

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 3160-4 or 3160-5 form.

Operator Signature Date: 4/8/19

Well information:

Operator: Logos Operating Well Name and Number: Rosa Unit #656H

API#: 30-039-31383 Section 25, Township 31 N/S, Range 06 E/W

Application Type:

- ☐ P&A ☐ Drilling/Casing Change ☒ Location Change
- ☐ Recomplete/DHC (For hydraulic fracturing operations review EPA
Underground injection control Guidance #84; Submit Gas Capture Plan form prior to
spudding or initiating recompletion operations)
- ☐ Other: Skid Well

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

**THIS WELL CANNOT BE SPUD UNTIL P&A FOR THE ROSA UNIT #656Y API# 30-039-31328
HAS BEEN COMPLETED.**

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ Hold C-104 for directional survey & "As Drilled" Plat
- ☐ Hold C-104 for NSL, NSP, DHC
- ☐ 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

April 22, 2019

Page 2

- 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

4/22/19

Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

FORM 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. NMSF 078769
2. Name of Operator LOGOS Operating, LLC		6. If Indian, Allottee or Tribe Name
3a. Address 2010 Afton Place Farmington, NM 87401	3b. Phone No. (include area code) (505) 787-2218	7. If Unit of CA/Agreement, Name and/or No. NMNM 78407E
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) 1030 FNL & 354 FEL, NE/NE, A, Sec 25 T31N R06W, Lot 1		8. Well Name and No. Rosa Unit 656H
		9. API Well No. 30-039-31328 - <i>Changed</i>
		10. Field and Pool or Exploratory Area Basin Mancos
		11. Country 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	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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 perfonned 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 recompleation 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 detennined that the site is ready for final inspection.)

LOGOS Operating is requesting a change in plans to the surface hole (SHL) and total depth (TD) per the attached C102 package, Operations and Directional Drill plans.

NMOCD

APR 11 2019

DISTRICT III

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Marie E. Florez		Title Regulatory Specialist
Signature <i>Marie E. Florez</i>		Date 04/08/2019

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by <i>Dave Mankiewicz</i>	Title <i>AFM</i>	Date <i>4/9/19</i>
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 <i>FEO</i>	

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)

NMOCD

Please NOTE:
New API# &
Property code

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

*API Number: 31383		*Pool Code: 97232	*Pool Name: BASIN MANCOS
*Property Code: 47033-320008	*Property Name: ROSA UNIT		*Well Number: 656H
*GRID No.: 289408	*Operator Name: LOGOS OPERATING, LLC		*Elevation: 6372'

¹⁰ Surface Location

U. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	25	31N	6W	1	1068	NORTH	289	EAST	RIO ARriba

¹¹ Bottom Hole Location If Different From Surface

U. or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	28	31N	5W		1380	NORTH	1199	WEST	RIO ARriba

*Dedicated Acres: 1144.85	N/2 - Section 25, T31N, R6W	*Joint or Infill	*Consolidation Code	*Order No.
	N/2 - Sections 30, 29, 28 T31N, R5W			

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.

Signature: *Marie E. Florez* Date: 04/08/2019
Printed Name: Marie E. Florez
E-mail Address: mflorez@logosresourcesllc.com

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.

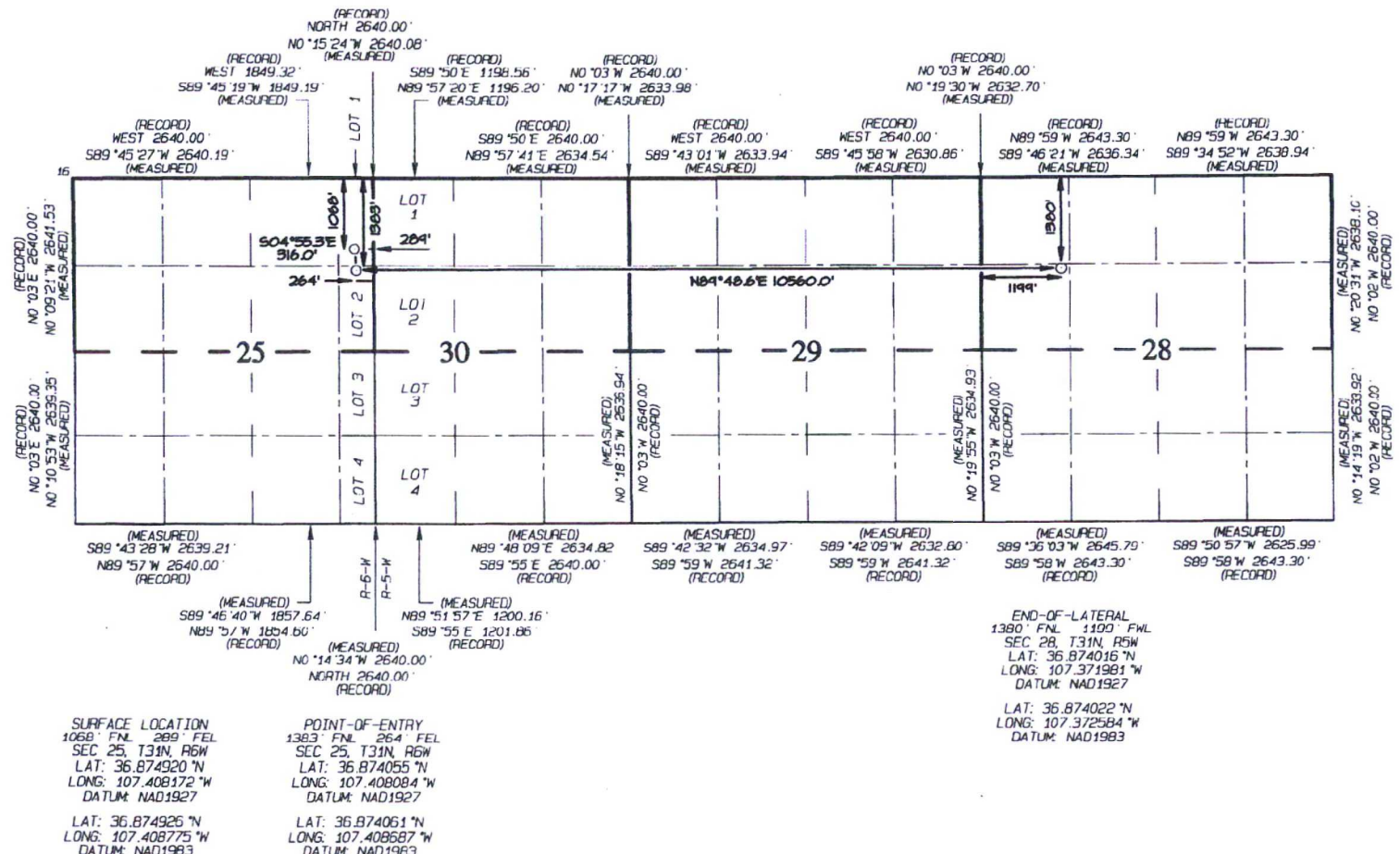
Date Revised: MARCH 23, 2019
Date of Survey: MARCH 15, 2019

