.00	0.00	0.00

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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,800.0	90.00	312.65	5,653.0	1,219.9	-1,296.8	1,780.4	0.00	0.00	0.00
7,900.0	90.00	312.65	5,653.0	1,287.7	-1,370.4	1,880.4	0.00	0.00	0.00
8,000.0	90.00	312.65	5,653.0	1,355.4	-1,444.0	1,980.4	0.00	0.00	0.00
8,100.0	90.00	312.65	5,653.0	1,423.1	-1,517.5	2,080.4	0.00	0.00	0.00
8,200.0	90.00	312.65	5,653.0	1,490.9	-1,591.1	2,180.4	0.00	0.00	0.00
8,300.0	90.00	312.65	5,653.0	1,558.6	-1,664.6	2,280.4	0.00	0.00	0.00
8,400.0	90.00	312.65	5,653.0	1,626.4	-1,738.2	2,380.4	0.00	0.00	0.00
8,500.0	90.00	312.65	5,653.0	1,694.1	-1,811.7	2,480.4	0.00	0.00	0.00
8,600.0	90.00	312.65	5,653.0	1,761.9	-1,885.3	2,580.4	0.00	0.00	0.00
8,700.0	90.00	312.65	5,653.0	1,829.6	-1,958.8	2,680.4	0.00	0.00	0.00
8,800.0	90.00	312.65	5,653.0	1,897.4	-2,032.4	2,780.4	0.00	0.00	0.00
8,900.0	90.00	312.65	5,653.0	1,965.1	-2,106.0	2,880.4	0.00	0.00	0.00
9,000.0	90.00	312.65	5,653.0	2,032.9	-2,179.5	2,980.4	0.00	0.00	0.00
9,100.0	90.00	312.65	5,653.0	2,100.6	-2,253.1	3,080.4	0.00	0.00	0.00
9,200.0	90.00	312.65	5,653.0	2,168.4	-2,326.6	3,180.4	0.00	0.00	0.00
9,300.0	90.00	312.65	5,653.0	2,236.1	-2,400.2	3,280.4	0.00	0.00	0.00
9,400.0	90.00	312.65	5,653.0	2,303.9	-2,473.7	3,380.4	0.00	0.00	0.00
9,500.0	90.00	312.65	5,653.0	2,371.6	-2,547.3	3,480.4	0.00	0.00	0.00
9,600.0	90.00	312.65	5,653.0	2,439.4	-2,620.8	3,580.4	0.00	0.00	0.00
9,700.0	90.00	312.65	5,653.0	2,507.1	-2,694.4	3,680.4	0.00	0.00	0.00
9,800.0	90.00	312.65	5,653.0	2,574.8	-2,768.0	3,780.4	0.00	0.00	0.00
9,900.0	90.00	312.65	5,653.0	2,642.6	-2,841.5	3,880.4	0.00	0.00	0.00
10,000.0	90.00	312.65	5,653.0	2,710.3	-2,915.1	3,980.4	0.00	0.00	0.00
10,100.0	90.00	312.65	5,653.0	2,778.1	-2,988.6	4,080.4	0.00	0.00	0.00
10,200.0	90.00	312.65	5,653.0	2,845.8	-3,062.2	4,180.4	0.00	0.00	0.00
10,300.0	90.00	312.65	5,653.0	2,913.6	-3,135.7	4,280.4	0.00	0.00	0.00
10,400.0	90.00	312.65	5,653.0	2,981.3	-3,209.3	4,380.4	0.00	0.00	0.00
10,500.0	90.00	312.65	5,653.0	3,049.1	-3,282.8	4,480.4	0.00	0.00	0.00
10,600.0	90.00	312.65	5,653.0	3,116.8	-3,356.4	4,580.4	0.00	0.00	0.00
10,700.0	90.00	312.65	5,653.0	3,184.6	-3,430.0	4,680.4	0.00	0.00	0.00
10,800.0	90.00	312.65	5,653.0	3,252.3	-3,503.5	4,780.4	0.00	0.00	0.00
10,900.0	90.00	312.65	5,653.0	3,320.1	-3,577.1	4,880.4	0.00	0.00	0.00
11,000.0	90.00	312.65	5,653.0	3,387.8	-3,650.6	4,980.4	0.00	0.00	0.00
11,100.0	90.00	312.65	5,653.0	3,455.6	-3,724.2	5,080.4	0.00	0.00	0.00
11,200.0	90.00	312.65	5,653.0	3,523.3	-3,797.7	5,180.4	0.00	0.00	0.00
11,300.0	90.00	312.65	5,653.0	3,591.0	-3,871.3	5,280.4	0.00	0.00	0.00
11,400.0	90.00	312.65	5,653.0	3,658.8	-3,944.8	5,380.4	0.00	0.00	0.00
11,500.0	90.00	312.65	5,653.0	3,726.5	-4,018.4	5,480.4	0.00	0.00	0.00
11,600.0	90.00	312.65	5,653.0	3,794.3	-4,091.9	5,580.4	0.00	0.00	0.00
11,700.0	90.00	312.65	5,653.0	3,862.0	-4,165.5	5,680.4	0.00	0.00	0.00
11,800.0	90.00	312.65	5,653.0	3,929.8	-4,239.1	5,780.4	0.00	0.00	0.00
11,900.0	90.00	312.65	5,653.0	3,997.5	-4,312.6	5,880.4	0.00	0.00	0.00
12,000.0	90.00	312.65	5,653.0	4,065.3	-4,386.2	5,980.4	0.00	0.00	0.00
12,100.0	90.00	312.65	5,653.0	4,133.0	-4,459.7	6,080.4	0.00	0.00	0.00
12,200.0	90.00	312.65	5,653.0	4,200.8	-4,533.3	6,180.4	0.00	0.00	0.00
12,300.0	90.00	312.65	5,653.0	4,268.5	-4,606.8	6,280.4	0.00	0.00	0.00
12,400.0	90.00	312.65	5,653.0	4,336.3	-4,680.4	6,380.4	0.00	0.00	0.00
12,500.0	90.00	312.65	5,653.0	4,404.0	-4,753.9	6,480.4	0.00	0.00	0.00
12,600.0	90.00	312.65	5,653.0	4,471.8	-4,827.5	6,580.4	0.00	0.00	0.00
12,700.0	90.00	312.65	5,653.0	4,539.5	-4,901.1	6,680.4	0.00	0.00	0.00
12,800.0	90.00	312.65	5,653.0	4,607.2	-4,974.6	6,780.4	0.00	0.00	0.00
12,900.0	90.00	312.65	5,653.0	4,675.0	-5,048.2	6,880.4	0.00	0.00	0.00
13,000.0	90.00	312.65	5,653.0	4,742.7	-5,121.7	6,980.4	0.00	0.00	0.00
13,100.0	90.00	312.65	5,653.0	4,810.5	-5,195.3	7,080.4	0.00	0.00	0.00

