

Form 3160-5  
(June 2019)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

FORM 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.	NMSF078764
6. If Indian, Allottee or Tribe Name	

**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		7. If Unit of CA/Agreement, Name and/or No. NMNM78407E
2. Name of Operator LOGOS OPERATING LLC		8. Well Name and No. ROSA UNIT 645H
3a. Address 2010 AFTON PLACE FARMINGTON, NM 87401	3b. Phone No. (include area code) (505) 278-8720	9. API Well No. 30-039-31322
4. Location of Well (Footage, Sec., T.,R.,M., or Survey Description) SEC 19 T31N R05W NENW (C) 960 FNL 497 FWL		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				
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off	
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity	
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other	
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon		
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> 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 recomplete 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 recompletion 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.)  
LOGOS Operating is requesting a change for API number 30-039-31322 Rosa Unit 645Y to new 30-039-31415 Rosa Unit 645H as the new surface location of 960 FNL 497 FWL and change in plans.  
Attached: New C102, Operation and Directional Drill plans.

Original surface-hole location from 953' FNL & 468' FWL to **new surface-hole location 960' FNL & 497' FWL**

Original bottom-hole location from 73' FNL & 1930' FWL to **new bottom-hole location 52' FNL & 2320' FWL**

Original TD @ 18,121' MD 6920' TVD to **new TD @ 17,598' MD 6965' TVD.**

Geology tops have been updated per changes.

Original KOP @ 6336' MD 6236' TVD to **new KOP @ 6406' MD 6348' TVD**

Original Landing point @ 7560' MD 7035' TVD to **new Landing point @ 7398' MD 6970' TVD**

Original 12.25" OH size, 9.625" Surface casing @ 320' to **new 17.5" OH size, 13.375" casing @ 320' MD**

Original 8.75" OH size, 7" Intermediate casing @ 6336' MD to **new 12.25" OH size, 9.625" casing @ 6268' MD 6211' TVD**

Original 6.125" OH size, 4.5" Production liner @ 18,121' MD to **new 8.5" OH size, 5.5" casing @ 17,598' MD 6965' TVD**

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

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed) Etta Trujillo	Title Regulatory Specialist
Signature <i>Etta Trujillo</i>	Date 02/11/2022

**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

State of New Mexico  
Energy, Minerals & Natural Resources Department

Form C-102  
Revised August 1, 2011

Submit one copy to  
Appropriate District Office

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

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

AMENDED REPORT

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

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* 12/21/2021  
Signature Date  
Etta Trujillo  
Printed Name  
etrujillo@logosresourcesllc.com  
E-mail Address

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-039-31415		2 Pool Code 97232		3 Pool Name BASIN MANCOS	
4 Property Code 320608		5 Property Name ROSA UNIT		6 Well Number 645H	
7 OGRID 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	960	NORTH	497	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
C	21	31N	5W		52	NORTH	2320	WEST	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		

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: DECEMBER 17, 2021  
Survey Date: JANUARY 2, 2015  
Signature and Seal of Professional Surveyor



