

Form 3160-5
(June 2019)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021**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.5. Lease Serial No. **NMSF078769**

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator **LOGOS OPERATING LLC**3a. Address **2010 AFTON PLACE, FARMINGTON, NM 87401** 3b. Phone No. (include area code)
(505) 278-87204. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC 19 T31N R05W NENW (C) 943 FNL 424 FWL7. If Unit of CA/Agreement, Name and/or No.
NMNM78407E8. Well Name and No. **ROSA UNIT 645H**9. API Well No. **30-039-31415**10. Field and Pool or Exploratory Area
BASIN MANCOS11. Country or Parish, State
RIO ARRIBA/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 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 detennined that the site is ready for final inspection.)

LOGOS Operating LLC, request a change in plans below:

Original bottom-hole location from 52' FNL & 2320' FWL to **new bottom-hole location 45' FNL & 362' FEL**Original TD @ 17,598' MD 6965' TVD to **new TD @ 20,177 MD 6968' TVD**

Geology tops have been updated per changes.

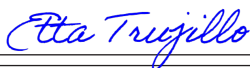
Original KOP @ 6406' MD 6348' TVD to **new KOP @ 6385' MD 6329' TVD**Original Landing Point @ 7398' MD 6970' TVD to **new Landing Point @ 7380' MD 6947' TVD**Original Intermediate casing 9.625" set depth @ 6268' MD 6211' TVD to **new casing depth 6270' MD 6211' TVD**Original Production casing 5.5" set depth @ 17,598' MD 6965' TVD to **new casing depth @ 20,177' MD 6968' TVD**

New 9.625" Intermediate & 5.5" Production cementing, grade and weight have been update per casing depth changes.

Attached: New C102, Operation and Directional Drill plans.

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)
ETTA TRUJILLORegulatory Specialist
Title

Signature



Date

8/1/2022

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

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)

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

¹ API Number	² Pool Code 97232	³ Pool Name BASIN MANCOS
⁴ Property Code 320608	⁵ Property Name ROSA UNIT	⁶ Well Number 645H
⁷ GRID No. 289408	⁸ Operator Name LOGOS OPERATING, LLC	⁹ Elevation 6305'

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
C	19	31N	5W	1	943	NORTH	424	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
A	21	31N	5W		45	NORTH	362	EAST	RIO ARriba
¹² Dedicated Acres 872.01	N/2 - Sections 19, 20, 21, T31N, R5W					¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-13457	

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

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.

Etta Trujillo 7/29/2022
Signature Date
Etta Trujillo

Printed Name
etrujillo@logosresourcesllc.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.

Date Revised: JULY 21, 2022
Survey Date: JANUARY 2, 2015

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

SURFACE LOCATION
943' FNL 424' FWL
SECTION 19, T31N, R5W
LAT: 36.889734°N
LONG: 107.405726°W
DATUM: NAD1927

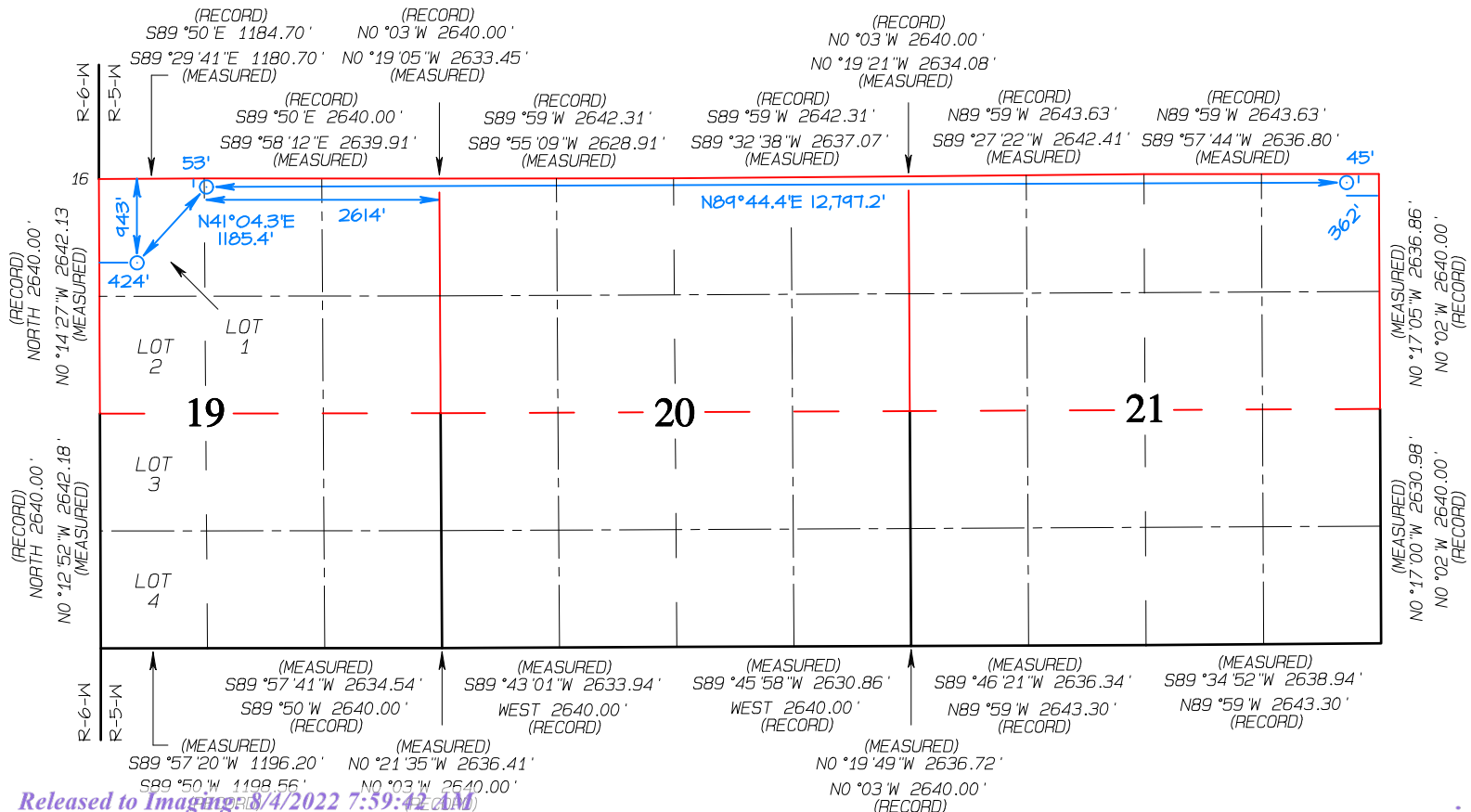
FIRST TAKE POINT
53' FNL 2614' FEL
SECTION 19, T31N, R5W
LAT: 36.892179°N
LONG: 107.403049°W
DATUM: NAD1927

