

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well ☐ Oil Well ☒ Gas Well ☐ Other		5. Lease Serial No. JIC40
2. Name of Operator DJR OPERATING LLC		6. If Indian, Allottee or Tribe Name JICARILLA APACHE
3a. Address 1600 BROADWAY SUITE 1600 DENVER, CO 80202		7. If Unit or CA/Agreement, Name and/or No.
3b. Phone No. (include area code) Ph: 505.632.3476		8. Well Name and No. ELK 301H
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 36 T24N R5W NWSW 1866FSL 921FWL 36.265152 N Lat, 107.319038 W Lon		9. API Well No. 30-039-31370-00-X1
		10. Field and Pool or Exploratory Area OTERO
		11. County or Parish, State RIO ARRIBA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

DJR Operating, LLC requests approval for a revised lateral for the subject well to conform with the NMOCD Otero Gallup Pool Rules (Pool Code 48450). DJR has adjusted the wellbore lateral by moving it 100 feet to the SW in Sec.35, T24N, R5W and re-adjusting the BHL to 1185 FSL & 576 FWL in Sec. 26, T24N, R5W. A revised C-102, Standard Planning Report, Trajectory & Drilling Plan are attached. New Pool change from Basin Mancos TO Otero Gallup.

NMOCD**JAN 15 2020****DISTRICT III**

14. I hereby certify that the foregoing is true and correct. Electronic Submission #499270 verified by the BLM Well Information System For DJR OPERATING LLC, sent to the Rio Puerco Committed to AFMSS for processing by JOE KILLINS on 01/15/2020 (20JK0018SE)	
Name (Printed/Typed) SHAW MARIE FORD	Title REGULATORY SPECIALIST
Signature (Electronic Submission)	Date 01/15/2020

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By <u>JOE KILLINS</u>	Title <u>PETROLEUM ENGINEER</u>	Date <u>01/15/2020</u>
Conditions of approval, if any, are attached. Approval of this notice 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.		Office <u>Rio Puerco</u>

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.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

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

DISTRICT II
611 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) 476-3460 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 48450	³ Pool Name OTERO GALLUP
⁴ Property Code 326978	⁵ Property Name ELK	⁶ Well Number 30IH
⁷ GRID No. 371838	⁸ Operator Name DJR OPERATING, LLC	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		1185	SOUTH	576	WEST	RIO ARRIBA

¹² Dedicated Acres SEC. 36=NW/SW, SW/NW, SEC. 35=NE/SE, NE/4, NE/NW, SEC. 26=NW/SW, S/2 SW, TOTAL = 440 ACRES	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

16

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.

Shaw-Marie Ford 01/08/2020
Signature Date
Shaw-Marie Ford
Printed Name
sford@djrlc.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
Plat Revised: 1/8/20
Signature and Seal of Professional Surveyor

17078
Certificate Number

MARSHALL W. ANDERSON
NEW MEXICO
17078
1-8-20
PROFESSIONAL SURVEYOR

Surface = Seculla

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' (14' KB)

SHL Geographical Coordinates (NAD-83)

Latitude 36.2651536° N
 Longitude 107.3190347° W

Kick Off Point for Horizontal Build Curve

5104-ft MD
 5104-ft TVD

KOP Geographical Coordinates

Latitude 36.2651536° N
 Longitude 107.3190347° W

Heel Location (Pay zone entry)

371-ft FWL & 2225-ft FSL
 Sec 36 T24N R5W

Heel Geographical Coordinates (NAD-83)

Latitude 36.26623923° N
 Longitude 107.32090321° W

Bottom Hole Location (TD)

676-ft FWL & 1185-ft FSL
 Sec 26 T24N R5W

BHL Geographical Coordinates (NAD-83)

Latitude 36.2788107° N
 Longitude 107.3377444° W

Well objectives

A vertical pilot hole will be drilled to 7054-ft MD (7054-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 5000-ft MD (5000-ft TVD), and then 7" casing will be run and cemented back to surface. After securing the wellbore, the well will be suspended for at least two months. 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 6752-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 about 2000 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	2081	2081	C	G	8.3	9.0 - 9.5
Picture Cliffs	2362	2362	Sd	G	8.3	9.0 - 9.5
Lewis	2465	2465	Sh	-		9.0 - 9.5
Chacra	3161	3161	Sd	-	8.3	9.0 - 9.5
Menefee	3942	3942	Sd, C	G	8.3	9.0 - 9.5
Point Lookout	4532	4532	Sd	-	8.3	9.0 - 9.5
Mancos	4661	4661	Sh	-		9.0 - 9.5
Mancos Silt	5300	5300	Slt	O/G	8.5	9.0 - 9.5
Gallup A	5598	5598	Slt	O/G	8.5	9.0 - 9.5
Gallup B	5647	5647	Sd	O/G	8.5	8.8 - 9.0
Gallup C	5754	5754	Sd	O/G	8.5	8.8 - 9.0
Lower Mancos	5895	5895	Sh	-	8.5	8.8 - 9.0
Juana Lopez	6342	6342	Sh	-		8.8 - 9.0
Greenhorn	6558	6558	Carbonate	O/G	8.5	8.8 - 9.0
Graneros	6627	6627	Sd			8.8 - 9.0
Dakota A	6670	6670	Sd	O/G	8.5	8.8 - 9.0
Dakota B	6724	6724	Sd	O/G	8.5	8.8 - 9.0
Dakota C	6766	6766	Sd	O/G	8.5	8.8 - 9.0
Burro Canyon	6870	6870	Sd	W	8.5	8.8 - 9.0
Morrison	6954	6954	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	2081	2081	C	G	8.3	9.0 - 9.5
Picture Cliffs	2362	2362	Sd	G	8.3	9.0 - 9.5
Lewis	2465	2465	Sh	-		9.0 - 9.5
Chacra	3161	3161	Sd	-	8.3	9.0 - 9.5
Menefee	3942	3942	Sd, C	G	8.3	9.0 - 9.5
Point Lookout	4532	4532	Sd	-	8.3	9.0 - 9.5
Mancos	4661	4661	Sh	-		9.0 - 9.5
Mancos Silt	5304	5300	Slt	O/G	8.5	9.0 - 9.5
Gallup A	5722	5598	Slt	O/G	8.5	9.0 - 9.5
Gallup B (objective)	5912	5647	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"	26	K-55	LTC	surf	5000	surf	5000	surface
4-1/2"	6-1/8"	11.6	P-110	LTC	4900	12845	4900	5647	4900

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

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

	<u>Lead</u>
Name	Redi-Mix
Type	I-II
Planned top	Surface
Density (ppg)	14.50
Yield (cf/sx)	1.61
Mix water (gal/sx)	7.41
Volume (sx)	114
Volume (bbls)	33
Volume (cu. ft.)	185
Excess %	50

7" Intermediate Casing

	<u>Lead</u>	<u>Tail</u>
	BJ Services	BJ Services
Type	III	Poz/G
Planned top	Surface	4205-ft
Density (ppg)	12.30	13.50
Yield (cf/sx)	2.34	1.50
Mix water (gal/sx)	13.26	7.20
Volume (sx)	363	201
Volume (bbls)	152	53
Volume (cu.ft.)	853	298
Excess %	55	50

4-1/2" Production Liner

	BJ Services
Type	Poz/G
Planned top	4900-ft
Density (ppg)	13.3
Yield (cf/sx)	1.56
Mix water (gal/sx)	7.71
Volume (sx)	671
Volume (bbls)	187
Volume (cu.ft)	1050
Excess %	40

Wellhead & Pressure Control

The well head will be an 11" 5M multi-bowl system. A 3M 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 geolograph 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 – 5617	9.0 – 9.5	38 – 45	8 – 14	<20
Production	Low solids, non-dispersed	5617 – 11582	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 quad-combo wireline run will be made in the vertical pilot hole, from TD to the base of surface casing.

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 sundried at a later date.



DJR Operating

Proposed Elk Unit

L36 2405

Elk 301H - Slot 1

Lateral

Plan: APD

Standard Planning Report

08 January, 2020



www.scientificdrilling.com



Scientific Drilling, Intl
Planning Report



Database: Grand Junction
Company: DJR Operating
Project: Proposed Elk Unit
Site: L36 2405
Well: Elk 301H
Wellbore: Lateral
Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
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	L36 2405, C Mallary			
Site Position:		Northing:	1,916,217.29 usft	Latitude: 36.265
From:	Lat/Long	Easting:	2,874,704.47 usft	Longitude: -107.319
Position Uncertainty:	0.00 ft	Slot Radius:	16.000 in	Grid Convergence: 0.30 °

Well	Elk 301H - Slot 1			
Well Position	+N/-S	0.00 ft	Northing:	1,916,217.29 usft
	+E/-W	0.00 ft	Easting:	2,874,704.47 usft
Position Uncertainty	0.00 ft	Wellhead Elevation:		Ground Level: 6,727.01 ft

Wellbore	Lateral				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM_FILE	5/15/2018	8.78	62.85	49,472.80000000

Design	APD			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	5,003.99
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	312.04

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
5,003.99	0.00	0.00	5,003.99	0.00	0.00	0.00	0.00	0.00	0.00	
5,103.99	0.00	0.00	5,103.99	0.00	0.00	0.00	0.00	0.00	0.00	
5,974.27	91.47	305.20	5,648.95	322.30	-456.86	10.51	10.51	0.00	305.20	
6,010.36	91.47	305.20	5,648.03	343.10	-486.35	0.00	0.00	0.00	0.00	
6,093.34	90.00	312.68	5,646.97	395.21	-550.83	9.18	-1.77	9.01	101.05	301H Heel rev 2
12,845.27	90.00	312.68	5,646.97	4,972.18	-5,514.70	0.00	0.00	0.00	0.00	301H Toe rev 1



Scientific Drilling, Intl
Planning Report



Database: Grand Junction
Company: DJR Operating
Project: Proposed Elk Unit
Site: L36 2405
Well: Elk 301H
Wellbore: Lateral
Design: APD