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

SURFACE LOCATION  
960' FNL 497' FWL  
SECTION 19, T31N, R5W  
LAT: 36.889688°N  
LONG: 107.405476°W  
DATUM: NAD1927

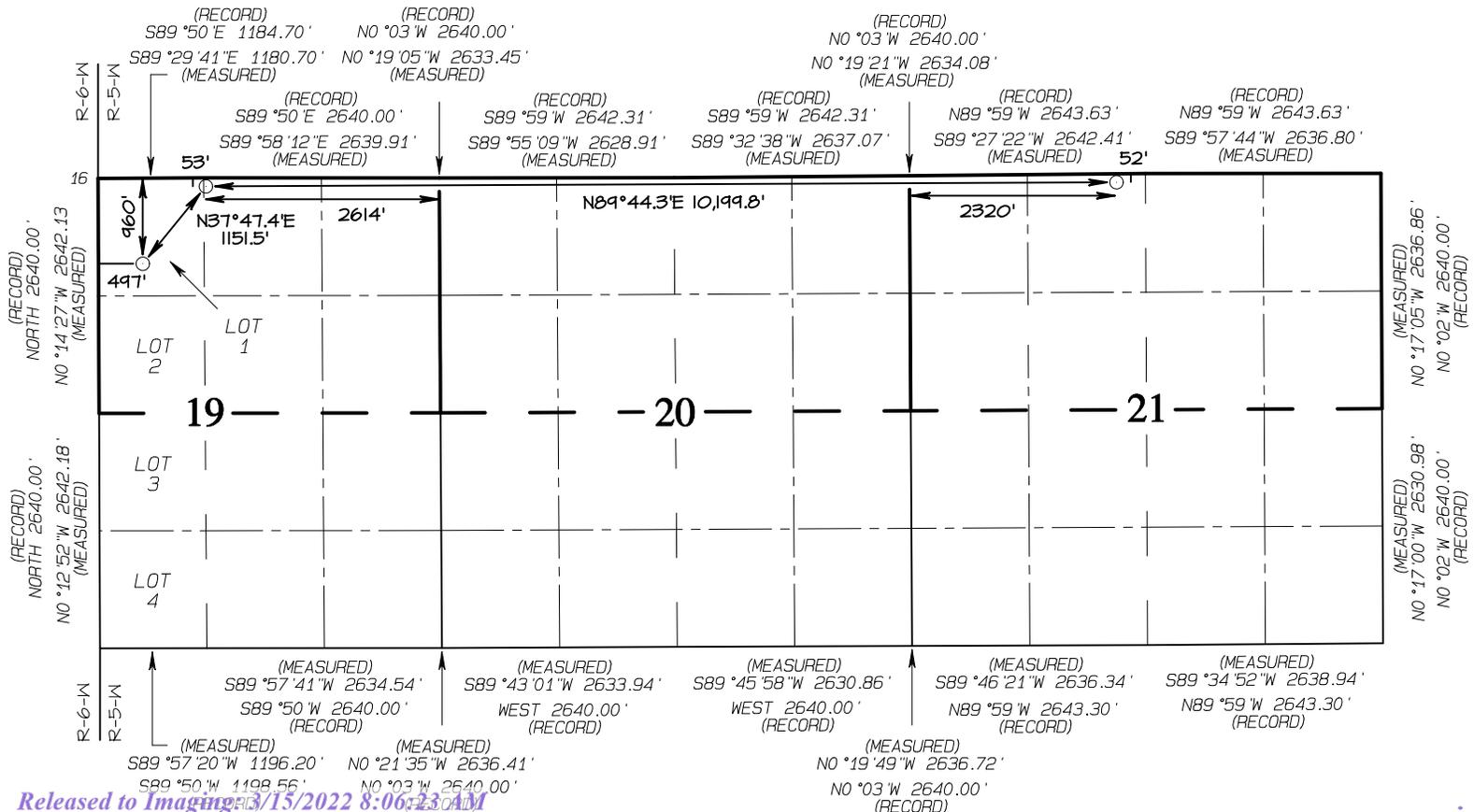
FIRST TAKE POINT  
53' FNL 2614' FWL  
SECTION 19, T31N, R5W  
LAT: 36.892179°N  
LONG: 107.403049°W  
DATUM: NAD1927

LAST TAKE POINT  
52' FNL 2320' FWL  
SECTION 21, T31N, R5W  
LAT: 36.892175°N  
LONG: 107.368170°W  
DATUM: NAD1927

LAT: 36.889694°N  
LONG: 107.406079°W  
DATUM: NAD1983

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

LAT: 36.892181°N  
LONG: 107.368772°W  
DATUM: NAD1983





Company: Logos Operating LLC  
 Project: Rio Arriba, NM NAD83  
 Site: Rosa Unit 27  
 Well: Rosa Unit 645H  
 Wellbore: OH  
 Design: Plan #2

**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 25' @ 6330.00ft  
 +N/-S 0.00 +E/-W 0.00 Northing 2143453.89 Easting 2848033.75 Latitude 36.8896939 Longitude -107.4060789 B3

Plan: Plan #2 (Rosa Unit 645H/OH)

Created By: Janie Collins Date: 16:30, November 19 2021



Azimuths to True North:  
 Magnetic North: 8.82°

Magnetic Field  
 Strength: 49683  
 Dip Angle: 63.82°  
 Date: 6/14/2021  
 Model: HDGM2021\_F1-E

**DESIGN TARGET DETAILS**

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
645H POE Rev 1	6970.00	906.80	709.67	2144363.86	2848739.35	36.8921847	-107.4036521
645H BHL Rev 1	6965.00	907.63	10909.52	2144410.35	2858939.07	36.8921811	-107.3687720