Planning Report

Database: EDM
Company: DJR Operating
Project: Proposed Elk Unit
Site: Four Corners Pad 1
Well: Slot 8
Wellbore: Elk 301H
Design: Lateral plan

Local Co-ordinate Reference: Well Slot 8
TVD Reference: Rig @ 6747.0usft (Rig TBD 20-ft KB)
MD Reference: Rig @ 6747.0usft (Rig TBD 20-ft KB)
North Reference: True
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,200.0	90.00	312.65	5,653.0	4,878.2	-5,268.8	7,180.4	0.00	0.00	0.00
13,300.0	90.00	312.65	5,653.0	4,946.0	-5,342.4	7,280.4	0.00	0.00	0.00
13,384.6	90.00	312.65	5,653.0	5,003.3	-5,404.6	7,365.0	0.00	0.00	0.00
Last take point									
13,400.0	90.00	312.65	5,653.0	5,013.7	-5,415.9	7,380.4	0.00	0.00	0.00
13,444.6	90.00	312.65	5,653.0	5,043.9	-5,448.7	7,425.0	0.00	0.00	0.00

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
301 B Toe - plan hits target center - Circle (radius 100.0)	0.00	0.00	5,653.0	5,043.9	-5,448.7	1,921,232	2,869,229	36.27900786	-107.33752070
301 B Heel - plan hits target center - Circle (radius 50.0)	0.00	0.00	5,653.0	39.8	-15.5	1,916,257	2,874,689	36.26526288	-107.31908740