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well Elk 301H - Slot 1
Rig @ 6740.99ft (AD 920)
Rig @ 6740.99ft (AD 920)
True
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)
5,003.99	0.00	0.00	5,003.99	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,103.99	0.00	0.00	5,103.99	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	10.09	305.20	5,199.50	4.86	-6.89	8.37	10.51	10.51	0.00
5,300.00	20.60	305.20	5,295.80	20.10	-28.49	34.61	10.51	10.51	0.00
5,400.00	31.11	305.20	5,385.67	45.20	-64.07	77.85	10.51	10.51	0.00
5,500.00	41.62	305.20	5,466.08	79.33	-112.45	136.64	10.51	10.51	0.00
5,600.00	52.13	305.20	5,534.34	121.35	-172.01	209.01	10.51	10.51	0.00
5,700.00	62.64	305.20	5,588.16	169.84	-240.74	292.53	10.51	10.51	0.00
5,800.00	73.15	305.20	5,625.74	223.17	-316.35	384.39	10.51	10.51	0.00
5,900.00	83.66	305.20	5,645.80	279.56	-396.28	481.52	10.51	10.51	0.00
5,974.27	91.47	305.20	5,648.95	322.30	-456.86	555.13	10.51	10.51	0.00
6,000.00	91.47	305.20	5,648.30	337.13	-477.88	580.67	0.00	0.00	0.00
6,010.36	91.47	305.20	5,648.03	343.10	-486.35	590.96	0.00	0.00	0.00
6,093.34	90.00	312.68	5,646.97	395.21	-550.83	673.75	9.18	-1.77	9.01
6,100.00	90.00	312.68	5,646.97	399.73	-555.73	680.41	0.00	0.00	0.00
6,200.00	90.00	312.68	5,646.97	467.51	-629.25	780.40	0.00	0.00	0.00
6,300.00	90.00	312.68	5,646.97	535.30	-702.77	880.40	0.00	0.00	0.00
6,400.00	90.00	312.68	5,646.97	603.09	-776.28	980.39	0.00	0.00	0.00
6,500.00	90.00	312.68	5,646.97	670.88	-849.80	1,080.38	0.00	0.00	0.00
6,600.00	90.00	312.68	5,646.97	738.66	-923.32	1,180.38	0.00	0.00	0.00
6,700.00	90.00	312.68	5,646.97	806.45	-996.84	1,280.37	0.00	0.00	0.00
6,800.00	90.00	312.68	5,646.97	874.24	-1,070.36	1,380.36	0.00	0.00	0.00
6,900.00	90.00	312.68	5,646.97	942.03	-1,143.87	1,480.36	0.00	0.00	0.00
7,000.00	90.00	312.68	5,646.97	1,009.81	-1,217.39	1,580.35	0.00	0.00	0.00
7,100.00	90.00	312.68	5,646.97	1,077.60	-1,290.91	1,680.35	0.00	0.00	0.00
7,200.00	90.00	312.68	5,646.97	1,145.39	-1,364.43	1,780.34	0.00	0.00	0.00
7,300.00	90.00	312.68	5,646.97	1,213.18	-1,437.94	1,880.33	0.00	0.00	0.00
7,400.00	90.00	312.68	5,646.97	1,280.96	-1,511.46	1,980.33	0.00	0.00	0.00
7,500.00	90.00	312.68	5,646.97	1,348.75	-1,584.98	2,080.32	0.00	0.00	0.00
7,600.00	90.00	312.68	5,646.97	1,416.54	-1,658.50	2,180.31	0.00	0.00	0.00
7,700.00	90.00	312.68	5,646.97	1,484.33	-1,732.01	2,280.31	0.00	0.00	0.00
7,800.00	90.00	312.68	5,646.97	1,552.11	-1,805.53	2,380.30	0.00	0.00	0.00
7,900.00	90.00	312.68	5,646.97	1,619.90	-1,879.05	2,480.30	0.00	0.00	0.00
8,000.00	90.00	312.68	5,646.97	1,687.69	-1,952.57	2,580.29	0.00	0.00	0.00
8,100.00	90.00	312.68	5,646.97	1,755.48	-2,026.09	2,680.28	0.00	0.00	0.00
8,200.00	90.00	312.68	5,646.97	1,823.27	-2,099.60	2,780.28	0.00	0.00	0.00
8,300.00	90.00	312.68	5,646.97	1,891.05	-2,173.12	2,880.27	0.00	0.00	0.00
8,400.00	90.00	312.68	5,646.97	1,958.84	-2,246.64	2,980.26	0.00	0.00	0.00
8,500.00	90.00	312.68	5,646.97	2,026.63	-2,320.16	3,080.26	0.00	0.00	0.00
8,600.00	90.00	312.68	5,646.97	2,094.42	-2,393.67	3,180.25	0.00	0.00	0.00
8,700.00	90.00	312.68	5,646.97	2,162.20	-2,467.19	3,280.25	0.00	0.00	0.00
8,800.00	90.00	312.68	5,646.97	2,229.99	-2,540.71	3,380.24	0.00	0.00	0.00
8,900.00	90.00	312.68	5,646.97	2,297.78	-2,614.23	3,480.23	0.00	0.00	0.00
9,000.00	90.00	312.68	5,646.97	2,365.57	-2,687.74	3,580.23	0.00	0.00	0.00
9,100.00	90.00	312.68	5,646.97	2,433.35	-2,761.26	3,680.22	0.00	0.00	0.00
9,200.00	90.00	312.68	5,646.97	2,501.14	-2,834.78	3,780.22	0.00	0.00	0.00
9,300.00	90.00	312.68	5,646.97	2,568.93	-2,908.30	3,880.21	0.00	0.00	0.00
9,400.00	90.00	312.68	5,646.97	2,636.72	-2,981.82	3,980.20	0.00	0.00	0.00
9,500.00	90.00	312.68	5,646.97	2,704.50	-3,055.33	4,080.20	0.00	0.00	0.00
9,600.00	90.00	312.68	5,646.97	2,772.29	-3,128.85	4,180.19	0.00	0.00	0.00
9,700.00	90.00	312.68	5,646.97	2,840.08	-3,202.37	4,280.18	0.00	0.00	0.00
9,800.00	90.00	312.68	5,646.97	2,907.87	-3,275.89	4,380.18	0.00	0.00	0.00
9,900.00	90.00	312.68	5,646.97	2,975.65	-3,349.40	4,480.17	0.00	0.00	0.00



Scientific Drilling, Intl
Planning Report



Database: Grand Junction
Company: DJR Operating
Project: Proposed Elk Unit
Site: L36 2405
Well: Elk 301H
Wellbore: Lateral
Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
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)
10,000.00	90.00	312.68	5,646.97	3,043.44	-3,422.92	4,580.17	0.00	0.00	0.00
10,100.00	90.00	312.68	5,646.97	3,111.23	-3,496.44	4,680.16	0.00	0.00	0.00
10,200.00	90.00	312.68	5,646.97	3,179.02	-3,569.96	4,780.15	0.00	0.00	0.00
10,300.00	90.00	312.68	5,646.97	3,246.80	-3,643.47	4,880.15	0.00	0.00	0.00
10,400.00	90.00	312.68	5,646.97	3,314.59	-3,716.99	4,980.14	0.00	0.00	0.00
10,500.00	90.00	312.68	5,646.97	3,382.38	-3,790.51	5,080.13	0.00	0.00	0.00
10,600.00	90.00	312.68	5,646.97	3,450.17	-3,864.03	5,180.13	0.00	0.00	0.00
10,700.00	90.00	312.68	5,646.97	3,517.95	-3,937.55	5,280.12	0.00	0.00	0.00
10,800.00	90.00	312.68	5,646.97	3,585.74	-4,011.06	5,380.12	0.00	0.00	0.00
10,900.00	90.00	312.68	5,646.97	3,653.53	-4,084.58	5,480.11	0.00	0.00	0.00
11,000.00	90.00	312.68	5,646.97	3,721.32	-4,158.10	5,580.10	0.00	0.00	0.00
11,100.00	90.00	312.68	5,646.97	3,789.10	-4,231.62	5,680.10	0.00	0.00	0.00
11,200.00	90.00	312.68	5,646.97	3,856.89	-4,305.13	5,780.09	0.00	0.00	0.00
11,300.00	90.00	312.68	5,646.97	3,924.68	-4,378.65	5,880.08	0.00	0.00	0.00
11,400.00	90.00	312.68	5,646.97	3,992.47	-4,452.17	5,980.08	0.00	0.00	0.00
11,500.00	90.00	312.68	5,646.97	4,060.25	-4,525.69	6,080.07	0.00	0.00	0.00
11,600.00	90.00	312.68	5,646.97	4,128.04	-4,599.20	6,180.07	0.00	0.00	0.00
11,700.00	90.00	312.68	5,646.97	4,195.83	-4,672.72	6,280.06	0.00	0.00	0.00
11,800.00	90.00	312.68	5,646.97	4,263.62	-4,746.24	6,380.05	0.00	0.00	0.00
11,900.00	90.00	312.68	5,646.97	4,331.40	-4,819.76	6,480.05	0.00	0.00	0.00
12,000.00	90.00	312.68	5,646.97	4,399.19	-4,893.28	6,580.04	0.00	0.00	0.00
12,100.00	90.00	312.68	5,646.97	4,466.98	-4,966.79	6,680.03	0.00	0.00	0.00
12,200.00	90.00	312.68	5,646.97	4,534.77	-5,040.31	6,780.03	0.00	0.00	0.00
12,300.00	90.00	312.68	5,646.97	4,602.55	-5,113.83	6,880.02	0.00	0.00	0.00
12,400.00	90.00	312.68	5,646.97	4,670.34	-5,187.35	6,980.02	0.00	0.00	0.00
12,500.00	90.00	312.68	5,646.97	4,738.13	-5,260.86	7,080.01	0.00	0.00	0.00
12,600.00	90.00	312.68	5,646.97	4,805.92	-5,334.38	7,180.00	0.00	0.00	0.00
12,700.00	90.00	312.68	5,646.97	4,873.70	-5,407.90	7,280.00	0.00	0.00	0.00
12,800.00	90.00	312.68	5,646.97	4,941.49	-5,481.42	7,379.99	0.00	0.00	0.00
12,845.27	90.00	312.68	5,646.97	4,972.18	-5,514.70	7,425.26	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
301H Toe rev 1 - plan hits target center - Circle (radius 100.00)	0.00	0.00	5,646.97	4,972.18	-5,514.70	1,921,160.11	2,869,163.45	36.279	-107.338
301H Heel rev 2 - plan hits target center - Circle (radius 50.00)	0.00	0.00	5,646.97	395.21	-550.83	1,916,609.57	2,874,151.54	36.266	-107.321

Database: Grand Junction
Company: DJR Operating
Project: Proposed Elk Unit
Site: L36 2405
Well: Elk 301H
Wellbore: Lateral
Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,080.98	2,080.98	Fruitland	coal	0.00	
2,080.98	2,080.98	Fruitland	Coal	0.00	
2,361.98	2,361.98	Picture Cliffs	sand	0.00	
2,361.98	2,361.98	Picture Cliffs	Sand	0.00	
2,464.98	2,464.98	Lewis	1_SHALE	0.00	
2,464.98	2,464.98	Lewis	shale	0.00	
2,464.98	2,464.98	Lewis	Shale	0.00	
3,160.98	3,160.98	Chacra	sand	0.00	
3,160.98	3,160.98	Chacra	Sand	0.00	
3,941.98	3,941.98	Menefee	Sandstone, Shaly	0.00	
4,531.98	4,531.98	Point Lookout	sand	0.00	
4,531.98	4,531.98	Point Lookout	Sand	0.00	
4,660.98	4,660.98	Mancos	1_SHALE	0.00	
4,660.98	4,660.98	Mancos	shale	0.00	
4,660.98	4,660.98	Mancos	Shale	0.00	
5,304.47	5,299.99	Mancos Silt	Shale, Silty	0.00	
5,722.27	5,597.99	Gallup A	sand	0.00	
5,722.27	5,597.99	Gallup A	Sand	0.00	
5,911.89	5,646.99	Gallup B	sand	0.00	
5,911.89	5,646.99	Gallup B	Sand	0.00	



Company: DJR Operating
Project: Proposed Elk Unit
Site: L36 2405
Well: Elk 301H
Wellbore: Lateral
Design: APD

PROJECT DETAILS: Proposed Elk Unit

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Western Zone
System Datum: Mean Sea Level
Local North: True



Azimuths to True North
Magnetic North: 8.78°

Magnetic Field
Strength: 49472.8nT
Dip Angle: 62.85°
Date: 5/15/2018
Model: HDGM_FILE

WELL DETAILS: Elk 301H

Rig @ 6740.99ft (AD 920)
+N/-S +E/-W Northing Easting Latitude Longitude
0.00 0.00 1916217.29 2874704.46 36.265 -107.319 1

Plan: APD (Elk 301H/Lateral)

Created By: Janie Collins Date: 8:31, January 08 2020

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
301H Heel rev 2	5646.97	395.21	-550.83	1916609.57	2874151.54	36.266	-107.321
301H Toe rev 1	5646.97	4972.18	-5514.70	1921160.10	2869163.45	36.279	-107.338