**SECTION DETAILS**

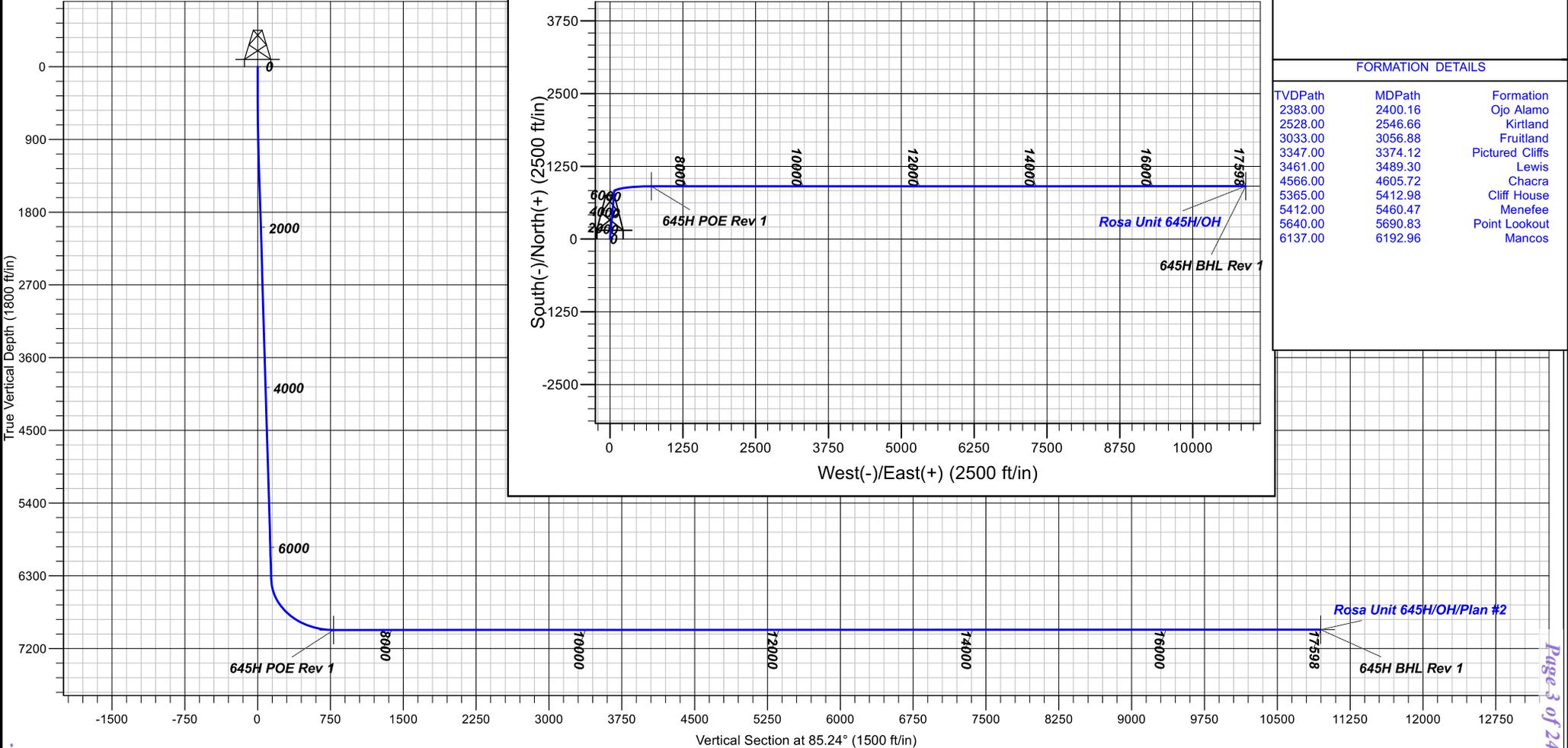
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00
860.16	8.20	5.09	858.76	29.20	2.60	2.00	5.09	5.01
6405.98	8.20	5.09	6347.83	817.37	72.80	0.00	0.00	140.31
7398.22	90.03	90.00	6970.00	906.80	709.67	9.00	84.95	782.41
17598.07	90.03	90.00	6965.00	907.63	10909.52	0.00	0.00	10947.21

**CASING DETAILS**

No casing data is available

**FORMATION DETAILS**

TVDPath	MDPath	Formation
2383.00	2400.16	Ojo Alamo
2528.00	2546.66	Kirtland
3033.00	3056.88	Fruitland
3347.00	3374.12	Pictured Cliffs
3461.00	3489.30	Lewis
4566.00	4605.72	Chacra
5365.00	5412.98	Cliff House
5412.00	5460.47	Menefee
5640.00	5690.83	Point Lookout
6137.00	6192.96	Mancos