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
REGISTERED PROFESSIONAL SURVEYOR
15269

JASON C. EDWARDS
Certificate Number 15269

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





LOGOS Operating, LLC Operations Plan

Note: This procedure will be adjusted onsite based upon actual conditions

Date:	April 4, 2019	Pool:	Basin Mancos
Well Name:	Rosa Unit 656H	Elevation:	6,372'
Surface Location:	Sec 25, T31N, R6W 1068 FNL, 289 FEL (36.874926° N, 107.408775° W – NAD83)	Measured Depth:	18,052
Bottom Hole Location:	Sec 28, T31N, R5W 1380 FNL, 1199 FWL (36.878042° N, 107.372609° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF-078769, CA Serial #NMNM-78407E

I. GEOLOGY

A. Formation Tops (KB): Estimated top of important geological markers:
SURFACE FORMATION – NACIMIENTO

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,513	2,500			
KIRTLAND	2,644	2,630	*POINT LOOKOUT	5,717	5,683
*FRUITLAND	3,115	3,098	*MANCOS	6,177	6,140
*PICTURED CLIFFS	3,444	3,425	KICKOFF POINT	6,408	6,369
LEWIS	3,539	3,519	TOP TARGET	6,913	6,807
CHACRA	4,633	4,606	LANDING POINT	7,489	7,071
*CLIFF HOUSE	5,466	5,433	BASE TARGET	7,489	7,071
MENEFEE	5,491	5,458	TD	18,052	6,825

* indicates depth at which anticipated water, oil, gas or other mineral bearing formations are expected to be encountered.

B. MUD LOGGING PROGRAM: Mudlogger on location from KOP to TD.

C. LOGGING PROGRAM: LWD GR from surface casing to TD.

D. NATURAL GAUGES: Gauge any noticeable increases in gas flow. Record all gauges in Tour book and on morning reports.

II. DRILLING

A. MUD PROGRAM: LSND mud (WBM) will be used to drill the 17-1/2" surface hole as well as the 12-1/4" directional vertical hole. A LSND (WBM) or (OBM) will be used to drill the 8-3/4" curve and lateral portion of the wellbore. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses.

BOP TESTING: While drill pipe is in use, the pipe rams and the blindrams will be function tested once each trip. The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure.

ROSA UNIT 654H



Annular preventers will be functionally operated at least once per week. Pipe rams will be activated daily and blind rams shall be activated each trip or at least weekly. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE. **All tests and inspections will be recorded and logged with time and results.**

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	320' or greater	13.375"	54.5 LBS	J-55 or equiv	BTC
INTERMEDIATE	12.25"	5,900' or greater	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.75"	Surface – 18,052'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

B. FLOAT EQUIPMENT:

1. SURFACE CASING: 13-3/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (4) joints of Surface Casing.
2. INTERMEDIATE CASING: 9-5/8" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancelation plugs for DV tools may be used if losses while cementing are not encountered.
3. PRODUCTION CASING: Run 5-1/2" casing with cement nose guide Float Shoe + 2 jts. of 5- 1/2" casing + Landing Collar + 5-1/2" pup joint + at least (1) one RSI (Sliding Sleeve) positioned inside the hard line.* Centralizer program will be determined by wellbore conditions. Production casing to be pressure tested during completion operations with frac stack installed.

NOTE: Use of DV tool would be considered by operator as back up in case we experience heavy losses and are concerned with cement not reaching surface. If major losses are not encountered we will not run DV tool.

C. CEMENTING:

(Note: Volumes may be adjusted onsite due to actual conditions)

1. SURFACE: 10 bbl Fresh Water Spacer, 595 sx (698.5 cu.ft.) of 15.8 ppg Type 1-11 (Neat G) @ 1.174 cu ft/sx yield with 2% Calcium Chloride, 0.125 lbm/sk Poly-E-Flake. Calculated using 500' casing and volume + 100% excess. Volumes will be less if casing is set shallower. WOC 12 hours. Test csg to 600 psi. Total Volume: (698.5cu-ft/595 sx/ Bbls). TOC at Surface.
2. INTERMEDIATE: The intermediate casing will be cemented in 2 or 3 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage. If losses are not observed during the second stage a cancelation plug will be pumped and the remaining cement will be pumped during stage 2.

Stage 1: Spacer #1: 10 bbl water spacer followed by 30 bbl Chemwash spacer. Lead Cement: 60.6 bbls, 175 sks (340 cu.ft.), 12.3 ppg@ 1.946 cuft/sk yield. Tail Cement: 43



bbls, 185 sks, (241.6 cuft), 13.5 ppg @ 1.3 cu'ft/sk yield. Displacement: Displace w/ +/- 507 bbl drilling mud or water. **Stage 2:** Spacer #1: 10 bbl water spacer followed by 20 bbl Chemwash spacer. Lead Cement: 171.3 bbls, 515 sks (968 cu.ft.), 12.4 ppg @ 1.879 cuft/sk yield. Tail Cement: 22.8 bbls, 100 sks, (128.1 cuft), 13.5 ppg @ 1.281 cu'ft/sk yield. Displacement: Displace w/ +/- 425.2 bbl drilling mud or water. **Stage 3:** Spacer #1: 10 bbl water spacer followed by 20 bbl Chemwash spacer. Lead Cement: 293 bbls, 905 sks (1647 cu.ft.), 12.5 ppg @ 1.82 cuft/sk yield. Tail Cement: 20.4 bbls, 100 sks, (114.7 cuft), 15.8 ppg @ 1.147 cu'ft/sk yield. Displacement: Displace w/ +/- 255 bbl drilling mud or water. Volumes are based on 6600' set depth and will be less if casing is set shallower. Excess of 80% from 500-3300' was used and excess of 50% from 3300-6600' was used. Actual excess pumped will be determined by well conditions.

3. **PRODUCTION:** Production casing will be cemented in 1 stage with at least 150' of cement overlap above intermediate shoe. A CBL or Temperature Survey will be used to determine TOC. Spacer #1: 60 bbl tuned water Spacer. Cement: HALCEM TM System. Yield 1.33 cuft/sk 13.3 ppg (2602 sx / 3383 cuft / 603 bbls). Tail Spacer: 40 BBL of MMCR. Displacement: Displace remaining with drilling mud or water. Calculations based on 15% excess, 150' overlap and intermediate shoe depth at 6600'. Actual volumes will vary.