SECTION DETAILS

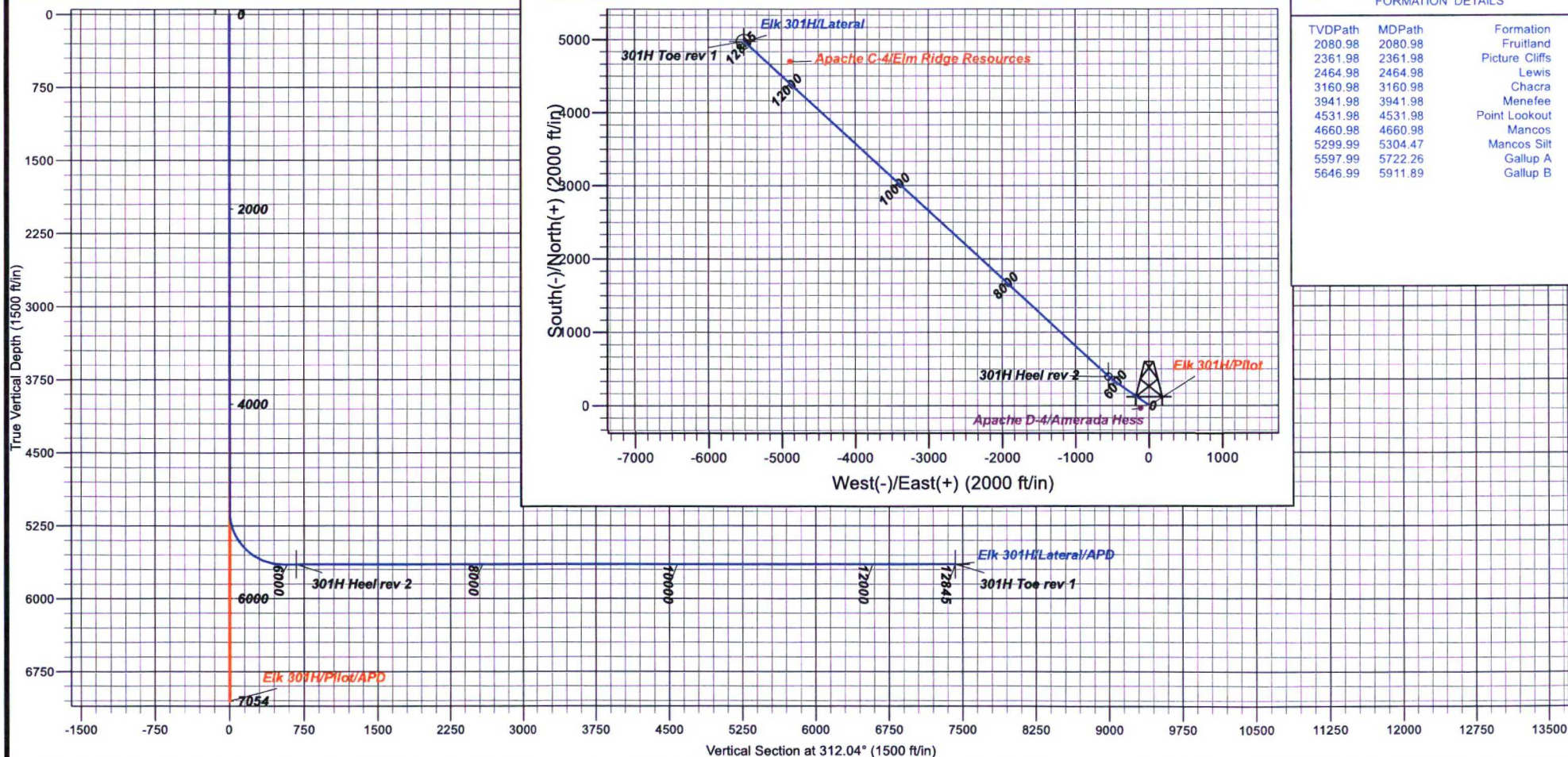
MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSecl	Target
5003.99	0.00	0.00	5003.99	0.00	0.00	0.00	0.00	0.00	
5103.99	0.00	0.00	5103.99	0.00	0.00	0.00	0.00	0.00	
5974.27	91.47	305.20	5648.95	322.30	-456.86	10.51	305.20	555.13	
6010.36	91.47	305.20	5648.03	343.10	-486.35	0.00	0.00	590.96	
6093.34	90.00	312.68	5646.97	395.21	-550.83	9.18	101.05	673.75	301H Heel rev 2
12845.27	90.00	312.68	5646.97	4972.18	-5514.70	0.00	0.00	7425.26	301H Toe rev 1

CASING DETAILS

No casing data is available

FORMATION DETAILS

TVDPath	MDPath	Formation
2080.98	2080.98	Fruitland
2361.98	2361.98	Picture Cliffs
2464.98	2464.98	Lewis
3160.98	3160.98	Chacara
3941.98	3941.98	Menefee
4531.98	4531.98	Point Lookout
4660.98	4660.98	Mancos
5299.99	5304.47	Mancos Silt
5597.99	5722.26	Gallup A
5646.99	5911.89	Gallup B





DJR Operating

Proposed Elk Unit

L36 2405

Elk 301H

Lateral

APD

Anticollision Report

08 January, 2020



www.scientificdrilling.com



Scientific Drilling, Intl
Anticollision Report



Company:	DJR Operating	Local Co-ordinate Reference:	Well Elk 301H - Slot 1
Project:	Proposed Elk Unit	TVD Reference:	Rig @ 6740.99ft (AD 920)
Reference Site:	L36 2405	MD Reference:	Rig @ 6740.99ft (AD 920)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Elk 301H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral	Database:	Grand Junction
Reference Design:	APD	Offset TVD Reference:	Offset Datum

Reference	APD		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum ellipse separation of 1,000.00 ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 1/7/2020	
From (ft)	To (ft)	Survey (Wellbore)
0.00	5,003.99	APD (Pilot)
5,003.99	12,845.27	APD (Lateral)
Tool Name	Description	
MWD+IGRF	OWSG MWD + IGRF or WMM	
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						
L36 2405						
Apache C-4 - Elm Ridge Resources - Original drilling	12,197.55	5,581.07	224.52	34.00	1.178	Level 2, CC
Apache C-4 - Elm Ridge Resources - Original drilling	12,200.00	5,581.06	224.53	33.99	1.178	Level 2, ES, SF
Apache D-4 - Amerada Hess - Original drilling	2,140.35	2,133.41	122.01	107.46	8.390	CC
Apache D-4 - Amerada Hess - Original drilling	2,500.06	2,493.09	122.16	105.04	7.135	ES, SF
Elk 301H - Pilot - APD	5,400.00	5,385.67	78.41	76.48	40.686	CC, ES, SF

Offset Design	L36 2405 - Apache C-4 - Elm Ridge Resources - Original drilling												Offset Site Error:	0.00 ft
Survey Program:	163-MWD+IGRF												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-46.13	4,697.93	-4,886.32	6,778.73					
100.00	100.00	33.03	33.03	0.15	0.06	-46.13	4,697.93	-4,886.32	6,778.40	6,778.18	0.21	N/A		
200.00	200.00	133.03	133.03	0.51	0.24	-46.13	4,697.93	-4,886.32	6,778.40	6,777.64	0.75	9,023.145		
300.00	300.00	233.03	233.03	0.87	0.54	-46.13	4,697.93	-4,886.32	6,778.40	6,776.98	1.41	4,791.914		
400.00	400.00	348.17	348.17	1.23	0.96	-46.13	4,698.03	-4,886.32	6,778.49	6,776.30	2.19	3,100.769		
500.00	500.00	433.04	433.03	1.59	1.26	-46.13	4,697.93	-4,886.32	6,778.40	6,775.55	2.85	2,379.369		
600.00	600.00	543.94	543.92	1.95	1.66	-46.12	4,698.28	-4,886.32	6,778.65	6,775.04	3.61	1,880.311		
700.00	700.00	633.06	633.03	2.31	1.98	-46.13	4,697.93	-4,886.32	6,778.40	6,774.11	4.28	1,582.579		
800.00	800.00	733.06	733.03	2.66	2.34	-46.13	4,697.93	-4,886.32	6,778.40	6,773.39	5.00	1,355.637		
900.00	900.00	846.27	846.23	3.02	2.74	-46.12	4,698.34	-4,886.32	6,778.70	6,772.93	5.76	1,175.931		
1,000.00	1,000.00	970.94	970.89	3.38	3.19	-46.13	4,697.67	-4,886.32	6,778.32	6,771.75	6.57	1,031.724		
1,026.20	1,026.20	959.28	959.22	3.47	3.15	-46.13	4,697.93	-4,886.32	6,778.40	6,771.77	6.62	1,023.600		
1,100.00	1,100.00	1,033.08	1,033.03	3.74	3.41	-46.13	4,697.93	-4,886.32	6,778.40	6,771.24	7.15	947.854		
1,200.00	1,200.00	1,143.05	1,142.99	4.10	3.81	-46.12	4,698.16	-4,886.32	6,778.56	6,770.66	7.90	857.606		
1,300.00	1,300.00	1,233.10	1,233.03	4.46	4.13	-46.13	4,697.93	-4,886.32	6,778.40	6,769.81	8.59	789.519		
1,400.00	1,400.00	1,333.10	1,333.03	4.81	4.49	-46.13	4,697.93	-4,886.32	6,778.40	6,769.09	9.30	728.646		
1,500.00	1,500.00	1,454.14	1,454.07	5.17	4.92	-46.12	4,698.17	-4,886.32	6,778.60	6,768.50	10.10	671.456		
1,600.00	1,600.00	1,533.13	1,533.03	5.53	5.21	-46.13	4,697.93	-4,886.32	6,778.40	6,767.66	10.74	631.292		
1,700.00	1,700.00	1,633.13	1,633.03	5.89	5.57	-46.13	4,697.93	-4,886.32	6,778.40	6,766.94	11.45	591.762		
1,800.00	1,800.00	1,753.53	1,753.42	6.25	6.00	-46.12	4,698.49	-4,886.32	6,778.81	6,766.57	12.24	553.603		
1,900.00	1,900.00	1,885.36	1,885.23	6.61	6.47	-46.13	4,697.47	-4,886.32	6,778.28	6,765.20	13.08	518.382		