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)
350.0	350.0	Surface casing	9.625	12.250
5,037.3	4,996.4	Intermediate casing	7.000	8.750

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
0.0	0.0	Kirtland	Shale	0.00	
2,101.4	2,087.0	Fruitland	Coal	0.00	
2,385.2	2,368.0	Picture Cliffs	Sand	0.00	
2,489.2	2,471.0	Lewis	Shale	0.00	
3,192.0	3,167.0	Chacra	Sand	0.00	
3,980.7	3,948.0	Menefee	Sandstone, Shaly	0.00	
4,576.5	4,538.0	Point Lookout	Sand	0.00	
4,706.8	4,667.0	Mancos	Shale	0.00	
5,358.2	5,306.0	Mancos Silt	Shale, Silty	0.00	
5,806.6	5,604.0	Gallup A	Sand	0.00	
6,058.0	5,653.0	Gallup B	Sand	0.00	

Planning Report

Database: EDM
Company: DJR Operating
Project: Proposed Elk Unit
Site: Four Corners Pad 1
Well: Slot 8
Wellbore: Elk 301H
Design: Lateral plan

Local Co-ordinate Reference: Well Slot 8
TVD Reference: Rig @ 6747.0usft (Rig TBD 20-ft KB)
MD Reference: Rig @ 6747.0usft (Rig TBD 20-ft KB)
North Reference: True
Survey Calculation Method: Minimum Curvature

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5,057.3	5,016.4	-351.3	486.8	KOP
6,118.0	5,653.0	80.4	-59.6	First take point
13,384.6	5,653.0	5,003.3	-5,404.6	Last take point



DJR Operating

**Proposed Elk Unit
Four Corners Pad 1
Slot 8**

**Elk 301H
Lateral plan**

Anticollision Report

04 June, 2018

Anticollision Report

Company:	DJR Operating	Local Co-ordinate Reference:	Well Slot 8
Project:	Proposed Elk Unit	TVD Reference:	Rig @ 6747.0usft (Rig TBD 20-ft KB)
Reference Site:	Four Corners Pad 1	MD Reference:	Rig @ 6747.0usft (Rig TBD 20-ft KB)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	Slot 8	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Elk 301H	Database:	EDM
Reference Design:	Lateral plan	Offset TVD Reference:	Offset Datum

Reference	Lateral plan		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	6/4/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	5,057.3	Pilot hole (Elk 301)	MWD+IGRF	OWSG MWD + IGRF or WMM	
5,057.3	13,444.6	Lateral plan (Elk 301H)	MWD+IGRF	OWSG MWD + IGRF or WMM	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Four Corners Pad 1						
Apache C-4 - Elm Ridge Resources - Original drilling	12,796.6	5,580.8	126.7	-71.3	0.640	Level 1, CC, ES, SF
Apache D-4 - Amerada Hess - Original drilling	407.8	394.8	122.2	120.2	58.576	CC, ES
Apache D-4 - Amerada Hess - Original drilling	2,500.0	2,468.9	356.4	339.3	20.740	SF
Slot 1 - Elk 336H - Lateral plan	400.0	400.0	140.0	137.5	57.422	CC
Slot 1 - Elk 336H - Lateral plan	407.8	407.8	140.0	137.5	56.137	ES
Slot 1 - Elk 336H - Lateral plan	7,000.0	5,350.0	1,507.5	1,450.7	26.542	SF
Slot 2 - Elk 297H - Lateral plan	414.4	414.7	120.0	117.5	47.244	CC, ES
Slot 2 - Elk 297H - Lateral plan	13,444.6	13,631.8	1,190.6	800.6	3.053	SF
Slot 3 - Elk 299H - Lateral plan	407.8	407.8	100.0	97.5	40.081	CC, ES
Slot 3 - Elk 299H - Lateral plan	13,444.6	13,731.3	607.9	222.5	1.577	SF
Slot 4 - Elk 338H - Lateral plan	407.8	407.8	80.0	77.6	32.099	CC, ES
Slot 4 - Elk 338H - Lateral plan	5,900.0	5,922.2	208.9	167.1	5.000	SF
Slot 5 - Elk 340H - Lateral plan	400.0	400.0	60.0	57.5	24.599	CC
Slot 5 - Elk 340H - Lateral plan	407.8	407.8	60.0	57.5	24.057	ES
Slot 5 - Elk 340H - Lateral plan	600.0	597.7	70.8	67.0	18.538	SF
Slot 6 - Elk 305H - Lateral plan	414.5	414.6	40.0	37.4	15.749	CC, ES
Slot 6 - Elk 305H - Lateral plan	13,444.6	13,573.0	1,213.0	823.5	3.114	SF
Slot 7 - Elk 303H - Lateral plan	407.8	407.8	20.0	17.5	8.036	CC, ES
Slot 7 - Elk 303H - Lateral plan	13,444.6	13,699.5	633.3	246.9	1.639	SF
Slot 8 - Elk 301 - Pilot hole	5,400.0	5,383.4	90.8	88.8	46.162	CC, ES, SF