LAT: 36.889740°N
LONG: 107.406329°W
DATUM: NAD1983

LAT: 36.892185°N
LONG: 107.403652°W
DATUM: NAD1983

LAST TAKE POINT
45' FNL 362' FEL
SECTION 21, T31N, R5W
LAT: 36.892172°N
LONG: 107.359288°W
DATUM: NAD1927

LAT: 36.892178°N
LONG: 107.359890°W
DATUM: NAD1983





LOGOS Operating, LLC Operations Plan

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

Date:	August 1, 2022	Pool:	Basin Mancos
Well Name:	Rosa Unit 645H	GL Elevation:	6,305'
Surface Location:	Sec 19, T31N, R5W 943 FNL, 424 FWL (36.8899740° N, 107.406329° W – NAD83)	Measured Depth:	20,177' (KB)
Bottom Hole Location:	Sec 21, T31N, R5W 45 FNL, 362 FEL (36.8921780° N, 107.3598900° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF078769, CA Serial #NMNM78407E

I. GEOLOGY

A. Formation Tops (Based on 25' KB Elevation): Estimated top of important geological markers:
SURFACE FORMATION – NACIMIENTO

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2403	2385	*POINT LOOKOUT	5696	5642
KIRTLAND	2550	2530	*MANCOS	6195	6139
*FRUITLAND	3060	3035	KICKOFF POINT	6385	6329
*PICTURED CLIFFS	3378	3349	LANDING POINT	7380	6947
LEWIS	3493	3463			
CHACRA	4610	4568			
*CLIFF HOUSE	5418	5367			
MENEFEE	5466	5414	TD	20177	6968

* 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 8-1/2" curve and lateral portion of the wellbore. Treat for lost circulation as necessary. Obtain returns prior to cementing. Notify Engineering of any mud losses. Mud weights of 6.5-13 ppg will be used as necessary to maintain sufficient overbalance of reservoir pressure.

Above ground steel pits will be used for fluid and cuttings while drilling. In the unlikely event that a tank develops a leak, upon immediate visual discovery, the fluid would be transferred to another tank and contaminated soil would be removed and disposed. Any leaks, spills or other undesirable events will be reported in accordance with BLM NTL 3A. Rig crews will monitor the tanks at all

ROSA UNIT 645H



times.

- B. BOP TESTING:** 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. Annular preventers will be functionally operated at least once per week. Pipe and blind rams shall be activated each trip or but not more than once a day. 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.** A full BOP test will be conducted when initially installed for the first well on the pad or if seals subject to test pressure are broken, following related repairs and at a minimum of 30 day intervals. A BOPE Shell Test only will be conducted for subsequent wells on the pad when seals subject to pressure have not been broken or repaired and fall within the 30 day interval of first full test.
- C. GeoHazards:** There are no Geohazards
- D. Maximum Anticipated Pressure:** $6968' \text{ TVD} \times 0.43 = 2996 \text{ psi}$
- E. H2S Concerns:** – There is no record of any naturally occurring H2S in any formation in the Rosa Unit. No H2S is anticipated in this formation or this well.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OHSIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	320' or greater	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,270'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	20,177'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

NOTE: All casing depths are approximate, based on KB elevation (25') and will be based on drilling conditions +/- 50'. Weights, grades and connections will be based on availability and may vary but will be equivalent or greater.

B. FLOAT EQUIPMENT:

- SURFACE CASING:** 13-3/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
- 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. Optional use of DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancellation plugs for DV tools may be used if losses while cementing are not encountered.
- PRODUCTION CASING:** Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2" full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) one Toe Sleeve (Sliding Sleeve) positioned inside the applicable production area. Centralizer program will be determined by wellbore conditions. Production casing to be pressure tested during completion operations with frac stack installed.

ROSA UNIT 645H



C. CEMENTING:

(Note: Cement type and volumes may be adjusted onsite due to actual conditions and availability)

1. SURFACE: Casing shall be set at ~ 320' and cemented to surface. TOC at Surface.
263 sks of 15.8 ppg Type Neat G, 1.18 cuft/sk yield or equivalent 223 sks of 14.6 ppg Type III with 1.39 cuft/sk yield, 30% excess.
2. INTERMEDIATE: Intermediate casing shall be kept fluid filled while running in to the hole to meet BLM minimum collapse requirements. 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. Operator proposes optional DV tools above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal. 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. If cement does not circulate to the DV tool(s) or to surface, a CBL will be run to determine TOC.

	Top (ft)	Footage (ft)	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	5,764	471	0.31318	1.3	209	37	1.15	182	15.8
Stage 1 Lead	4,647	1,117	0.31318	1.3	455	81	2.30	198	12.0
					664	118		380	
Stage 2 Tail	3,715	932	0.31318	1.3	379	68	1.73	219	13.2
Stage 2 Lead	3,118	597	0.31318	1.3	243	43	2.30	106	12.0
					623	111		325	
Stage 3 Tail	2,468	650	0.31318	1.3	265	47	1.73	153	13.2
Stage 3 Lead	320	2,148	0.31318	1.3	875	156	2.30	380	12.0
Stage 3 Lead	-	320	0.36268	1	116	21	2.30	50	12.0
					1,255	224		584	
All Stage Totals					2,542	453		1,288	

Calculations based on 30% excess for open hole and cement to surface. Actual excess pumped will be determined by well conditions.

3. PRODUCTION: Production casing will be cemented in 1 stage with 100' of cement overlap above intermediate shoe. A CBL, or alternatively, a Temperature Survey will be used to determine TOC.

	Top (ft)	Footage (ft)	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	6,170	100	0.2531	1	25	5	1.53	17	13.2
Open Hole Lead	6,270	13,907	0.2291	1.15	3,674	654	1.53	2,402	13.2
					3,700	659		2,418	

Calculations based on 15% excess for open hole and 100' overlap into intermediate casing. 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 if cement is not circulated.

B. PRESSURE TEST

- C. Pressure test 5-1/2" casing to 1533 psi (0.22 psi/ft * 6,968' TVD) for 30 minutes. Increase pressure to Open RSI sleeves.