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



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Apache C-4 - Elm Ridge Resources - Original drilling													Offset Site Error:	0.00 ft
Survey Program: 163-MWD+IGRF													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
1,905.74	1,905.74	1,892.92	1,892.79	6.63	6.50	-46.13	4,697.38	-4,886.32	6,778.23	6,765.11	13.12	516.496		
2,000.00	2,000.00	1,933.17	1,933.03	6.97	6.64	-46.13	4,697.93	-4,886.32	6,778.40	6,764.79	13.61	498.174		
2,100.00	2,100.00	2,033.17	2,033.03	7.32	7.00	-46.13	4,697.93	-4,886.32	6,778.40	6,764.07	14.32	473.228		
2,200.00	2,200.00	2,149.60	2,149.44	7.68	7.42	-46.12	4,698.40	-4,886.32	6,778.74	6,763.64	15.10	448.930		
2,300.00	2,300.00	2,267.52	2,267.36	8.04	7.85	-46.13	4,697.76	-4,886.32	6,778.37	6,762.49	15.88	426.821		
2,310.73	2,310.73	2,280.17	2,280.01	8.08	7.89	-46.13	4,697.67	-4,886.32	6,778.31	6,762.35	15.96	424.577		
2,400.00	2,400.00	2,333.22	2,333.03	8.40	8.08	-46.13	4,697.93	-4,886.32	6,778.40	6,761.92	16.48	411.423		
2,500.00	2,500.00	2,433.22	2,433.03	8.76	8.44	-46.13	4,697.93	-4,886.32	6,778.40	6,761.20	17.19	394.265		
2,600.00	2,600.00	2,557.48	2,557.27	9.12	8.88	-46.12	4,698.49	-4,886.32	6,778.83	6,760.83	18.00	376.682		
2,700.00	2,700.00	2,683.80	2,683.58	9.47	9.34	-46.13	4,697.48	-4,886.32	6,778.27	6,759.47	18.81	360.414		
2,725.19	2,725.19	2,658.43	2,658.22	9.56	9.25	-46.13	4,697.93	-4,886.32	6,778.40	6,759.59	18.81	360.414		
2,800.00	2,800.00	2,733.24	2,733.03	9.83	9.52	-46.13	4,697.93	-4,886.32	6,778.40	6,759.05	19.34	350.420		
2,900.00	2,900.00	2,833.24	2,833.03	10.19	9.87	-46.13	4,697.93	-4,886.32	6,778.40	6,758.33	20.06	337.895		
3,000.00	3,000.00	2,935.63	2,935.41	10.55	10.24	-46.12	4,698.18	-4,886.32	6,778.57	6,757.78	20.79	326.109		
3,100.00	3,100.00	3,040.06	3,039.84	10.91	10.62	-46.13	4,698.07	-4,886.32	6,778.50	6,756.98	21.52	315.000		
3,200.00	3,200.00	3,133.28	3,133.03	11.27	10.95	-46.13	4,697.93	-4,886.32	6,778.40	6,756.18	22.21	305.169		
3,300.00	3,300.00	3,233.28	3,233.03	11.63	11.31	-46.13	4,697.93	-4,886.32	6,778.40	6,755.47	22.93	295.622		
3,400.00	3,400.00	3,333.28	3,333.03	11.98	11.67	-46.13	4,697.93	-4,886.32	6,778.40	6,754.75	23.65	286.653		
3,500.00	3,500.00	3,445.90	3,445.63	12.34	12.07	-46.12	4,698.91	-4,886.32	6,779.09	6,754.68	24.41	277.727		
3,600.00	3,600.00	3,565.69	3,565.42	12.70	12.50	-46.12	4,698.34	-4,886.32	6,778.76	6,753.56	25.20	269.030		
3,700.00	3,700.00	3,633.35	3,633.03	13.06	12.75	-46.13	4,697.93	-4,886.32	6,778.40	6,752.60	25.80	262.738		
3,800.00	3,800.00	3,733.35	3,733.03	13.42	13.11	-46.13	4,697.93	-4,886.32	6,778.40	6,751.88	26.52	255.630		
3,900.00	3,900.00	3,833.35	3,833.03	13.78	13.47	-46.13	4,697.93	-4,886.32	6,778.40	6,751.16	27.23	248.896		
4,000.00	4,000.00	3,942.70	3,942.36	14.13	13.86	-46.12	4,699.02	-4,886.32	6,779.16	6,751.18	27.98	242.246		
4,100.00	4,100.00	4,061.07	4,060.72	14.49	14.28	-46.12	4,698.56	-4,886.32	6,778.89	6,750.12	28.77	235.644		
4,200.00	4,200.00	4,179.45	4,179.09	14.85	14.71	-46.13	4,697.63	-4,886.32	6,778.34	6,748.79	29.55	229.385		
4,213.31	4,213.31	4,195.21	4,194.85	14.90	14.77	-46.13	4,697.47	-4,886.32	6,778.25	6,748.60	29.65	228.576		
4,300.00	4,300.00	4,233.43	4,233.03	15.21	14.90	-46.13	4,697.93	-4,886.32	6,778.40	6,748.29	30.10	225.168		
4,400.00	4,400.00	4,333.43	4,333.03	15.57	15.26	-46.13	4,697.93	-4,886.32	6,778.40	6,747.57	30.82	219.927		
4,500.00	4,500.00	4,440.59	4,440.17	15.93	15.65	-46.12	4,698.99	-4,886.32	6,779.13	6,747.57	31.56	214.774		
4,600.00	4,600.00	4,560.24	4,559.81	16.29	16.08	-46.12	4,698.55	-4,886.32	6,778.88	6,746.53	32.35	209.539		
4,700.00	4,700.00	4,679.89	4,679.46	16.64	16.51	-46.13	4,697.62	-4,886.32	6,778.34	6,745.20	33.14	204.546		
4,713.25	4,713.25	4,695.75	4,695.31	16.69	16.56	-46.13	4,697.46	-4,886.32	6,778.25	6,745.01	33.24	203.902		
4,800.00	4,800.00	4,733.51	4,733.03	17.00	16.70	-46.13	4,697.93	-4,886.32	6,778.40	6,744.70	33.69	201.195		
4,900.00	4,900.00	4,833.51	4,833.03	17.36	17.06	-46.13	4,697.93	-4,886.32	6,778.40	6,743.99	34.41	197.001		
5,000.00	5,000.00	4,940.68	4,940.19	17.72	17.44	-46.12	4,698.99	-4,886.32	6,779.13	6,743.98	35.15	192.860		
5,100.00	5,100.00	5,060.32	5,059.82	17.91	17.87	-46.12	4,698.55	-4,886.32	6,778.88	6,743.11	35.77	189.519		
5,200.00	5,199.50	5,179.33	5,178.81	17.93	18.30	8.83	4,697.63	-4,886.32	6,770.01	6,733.79	36.22	186.933		
5,300.00	5,295.80	5,229.36	5,228.83	17.96	18.48	9.30	4,697.93	-4,886.32	6,743.94	6,707.51	36.43	185.127		
5,400.00	5,385.67	5,319.22	5,318.69	18.04	18.80	10.22	4,697.93	-4,886.32	6,700.89	6,664.09	36.80	182.091		
5,500.00	5,466.08	5,400.00	5,399.47	18.22	19.09	11.77	4,698.47	-4,886.32	6,642.76	6,605.60	37.15	178.788		
5,600.00	5,534.34	5,474.22	5,473.69	18.59	19.36	14.41	4,698.42	-4,886.32	6,570.71	6,533.22	37.50	175.227		
5,700.00	5,588.16	5,532.62	5,532.09	19.21	19.57	19.21	4,698.30	-4,886.32	6,487.57	6,449.77	37.79	171.665		
5,800.00	5,625.74	5,573.26	5,572.73	20.14	19.71	29.37	4,698.19	-4,886.32	6,396.14	6,358.12	38.02	168.228		
5,900.00	5,645.80	5,594.83	5,594.30	21.36	19.79	56.73	4,698.12	-4,886.32	6,299.55	6,261.38	38.17	165.027		
6,000.00	5,648.30	5,597.31	5,596.78	22.82	19.80	99.56	4,698.11	-4,886.32	6,201.02	6,162.78	38.24	162.140		
6,100.00	5,646.97	5,595.63	5,595.10	24.45	19.79	93.85	4,698.12	-4,886.32	6,101.67	6,063.38	38.29	159.366		
6,200.00	5,646.97	5,595.37	5,594.84	26.19	19.79	93.79	4,698.12	-4,886.32	6,001.74	5,963.43	38.31	156.664		
6,300.00	5,646.97	5,595.12	5,594.58	28.05	19.79	93.72	4,698.12	-4,886.32	5,901.81	5,863.48	38.33	153.956		
6,400.00	5,646.97	5,594.86	5,594.33	30.01	19.79	93.65	4,698.12	-4,886.32	5,801.89	5,763.52	38.36	151.243		
6,500.00	5,646.97	5,594.61	5,594.07	32.04	19.79	93.59	4,698.12	-4,886.32	5,701.96	5,663.57	38.39	148.525		
6,600.00	5,646.97	5,594.35	5,593.82	34.14	19.79	93.53	4,698.12	-4,886.32	5,602.04	5,563.62	38.42	145.802		

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



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Apache C-4 - Elm Ridge Resources - Original drilling													Offset Site Error: 0.00 ft
Survey Program: 163-MWD+IGRF													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,700.00	5,646.97	5,594.10	5,593.57	36.29	19.79	93.46	4,698.12	-4,886.32	5,502.12	5,463.67	38.46	143.074	
6,800.00	5,646.97	5,593.84	5,593.31	38.49	19.79	93.40	4,698.12	-4,886.32	5,402.21	5,363.71	38.49	140.341	
6,900.00	5,646.97	5,593.59	5,593.06	40.72	19.78	93.33	4,698.13	-4,886.32	5,302.30	5,263.76	38.53	137.604	
7,000.00	5,646.97	5,593.34	5,592.81	42.99	19.78	93.27	4,698.13	-4,886.32	5,202.39	5,163.81	38.58	134.862	
7,100.00	5,646.97	5,593.09	5,592.56	45.28	19.78	93.20	4,698.13	-4,886.32	5,102.48	5,063.86	38.62	132.116	
7,200.00	5,646.97	5,592.84	5,592.30	47.60	19.78	93.14	4,698.13	-4,886.32	5,002.58	4,963.91	38.67	129.366	
7,300.00	5,646.97	5,592.59	5,592.05	49.93	19.78	93.08	4,698.13	-4,886.32	4,902.69	4,863.96	38.72	126.611	
7,400.00	5,646.97	5,592.34	5,591.80	52.29	19.78	93.01	4,698.13	-4,886.32	4,802.79	4,764.01	38.78	123.853	
7,500.00	5,646.97	5,592.09	5,591.56	54.65	19.78	92.95	4,698.13	-4,886.32	4,702.90	4,664.07	38.84	121.091	
7,600.00	5,646.97	5,591.84	5,591.31	57.03	19.78	92.89	4,698.13	-4,886.32	4,603.02	4,564.12	38.90	118.325	
7,700.00	5,646.97	5,591.59	5,591.06	59.42	19.78	92.82	4,698.13	-4,886.32	4,503.14	4,464.17	38.97	115.555	
7,800.00	5,646.97	5,591.35	5,590.81	61.83	19.78	92.76	4,698.13	-4,886.32	4,403.27	4,364.23	39.04	112.781	
7,900.00	5,646.97	5,591.10	5,590.57	64.24	19.78	92.70	4,698.13	-4,886.32	4,303.40	4,264.28	39.12	110.004	
8,000.00	5,646.97	5,590.85	5,590.32	66.65	19.77	92.63	4,698.13	-4,886.32	4,203.54	4,164.34	39.20	107.223	
8,100.00	5,646.97	5,590.61	5,590.08	69.08	19.77	92.57	4,698.14	-4,886.32	4,103.69	4,064.40	39.29	104.438	
8,200.00	5,646.97	5,590.36	5,589.83	71.51	19.77	92.51	4,698.14	-4,886.32	4,003.84	3,964.46	39.39	101.650	
8,300.00	5,646.97	5,590.12	5,589.59	73.95	19.77	92.45	4,698.14	-4,886.32	3,904.01	3,864.52	39.49	98.858	
8,400.00	5,646.97	5,589.88	5,589.34	76.39	19.77	92.39	4,698.14	-4,886.32	3,804.18	3,764.58	39.60	96.063	
8,500.00	5,646.97	5,589.63	5,589.10	78.84	19.77	92.32	4,698.14	-4,886.32	3,704.36	3,664.64	39.72	93.264	
8,600.00	5,646.97	5,589.39	5,588.86	81.29	19.77	92.26	4,698.14	-4,886.32	3,604.54	3,564.70	39.85	90.461	
8,700.00	5,646.97	5,589.15	5,588.62	83.75	19.77	92.20	4,698.14	-4,886.32	3,504.74	3,464.76	39.98	87.655	
8,800.00	5,646.97	5,588.91	5,588.38	86.21	19.77	92.14	4,698.14	-4,886.32	3,404.96	3,364.82	40.13	84.845	
8,900.00	5,646.97	5,588.67	5,588.14	88.67	19.77	92.08	4,698.14	-4,886.32	3,305.18	3,264.89	40.29	82.031	
9,000.00	5,646.97	5,588.43	5,587.90	91.14	19.77	92.02	4,698.14	-4,886.32	3,205.42	3,164.95	40.47	79.213	
9,100.00	5,646.97	5,588.19	5,587.66	93.61	19.76	91.96	4,698.14	-4,886.32	3,105.67	3,065.02	40.65	76.392	
9,200.00	5,646.97	5,587.95	5,587.42	96.08	19.76	91.90	4,698.14	-4,886.32	3,005.94	2,965.08	40.86	73.566	
9,300.00	5,646.97	5,587.71	5,587.18	98.55	19.76	91.83	4,698.15	-4,886.32	2,906.23	2,865.15	41.09	70.736	
9,400.00	5,646.97	5,587.48	5,586.94	101.03	19.76	91.77	4,698.15	-4,886.32	2,806.54	2,765.21	41.33	67.903	
9,500.00	5,646.97	5,587.24	5,586.71	103.50	19.76	91.71	4,698.15	-4,886.32	2,706.88	2,665.27	41.60	65.065	
9,600.00	5,646.97	5,587.00	5,586.47	105.98	19.76	91.65	4,698.15	-4,886.32	2,607.23	2,565.33	41.90	62.224	
9,700.00	5,646.97	5,586.77	5,586.24	108.47	19.76	91.59	4,698.15	-4,886.32	2,507.62	2,465.39	42.23	59.378	
9,800.00	5,646.97	5,586.53	5,586.00	110.95	19.76	91.53	4,698.15	-4,886.32	2,408.04	2,365.44	42.60	56.530	
9,900.00	5,646.97	5,586.30	5,585.77	113.43	19.76	91.47	4,698.15	-4,886.32	2,308.49	2,265.49	43.01	53.679	
10,000.00	5,646.97	5,586.06	5,585.53	115.92	19.76	91.41	4,698.15	-4,886.32	2,208.99	2,165.53	43.46	50.825	
10,100.00	5,646.97	5,585.83	5,585.30	118.41	19.76	91.35	4,698.15	-4,886.32	2,109.53	2,065.56	43.98	47.970	
10,200.00	5,646.97	5,585.60	5,585.07	120.90	19.76	91.30	4,698.15	-4,886.32	2,010.13	1,965.57	44.56	45.116	
10,300.00	5,646.97	5,585.37	5,584.83	123.39	19.75	91.24	4,698.15	-4,886.32	1,910.79	1,865.57	45.21	42.262	
10,400.00	5,646.97	5,585.13	5,584.60	125.88	19.75	91.18	4,698.15	-4,886.32	1,811.52	1,765.55	45.96	39.413	
10,500.00	5,646.97	5,584.90	5,584.37	128.37	19.75	91.12	4,698.16	-4,886.32	1,712.33	1,665.51	46.82	36.570	
10,600.00	5,646.97	5,584.67	5,584.14	130.86	19.75	91.06	4,698.16	-4,886.32	1,613.25	1,565.43	47.82	33.738	
10,700.00	5,646.97	5,584.44	5,583.91	133.36	19.75	91.00	4,698.16	-4,886.32	1,514.29	1,465.32	48.97	30.922	
10,800.00	5,646.97	5,584.21	5,583.68	135.85	19.75	90.94	4,698.16	-4,886.32	1,415.47	1,365.15	50.32	28.127	
10,900.00	5,646.97	5,583.99	5,583.45	138.35	19.75	90.88	4,698.16	-4,886.32	1,316.83	1,264.91	51.92	25.362	
11,000.00	5,646.97	5,583.76	5,583.22	140.85	19.75	90.83	4,698.16	-4,886.32	1,218.42	1,164.59	53.83	22.636	
11,100.00	5,646.97	5,583.53	5,583.00	143.34	19.75	90.77	4,698.16	-4,886.32	1,120.28	1,064.16	56.12	19.963	
11,200.00	5,646.97	5,583.30	5,582.77	145.84	19.75	90.71	4,698.16	-4,886.32	1,022.51	963.59	58.91	17.356	
11,300.00	5,646.97	5,583.08	5,582.54	148.34	19.75	90.65	4,698.16	-4,886.32	925.21	862.84	62.37	14.835	
11,400.00	5,646.97	5,582.85	5,582.32	150.84	19.75	90.59	4,698.16	-4,886.32	828.55	761.85	66.70	12.422	
11,500.00	5,646.97	5,582.62	5,582.09	153.34	19.75	90.54	4,698.16	-4,886.32	732.79	660.55	72.24	10.144	
11,600.00	5,646.97	5,582.40	5,581.87	155.84	19.74	90.48	4,698.16	-4,886.32	638.34	558.86	79.48	8.032	
11,700.00	5,646.97	5,582.17	5,581.64	158.34	19.74	90.42	4,698.16	-4,886.32	545.86	456.70	89.16	6.122	
11,800.00	5,646.97	5,581.95	5,581.42	160.85	19.74	90.36	4,698.16	-4,886.32	456.57	354.11	102.46	4.456	