Cement calculations are used for volume estimation. Well conditions will dictate final cement job design. Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected. All waiting on cement times shall be a minimum of 8 hours or adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

IV. **COMPLETION**

A. **CBL**

CBLs and/or Temperature Surveys will be performed as needed or required to determine cement top.

B. **PRESSURE TEST**

With frac stack installed on wellhead, pressure test 5-1/2" casing to 4000 psi, hold at 1500 psi for 30 minutes. Increase pressure to Open RSI sleeves.

C. **STIMULATION**

Stimulate with sand and water. Isolate stages with flow through or dissolvable frac plugs. Drill out frac plugs and flowback lateral.

D. **PRODUCTION TUBING**

Run 2-7/8", 6.5#, J-55, EUE tubing will be ran once volumes and pressures dictate.

*NOTE: Although this horizontal well may be drilled past the applicable setbacks, an unorthodox location application is not required because the completed interval in this well, as defined by 19.15.16.7 8(1) NMAC, will be entirely within the applicable setbacks. This approach complies with all applicable rules, including 19.15.16.14 A(3) NMAC, 19.15.16.14 8(2) NMAC, 19.15.16.15 8(2) NMAC, and 19.15.16.15. 8(4) NMAC.



Company: Logos Operating LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 29
Well: Rosa Unit #656H
Wellbore: OH
Design: Plan #4 2Apr19 jcsdi

PROJECT DETAILS: Rio Arriba, NM NAD83

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: 8.88°

Magnetic Field
Strength: 49854.2snT
Dip Angle: 63.43°
Date: 3/6/2019
Model: HDGM

WELL DETAILS: Rosa Unit #656H

GL 6372' & RKB 25' @ 6397.00usft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	2138073.89	2847269.23	36.8749260	-107.4087750 B3 (656H)

Plan: Plan #4 2Apr19 jcsdi (Rosa Unit #656H/OH)

Created By: Janie Collins Date: 15:25, April 02 2019

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Rosa 656H POE	7071.00	-315.03	25.78	2137758.98	2847296.41	36.8740607	-107.4086869
Rosa 656H BHL	6825.00	-326.96	10585.81	2137794.01	2857856.39	36.8740224	-107.3725836

SECTION DETAILS

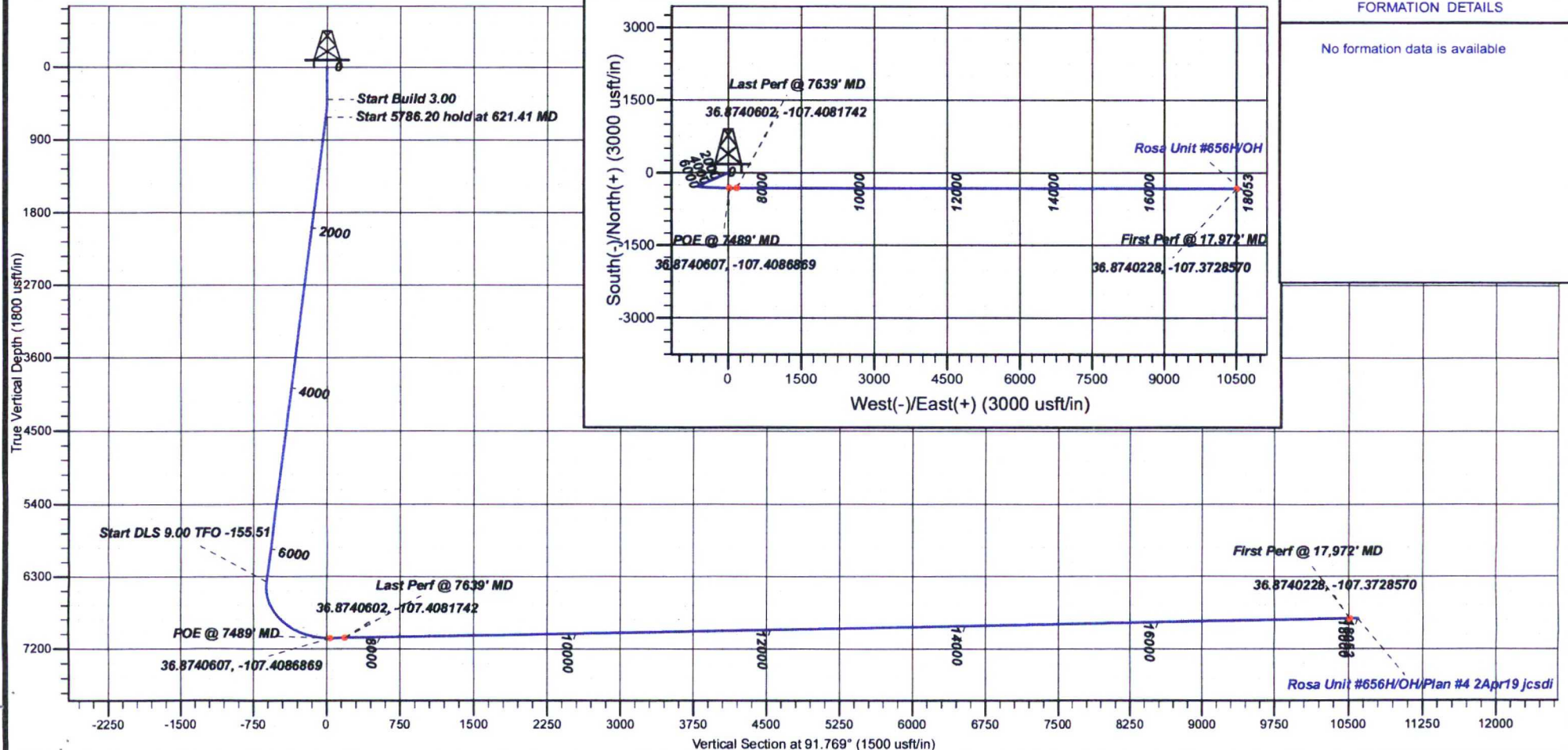
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dieg	TFace	VSec	Target
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	
621.41	6.84	245.780	620.91	-5.26	-11.69	3.00	245.78	-11.52	
6407.61	6.84	245.780	6368.28	-279.83	-622.06	0.00	0.00	-813.13	
7489.67	91.33	90.065	7071.00	-315.03	25.78	9.00	-155.51	35.49	Rosa 656H POE
18052.57	91.33	90.065	6825.00	-326.96	10585.81	0.00	0.00	10590.85	Rosa 656H BHL