Offset Design												Offset Site Error:	0.0 usft
Four Corners Pad 1 - Apache C-4 - Elm Ridge Resources - Original drilling												Offset Well Error:	0.0 usft
Survey Program: 163-MWD+IGRF													
Reference				Offset				Semi Major Axis				Distance	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	0.0	-46.13	4,697.9	-4,886.3	6,778.8				
100.0	100.0	27.0	27.0	0.1	0.0	-46.13	4,697.9	-4,886.3	6,778.4	6,778.2	0.19	N/A	
200.0	200.0	127.0	127.0	0.5	0.2	-46.13	4,697.9	-4,886.3	6,778.4	6,777.7	0.73	9,290.190	
300.0	300.0	227.0	227.0	0.9	0.5	-46.13	4,697.9	-4,886.3	6,778.4	6,777.0	1.38	4,904.259	
400.0	400.0	340.7	340.7	1.2	0.9	-46.13	4,698.0	-4,886.3	6,778.5	6,776.3	2.15	3,154.986	
407.8	407.8	350.4	350.4	1.2	1.0	-46.13	4,698.0	-4,886.3	6,778.5	6,776.3	2.21	3,065.183	
413.6	413.6	357.6	357.6	1.3	1.0	-171.94	4,698.0	-4,886.3	6,778.5	6,776.2	2.26	3,002.820	

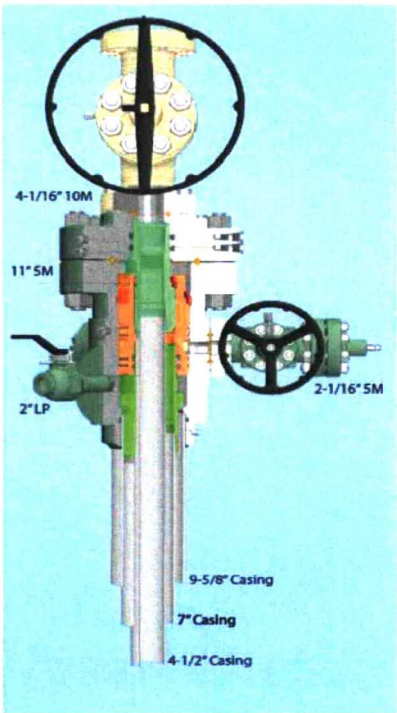
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



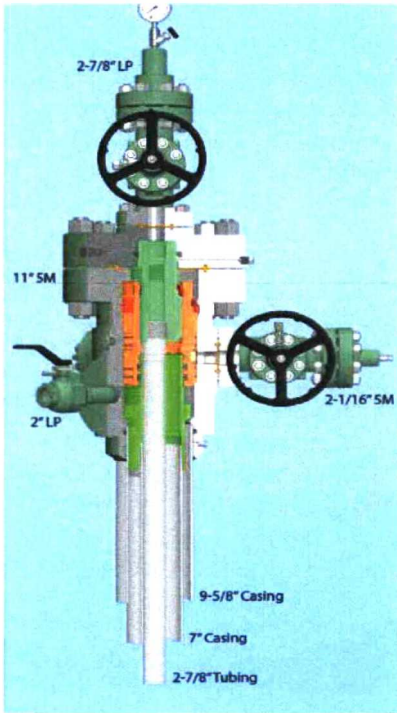
Proposed Wellhead
11" 5M Multi-bowl



Frac configuration with 4-1/2" tieback



Production configuration with 2-7/8" tubing



Choke Manifold

Actual system to conform with Onshore Order 2