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



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Apache C-4 - Elm Ridge Resources - Original drilling													Offset Site Error: 0.00 ft
Survey Program: 163-MWD+IGRF													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
11,900.00	5,646.97	5,581.73	5,581.19	163.35	19.74	90.31	4,698.17	-4,886.32	372.75	251.76	121.00	3.081	
12,000.00	5,646.97	5,581.50	5,580.97	165.85	19.74	90.25	4,698.17	-4,886.32	299.06	152.81	146.25	2.045	
12,100.00	5,646.97	5,581.28	5,580.75	168.35	19.74	90.19	4,698.17	-4,886.32	244.80	69.68	175.12	1.398	Level 3
12,197.55	5,646.97	5,581.07	5,580.53	170.80	19.74	90.14	4,698.17	-4,886.32	224.52	34.00	190.51	1.178	Level 2, CC
12,200.00	5,646.97	5,581.06	5,580.53	170.86	19.74	90.14	4,698.17	-4,886.32	224.53	33.99	190.55	1.178	Level 2, ES, SF
12,300.00	5,646.97	5,580.84	5,580.31	173.36	19.74	90.08	4,698.17	-4,886.32	246.79	69.92	176.87	1.395	Level 3
12,400.00	5,646.97	5,580.62	5,580.09	175.87	19.74	90.02	4,698.17	-4,886.32	302.31	152.53	149.78	2.018	
12,500.00	5,646.97	5,580.40	5,579.87	178.37	19.74	89.97	4,698.17	-4,886.32	376.67	250.86	125.81	2.994	
12,600.00	5,646.97	5,580.18	5,579.65	180.88	19.74	89.91	4,698.17	-4,886.32	460.84	352.78	108.06	4.265	
12,700.00	5,646.97	5,579.96	5,579.43	183.38	19.74	89.86	4,698.17	-4,886.32	550.33	455.09	95.24	5.778	
12,800.00	5,646.97	5,579.74	5,579.21	185.89	19.73	89.80	4,698.17	-4,886.32	642.92	557.09	85.84	7.490	
12,845.27	5,646.97	5,579.64	5,579.11	187.02	19.73	89.78	4,698.17	-4,886.32	685.53	603.13	82.40	8.320	

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



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Apache D-4 - Amerada Hess - Original drilling													Offset Site Error: 0.00 ft	
Survey Program: 321-MWD+IGRF													Offset Well Error: 0.00 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-107.03	-35.81	-116.88	122.44					
100.00	100.00	93.03	93.03	0.15	0.17	-107.03	-35.81	-116.88	122.24	121.92	0.32	380.757		
200.00	200.00	193.03	193.03	0.51	0.35	-107.03	-35.81	-116.88	122.24	121.38	0.86	142.360		
300.00	300.00	293.03	293.03	0.87	0.53	-107.03	-35.81	-116.88	122.24	120.84	1.40	87.546		
400.00	400.00	393.03	393.03	1.23	0.83	-107.03	-35.81	-116.88	122.24	120.18	2.06	59.252		
500.00	500.00	493.03	493.03	1.59	1.19	-107.03	-35.81	-116.88	122.24	119.46	2.78	43.972		
576.48	576.48	569.50	569.50	1.86	1.47	-106.91	-35.54	-116.88	122.16	118.83	3.33	36.705		
600.00	600.00	593.02	593.02	1.95	1.55	-106.91	-35.54	-116.88	122.16	118.67	3.50	34.935		
700.00	700.00	692.99	692.99	2.31	1.91	-106.94	-35.61	-116.88	122.18	117.97	4.21	28.997		
800.00	800.00	792.96	792.96	2.66	2.27	-107.01	-35.76	-116.88	122.23	117.29	4.93	24.790		
900.00	900.00	893.03	893.03	3.02	2.63	-107.03	-35.81	-116.88	122.24	116.59	5.65	21.645		
1,000.00	1,000.00	993.03	993.03	3.38	2.98	-107.03	-35.81	-116.88	122.24	115.88	6.36	19.207		
1,083.48	1,083.48	1,076.51	1,076.51	3.68	3.28	-106.91	-35.53	-116.88	122.16	115.20	6.96	17.544		
1,100.00	1,100.00	1,093.03	1,093.02	3.74	3.34	-106.91	-35.53	-116.88	122.16	115.08	7.08	17.251		
1,200.00	1,200.00	1,193.00	1,192.99	4.10	3.70	-106.94	-35.59	-116.88	122.18	114.38	7.80	15.667		
1,300.00	1,300.00	1,292.97	1,292.96	4.46	4.06	-107.00	-35.73	-116.88	122.22	113.70	8.52	14.353		
1,400.00	1,400.00	1,393.04	1,393.03	4.81	4.42	-107.03	-35.81	-116.88	122.24	113.01	9.23	13.240		
1,500.00	1,500.00	1,493.04	1,493.03	5.17	4.78	-107.03	-35.81	-116.88	122.24	112.29	9.95	12.286		
1,600.00	1,600.00	1,593.04	1,593.03	5.53	5.14	-107.03	-35.81	-116.88	122.24	111.57	10.67	11.460		
1,640.17	1,640.17	1,633.19	1,633.17	5.68	5.28	-106.78	-35.24	-116.88	122.07	111.12	10.95	11.144		
1,700.00	1,700.00	1,692.99	1,692.97	5.89	5.49	-106.80	-35.30	-116.88	122.09	110.71	11.38	10.725		
1,800.00	1,800.00	1,792.94	1,792.92	6.25	5.85	-106.91	-35.53	-116.88	122.16	110.06	12.10	10.096		
1,900.00	1,900.00	1,893.07	1,893.03	6.61	6.21	-107.03	-35.81	-116.88	122.24	109.42	12.82	9.537		
2,000.00	2,000.00	1,993.07	1,993.03	6.97	6.57	-107.03	-35.81	-116.88	122.24	108.71	13.53	9.031		
2,100.00	2,100.00	2,093.07	2,093.03	7.32	6.93	-107.03	-35.81	-116.88	122.24	107.99	14.25	8.577		
2,140.35	2,140.35	2,133.41	2,133.35	7.47	7.07	-106.67	-35.00	-116.88	122.01	107.46	14.54	8.390 CC		
2,200.00	2,200.00	2,193.01	2,192.95	7.68	7.29	-106.71	-35.08	-116.88	122.03	107.06	14.97	8.152		
2,300.00	2,300.00	2,292.93	2,292.87	8.04	7.65	-106.86	-35.42	-116.88	122.13	106.44	15.69	7.786		
2,400.00	2,400.00	2,393.12	2,393.03	8.40	8.00	-107.03	-35.81	-116.88	122.24	105.84	16.40	7.452		
2,463.50	2,463.50	2,456.62	2,456.52	8.63	8.23	-106.90	-35.50	-116.88	122.15	105.29	16.86	7.245		
2,500.00	2,500.00	2,493.03	2,492.93	8.76	8.36	-106.92	-35.55	-116.88	122.16	105.04	17.12	7.135		
2,500.06	2,500.06	2,493.09	2,492.99	8.76	8.36	-106.92	-35.55	-116.88	122.16	105.04	17.12	7.135 ES, SF		
2,600.00	2,600.00	2,553.01	2,552.90	9.12	8.57	-107.03	-35.81	-116.88	128.66	111.69	16.97	7.582		
2,700.00	2,700.00	2,553.01	2,552.90	9.47	8.57	-107.03	-35.81	-116.88	185.95	172.74	13.21	14.072		
2,800.00	2,800.00	2,553.01	2,552.90	9.83	8.57	-107.03	-35.81	-116.88	269.45	258.56	10.89	24.739		
2,900.00	2,900.00	2,553.01	2,552.90	10.19	8.57	-107.03	-35.81	-116.88	361.43	351.60	9.82	36.796		
3,000.00	3,000.00	2,553.01	2,552.90	10.55	8.57	-107.03	-35.81	-116.88	456.79	447.47	9.32	49.007		
3,100.00	3,100.00	2,553.01	2,552.90	10.91	8.57	-107.03	-35.81	-116.88	553.79	544.70	9.09	60.956		
3,200.00	3,200.00	2,553.01	2,552.90	11.27	8.57	-107.03	-35.81	-116.88	651.70	642.71	8.99	72.520		
3,300.00	3,300.00	2,553.01	2,552.90	11.63	8.57	-107.03	-35.81	-116.88	750.15	741.19	8.96	83.678		
3,400.00	3,400.00	2,553.01	2,552.90	11.98	8.57	-107.03	-35.81	-116.88	848.97	839.98	8.99	94.433		
3,500.00	3,500.00	2,553.01	2,552.90	12.34	8.57	-107.03	-35.81	-116.88	948.04	939.00	9.05	104.800		
3,600.00	3,600.00	2,553.01	2,552.90	12.70	8.57	-107.03	-35.81	-116.88	1,047.29	1,038.16	9.12	114.794		
3,700.00	3,700.00	2,553.01	2,552.90	13.06	8.57	-107.03	-35.81	-116.88	1,146.66	1,137.45	9.22	124.429		
3,800.00	3,800.00	2,553.01	2,552.90	13.42	8.57	-107.03	-35.81	-116.88	1,246.14	1,236.82	9.32	133.718		
3,900.00	3,900.00	2,553.01	2,552.90	13.78	8.57	-107.03	-35.81	-116.88	1,345.69	1,336.26	9.43	142.673		
4,000.00	4,000.00	2,553.01	2,552.90	14.13	8.57	-107.03	-35.81	-116.88	1,445.31	1,435.75	9.55	151.304		
4,100.00	4,100.00	2,553.01	2,552.90	14.49	8.57	-107.03	-35.81	-116.88	1,544.97	1,535.29	9.68	159.622		
4,200.00	4,200.00	2,553.01	2,552.90	14.85	8.57	-107.03	-35.81	-116.88	1,644.68	1,634.87	9.81	167.635		
4,300.00	4,300.00	2,553.01	2,552.90	15.21	8.57	-107.03	-35.81	-116.88	1,744.42	1,734.47	9.95	175.354		
4,400.00	4,400.00	2,553.01	2,552.90	15.57	8.57	-107.03	-35.81	-116.88	1,844.18	1,834.09	10.09	182.786		
4,500.00	4,500.00	2,553.01	2,552.90	15.93	8.57	-107.03	-35.81	-116.88	1,943.98	1,933.74	10.23	189.940		