CASING DETAILS

No casing data is available

FORMATION DETAILS

No formation data is available





Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 29

Rosa Unit #656H - Slot B3 (656H)

OH

Plan: Plan #4 2Apr19 jcsdi

Standard Planning Report

02 April, 2019



Scientific Drilling

www.scientificdrilling.com



Scientific Drilling, Intl
Planning Report



Database: Grand Junction District
Company: Logos Operating LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 29
Well: Rosa Unit #656H
Wellbore: OH
Design: Plan #4 2Apr19 jcsdi

Local Co-ordinate Reference: Well Rosa Unit #656H - Slot B3 (656H)
TVD Reference: GL 6372' & RKB 25' @ 6397.00usft
MD Reference: GL 6372' & RKB 25' @ 6397.00usft
North Reference: True
Survey Calculation Method: Minimum Curvature

Project	Rio Arriba, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Rosa Unit 29			
Site Position:		Northing:	2,138,126.53 usft	Latitude: 36.8750715
From:	Map	Easting:	2,847,195.58 usft	Longitude: -107.4090261
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: 0.25 °

Well	Rosa Unit #656H - Slot B3 (656H)			
Well Position	+N/-S	-52.97 usft	Northing:	2,138,073.89 usft
	+E/-W	73.42 usft	Easting:	2,847,269.24 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level: 6,372.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/6/2019	8.88	63.43	49,854

Design	Plan #4 2Apr19 jcsdi			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	91.769

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
621.41	6.64	245.780	620.91	-5.26	-11.69	3.00	3.00	0.00	245.78	
6,407.61	6.64	245.780	6,368.28	-279.83	-622.06	0.00	0.00	0.00	0.00	
7,489.67	91.33	90.065	7,071.00	-315.03	25.78	9.00	7.83	-14.39	-155.51	Rosa 656H POE
18,052.57	91.33	90.065	6,825.00	-326.96	10,585.81	0.00	0.00	0.00	0.00	Rosa 656H BHL



Scientific Drilling, Intl
Planning Report



Database: Grand Junction District
Company: Logos Operating LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 29
Well: Rosa Unit #656H
Wellbore: OH
Design: Plan #4 2Apr19 jcsdi

Local Co-ordinate Reference: Well Rosa Unit #656H - Slot B3 (656H)
TVD Reference: GL 6372' & RKB 25' @ 6397.00usft
MD Reference: GL 6372' & RKB 25' @ 6397.00usft
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 (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.000	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.000	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.000	400.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 3.00									
500.00	3.00	245.780	499.95	-1.07	-2.39	-2.35	3.00	3.00	0.00
600.00	6.00	245.780	599.63	-4.29	-9.54	-9.40	3.00	3.00	0.00
621.41	6.64	245.780	620.91	-5.26	-11.69	-11.52	3.00	3.00	0.00
Start 5786.20 hold at 621.41 MD									
700.00	6.64	245.780	698.98	-8.99	-19.98	-19.69	0.00	0.00	0.00
800.00	6.64	245.780	798.31	-13.73	-30.53	-30.09	0.00	0.00	0.00
900.00	6.64	245.780	897.63	-18.48	-41.08	-40.49	0.00	0.00	0.00
1,000.00	6.64	245.780	996.96	-23.22	-51.63	-50.89	0.00	0.00	0.00
1,100.00	6.64	245.780	1,096.29	-27.97	-62.18	-61.28	0.00	0.00	0.00
1,200.00	6.64	245.780	1,195.62	-32.72	-72.73	-71.68	0.00	0.00	0.00
1,300.00	6.64	245.780	1,294.95	-37.46	-83.27	-82.08	0.00	0.00	0.00
1,400.00	6.64	245.780	1,394.28	-42.21	-93.82	-92.48	0.00	0.00	0.00
1,500.00	6.64	245.780	1,493.61	-46.95	-104.37	-102.87	0.00	0.00	0.00
1,600.00	6.64	245.780	1,592.94	-51.70	-114.92	-113.27	0.00	0.00	0.00
1,700.00	6.64	245.780	1,692.26	-56.44	-125.47	-123.67	0.00	0.00	0.00
1,800.00	6.64	245.780	1,791.59	-61.19	-136.02	-134.06	0.00	0.00	0.00
1,900.00	6.64	245.780	1,890.92	-65.93	-146.57	-144.46	0.00	0.00	0.00
2,000.00	6.64	245.780	1,990.25	-70.68	-157.12	-154.86	0.00	0.00	0.00
2,100.00	6.64	245.780	2,089.58	-75.42	-167.66	-165.26	0.00	0.00	0.00
2,200.00	6.64	245.780	2,188.91	-80.17	-178.21	-175.65	0.00	0.00	0.00
2,300.00	6.64	245.780	2,288.24	-84.91	-188.76	-186.05	0.00	0.00	0.00
2,400.00	6.64	245.780	2,387.57	-89.66	-199.31	-196.45	0.00	0.00	0.00
2,500.00	6.64	245.780	2,486.89	-94.40	-209.86	-206.84	0.00	0.00	0.00
2,600.00	6.64	245.780	2,586.22	-99.15	-220.41	-217.24	0.00	0.00	0.00
2,700.00	6.64	245.780	2,685.55	-103.89	-230.96	-227.64	0.00	0.00	0.00
2,800.00	6.64	245.780	2,784.88	-108.64	-241.51	-238.04	0.00	0.00	0.00
2,900.00	6.64	245.780	2,884.21	-113.39	-252.05	-248.43	0.00	0.00	0.00
3,000.00	6.64	245.780	2,983.54	-118.13	-262.60	-258.83	0.00	0.00	0.00
3,100.00	6.64	245.780	3,082.87	-122.88	-273.15	-269.23	0.00	0.00	0.00
3,200.00	6.64	245.780	3,182.20	-127.62	-283.70	-279.63	0.00	0.00	0.00
3,300.00	6.64	245.780	3,281.53	-132.37	-294.25	-290.02	0.00	0.00	0.00
3,400.00	6.64	245.780	3,380.85	-137.11	-304.80	-300.42	0.00	0.00	0.00
3,500.00	6.64	245.780	3,480.18	-141.86	-315.35	-310.82	0.00	0.00	0.00
3,600.00	6.64	245.780	3,579.51	-146.60	-325.90	-321.21	0.00	0.00	0.00
3,700.00	6.64	245.780	3,678.84	-151.35	-336.44	-331.61	0.00	0.00	0.00
3,800.00	6.64	245.780	3,778.17	-156.09	-346.99	-342.01	0.00	0.00	0.00
3,900.00	6.64	245.780	3,877.50	-160.84	-357.54	-352.41	0.00	0.00	0.00
4,000.00	6.64	245.780	3,976.83	-165.58	-368.09	-362.80	0.00	0.00	0.00
4,100.00	6.64	245.780	4,076.16	-170.33	-378.64	-373.20	0.00	0.00	0.00
4,200.00	6.64	245.780	4,175.48	-175.07	-389.19	-383.60	0.00	0.00	0.00
4,300.00	6.64	245.780	4,274.81	-179.82	-399.74	-393.99	0.00	0.00	0.00
4,400.00	6.64	245.780	4,374.14	-184.57	-410.29	-404.39	0.00	0.00	0.00
4,500.00	6.64	245.780	4,473.47	-189.31	-420.83	-414.79	0.00	0.00	0.00
4,600.00	6.64	245.780	4,572.80	-194.06	-431.38	-425.19	0.00	0.00	0.00
4,700.00	6.64	245.780	4,672.13	-198.80	-441.93	-435.58	0.00	0.00	0.00
4,800.00	6.64	245.780	4,771.46	-203.55	-452.48	-445.98	0.00	0.00	0.00
4,900.00	6.64	245.780	4,870.79	-208.29	-463.03	-456.38	0.00	0.00	0.00
5,000.00	6.64	245.780	4,970.11	-213.04	-473.58	-466.78	0.00	0.00	0.00