Released to Imaging: 3/15/2022 8:06:23 AM

Received by OCD: 11/19/21 5:10 PM

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## **Logos Operating LLC**

**Rio Arriba, NM NAD83**

**Rosa Unit 27**

**Rosa Unit 645H - Slot B3**

**OH**

**Plan: Plan #2**

## **Standard Planning Report**

**19 November, 2021**





Lonestar Consulting, LLC

Planning Report



<b>Database:</b>	Grand Junction	<b>Local Co-ordinate Reference</b>	Well Rosa Unit 645H - Slot B3
<b>Company:</b>	Logos Operating LLC	<b>TVD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Project:</b>	Rio Arriba, NM NAD83	<b>MD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Site:</b>	Rosa Unit 27	<b>North Reference:</b>	True
<b>Well:</b>	Rosa Unit 645H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

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

<b>Site</b>	Rosa Unit 27				
<b>Site Position:</b>		<b>Northing:</b>	2,143,451.58 usft	<b>Latitude:</b>	36.8896880
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,848,002.44 usft	<b>Longitude:</b>	-107.4061860
<b>Position Uncertainty:</b>	0.00 ft	<b>Slot Radius:</b>	13.200 in	<b>Grid Convergence:</b>	0.26 °

<b>Well</b>	Rosa Unit 645H - Slot B3					
<b>Well Position</b>	<b>+N/-S</b>	2.17 ft	<b>Northing:</b>	2,143,453.89 usft	<b>Latitude:</b>	36.8896939
	<b>+E/-W</b>	31.32 ft	<b>Easting:</b>	2,848,033.75 usft	<b>Longitude:</b>	-107.4060790
<b>Position Uncertainty</b>		0.00 ft	<b>Wellhead Elevation:</b>		<b>Ground Level:</b>	6,305.00 ft

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

<b>Design</b>	Plan #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Direction</b>
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	85.24

<b>Plan Survey Tool Program</b>	<b>Date</b>	11/19/2021		
<b>Depth From</b>	<b>Depth To</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>
(ft)	(ft)			
1	0.00	17,598.07 Plan #2 (OH)	MWD+HDGM	
			OWSG MWD + HDGM	

<b>Plan Sections</b>										
<b>Measured</b>	<b>Inclination</b>	<b>Azimuth</b>	<b>Vertical</b>	<b>+N/-S</b>	<b>+E/-W</b>	<b>Dogleg</b>	<b>Build</b>	<b>Turn</b>	<b>TFO</b>	<b>Target</b>
<b>Depth</b>	<b>(°)</b>	<b>(°)</b>	<b>Depth</b>	<b>(ft)</b>	<b>(ft)</b>	<b>Rate</b>	<b>Rate</b>	<b>Rate</b>	<b>(°)</b>	
(ft)			(ft)			(°/100ft)	(°/100ft)	(°/100ft)		
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	
860.16	8.20	5.09	858.76	29.20	2.60	2.00	2.00	0.00	5.09	
6,405.98	8.20	5.09	6,347.83	817.37	72.80	0.00	0.00	0.00	0.00	
7,398.22	90.03	90.00	6,970.00	906.80	709.67	9.00	8.25	8.56	84.95	645H POE Rev 1
17,598.07	90.03	90.00	6,965.00	907.63	10,909.52	0.00	0.00	0.00	0.00	645H BHL Rev 1



Lonestar Consulting, LLC

Planning Report



<b>Database:</b>	Grand Junction	<b>Local Co-ordinate Reference</b>	Well Rosa Unit 645H - Slot B3
<b>Company:</b>	Logos Operating LLC	<b>TVD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Project:</b>	Rio Arriba, NM NAD83	<b>MD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Site:</b>	Rosa Unit 27	<b>North Reference:</b>	True
<b>Well:</b>	Rosa Unit 645H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