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



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Apache D-4 - Amerada Hess - Original drilling													Offset Site Error:	0.00 ft
Survey Program: 321-MWD+IGRF													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
4,600.00	4,600.00	2,553.01	2,552.90	16.29	8.57	-107.03	-35.81	-116.88	2,043.79	2,033.40	10.38	196.823		
4,700.00	4,700.00	2,553.01	2,552.90	16.64	8.57	-107.03	-35.81	-116.88	2,143.62	2,133.08	10.54	203.443		
4,800.00	4,800.00	2,553.01	2,552.90	17.00	8.57	-107.03	-35.81	-116.88	2,243.46	2,232.77	10.69	209.808		
4,900.00	4,900.00	2,553.01	2,552.90	17.36	8.57	-107.03	-35.81	-116.88	2,343.32	2,332.47	10.85	215.924		
5,000.00	5,000.00	2,553.01	2,552.90	17.72	8.57	-107.03	-35.81	-116.88	2,443.19	2,432.17	11.02	221.800		
5,100.00	5,100.00	2,553.01	2,552.90	17.91	8.57	-107.03	-35.81	-116.88	2,543.07	2,531.89	11.18	227.460		
5,200.00	5,199.50	2,553.01	2,552.90	17.93	8.57	-10.37	-35.81	-116.88	2,642.24	2,630.90	11.33	233.150		
5,300.00	5,295.80	2,553.01	2,552.90	17.96	8.57	-5.52	-35.81	-116.88	2,737.93	2,726.47	11.46	238.925		
5,400.00	5,385.67	2,553.01	2,552.90	18.04	8.57	-3.79	-35.81	-116.88	2,827.45	2,815.88	11.57	244.309		
5,500.00	5,466.08	2,553.01	2,552.90	18.22	8.57	-2.94	-35.81	-116.88	2,908.49	2,896.80	11.69	248.712		
5,600.00	5,534.34	2,553.01	2,552.90	18.59	8.57	-2.44	-35.81	-116.88	2,979.13	2,967.28	11.85	251.486		
5,700.00	5,588.16	2,553.01	2,552.90	19.21	8.57	-2.14	-35.81	-116.88	3,037.79	3,025.74	12.05	252.026		
5,800.00	5,625.74	2,553.01	2,552.90	20.14	8.57	-1.95	-35.81	-116.88	3,083.24	3,070.90	12.34	249.927		
5,900.00	5,645.80	2,553.01	2,552.90	21.36	8.57	-1.83	-35.81	-116.88	3,114.56	3,101.86	12.71	245.132		
6,000.00	5,648.30	2,553.01	2,552.90	22.82	8.57	-1.79	-35.81	-116.88	3,131.74	3,118.58	13.16	238.002		
6,100.00	5,646.97	2,553.01	2,552.90	24.45	8.57	-0.42	-35.81	-116.88	3,148.40	3,134.70	13.70	229.755		
6,200.00	5,646.97	2,553.01	2,552.90	26.19	8.57	-0.42	-35.81	-116.88	3,169.54	3,155.24	14.31	221.566		
6,300.00	5,646.97	2,553.01	2,552.90	28.05	8.57	-0.42	-35.81	-116.88	3,193.68	3,178.73	14.95	213.607		
6,400.00	5,646.97	2,553.01	2,552.90	30.01	8.57	-0.42	-35.81	-116.88	3,220.74	3,205.11	15.63	206.072		
6,500.00	5,646.97	2,553.01	2,552.90	32.04	8.57	-0.42	-35.81	-116.88	3,250.65	3,234.32	16.33	199.074		
6,600.00	5,646.97	2,553.01	2,552.90	34.14	8.57	-0.42	-35.81	-116.88	3,283.34	3,266.30	17.04	192.668		
6,700.00	5,646.97	2,553.01	2,552.90	36.29	8.57	-0.42	-35.81	-116.88	3,318.72	3,300.96	17.76	186.870		
6,800.00	5,646.97	2,553.01	2,552.90	38.49	8.57	-0.42	-35.81	-116.88	3,356.70	3,338.23	18.48	181.670		
6,900.00	5,646.97	2,553.01	2,552.90	40.72	8.57	-0.42	-35.81	-116.88	3,397.21	3,378.02	19.19	177.041		
7,000.00	5,646.97	2,553.01	2,552.90	42.99	8.57	-0.42	-35.81	-116.88	3,440.15	3,420.25	19.89	172.948		
7,100.00	5,646.97	2,553.01	2,552.90	45.28	8.57	-0.42	-35.81	-116.88	3,485.42	3,464.84	20.58	169.354		
7,200.00	5,646.97	2,553.01	2,552.90	47.60	8.57	-0.42	-35.81	-116.88	3,532.95	3,511.70	21.26	166.217		
7,300.00	5,646.97	2,553.01	2,552.90	49.93	8.57	-0.42	-35.81	-116.88	3,582.64	3,560.73	21.91	163.500		
7,400.00	5,646.97	2,553.01	2,552.90	52.29	8.57	-0.42	-35.81	-116.88	3,634.41	3,611.85	22.55	161.165		
7,500.00	5,646.97	2,553.01	2,552.90	54.65	8.57	-0.42	-35.81	-116.88	3,688.15	3,664.98	23.17	159.179		
7,600.00	5,646.97	2,553.01	2,552.90	57.03	8.57	-0.42	-35.81	-116.88	3,743.80	3,720.03	23.77	157.510		
7,700.00	5,646.97	2,553.01	2,552.90	59.42	8.57	-0.42	-35.81	-116.88	3,801.27	3,776.92	24.35	156.130		
7,800.00	5,646.97	2,553.01	2,552.90	61.83	8.57	-0.42	-35.81	-116.88	3,860.47	3,835.56	24.90	155.012		
7,900.00	5,646.97	2,553.01	2,552.90	64.24	8.57	-0.42	-35.81	-116.88	3,921.32	3,895.88	25.44	154.132		
8,000.00	5,646.97	2,553.01	2,552.90	66.65	8.57	-0.42	-35.81	-116.88	3,983.76	3,957.80	25.96	153.470		
8,100.00	5,646.97	2,553.01	2,552.90	69.08	8.57	-0.42	-35.81	-116.88	4,047.71	4,021.25	26.45	153.006		
8,200.00	5,646.97	2,553.01	2,552.90	71.51	8.57	-0.42	-35.81	-116.88	4,113.09	4,086.16	26.93	152.724		
8,300.00	5,646.97	2,553.01	2,552.90	73.95	8.57	-0.42	-35.81	-116.88	4,179.84	4,152.45	27.39	152.607		
8,400.00	5,646.97	2,553.01	2,552.90	76.39	8.57	-0.42	-35.81	-116.88	4,247.90	4,220.07	27.83	152.641		
8,500.00	5,646.97	2,553.01	2,552.90	78.84	8.57	-0.42	-35.81	-116.88	4,317.20	4,288.95	28.25	152.814		
8,600.00	5,646.97	2,553.01	2,552.90	81.29	8.57	-0.42	-35.81	-116.88	4,387.69	4,359.03	28.66	153.115		
8,700.00	5,646.97	2,553.01	2,552.90	83.75	8.57	-0.42	-35.81	-116.88	4,459.30	4,430.26	29.04	153.533		
8,800.00	5,646.97	2,553.01	2,552.90	86.21	8.57	-0.42	-35.81	-116.88	4,531.99	4,502.57	29.42	154.058		
8,900.00	5,646.97	2,553.01	2,552.90	88.67	8.57	-0.42	-35.81	-116.88	4,605.71	4,575.93	29.78	154.683		
9,000.00	5,646.97	2,553.01	2,552.90	91.14	8.57	-0.42	-35.81	-116.88	4,680.40	4,650.28	30.12	155.399		
9,100.00	5,646.97	2,553.01	2,552.90	93.61	8.57	-0.42	-35.81	-116.88	4,756.01	4,725.57	30.45	156.200		
9,200.00	5,646.97	2,553.01	2,552.90	96.08	8.57	-0.42	-35.81	-116.88	4,832.52	4,801.76	30.76	157.079		
9,300.00	5,646.97	2,553.01	2,552.90	98.55	8.57	-0.42	-35.81	-116.88	4,909.87	4,878.80	31.07	158.030		
9,400.00	5,646.97	2,553.01	2,552.90	101.03	8.57	-0.42	-35.81	-116.88	4,988.03	4,956.66	31.36	159.048		
9,500.00	5,646.97	2,553.01	2,552.90	103.50	8.57	-0.42	-35.81	-116.88	5,066.95	5,035.31	31.64	160.128		
9,600.00	5,646.97	2,553.01	2,552.90	105.98	8.57	-0.42	-35.81	-116.88	5,146.61	5,114.69	31.91	161.266		
9,700.00	5,646.97	2,553.01	2,552.90	108.47	8.57	-0.42	-35.81	-116.88	5,226.96	5,194.79	32.17	162.457		