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Planning Report



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Local Co-ordinate Reference:
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Survey Calculation Method:

Well Rosa Unit #656H - Slot B3 (656H)
GL 6372' & RKB 25' @ 6397.00usft
GL 6372' & RKB 25' @ 6397.00usft
True
Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,100.00	6.64	245.780	5,069.44	-217.78	-484.13	-477.17	0.00	0.00	0.00
5,200.00	6.64	245.780	5,168.77	-222.53	-494.68	-487.57	0.00	0.00	0.00
5,300.00	6.64	245.780	5,268.10	-227.27	-505.22	-497.97	0.00	0.00	0.00
5,400.00	6.64	245.780	5,367.43	-232.02	-515.77	-508.36	0.00	0.00	0.00
5,500.00	6.64	245.780	5,466.76	-236.76	-526.32	-518.76	0.00	0.00	0.00
5,600.00	6.64	245.780	5,566.09	-241.51	-536.87	-529.16	0.00	0.00	0.00
5,700.00	6.64	245.780	5,665.42	-246.25	-547.42	-539.56	0.00	0.00	0.00
5,800.00	6.64	245.780	5,764.74	-251.00	-557.97	-549.95	0.00	0.00	0.00
5,900.00	6.64	245.780	5,864.07	-255.74	-568.52	-560.35	0.00	0.00	0.00
6,000.00	6.64	245.780	5,963.40	-260.49	-579.06	-570.75	0.00	0.00	0.00
6,100.00	6.64	245.780	6,062.73	-265.24	-589.61	-581.14	0.00	0.00	0.00
6,200.00	6.64	245.780	6,162.06	-269.98	-600.16	-591.54	0.00	0.00	0.00
6,300.00	6.64	245.780	6,261.39	-274.73	-610.71	-601.94	0.00	0.00	0.00
6,400.00	6.64	245.780	6,360.72	-279.47	-621.26	-612.34	0.00	0.00	0.00
6,407.61	6.64	245.780	6,368.28	-279.83	-622.06	-613.13	0.00	0.00	0.00
Start DLS 9.00 TFO -165.51									
6,500.00	3.56	140.601	6,460.43	-284.25	-625.12	-616.05	9.00	-3.33	-113.84
6,600.00	11.59	103.665	6,559.52	-289.03	-613.36	-604.15	9.00	8.03	-36.94
6,700.00	20.44	97.529	6,655.54	-293.71	-586.23	-576.88	9.00	8.85	-6.14
6,800.00	29.38	95.020	6,746.15	-298.15	-544.39	-534.93	9.00	8.94	-2.51
6,900.00	38.35	93.608	6,829.10	-302.26	-488.88	-479.31	9.00	8.97	-1.41
7,000.00	47.33	92.666	6,902.35	-305.93	-421.05	-411.41	9.00	8.98	-0.94
7,100.00	56.31	91.963	6,964.11	-309.07	-342.59	-332.89	9.00	8.98	-0.70
7,200.00	65.30	91.394	7,012.84	-311.60	-255.42	-245.68	9.00	8.99	-0.57
7,300.00	74.28	90.903	7,047.35	-313.47	-161.69	-151.94	9.00	8.99	-0.49
7,400.00	83.27	90.453	7,066.79	-314.62	-63.71	-53.97	9.00	8.99	-0.45
7,489.67	91.33	90.065	7,071.00	-315.03	25.78	35.50	9.00	8.99	-0.43
POE @ 7489' MD - 36.8740607, -107.4088869									
7,500.00	91.33	90.065	7,070.76	-315.04	36.11	45.82	0.00	0.00	0.00
7,600.00	91.33	90.065	7,068.43	-315.15	136.08	145.75	0.00	0.00	0.00
7,639.67	91.33	90.065	7,067.51	-315.20	175.74	185.39	0.00	0.00	0.00
Last Perf @ 7639' MD - 36.8740602, -107.4081742									
7,700.00	91.33	90.065	7,066.10	-315.26	236.06	245.68	0.00	0.00	0.00
7,800.00	91.33	90.065	7,063.77	-315.38	336.03	345.60	0.00	0.00	0.00
7,900.00	91.33	90.065	7,061.44	-315.49	436.00	445.53	0.00	0.00	0.00
8,000.00	91.33	90.065	7,059.11	-315.60	535.97	545.46	0.00	0.00	0.00
8,100.00	91.33	90.065	7,056.79	-315.71	635.95	645.39	0.00	0.00	0.00
8,200.00	91.33	90.065	7,054.46	-315.83	735.92	745.32	0.00	0.00	0.00
8,300.00	91.33	90.065	7,052.13	-315.94	835.89	845.25	0.00	0.00	0.00
8,400.00	91.33	90.065	7,049.80	-316.05	935.86	945.18	0.00	0.00	0.00
8,500.00	91.33	90.065	7,047.47	-316.17	1,035.84	1,045.10	0.00	0.00	0.00
8,600.00	91.33	90.065	7,045.14	-316.28	1,135.81	1,145.03	0.00	0.00	0.00
8,700.00	91.33	90.065	7,042.81	-316.39	1,235.78	1,244.96	0.00	0.00	0.00
8,800.00	91.33	90.065	7,040.48	-316.50	1,335.76	1,344.89	0.00	0.00	0.00
8,900.00	91.33	90.065	7,038.15	-316.62	1,435.73	1,444.82	0.00	0.00	0.00
9,000.00	91.33	90.065	7,035.83	-316.73	1,535.70	1,544.75	0.00	0.00	0.00
9,100.00	91.33	90.065	7,033.50	-316.84	1,635.67	1,644.68	0.00	0.00	0.00
9,200.00	91.33	90.065	7,031.17	-316.95	1,735.65	1,744.60	0.00	0.00	0.00
9,300.00	91.33	90.065	7,028.84	-317.07	1,835.62	1,844.53	0.00	0.00	0.00
9,400.00	91.33	90.065	7,026.51	-317.18	1,935.59	1,944.46	0.00	0.00	0.00
9,500.00	91.33	90.065	7,024.18	-317.29	2,035.57	2,044.39	0.00	0.00	0.00
9,600.00	91.33	90.065	7,021.85	-317.41	2,135.54	2,144.32	0.00	0.00	0.00
9,700.00	91.33	90.065	7,019.52	-317.52	2,235.51	2,244.25	0.00	0.00	0.00