D. STIMULATION

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

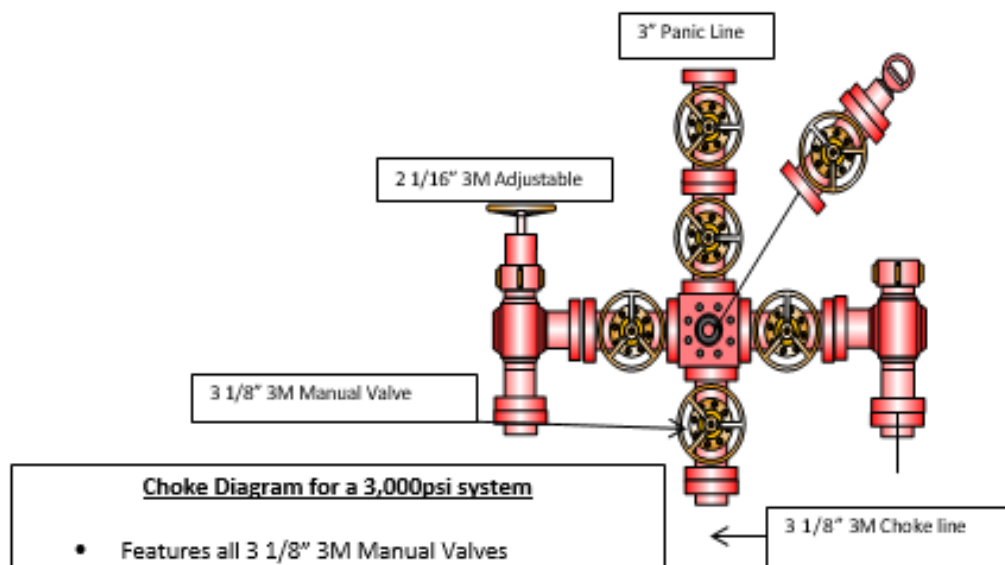
E. PRODUCTION TUBING

2-7/8", 6.5#, J-55 or L-80, EUE tubing will be run once volumes and pressures dictate. Due to the extremely high initial flow rates and pressures seen in offset wells, tubing will be installed once it is safe to do so, typically 12-18 months after completion.

*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.

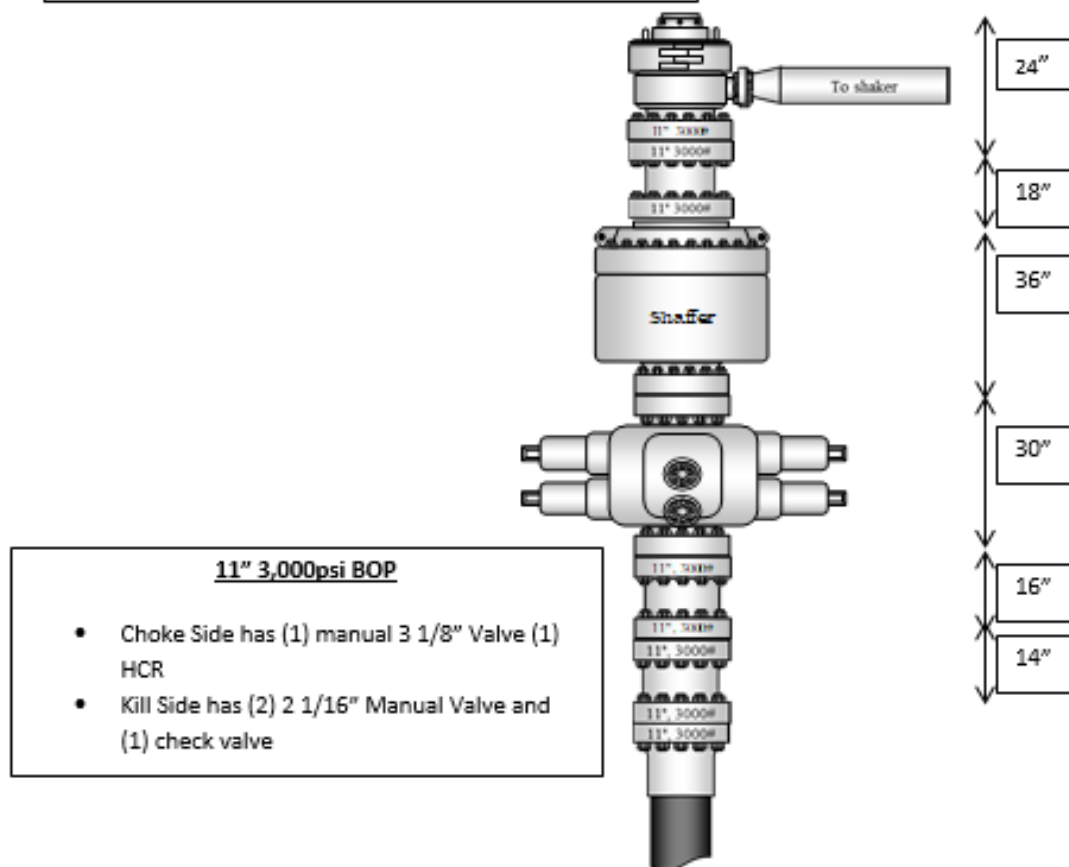


3M 11" B.O.P.E Diagram



Choke Diagram for a 3,000psi system

- Features all 3 1/8" 3M Manual Valves
- Two 2 1/16" Manual Adjustable Choke Valves
- 3" Panic Line and 2" Vent lines
- (2) 3 1/8" 3M ~~Coflex~~ Hose f/Choke to BOP



ROSA UNIT 645H

Released to Imaging: 8/4/2023 9:42 AM



Company: Logos Operating LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 27
Well: Rosa Unit 645H
Wellbore: OH
Design: Plan #5

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



WELL DETAILS: Rosa Unit 645H

GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	2143470.17	2847960.54	36.8897396	-107.4063290	B8

Plan: Plan #5 (Rosa Unit 645H/OH)

Created By: Janie Collins Date: 13:18, July 11 2022



Azimuths to True North
Magnetic North: 8.28°

Magnetic Field
Strength: 49683.0 nT
Dip Angle: 63.37°
Date: 6/14/2021
Model: HDGM2021_F8

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
645H POE Rev 3	6947.00	890.20	782.80	2144363.86	2848739.35	36.8921847	-107.4036521
645H BHL Rev 3	6968.00	891.05	13580.00	2144421.97	2861536.39	36.8921780	-107.3598900