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



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Apache D-4 - Amerada Hess - Original drilling													Offset Site Error:	0.00 ft
Survey Program: 321-MWD+IGRF													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
9,800.00	5,646.97	2,553.01	2,552.90	110.95	8.57	-0.42	-35.81	-116.88	5,307.98	5,275.56	32.43	163.698		
9,900.00	5,646.97	2,553.01	2,552.90	113.43	8.57	-0.42	-35.81	-116.88	5,389.65	5,356.98	32.67	164.985		
10,000.00	5,646.97	2,553.01	2,552.90	115.92	8.57	-0.42	-35.81	-116.88	5,471.91	5,439.01	32.90	166.315		
10,100.00	5,646.97	2,553.01	2,552.90	118.41	8.57	-0.42	-35.81	-116.88	5,554.77	5,521.64	33.13	167.684		
10,200.00	5,646.97	2,553.01	2,552.90	120.90	8.57	-0.42	-35.81	-116.88	5,638.17	5,604.83	33.34	169.091		
10,300.00	5,646.97	2,553.01	2,552.90	123.39	8.57	-0.42	-35.81	-116.88	5,722.11	5,688.56	33.55	170.532		
10,400.00	5,646.97	2,553.01	2,552.90	125.88	8.57	-0.42	-35.81	-116.88	5,806.56	5,772.80	33.76	172.006		
10,500.00	5,646.97	2,553.01	2,552.90	128.37	8.57	-0.42	-35.81	-116.88	5,891.50	5,857.54	33.95	173.509		
10,600.00	5,646.97	2,553.01	2,552.90	130.86	8.57	-0.42	-35.81	-116.88	5,976.90	5,942.75	34.15	175.041		
10,700.00	5,646.97	2,553.01	2,552.90	133.36	8.57	-0.42	-35.81	-116.88	6,062.75	6,028.41	34.33	176.598		
10,800.00	5,646.97	2,553.01	2,552.90	135.85	8.57	-0.42	-35.81	-116.88	6,149.02	6,114.51	34.51	178.180		
10,900.00	5,646.97	2,553.01	2,552.90	138.35	8.57	-0.42	-35.81	-116.88	6,235.71	6,201.02	34.68	179.784		
11,000.00	5,646.97	2,553.01	2,552.90	140.85	8.57	-0.42	-35.81	-116.88	6,322.78	6,287.93	34.85	181.409		
11,100.00	5,646.97	2,553.01	2,552.90	143.34	8.57	-0.42	-35.81	-116.88	6,410.24	6,375.22	35.02	183.053		
11,200.00	5,646.97	2,553.01	2,552.90	145.84	8.57	-0.42	-35.81	-116.88	6,498.06	6,462.88	35.18	184.716		
11,300.00	5,646.97	2,553.01	2,552.90	148.34	8.57	-0.42	-35.81	-116.88	6,586.22	6,550.89	35.33	186.395		
11,400.00	5,646.97	2,553.01	2,552.90	150.84	8.57	-0.42	-35.81	-116.88	6,674.72	6,639.23	35.49	188.090		
11,500.00	5,646.97	2,553.01	2,552.90	153.34	8.57	-0.42	-35.81	-116.88	6,763.54	6,727.91	35.64	189.800		
11,600.00	5,646.97	2,553.01	2,552.90	155.84	8.57	-0.42	-35.81	-116.88	6,852.67	6,816.89	35.78	191.523		
11,700.00	5,646.97	2,553.01	2,552.90	158.34	8.57	-0.42	-35.81	-116.88	6,942.09	6,906.17	35.92	193.258		
11,800.00	5,646.97	2,553.01	2,552.90	160.85	8.57	-0.42	-35.81	-116.88	7,031.80	6,995.74	36.06	195.005		
11,900.00	5,646.97	2,553.01	2,552.90	163.35	8.57	-0.42	-35.81	-116.88	7,121.78	7,085.59	36.19	196.763		
12,000.00	5,646.97	2,553.01	2,552.90	165.85	8.57	-0.42	-35.81	-116.88	7,212.03	7,175.70	36.33	198.530		
12,100.00	5,646.97	2,553.01	2,552.90	168.35	8.57	-0.42	-35.81	-116.88	7,302.53	7,266.07	36.46	200.306		
12,200.00	5,646.97	2,553.01	2,552.90	170.86	8.57	-0.42	-35.81	-116.88	7,393.27	7,356.69	36.58	202.090		
12,300.00	5,646.97	2,553.01	2,552.90	173.36	8.57	-0.42	-35.81	-116.88	7,484.26	7,447.55	36.71	203.881		
12,400.00	5,646.97	2,553.01	2,552.90	175.87	8.57	-0.42	-35.81	-116.88	7,575.46	7,538.63	36.83	205.679		
12,500.00	5,646.97	2,553.01	2,552.90	178.37	8.57	-0.42	-35.81	-116.88	7,666.89	7,629.94	36.95	207.484		
12,600.00	5,646.97	2,553.01	2,552.90	180.88	8.57	-0.42	-35.81	-116.88	7,758.53	7,721.46	37.07	209.293		
12,700.00	5,646.97	2,553.01	2,552.90	183.38	8.57	-0.42	-35.81	-116.88	7,850.37	7,813.19	37.19	211.108		
12,800.00	5,646.97	2,553.01	2,552.90	185.89	8.57	-0.42	-35.81	-116.88	7,942.41	7,905.11	37.30	212.927		
12,845.27	5,646.97	2,553.01	2,552.90	187.02	8.57	-0.42	-35.81	-116.88	7,984.15	7,946.80	37.35	213.752		



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Elk 301H - Pilot - APD													Offset Site Error: 0.00 ft
Survey Program: 0-MWD+IGRF													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
5,110.49	5,110.49	5,110.49	5,110.49	0.19	0.38	180.00	0.00	0.00	0.10	-0.47	0.57	0.171	Level 1
5,200.00	5,199.50	5,199.50	5,199.50	0.31	0.70	180.00	0.00	0.00	8.43	7.43	1.00	8.410	
5,300.00	5,295.80	5,295.80	5,295.80	0.39	1.05	180.00	0.00	0.00	34.86	33.43	1.43	24.421	
5,400.00	5,385.67	5,385.67	5,385.67	0.71	1.37	180.00	0.00	0.00	78.41	76.48	1.93	40.686	CC, ES, SF
5,500.00	5,466.08	5,466.08	5,466.08	1.64	1.66	180.00	0.00	0.00	137.62	134.48	3.14	43.821	
5,600.00	5,534.34	5,534.34	5,534.34	2.84	1.90	180.00	0.00	0.00	210.51	205.99	4.51	46.636	
5,700.00	5,588.16	5,588.16	5,588.16	4.31	2.09	180.00	0.00	0.00	294.62	288.58	6.05	48.729	
5,800.00	5,625.74	5,625.74	5,625.74	6.00	2.23	180.00	0.00	0.00	387.14	379.46	7.68	50.411	
5,900.00	5,645.80	5,645.80	5,645.80	7.87	2.30	180.00	0.00	0.00	484.97	475.63	9.34	51.950	
6,000.00	5,648.30	5,648.30	5,648.30	9.83	2.31	0.00	0.00	0.00	584.83	573.90	10.93	53.503	
6,100.00	5,646.97	5,646.97	5,646.97	11.83	2.30	90.00	0.00	0.00	684.56	672.05	12.50	54.744	
6,200.00	5,646.97	5,646.97	5,646.97	13.87	2.30	90.00	0.00	0.00	783.92	769.84	14.07	55.698	
6,300.00	5,646.97	5,646.97	5,646.97	15.95	2.30	90.00	0.00	0.00	883.42	867.84	15.58	56.691	
6,400.00	5,646.97	5,646.97	5,646.97	18.06	2.30	90.00	0.00	0.00	983.02	965.99	17.03	57.707	
6,500.00	5,646.97	5,646.97	5,646.97	20.20	2.30	90.00	0.00	0.00	1,082.70	1,064.27	18.43	58.740	
6,600.00	5,646.97	5,646.97	5,646.97	22.38	2.30	90.00	0.00	0.00	1,182.43	1,162.65	19.78	59.783	
6,700.00	5,646.97	5,646.97	5,646.97	24.58	2.30	90.00	0.00	0.00	1,282.21	1,261.13	21.08	60.832	
6,800.00	5,646.97	5,646.97	5,646.97	26.81	2.30	90.00	0.00	0.00	1,382.01	1,359.68	22.33	61.885	
6,900.00	5,646.97	5,646.97	5,646.97	29.06	2.30	90.00	0.00	0.00	1,481.84	1,458.30	23.54	62.940	
7,000.00	5,646.97	5,646.97	5,646.97	31.34	2.30	90.00	0.00	0.00	1,581.70	1,556.98	24.72	63.993	
7,100.00	5,646.97	5,646.97	5,646.97	33.63	2.30	90.00	0.00	0.00	1,681.57	1,655.72	25.85	65.044	
7,200.00	5,646.97	5,646.97	5,646.97	35.94	2.30	90.00	0.00	0.00	1,781.45	1,754.50	26.95	66.091	
7,300.00	5,646.97	5,646.97	5,646.97	38.27	2.30	90.00	0.00	0.00	1,881.35	1,853.33	28.02	67.133	
7,400.00	5,646.97	5,646.97	5,646.97	40.61	2.30	90.00	0.00	0.00	1,981.26	1,952.19	29.06	68.169	
7,500.00	5,646.97	5,646.97	5,646.97	42.96	2.30	90.00	0.00	0.00	2,081.18	2,051.10	30.08	69.199	
7,600.00	5,646.97	5,646.97	5,646.97	45.33	2.30	90.00	0.00	0.00	2,181.10	2,150.04	31.06	70.222	
7,700.00	5,646.97	5,646.97	5,646.97	47.71	2.30	90.00	0.00	0.00	2,281.03	2,249.01	32.02	71.238	
7,800.00	5,646.97	5,646.97	5,646.97	50.09	2.30	90.00	0.00	0.00	2,380.97	2,348.01	32.96	72.246	
7,900.00	5,646.97	5,646.97	5,646.97	52.48	2.30	90.00	0.00	0.00	2,480.91	2,447.04	33.87	73.246	
8,000.00	5,646.97	5,646.97	5,646.97	54.89	2.30	90.00	0.00	0.00	2,580.86	2,546.09	34.76	74.239	
8,100.00	5,646.97	5,646.97	5,646.97	57.30	2.30	90.00	0.00	0.00	2,680.81	2,645.17	35.64	75.223	
8,200.00	5,646.97	5,646.97	5,646.97	59.71	2.30	90.00	0.00	0.00	2,780.76	2,744.27	36.49	76.199	
8,300.00	5,646.97	5,646.97	5,646.97	62.13	2.30	90.00	0.00	0.00	2,880.72	2,843.39	37.33	77.167	
8,400.00	5,646.97	5,646.97	5,646.97	64.56	2.30	90.00	0.00	0.00	2,980.68	2,942.53	38.15	78.127	
8,500.00	5,646.97	5,646.97	5,646.97	66.99	2.30	90.00	0.00	0.00	3,080.64	3,041.68	38.96	79.079	
8,600.00	5,646.97	5,646.97	5,646.97	69.43	2.30	90.00	0.00	0.00	3,180.61	3,140.86	39.75	80.023	
8,700.00	5,646.97	5,646.97	5,646.97	71.87	2.30	90.00	0.00	0.00	3,280.57	3,240.05	40.52	80.958	
8,800.00	5,646.97	5,646.97	5,646.97	74.32	2.30	90.00	0.00	0.00	3,380.54	3,339.26	41.28	81.887	
8,900.00	5,646.97	5,646.97	5,646.97	76.77	2.30	90.00	0.00	0.00	3,480.51	3,438.48	42.03	82.807	
9,000.00	5,646.97	5,646.97	5,646.97	79.22	2.30	90.00	0.00	0.00	3,580.48	3,537.72	42.77	83.720	
9,100.00	5,646.97	5,646.97	5,646.97	81.67	2.30	90.00	0.00	0.00	3,680.46	3,636.97	43.49	84.626	
9,200.00	5,646.97	5,646.97	5,646.97	84.13	2.30	90.00	0.00	0.00	3,780.43	3,736.23	44.20	85.524	
9,300.00	5,646.97	5,646.97	5,646.97	86.59	2.30	90.00	0.00	0.00	3,880.41	3,835.51	44.90	86.415	
9,400.00	5,646.97	5,646.97	5,646.97	89.06	2.30	90.00	0.00	0.00	3,980.39	3,934.79	45.60	87.298	
9,500.00	5,646.97	5,646.97	5,646.97	91.52	2.30	90.00	0.00	0.00	4,080.37	4,034.09	46.28	88.175	
9,600.00	5,646.97	5,646.97	5,646.97	93.99	2.30	90.00	0.00	0.00	4,180.35	4,133.40	46.95	89.046	
9,700.00	5,646.97	5,646.97	5,646.97	96.46	2.30	90.00	0.00	0.00	4,280.33	4,232.72	47.61	89.909	
9,800.00	5,646.97	5,646.97	5,646.97	98.94	2.30	90.00	0.00	0.00	4,380.31	4,332.05	48.26	90.766	
9,900.00	5,646.97	5,646.97	5,646.97	101.41	2.30	90.00	0.00	0.00	4,480.29	4,431.39	48.90	91.616	
10,000.00	5,646.97	5,646.97	5,646.97	103.89	2.30	90.00	0.00	0.00	4,580.28	4,530.74	49.54	92.460	
10,100.00	5,646.97	5,646.97	5,646.97	106.37	2.30	90.00	0.00	0.00	4,680.26	4,630.09	50.16	93.298	
10,200.00	5,646.97	5,646.97	5,646.97	108.85	2.30	90.00	0.00	0.00	4,780.24	4,729.46	50.78	94.130	