Scientific Drilling, Intl
Planning Report



Database: Grand Junction District
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Well: Rosa Unit #656H
Wellbore: OH
Design: Plan #4 2Apr19 jcsdi

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

Well Rosa Unit #656H - Slot B3 (656H)
GL 6372' & RKB 25' @ 6397.00usft
GL 6372' & RKB 25' @ 6397.00usft
True
Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,800.00	91.33	90.065	7,017.19	-317.63	2,335.48	2,344.18	0.00	0.00	0.00
9,900.00	91.33	90.065	7,014.87	-317.74	2,435.46	2,444.11	0.00	0.00	0.00
10,000.00	91.33	90.065	7,012.54	-317.86	2,535.43	2,544.03	0.00	0.00	0.00
10,100.00	91.33	90.065	7,010.21	-317.97	2,635.40	2,643.96	0.00	0.00	0.00
10,200.00	91.33	90.065	7,007.88	-318.08	2,735.38	2,743.89	0.00	0.00	0.00
10,300.00	91.33	90.065	7,005.55	-318.19	2,835.35	2,843.82	0.00	0.00	0.00
10,400.00	91.33	90.065	7,003.22	-318.31	2,935.32	2,943.75	0.00	0.00	0.00
10,500.00	91.33	90.065	7,000.89	-318.42	3,035.29	3,043.68	0.00	0.00	0.00
10,600.00	91.33	90.065	6,998.56	-318.53	3,135.27	3,143.61	0.00	0.00	0.00
10,700.00	91.33	90.065	6,996.23	-318.64	3,235.24	3,243.53	0.00	0.00	0.00
10,800.00	91.33	90.065	6,993.91	-318.76	3,335.21	3,343.46	0.00	0.00	0.00
10,900.00	91.33	90.065	6,991.58	-318.87	3,435.19	3,443.39	0.00	0.00	0.00
11,000.00	91.33	90.065	6,989.25	-318.98	3,535.16	3,543.32	0.00	0.00	0.00
11,100.00	91.33	90.065	6,986.92	-319.10	3,635.13	3,643.25	0.00	0.00	0.00
11,200.00	91.33	90.065	6,984.59	-319.21	3,735.10	3,743.18	0.00	0.00	0.00
11,300.00	91.33	90.065	6,982.26	-319.32	3,835.08	3,843.11	0.00	0.00	0.00
11,400.00	91.33	90.065	6,979.93	-319.43	3,935.05	3,943.03	0.00	0.00	0.00
11,500.00	91.33	90.065	6,977.60	-319.55	4,035.02	4,042.96	0.00	0.00	0.00
11,600.00	91.33	90.065	6,975.27	-319.66	4,134.99	4,142.89	0.00	0.00	0.00
11,700.00	91.33	90.065	6,972.95	-319.77	4,234.97	4,242.82	0.00	0.00	0.00
11,800.00	91.33	90.065	6,970.62	-319.88	4,334.94	4,342.75	0.00	0.00	0.00
11,900.00	91.33	90.065	6,968.29	-320.00	4,434.91	4,442.68	0.00	0.00	0.00
12,000.00	91.33	90.065	6,965.96	-320.11	4,534.89	4,542.61	0.00	0.00	0.00
12,100.00	91.33	90.065	6,963.63	-320.22	4,634.86	4,642.54	0.00	0.00	0.00
12,200.00	91.33	90.065	6,961.30	-320.34	4,734.83	4,742.46	0.00	0.00	0.00
12,300.00	91.33	90.065	6,958.97	-320.45	4,834.80	4,842.39	0.00	0.00	0.00
12,400.00	91.33	90.065	6,956.64	-320.56	4,934.78	4,942.32	0.00	0.00	0.00
12,500.00	91.33	90.065	6,954.31	-320.67	5,034.75	5,042.25	0.00	0.00	0.00
12,600.00	91.33	90.065	6,951.99	-320.79	5,134.72	5,142.18	0.00	0.00	0.00
12,700.00	91.33	90.065	6,949.66	-320.90	5,234.70	5,242.11	0.00	0.00	0.00
12,800.00	91.33	90.065	6,947.33	-321.01	5,334.67	5,342.04	0.00	0.00	0.00
12,900.00	91.33	90.065	6,945.00	-321.12	5,434.64	5,441.96	0.00	0.00	0.00
13,000.00	91.33	90.065	6,942.67	-321.24	5,534.61	5,541.89	0.00	0.00	0.00
13,100.00	91.33	90.065	6,940.34	-321.35	5,634.59	5,641.82	0.00	0.00	0.00
13,200.00	91.33	90.065	6,938.01	-321.46	5,734.56	5,741.75	0.00	0.00	0.00
13,300.00	91.33	90.065	6,935.68	-321.57	5,834.53	5,841.68	0.00	0.00	0.00
13,400.00	91.33	90.065	6,933.35	-321.69	5,934.51	5,941.61	0.00	0.00	0.00
13,500.00	91.33	90.065	6,931.03	-321.80	6,034.48	6,041.54	0.00	0.00	0.00
13,600.00	91.33	90.065	6,928.70	-321.91	6,134.45	6,141.47	0.00	0.00	0.00
13,700.00	91.33	90.065	6,926.37	-322.03	6,234.42	6,241.39	0.00	0.00	0.00
13,800.00	91.33	90.065	6,924.04	-322.14	6,334.40	6,341.32	0.00	0.00	0.00
13,900.00	91.33	90.065	6,921.71	-322.25	6,434.37	6,441.25	0.00	0.00	0.00
14,000.00	91.33	90.065	6,919.38	-322.36	6,534.34	6,541.18	0.00	0.00	0.00
14,100.00	91.33	90.065	6,917.05	-322.48	6,634.32	6,641.11	0.00	0.00	0.00
14,200.00	91.33	90.065	6,914.72	-322.59	6,734.29	6,741.04	0.00	0.00	0.00
14,300.00	91.33	90.065	6,912.39	-322.70	6,834.26	6,840.97	0.00	0.00	0.00
14,400.00	91.33	90.065	6,910.06	-322.81	6,934.23	6,940.89	0.00	0.00	0.00
14,500.00	91.33	90.065	6,907.74	-322.93	7,034.21	7,040.82	0.00	0.00	0.00
14,600.00	91.33	90.065	6,905.41	-323.04	7,134.18	7,140.75	0.00	0.00	0.00
14,700.00	91.33	90.065	6,903.08	-323.15	7,234.15	7,240.68	0.00	0.00	0.00
14,800.00	91.33	90.065	6,900.75	-323.27	7,334.12	7,340.61	0.00	0.00	0.00
14,900.00	91.33	90.065	6,898.42	-323.38	7,434.10	7,440.54	0.00	0.00	0.00
15,000.00	91.33	90.065	6,896.09	-323.49	7,534.07	7,540.47	0.00	0.00	0.00
15,100.00	91.33	90.065	6,893.76	-323.60	7,634.04	7,640.39	0.00	0.00	0.00