SECTION DETAILS

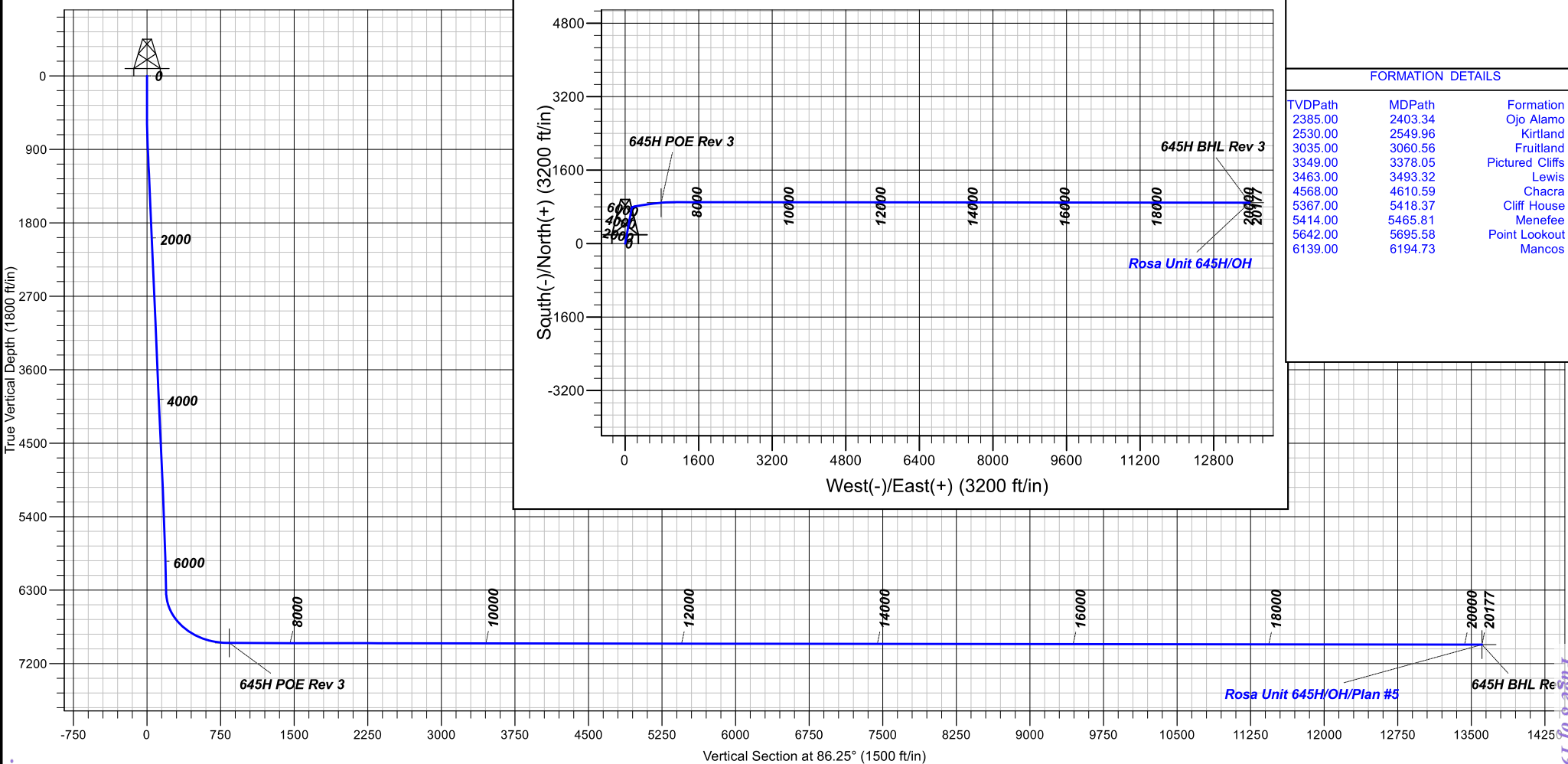
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00
875.00	8.50	10.42	873.44	30.95	5.69	2.00	10.42	7.71
5300.00	8.50	10.42	5249.84	674.22	123.99	0.00	0.00	167.86
6200.00	4.00	10.42	6144.26	770.56	141.70	0.50	180.00	191.85
6385.00	4.00	10.42	6328.81	783.25	144.04	0.00	0.00	195.01
7357.18	89.30	84.12	6946.72	887.89	760.42	9.07	73.79	816.92
7379.68	89.30	84.12	6947.00	890.20	782.80	0.00	0.00	839.41
7678.42	89.91	90.07	6949.05	905.34	1081.02	2.00	84.13	1137.97
20177.43	89.91	90.07	6968.00	891.05	13580.00	0.00	0.00	13609.20

CASING DETAILS

No casing data is available

FORMATION DETAILS

TVDPath	MDPath	Formation
2385.00	2403.34	Ojo Alamo
2530.00	2549.96	Kirtland
3035.00	3060.56	Fruitland
3349.00	3378.05	Pictured Cliffs
3463.00	3493.32	Lewis
4568.00	4610.59	Chacra
5367.00	5418.37	Cliff House
5414.00	5465.81	Menefee
5642.00	5695.58	Point Lookout
6139.00	6194.73	Mancos



Received by OCB: 8/13/2023 4:52 PM

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Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 645H - Slot B8

OH

Plan: Plan #5

Standard Planning Report

11 July, 2022





Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 645H - Slot B8
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 645H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #5		

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 27			
Site Position:		Northing:	2,143,451.58 usft	Latitude:	36.8896880
From:	Lat/Long	Easting:	2,848,002.44 usft	Longitude:	-107.4061860
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in		

Well	Rosa Unit 645H - Slot B8					
Well Position	+N/-S	0.00 ft	Northing:	2,143,470.17 usft	Latitude:	36.8897395
	+E/-W	0.00 ft	Easting:	2,847,960.54 usft	Longitude:	-107.4063290
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft
Grid Convergence:		0.26 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2021_FILE	6/14/2021	8.68	63.37	49,683.80000000

Design	Plan #5			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	86.25

Plan Survey Tool Program	Date	7/11/2022		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	20,177.43 Plan #5 (OH)	MWD+HDGM	
			OWSG MWD + HDGM	



Lonestar Consulting, LLC
Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 645H - Slot B8
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 645H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #5		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00	
875.00	8.50	10.42	873.44	30.95	5.69	2.00	2.00	0.00	10.42	
5,300.00	8.50	10.42	5,249.84	674.22	123.99	0.00	0.00	0.00	0.00	
6,200.00	4.00	10.42	6,144.26	770.56	141.70	0.50	-0.50	0.00	180.00	
6,385.00	4.00	10.42	6,328.81	783.25	144.04	0.00	0.00	0.00	0.00	
7,357.18	89.30	84.12	6,946.73	887.89	760.42	9.07	8.77	7.58	73.79	
7,379.68	89.30	84.12	6,947.00	890.20	782.80	0.00	0.00	0.00	0.00	645H POE Rev 3
7,678.42	89.91	90.07	6,949.05	905.34	1,081.02	2.00	0.21	1.99	84.13	
20,177.43	89.91	90.07	6,968.00	891.05	13,580.00	0.00	0.00	0.00	0.00	645H BHL Rev 3