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



Scientific Drilling, Intl
Anticollision Report



Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Offset Design L36 2405 - Elk 301H - Pilot - APD													Offset Site Error: 0.00 ft
Survey Program: 0-MWD+IGRF													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
10,300.00	5,646.97	5,646.97	5,646.97	111.33	2.30	90.00	0.00	0.00	4,880.23	4,828.83	51.39	94.956	
10,400.00	5,646.97	5,646.97	5,646.97	113.81	2.30	90.00	0.00	0.00	4,980.22	4,928.22	52.00	95.776	
10,500.00	5,646.97	5,646.97	5,646.97	116.29	2.30	90.00	0.00	0.00	5,080.20	5,027.61	52.60	96.591	
10,600.00	5,646.97	5,646.97	5,646.97	118.78	2.30	90.00	0.00	0.00	5,180.19	5,127.00	53.18	97.400	
10,700.00	5,646.97	5,646.97	5,646.97	121.27	2.30	90.00	0.00	0.00	5,280.18	5,226.41	53.77	98.203	
10,800.00	5,646.97	5,646.97	5,646.97	123.75	2.30	90.00	0.00	0.00	5,380.16	5,325.82	54.34	99.001	
10,900.00	5,646.97	5,646.97	5,646.97	126.24	2.30	90.00	0.00	0.00	5,480.15	5,425.24	54.91	99.794	
11,000.00	5,646.97	5,646.97	5,646.97	128.73	2.30	90.00	0.00	0.00	5,580.14	5,524.66	55.48	100.581	
11,100.00	5,646.97	5,646.97	5,646.97	131.22	2.30	90.00	0.00	0.00	5,680.13	5,624.09	56.04	101.363	
11,200.00	5,646.97	5,646.97	5,646.97	133.71	2.30	90.00	0.00	0.00	5,780.12	5,723.53	56.59	102.141	
11,300.00	5,646.97	5,646.97	5,646.97	136.21	2.30	90.00	0.00	0.00	5,880.11	5,822.97	57.14	102.913	
11,400.00	5,646.97	5,646.97	5,646.97	138.70	2.30	90.00	0.00	0.00	5,980.10	5,922.42	57.68	103.681	
11,500.00	5,646.97	5,646.97	5,646.97	141.19	2.30	90.00	0.00	0.00	6,080.09	6,021.88	58.21	104.444	
11,600.00	5,646.97	5,646.97	5,646.97	143.69	2.30	90.00	0.00	0.00	6,180.08	6,121.34	58.74	105.203	
11,700.00	5,646.97	5,646.97	5,646.97	146.18	2.30	90.00	0.00	0.00	6,280.07	6,220.80	59.27	105.956	
11,800.00	5,646.97	5,646.97	5,646.97	148.68	2.30	90.00	0.00	0.00	6,380.06	6,320.27	59.79	106.706	
11,900.00	5,646.97	5,646.97	5,646.97	151.18	2.30	90.00	0.00	0.00	6,480.06	6,419.75	60.31	107.451	
12,000.00	5,646.97	5,646.97	5,646.97	153.67	2.30	90.00	0.00	0.00	6,580.05	6,519.23	60.82	108.192	
12,100.00	5,646.97	5,646.97	5,646.97	156.17	2.30	90.00	0.00	0.00	6,680.04	6,618.71	61.33	108.928	
12,200.00	5,646.97	5,646.97	5,646.97	158.67	2.30	90.00	0.00	0.00	6,780.03	6,718.20	61.83	109.661	
12,300.00	5,646.97	5,646.97	5,646.97	161.17	2.30	90.00	0.00	0.00	6,880.02	6,817.70	62.33	110.389	
12,400.00	5,646.97	5,646.97	5,646.97	163.67	2.30	90.00	0.00	0.00	6,980.02	6,917.20	62.82	111.113	
12,500.00	5,646.97	5,646.97	5,646.97	166.17	2.30	90.00	0.00	0.00	7,080.01	7,016.70	63.31	111.834	
12,600.00	5,646.97	5,646.97	5,646.97	168.67	2.30	90.00	0.00	0.00	7,180.00	7,116.21	63.79	112.550	
12,700.00	5,646.97	5,646.97	5,646.97	171.17	2.30	90.00	0.00	0.00	7,280.00	7,215.72	64.28	113.263	
12,800.00	5,646.97	5,646.97	5,646.97	173.67	2.30	90.00	0.00	0.00	7,379.99	7,315.24	64.75	113.972	
12,845.27	5,646.97	5,646.97	5,646.97	174.81	2.30	90.00	0.00	0.00	7,425.26	7,360.29	64.97	114.292	

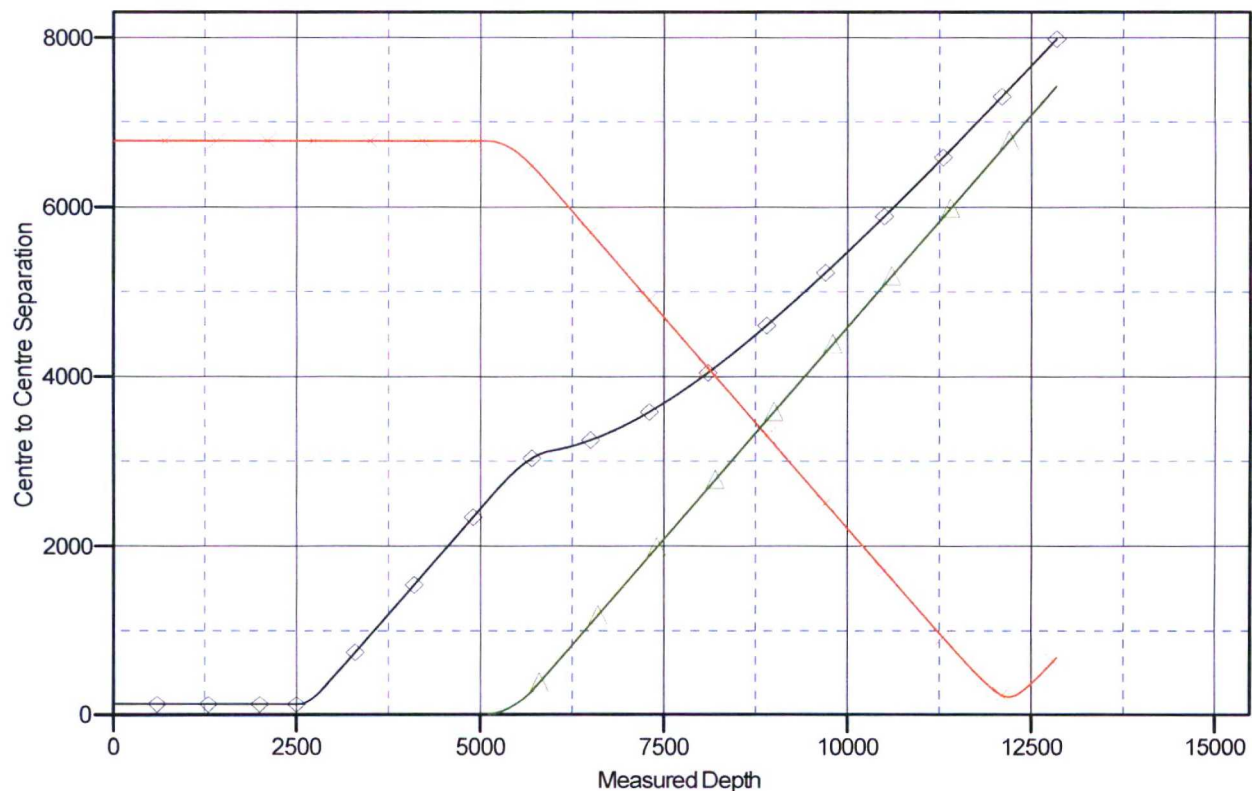
Company: DJR Operating
Project: Proposed Elk Unit
Reference Site: L36 2405
Site Error: 0.00 ft
Reference Well: Elk 301H
Well Error: 0.00 ft
Reference Wellbore: Lateral
Reference Design: APD

Local Co-ordinate Reference: Well Elk 301H - Slot 1
TVD Reference: Rig @ 6740.99ft (AD 920)
MD Reference: Rig @ 6740.99ft (AD 920)
North Reference: True
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction
Offset TVD Reference: Offset Datum

Reference Depths are relative to Rig @ 6740.99ft (AD 920)
Offset Depths are relative to Offset Datum
Central Meridian is -107.833

Coordinates are relative to: Elk 301H - Slot 1
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.30°

Ladder Plot



LEGEND

D-4, Amerada Hess, Original drilling V0

Apache C-4, Elm Ridge Resources, Original drilling V0

Elk 301H, Pilot, APD V0

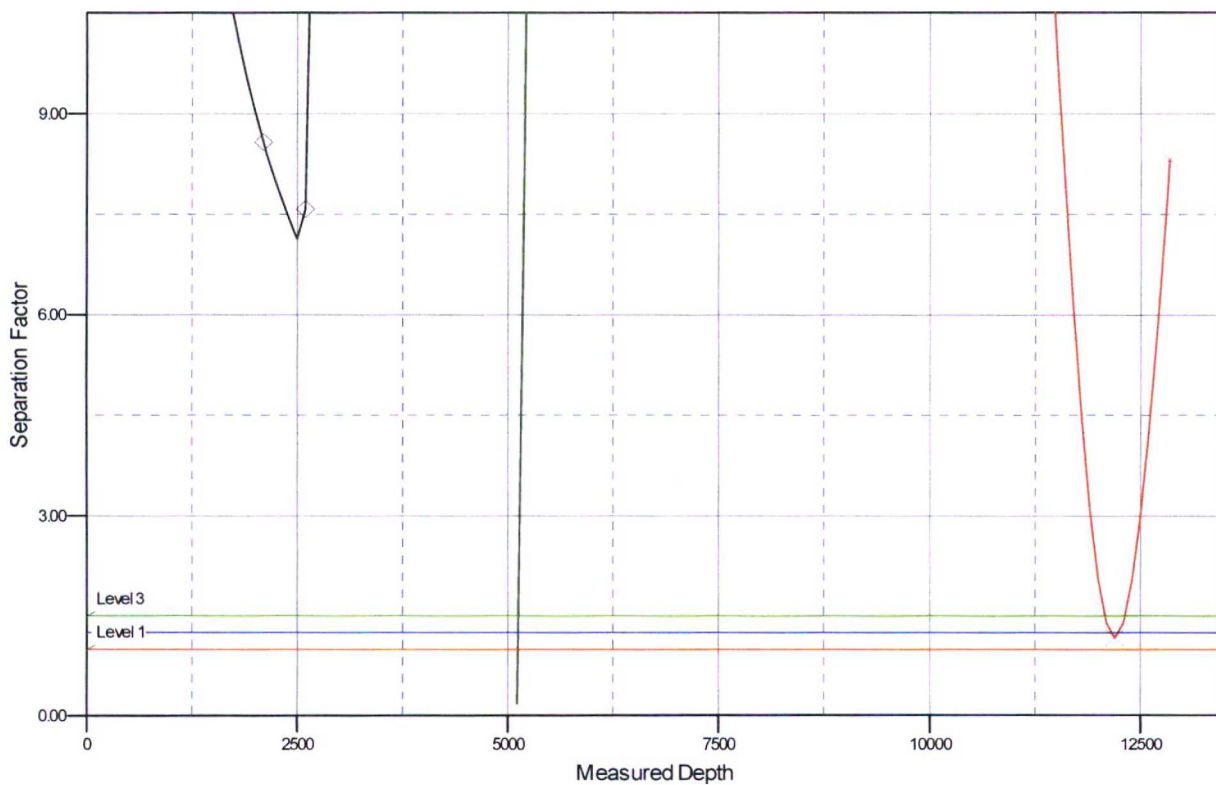
Company: DJR Operating
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Reference Depths are relative to Rig @ 6740.99ft (AD 920)
Offset Depths are relative to Offset Datum
Central Meridian is -107.833

Coordinates are relative to: Elk 301H - Slot 1
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.30°

Separation Factor Plot



LEGEND

the D-4, Amerada Hess, Original drilling V0

Apache C-4, Elm Ridge Resources, Original drilling V0

Elk 301H, Pilot, APD V0