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North Reference: True
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Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,200.00	91.33	90.065	6,891.43	-323.72	7,734.02	7,740.32	0.00	0.00	0.00
15,300.00	91.33	90.065	6,889.10	-323.83	7,833.99	7,840.25	0.00	0.00	0.00
15,400.00	91.33	90.065	6,886.78	-323.94	7,933.96	7,940.18	0.00	0.00	0.00
15,500.00	91.33	90.065	6,884.45	-324.05	8,033.93	8,040.11	0.00	0.00	0.00
15,600.00	91.33	90.065	6,882.12	-324.17	8,133.91	8,140.04	0.00	0.00	0.00
15,700.00	91.33	90.065	6,879.79	-324.28	8,233.88	8,239.97	0.00	0.00	0.00
15,800.00	91.33	90.065	6,877.46	-324.39	8,333.85	8,339.90	0.00	0.00	0.00
15,900.00	91.33	90.065	6,875.13	-324.51	8,433.83	8,439.82	0.00	0.00	0.00
16,000.00	91.33	90.065	6,872.80	-324.62	8,533.80	8,539.75	0.00	0.00	0.00
16,100.00	91.33	90.065	6,870.47	-324.73	8,633.77	8,639.68	0.00	0.00	0.00
16,200.00	91.33	90.065	6,868.14	-324.84	8,733.74	8,739.61	0.00	0.00	0.00
16,300.00	91.33	90.065	6,865.82	-324.96	8,833.72	8,839.54	0.00	0.00	0.00
16,400.00	91.33	90.065	6,863.49	-325.07	8,933.69	8,939.47	0.00	0.00	0.00
16,500.00	91.33	90.065	6,861.16	-325.18	9,033.66	9,039.40	0.00	0.00	0.00
16,600.00	91.33	90.065	6,858.83	-325.29	9,133.64	9,139.32	0.00	0.00	0.00
16,700.00	91.33	90.065	6,856.50	-325.41	9,233.61	9,239.25	0.00	0.00	0.00
16,800.00	91.33	90.065	6,854.17	-325.52	9,333.58	9,339.18	0.00	0.00	0.00
16,900.00	91.33	90.065	6,851.84	-325.63	9,433.55	9,439.11	0.00	0.00	0.00
17,000.00	91.33	90.065	6,849.51	-325.74	9,533.53	9,539.04	0.00	0.00	0.00
17,100.00	91.33	90.065	6,847.18	-325.86	9,633.50	9,638.97	0.00	0.00	0.00
17,200.00	91.33	90.065	6,844.86	-325.97	9,733.47	9,738.90	0.00	0.00	0.00
17,300.00	91.33	90.065	6,842.53	-326.08	9,833.45	9,838.83	0.00	0.00	0.00
17,400.00	91.33	90.065	6,840.20	-326.20	9,933.42	9,938.75	0.00	0.00	0.00
17,500.00	91.33	90.065	6,837.87	-326.31	10,033.39	10,038.68	0.00	0.00	0.00
17,600.00	91.33	90.065	6,835.54	-326.42	10,133.36	10,138.61	0.00	0.00	0.00
17,700.00	91.33	90.065	6,833.21	-326.53	10,233.34	10,238.54	0.00	0.00	0.00
17,800.00	91.33	90.065	6,830.88	-326.65	10,333.31	10,338.47	0.00	0.00	0.00
17,900.00	91.33	90.065	6,828.55	-326.76	10,433.28	10,438.40	0.00	0.00	0.00
17,972.57	91.33	90.065	6,826.86	-326.84	10,505.83	10,510.92	0.00	0.00	0.00
First Perf @ 17,972' MD - 36.8740228, -107.3728570									
18,000.00	91.33	90.065	6,826.22	-326.87	10,533.26	10,538.33	0.00	0.00	0.00
18,052.57	91.33	90.065	6,825.00	-326.96	10,585.81	10,590.85	0.00	0.00	0.00
TD at 18052.57									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Rosa 656H BHL	0.00	0.000	6,825.00	-326.96	10,585.81	2,137,794.01	2,857,856.39	36.8740224	-107.3725836
- plan hits target center									
- Point									
Rosa 656H POE	0.00	0.000	7,071.00	-315.03	25.78	2,137,758.98	2,847,296.42	36.8740607	-107.4086869
- plan hits target center									
- Point									