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 645H - Slot B8
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 645H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	1.00	10.42	500.00	0.43	0.08	0.11	2.00	2.00	0.00
600.00	3.00	10.42	599.93	3.86	0.71	0.96	2.00	2.00	0.00
700.00	5.00	10.42	699.68	10.72	1.97	2.67	2.00	2.00	0.00
800.00	7.00	10.42	799.13	21.00	3.86	5.23	2.00	2.00	0.00
875.00	8.50	10.42	873.44	30.95	5.69	7.71	2.00	2.00	0.00
900.00	8.50	10.42	898.17	34.58	6.36	8.61	0.00	0.00	0.00
1,000.00	8.50	10.42	997.07	49.12	9.03	12.23	0.00	0.00	0.00
1,100.00	8.50	10.42	1,095.97	63.66	11.71	15.85	0.00	0.00	0.00
1,200.00	8.50	10.42	1,194.87	78.19	14.38	19.47	0.00	0.00	0.00
1,300.00	8.50	10.42	1,293.77	92.73	17.05	23.09	0.00	0.00	0.00
1,400.00	8.50	10.42	1,392.68	107.27	19.73	26.71	0.00	0.00	0.00
1,500.00	8.50	10.42	1,491.58	121.81	22.40	30.33	0.00	0.00	0.00
1,600.00	8.50	10.42	1,590.48	136.34	25.07	33.95	0.00	0.00	0.00
1,700.00	8.50	10.42	1,689.38	150.88	27.75	37.57	0.00	0.00	0.00
1,800.00	8.50	10.42	1,788.28	165.42	30.42	41.18	0.00	0.00	0.00
1,900.00	8.50	10.42	1,887.18	179.95	33.09	44.80	0.00	0.00	0.00
2,000.00	8.50	10.42	1,986.09	194.49	35.77	48.42	0.00	0.00	0.00
2,100.00	8.50	10.42	2,084.99	209.03	38.44	52.04	0.00	0.00	0.00
2,200.00	8.50	10.42	2,183.89	223.57	41.11	55.66	0.00	0.00	0.00
2,300.00	8.50	10.42	2,282.79	238.10	43.79	59.28	0.00	0.00	0.00
2,400.00	8.50	10.42	2,381.69	252.64	46.46	62.90	0.00	0.00	0.00
2,500.00	8.50	10.42	2,480.59	267.18	49.13	66.52	0.00	0.00	0.00
2,600.00	8.50	10.42	2,579.50	281.71	51.81	70.14	0.00	0.00	0.00
2,700.00	8.50	10.42	2,678.40	296.25	54.48	73.76	0.00	0.00	0.00
2,800.00	8.50	10.42	2,777.30	310.79	57.15	77.38	0.00	0.00	0.00
2,900.00	8.50	10.42	2,876.20	325.33	59.83	81.00	0.00	0.00	0.00
3,000.00	8.50	10.42	2,975.10	339.86	62.50	84.62	0.00	0.00	0.00
3,100.00	8.50	10.42	3,074.00	354.40	65.17	88.24	0.00	0.00	0.00
3,200.00	8.50	10.42	3,172.90	368.94	67.85	91.86	0.00	0.00	0.00
3,300.00	8.50	10.42	3,271.81	383.47	70.52	95.48	0.00	0.00	0.00
3,400.00	8.50	10.42	3,370.71	398.01	73.19	99.09	0.00	0.00	0.00
3,500.00	8.50	10.42	3,469.61	412.55	75.87	102.71	0.00	0.00	0.00
3,600.00	8.50	10.42	3,568.51	427.09	78.54	106.33	0.00	0.00	0.00
3,700.00	8.50	10.42	3,667.41	441.62	81.21	109.95	0.00	0.00	0.00
3,800.00	8.50	10.42	3,766.31	456.16	83.89	113.57	0.00	0.00	0.00
3,900.00	8.50	10.42	3,865.22	470.70	86.56	117.19	0.00	0.00	0.00
4,000.00	8.50	10.42	3,964.12	485.24	89.23	120.81	0.00	0.00	0.00
4,100.00	8.50	10.42	4,063.02	499.77	91.91	124.43	0.00	0.00	0.00
4,200.00	8.50	10.42	4,161.92	514.31	94.58	128.05	0.00	0.00	0.00
4,300.00	8.50	10.42	4,260.82	528.85	97.25	131.67	0.00	0.00	0.00
4,400.00	8.50	10.42	4,359.72	543.38	99.93	135.29	0.00	0.00	0.00
4,500.00	8.50	10.42	4,458.63	557.92	102.60	138.91	0.00	0.00	0.00
4,600.00	8.50	10.42	4,557.53	572.46	105.27	142.53	0.00	0.00	0.00
4,700.00	8.50	10.42	4,656.43	587.00	107.95	146.15	0.00	0.00	0.00
4,800.00	8.50	10.42	4,755.33	601.53	110.62	149.77	0.00	0.00	0.00
4,900.00	8.50	10.42	4,854.23	616.07	113.29	153.39	0.00	0.00	0.00



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 645H - Slot B8
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 645H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #5		

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)	
5,000.00	8.50	10.42	4,953.13	630.61	115.97	157.01	0.00	0.00	0.00	
5,100.00	8.50	10.42	5,052.03	645.14	118.64	160.62	0.00	0.00	0.00	
5,200.00	8.50	10.42	5,150.94	659.68	121.31	164.24	0.00	0.00	0.00	
5,300.00	8.50	10.42	5,249.84	674.22	123.99	167.86	0.00	0.00	0.00	
5,400.00	8.00	10.42	5,348.80	688.33	126.58	171.38	0.50	-0.50	0.00	
5,500.00	7.50	10.42	5,447.89	701.59	129.02	174.68	0.50	-0.50	0.00	
5,600.00	7.00	10.42	5,547.09	714.01	131.30	177.77	0.50	-0.50	0.00	
5,700.00	6.50	10.42	5,646.40	725.57	133.43	180.65	0.50	-0.50	0.00	
5,800.00	6.00	10.42	5,745.80	736.27	135.40	183.31	0.50	-0.50	0.00	
5,900.00	5.50	10.42	5,845.30	746.13	137.21	185.77	0.50	-0.50	0.00	
6,000.00	5.00	10.42	5,944.88	755.13	138.86	188.01	0.50	-0.50	0.00	
6,100.00	4.50	10.42	6,044.53	763.27	140.36	190.03	0.50	-0.50	0.00	
6,200.00	4.00	10.42	6,144.26	770.56	141.70	191.85	0.50	-0.50	0.00	
6,300.00	4.00	10.42	6,244.02	777.42	142.96	193.56	0.00	0.00	0.00	
6,385.00	4.00	10.42	6,328.81	783.25	144.04	195.01	0.00	0.00	0.00	
6,400.00	4.57	27.05	6,343.77	784.30	144.40	195.44	9.07	3.80	110.84	
6,500.00	12.16	66.02	6,442.69	792.14	155.86	207.39	9.07	7.59	38.97	
6,600.00	20.96	74.08	6,538.46	801.35	182.74	234.82	9.07	8.80	8.05	
6,700.00	29.91	77.47	6,628.68	811.69	224.37	277.03	9.07	8.96	3.39	
6,800.00	38.92	79.40	6,711.09	822.90	279.70	332.98	9.07	9.01	1.93	
6,900.00	47.95	80.70	6,783.64	834.71	347.36	401.27	9.07	9.03	1.30	
7,000.00	56.98	81.67	6,844.50	846.81	425.64	480.18	9.07	9.04	0.97	
7,100.00	66.03	82.46	6,892.15	858.90	512.60	567.74	9.07	9.04	0.79	
7,200.00	75.08	83.14	6,925.41	870.69	606.06	661.76	9.07	9.05	0.69	
7,300.00	84.12	83.77	6,943.45	881.88	703.67	759.90	9.07	9.05	0.63	
7,357.18	89.30	84.12	6,946.73	887.89	760.42	816.92	9.07	9.05	0.61	
7,379.68	89.30	84.12	6,947.00	890.20	782.80	839.41	0.00	0.00	0.00	
7,400.00	89.34	84.53	6,947.24	892.21	803.02	859.71	2.00	0.20	1.99	
7,500.00	89.55	86.52	6,948.21	900.02	902.71	959.70	2.00	0.20	1.99	
7,600.00	89.75	88.51	6,948.82	904.36	1,002.60	1,059.66	2.00	0.21	1.99	
7,678.42	89.91	90.07	6,949.05	905.34	1,081.02	1,137.97	2.00	0.21	1.99	
7,700.00	89.91	90.07	6,949.09	905.31	1,102.60	1,159.50	0.00	0.00	0.00	
7,800.00	89.91	90.07	6,949.24	905.20	1,202.60	1,259.28	0.00	0.00	0.00	
7,900.00	89.91	90.07	6,949.39	905.08	1,302.59	1,359.06	0.00	0.00	0.00	
8,000.00	89.91	90.07	6,949.54	904.97	1,402.59	1,458.84	0.00	0.00	0.00	
8,100.00	89.91	90.07	6,949.69	904.85	1,502.59	1,558.61	0.00	0.00	0.00	
8,200.00	89.91	90.07	6,949.84	904.74	1,602.59	1,658.39	0.00	0.00	0.00	
8,300.00	89.91	90.07	6,950.00	904.63	1,702.59	1,758.17	0.00	0.00	0.00	
8,400.00	89.91	90.07	6,950.15	904.51	1,802.59	1,857.95	0.00	0.00	0.00	
8,500.00	89.91	90.07	6,950.30	904.40	1,902.59	1,957.73	0.00	0.00	0.00	
8,600.00	89.91	90.07	6,950.45	904.28	2,002.59	2,057.50	0.00	0.00	0.00	
8,700.00	89.91	90.07	6,950.60	904.17	2,102.59	2,157.28	0.00	0.00	0.00	
8,800.00	89.91	90.07	6,950.75	904.05	2,202.59	2,257.06	0.00	0.00	0.00	
8,900.00	89.91	90.07	6,950.91	903.94	2,302.59	2,356.84	0.00	0.00	0.00	
9,000.00	89.91	90.07	6,951.06	903.83	2,402.59	2,456.61	0.00	0.00	0.00	
9,100.00	89.91	90.07	6,951.21	903.71	2,502.59	2,556.39	0.00	0.00	0.00	
9,200.00	89.91	90.07	6,951.36	903.60	2,602.59	2,656.17	0.00	0.00	0.00	
9,300.00	89.91	90.07	6,951.51	903.48	2,702.59	2,755.95	0.00	0.00	0.00	
9,400.00	89.91	90.07	6,951.66	903.37	2,802.59	2,855.73	0.00	0.00	0.00	
9,500.00	89.91	90.07	6,951.82	903.25	2,902.59	2,955.50	0.00	0.00	0.00	
9,600.00	89.91	90.07	6,951.97	903.14	3,002.59	3,055.28	0.00	0.00	0.00	
9,700.00	89.91	90.07	6,952.12	903.03	3,102.59	3,155.06	0.00	0.00	0.00	



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 645H - Slot B8
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 645H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #5		

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)	
9,800.00	89.91	90.07	6,952.27	902.91	3,202.59	3,254.84	0.00	0.00	0.00	
9,900.00	89.91	90.07	6,952.42	902.80	3,302.59	3,354.61	0.00	0.00	0.00	
10,000.00	89.91	90.07	6,952.57	902.68	3,402.59	3,454.39	0.00	0.00	0.00	
10,100.00	89.91	90.07	6,952.72	902.57	3,502.59	3,554.17	0.00	0.00	0.00	
10,200.00	89.91	90.07	6,952.88	902.45	3,602.59	3,653.95	0.00	0.00	0.00	
10,300.00	89.91	90.07	6,953.03	902.34	3,702.59	3,753.73	0.00	0.00	0.00	
10,400.00	89.91	90.07	6,953.18	902.23	3,802.59	3,853.50	0.00	0.00	0.00	
10,500.00	89.91	90.07	6,953.33	902.11	3,902.59	3,953.28	0.00	0.00	0.00	
10,600.00	89.91	90.07	6,953.48	902.00	4,002.59	4,053.06	0.00	0.00	0.00	
10,700.00	89.91	90.07	6,953.63	901.88	4,102.59	4,152.84	0.00	0.00	0.00	
10,800.00	89.91	90.07	6,953.79	901.77	4,202.59	4,252.61	0.00	0.00	0.00	
10,900.00	89.91	90.07	6,953.94	901.65	4,302.59	4,352.39	0.00	0.00	0.00	
11,000.00	89.91	90.07	6,954.09	901.54	4,402.59	4,452.17	0.00	0.00	0.00	
11,100.00	89.91	90.07	6,954.24	901.43	4,502.59	4,551.95	0.00	0.00	0.00	
11,200.00	89.91	90.07	6,954.39	901.31	4,602.59	4,651.73	0.00	0.00	0.00	
11,300.00	89.91	90.07	6,954.54	901.20	4,702.59	4,751.50	0.00	0.00	0.00	
11,400.00	89.91	90.07	6,954.70	901.08	4,802.59	4,851.28	0.00	0.00	0.00	
11,500.00	89.91	90.07	6,954.85	900.97	4,902.59	4,951.06	0.00	0.00	0.00	
11,600.00	89.91	90.07	6,955.00	900.85	5,002.59	5,050.84	0.00	0.00	0.00	
11,700.00	89.91	90.07	6,955.15	900.74	5,102.59	5,150.61	0.00	0.00	0.00	
11,800.00	89.91	90.07	6,955.30	900.63	5,202.59	5,250.39	0.00	0.00	0.00	
11,900.00	89.91	90.07	6,955.45	900.51	5,302.59	5,350.17	0.00	0.00	0.00	
12,000.00	89.91	90.07	6,955.60	900.40	5,402.59	5,449.95	0.00	0.00	0.00	
12,100.00	89.91	90.07	6,955.76	900.28	5,502.59	5,549.73	0.00	0.00	0.00	
12,200.00	89.91	90.07	6,955.91	900.17	5,602.59	5,649.50	0.00	0.00	0.00	
12,300.00	89.91	90.07	6,956.06	900.05	5,702.59	5,749.28	0.00	0.00	0.00	
12,400.00	89.91	90.07	6,956.21	899.94	5,802.59	5,849.06	0.00	0.00	0.00	
12,500.00	89.91	90.07	6,956.36	899.83	5,902.59	5,948.84	0.00	0.00	0.00	
12,600.00	89.91	90.07	6,956.51	899.71	6,002.59	6,048.61	0.00	0.00	0.00	
12,700.00	89.91	90.07	6,956.67	899.60	6,102.59	6,148.39	0.00	0.00	0.00	
12,800.00	89.91	90.07	6,956.82	899.48	6,202.59	6,248.17	0.00	0.00	0.00	
12,900.00	89.91	90.07	6,956.97	899.37	6,302.59	6,347.95	0.00	0.00	0.00	
13,000.00	89.91	90.07	6,957.12	899.25	6,402.59	6,447.73	0.00	0.00	0.00	
13,100.00	89.91	90.07	6,957.27	899.14	6,502.59	6,547.50	0.00	0.00	0.00	
13,200.00	89.91	90.07	6,957.42	899.03	6,602.59	6,647.28	0.00	0.00	0.00	
13,300.00	89.91	90.07	6,957.58	898.91	6,702.59	6,747.06	0.00	0.00	0.00	
13,400.00	89.91	90.07	6,957.73	898.80	6,802.59	6,846.84	0.00	0.00	0.00	
13,500.00	89.91	90.07	6,957.88	898.68	6,902.58	6,946.61	0.00	0.00	0.00	
13,600.00	89.91	90.07	6,958.03	898.57	7,002.58	7,046.39	0.00	0.00	0.00	
13,700.00	89.91	90.07	6,958.18	898.45	7,102.58	7,146.17	0.00	0.00	0.00	
13,800.00	89.91	90.07	6,958.33	898.34	7,202.58	7,245.95	0.00	0.00	0.00	
13,900.00	89.91	90.07	6,958.48	898.23	7,302.58	7,345.73	0.00	0.00	0.00	
14,000.00	89.91	90.07	6,958.64	898.11	7,402.58	7,445.50	0.00	0.00	0.00	
14,100.00	89.91	90.07	6,958.79	898.00	7,502.58	7,545.28	0.00	0.00	0.00	
14,200.00	89.91	90.07	6,958.94	897.88	7,602.58	7,645.06	0.00	0.00	0.00	
14,300.00	89.91	90.07	6,959.09	897.77	7,702.58	7,744.84	0.00	0.00	0.00	
14,400.00	89.91	90.07	6,959.24	897.65	7,802.58	7,844.61	0.00	0.00	0.00	
14,500.00	89.91	90.07	6,959.39	897.54	7,902.58	7,944.39	0.00	0.00	0.00	
14,600.00	89.91	90.07	6,959.55	897.43	8,002.58	8,044.17	0.00	0.00	0.00	
14,700.00	89.91	90.07	6,959.70	897.31	8,102.58	8,143.95	0.00	0.00	0.00	
14,800.00	89.91	90.07	6,959.85	897.20	8,202.58	8,243.73	0.00	0.00	0.00	
14,900.00	89.91	90.07	6,960.00	897.08	8,302.58	8,343.50	0.00	0.00	0.00	