Scientific Drilling, Intl
Planning Report



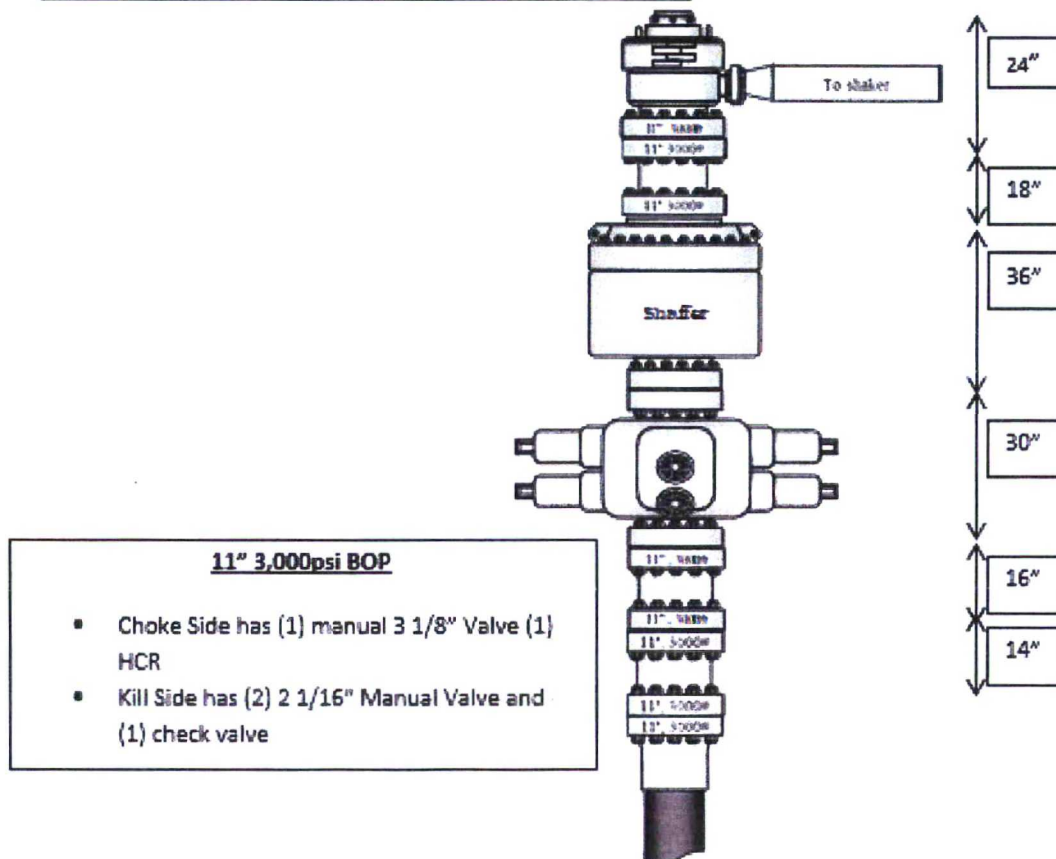
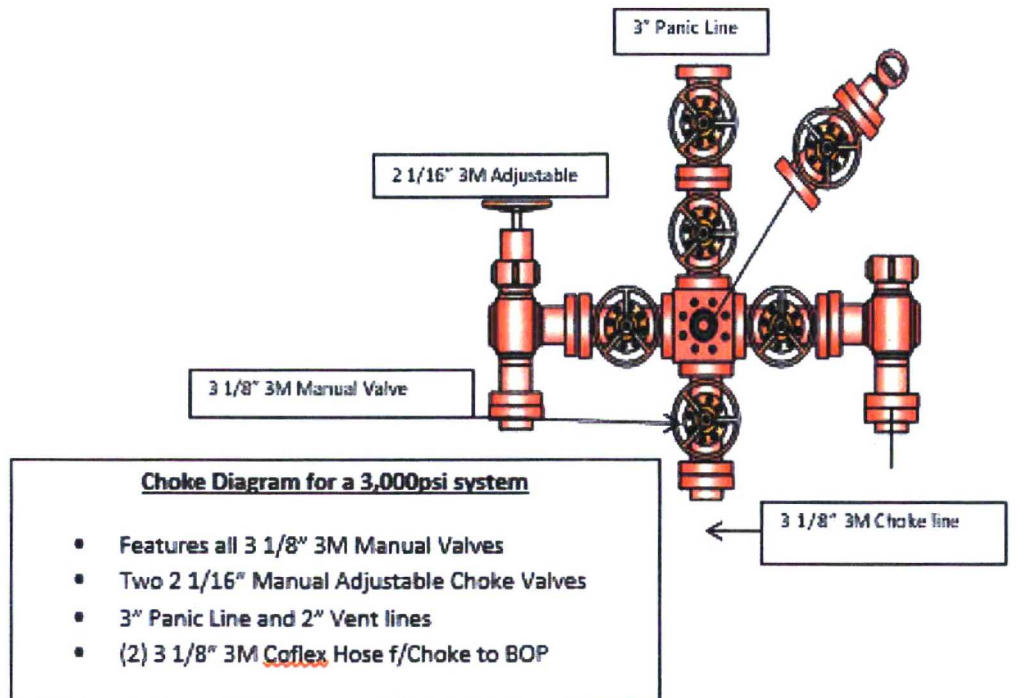
Database: Grand Junction District
Company: Logos Operating LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 29
Well: Rosa Unit #656H
Wellbore: OH
Design: Plan #4 2Apr19 jcsdi

Local Co-ordinate Reference: Well Rosa Unit #656H - Slot B3 (656H)
TVD Reference: GL 6372' & RKB 25' @ 6397.00usft
MD Reference: GL 6372' & RKB 25' @ 6397.00usft
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)	
400.00	400.00	0.00	0.00	Start Build 3.00
621.41	620.91	-5.26	-11.69	Start 5786.20 hold at 621.41 MD
6,407.61	6,368.28	-279.83	-622.06	Start DLS 9.00 TFO -155.51
7,489.67	7,071.00	-315.03	25.78	POE @ 7489' MD
7,489.67	7,071.00	-315.03	25.78	36.8740607, -107.4086869
7,639.67	7,067.51	-315.20	175.74	Last Perf @ 7639' MD
7,639.67	7,067.51	-315.20	175.74	36.8740602, -107.4081742
17,972.57	6,826.86	-326.84	10,505.83	First Perf @ 17,972' MD
17,972.57	6,826.86	-326.84	10,505.83	36.8740228, -107.3728570
18,052.57	6,825.00	-326.96	10,585.81	TD at 18052.57

3M 11" B.O.P.E Diagram



Directions from the Intersection of US Hwy 550 & US Hwy 64

in Bloomfield, NM to Logos Operating, LLC Rosa Unit #656H

1068' FNL & 289' FEL, Section 25, T31N, R6W, N.M.P.M., Rio Arriba County, NM

Latitude: 36.874926°N Longitude: 107.408775°W Datum: NAD1983

From the intersection of US Hwy 550 & US Hwy 64 in Bloomfield, NM, travel Easterly on US Hwy 64 for 38.0 miles to Mile Marker 102.3 to State Hwy 527 (Simms Hwy);

Go Left (North-westerly) on State Hwy 527 (Simms Hwy) for 7.9 miles to Rosa Road @ La Jara Station;

Go Right (Northerly) on Rosa Road for 6.5 miles to 4-way intersection;

Go Left which is straight (North-easterly) remaining on Rosa Road for 4.0 miles to 4-way intersection;

Go Straight (Northerly) for 0.4 miles to staked Logos Rosa Unit #656H location which overlaps existing Logos Rosa Unit #165A location.