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 645H - Slot B8
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 645H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #5		

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)
15,000.00	89.91	90.07	6,960.15	896.97	8,402.58	8,443.28	0.00	0.00	0.00
15,100.00	89.91	90.07	6,960.30	896.85	8,502.58	8,543.06	0.00	0.00	0.00
15,200.00	89.91	90.07	6,960.46	896.74	8,602.58	8,642.84	0.00	0.00	0.00
15,300.00	89.91	90.07	6,960.61	896.63	8,702.58	8,742.61	0.00	0.00	0.00
15,400.00	89.91	90.07	6,960.76	896.51	8,802.58	8,842.39	0.00	0.00	0.00
15,500.00	89.91	90.07	6,960.91	896.40	8,902.58	8,942.17	0.00	0.00	0.00
15,600.00	89.91	90.07	6,961.06	896.28	9,002.58	9,041.95	0.00	0.00	0.00
15,700.00	89.91	90.07	6,961.21	896.17	9,102.58	9,141.73	0.00	0.00	0.00
15,800.00	89.91	90.07	6,961.36	896.05	9,202.58	9,241.50	0.00	0.00	0.00
15,900.00	89.91	90.07	6,961.52	895.94	9,302.58	9,341.28	0.00	0.00	0.00
16,000.00	89.91	90.07	6,961.67	895.83	9,402.58	9,441.06	0.00	0.00	0.00
16,100.00	89.91	90.07	6,961.82	895.71	9,502.58	9,540.84	0.00	0.00	0.00
16,200.00	89.91	90.07	6,961.97	895.60	9,602.58	9,640.61	0.00	0.00	0.00
16,300.00	89.91	90.07	6,962.12	895.48	9,702.58	9,740.39	0.00	0.00	0.00
16,400.00	89.91	90.07	6,962.27	895.37	9,802.58	9,840.17	0.00	0.00	0.00
16,500.00	89.91	90.07	6,962.43	895.25	9,902.58	9,939.95	0.00	0.00	0.00
16,600.00	89.91	90.07	6,962.58	895.14	10,002.58	10,039.72	0.00	0.00	0.00
16,700.00	89.91	90.07	6,962.73	895.03	10,102.58	10,139.50	0.00	0.00	0.00
16,800.00	89.91	90.07	6,962.88	894.91	10,202.58	10,239.28	0.00	0.00	0.00
16,900.00	89.91	90.07	6,963.03	894.80	10,302.58	10,339.06	0.00	0.00	0.00
17,000.00	89.91	90.07	6,963.18	894.68	10,402.58	10,438.84	0.00	0.00	0.00
17,100.00	89.91	90.07	6,963.34	894.57	10,502.58	10,538.61	0.00	0.00	0.00
17,200.00	89.91	90.07	6,963.49	894.45	10,602.58	10,638.39	0.00	0.00	0.00
17,300.00	89.91	90.07	6,963.64	894.34	10,702.58	10,738.17	0.00	0.00	0.00
17,400.00	89.91	90.07	6,963.79	894.23	10,802.58	10,837.95	0.00	0.00	0.00
17,500.00	89.91	90.07	6,963.94	894.11	10,902.58	10,937.72	0.00	0.00	0.00
17,600.00	89.91	90.07	6,964.09	894.00	11,002.58	11,037.50	0.00	0.00	0.00
17,700.00	89.91	90.07	6,964.24	893.88	11,102.58	11,137.28	0.00	0.00	0.00
17,800.00	89.91	90.07	6,964.40	893.77	11,202.58	11,237.06	0.00	0.00	0.00
17,900.00	89.91	90.07	6,964.55	893.65	11,302.58	11,336.84	0.00	0.00	0.00
18,000.00	89.91	90.07	6,964.70	893.54	11,402.58	11,436.61	0.00	0.00	0.00
18,100.00	89.91	90.07	6,964.85	893.43	11,502.58	11,536.39	0.00	0.00	0.00
18,200.00	89.91	90.07	6,965.00	893.31	11,602.58	11,636.17	0.00	0.00	0.00
18,300.00	89.91	90.07	6,965.15	893.20	11,702.58	11,735.95	0.00	0.00	0.00
18,400.00	89.91	90.07	6,965.31	893.08	11,802.58	11,835.72	0.00	0.00	0.00
18,500.00	89.91	90.07	6,965.46	892.97	11,902.58	11,935.50	0.00	0.00	0.00
18,600.00	89.91	90.07	6,965.61	892.85	12,002.58	12,035.28	0.00	0.00	0.00
18,700.00	89.91	90.07	6,965.76	892.74	12,102.58	12,135.06	0.00	0.00	0.00
18,800.00	89.91	90.07	6,965.91	892.63	12,202.58	12,234.84	0.00	0.00	0.00
18,900.00	89.91	90.07	6,966.06	892.51	12,302.58	12,334.61	0.00	0.00	0.00
19,000.00	89.91	90.07	6,966.22	892.40	12,402.58	12,434.39	0.00	0.00	0.00
19,100.00	89.91	90.07	6,966.37	892.28	12,502.57	12,534.17	0.00	0.00	0.00
19,200.00	89.91	90.07	6,966.52	892.17	12,602.57	12,633.95	0.00	0.00	0.00
19,300.00	89.91	90.07	6,966.67	892.05	12,702.57	12,733.72	0.00	0.00	0.00
19,400.00	89.91	90.07	6,966.82	891.94	12,802.57	12,833.50	0.00	0.00	0.00
19,500.00	89.91	90.07	6,966.97	891.83	12,902.57	12,933.28	0.00	0.00	0.00
19,600.00	89.91	90.07	6,967.12	891.71	13,002.57	13,033.06	0.00	0.00	0.00
19,700.00	89.91	90.07	6,967.28	891.60	13,102.57	13,132.84	0.00	0.00	0.00
19,800.00	89.91	90.07	6,967.43	891.48	13,202.57	13,232.61	0.00	0.00	0.00
19,900.00	89.91	90.07	6,967.58	891.37	13,302.57	13,332.39	0.00	0.00	0.00
20,000.00	89.91	90.07	6,967.73	891.25	13,402.57	13,432.17	0.00	0.00	0.00
20,100.00	89.91	90.07	6,967.88	891.14	13,502.57	13,531.95	0.00	0.00	0.00



Lonestar Consulting, LLC Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 645H - Slot B8
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 645H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #5		

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)
20,177.43	89.91	90.07	6,968.00	891.05	13,580.00	13,609.20	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
645H POE Rev 3 - plan hits target center - Point	0.00	0.00	6,947.00	890.20	782.80	2,144,363.86	2,848,739.35	36.8921846	-107.4036521
645H BHL Rev 3 - plan hits target center - Point	0.00	0.00	6,968.00	891.05	13,580.00	2,144,421.97	2,861,536.39	36.8921779	-107.3598900

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,403.34	2,385.00	Ojo Alamo		0.00	0.00	
2,549.96	2,530.00	Kirtland		0.00	0.00	
3,060.56	3,035.00	Fruitland		0.00	0.00	
3,378.05	3,349.00	Pictured Cliffs		0.00	0.00	
3,493.32	3,463.00	Lewis		0.00	0.00	
4,610.59	4,568.00	Chacra		0.00	0.00	
5,418.37	5,367.00	Cliff House		0.00	0.00	
5,465.81	5,414.00	Menefee		0.00	0.00	
5,695.58	5,642.00	Point Lookout		0.00	0.00	
6,194.73	6,139.00	Mancos		0.00	0.00	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
450.00	450.00	0.00	0.00	Start Build 2.00	
875.00	873.44	30.95	5.69	Start 4425.00 hold at 875.00 MD	
5,300.00	5,249.84	674.22	123.99	Start DLS 0.50 TFO 180.00	
6,200.00	6,144.26	770.56	141.70	Start 185.00 hold at 6200.00 MD	
6,385.00	6,328.81	783.25	144.04	Start DLS 9.07 TFO 73.79	
7,357.18	6,946.73	887.89	760.42	Start 22.50 hold at 7357.18 MD	
7,379.68	6,947.00	890.20	782.80	Start DLS 2.00 TFO 84.13	
7,678.42	6,949.05	905.34	1,081.02	Start 12499.01 hold at 7678.42 MD	
20,177.43	6,968.00	891.05	13,580.00	TD at 20177.43	

Well Name: ROSA UNIT	Well Location: T31N / R5W / SEC 19 / NENW / 36.889712 / -107.406179	County or Parish/State: RIO ARRIBA / NM
Well Number: 645H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF078764	Unit or CA Name: ROSA UNIT-MANCOS PA	Unit or CA Number: NMNM78407E
US Well Number: 300393141500X1	Well Status: Temporarily Abandoned	Operator: LOGOS OPERATING LLC

Notice of Intent

Sundry ID: 2685019

Type of Submission: Notice of Intent Type of Action: Other

Date Sundry Submitted: 08/01/2022 Time Sundry Submitted: 02:59

Date proposed operation will begin: 08/02/2022

Procedure Description: LOGOS Operating LLC, request a change in plans below: Original bottom-hole location from 52' FNL & 2320' FWL to new bottom-hole location 45' FNL & 362' FEL Original TD @ 17,598' MD 6965' TVD to new TD @ 20,177 MD 6968' TVD Geology tops have been updated per changes. Original KOP @ 6406' MD 6348' TVD to new KOP @ 6385' MD 6329' TVD Original Landing Point @ 7398' MD 6970' TVD to new Landing Point @ 7380' MD 6947' TVD Original Intermediate casing 9.625" set depth @ 6268' MD 6211' TVD to new casing depth 6270' MD 6211' TVD Original Production casing 5.5" set depth @ 17,598' MD 6965' TVD to new casing depth @ 20,177' MD 6968' TVD New 9.625" Intermediate & 5.5" Production cementing, grade and weight have been update per casing depth changes. Attached: New C102, Operation and Directional Drill plans.

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

3160_5_Rosa_Unit_645H_Change_in_Plans__INT_PROD_20220801_20220801145837.pdf

Well Name: ROSA UNIT	Well Location: T31N / R5W / SEC 19 / NENW / 36.889712 / -107.406179	County or Parish/State: RIO ARRIBA / NM
Well Number: 645H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF078764	Unit or CA Name: ROSA UNIT-MANCOS PA	Unit or CA Number: NMNM78407E
US Well Number: 300393141500X1	Well Status: Temporarily Abandoned	Operator: LOGOS OPERATING LLC

Operator

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a

Operator Electronic Signature: ETTA TRUJILLO	Signed on: AUG 01, 2022 02:59 PM
Name: LOGOS OPERATING LLC	
Title: Regulatory Specialist	
Street Address: 2010 AFTON PLACE	
City: Farmington	State: NM
Phone: (505) 324-4154	
Email address: ETRUJILLO@LOGOSRESOURCESLLC.COM	

Field

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

BLM Point of Contact

BLM POC Name: KENNETH G RENNICK	BLM POC Title: Petroleum Engineer
BLM POC Phone: 5055647742	BLM POC Email Address: krennick@blm.gov
Disposition: Approved	Disposition Date: 08/02/2022
Signature: Kenneth Rennick	

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 130754

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 130754
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Adhere to previous NMOCD Conditions of Approval	8/4/2022