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	5.09	500.00	0.43	0.04	0.07	2.00	2.00	0.00	
600.00	3.00	5.09	599.93	3.91	0.35	0.67	2.00	2.00	0.00	
700.00	5.00	5.09	699.68	10.86	0.97	1.86	2.00	2.00	0.00	
800.00	7.00	5.09	799.13	21.27	1.89	3.65	2.00	2.00	0.00	
860.16	8.20	5.09	858.76	29.20	2.60	5.01	2.00	2.00	0.00	
900.00	8.20	5.09	898.19	34.86	3.10	5.98	0.00	0.00	0.00	
1,000.00	8.20	5.09	997.17	49.07	4.37	8.42	0.00	0.00	0.00	
1,100.00	8.20	5.09	1,096.15	63.28	5.64	10.86	0.00	0.00	0.00	
1,200.00	8.20	5.09	1,195.12	77.49	6.90	13.30	0.00	0.00	0.00	
1,300.00	8.20	5.09	1,294.10	91.71	8.17	15.74	0.00	0.00	0.00	
1,400.00	8.20	5.09	1,393.08	105.92	9.43	18.18	0.00	0.00	0.00	
1,500.00	8.20	5.09	1,492.05	120.13	10.70	20.62	0.00	0.00	0.00	
1,600.00	8.20	5.09	1,591.03	134.34	11.96	23.06	0.00	0.00	0.00	
1,700.00	8.20	5.09	1,690.01	148.55	13.23	25.50	0.00	0.00	0.00	
1,800.00	8.20	5.09	1,788.98	162.77	14.50	27.94	0.00	0.00	0.00	
1,900.00	8.20	5.09	1,887.96	176.98	15.76	30.38	0.00	0.00	0.00	
2,000.00	8.20	5.09	1,986.94	191.19	17.03	32.82	0.00	0.00	0.00	
2,100.00	8.20	5.09	2,085.91	205.40	18.29	35.26	0.00	0.00	0.00	
2,200.00	8.20	5.09	2,184.89	219.62	19.56	37.70	0.00	0.00	0.00	
2,300.00	8.20	5.09	2,283.87	233.83	20.82	40.14	0.00	0.00	0.00	
2,400.00	8.20	5.09	2,382.85	248.04	22.09	42.58	0.00	0.00	0.00	
2,500.00	8.20	5.09	2,481.82	262.25	23.36	45.02	0.00	0.00	0.00	
2,600.00	8.20	5.09	2,580.80	276.46	24.62	47.46	0.00	0.00	0.00	
2,700.00	8.20	5.09	2,679.78	290.68	25.89	49.90	0.00	0.00	0.00	
2,800.00	8.20	5.09	2,778.75	304.89	27.15	52.34	0.00	0.00	0.00	
2,900.00	8.20	5.09	2,877.73	319.10	28.42	54.78	0.00	0.00	0.00	
3,000.00	8.20	5.09	2,976.71	333.31	29.68	57.22	0.00	0.00	0.00	
3,100.00	8.20	5.09	3,075.68	347.52	30.95	59.66	0.00	0.00	0.00	
3,200.00	8.20	5.09	3,174.66	361.74	32.22	62.10	0.00	0.00	0.00	
3,300.00	8.20	5.09	3,273.64	375.95	33.48	64.54	0.00	0.00	0.00	
3,400.00	8.20	5.09	3,372.61	390.16	34.75	66.98	0.00	0.00	0.00	
3,500.00	8.20	5.09	3,471.59	404.37	36.01	69.42	0.00	0.00	0.00	
3,600.00	8.20	5.09	3,570.57	418.58	37.28	71.86	0.00	0.00	0.00	
3,700.00	8.20	5.09	3,669.54	432.80	38.55	74.30	0.00	0.00	0.00	
3,800.00	8.20	5.09	3,768.52	447.01	39.81	76.74	0.00	0.00	0.00	
3,900.00	8.20	5.09	3,867.50	461.22	41.08	79.17	0.00	0.00	0.00	
4,000.00	8.20	5.09	3,966.47	475.43	42.34	81.61	0.00	0.00	0.00	
4,100.00	8.20	5.09	4,065.45	489.64	43.61	84.05	0.00	0.00	0.00	
4,200.00	8.20	5.09	4,164.43	503.86	44.87	86.49	0.00	0.00	0.00	
4,300.00	8.20	5.09	4,263.41	518.07	46.14	88.93	0.00	0.00	0.00	
4,400.00	8.20	5.09	4,362.38	532.28	47.41	91.37	0.00	0.00	0.00	
4,500.00	8.20	5.09	4,461.36	546.49	48.67	93.81	0.00	0.00	0.00	
4,600.00	8.20	5.09	4,560.34	560.70	49.94	96.25	0.00	0.00	0.00	
4,700.00	8.20	5.09	4,659.31	574.92	51.20	98.69	0.00	0.00	0.00	
4,800.00	8.20	5.09	4,758.29	589.13	52.47	101.13	0.00	0.00	0.00	
4,900.00	8.20	5.09	4,857.27	603.34	53.73	103.57	0.00	0.00	0.00	
5,000.00	8.20	5.09	4,956.24	617.55	55.00	106.01	0.00	0.00	0.00	



Lonestar Consulting, LLC

Planning Report



<b>Database:</b>	Grand Junction	<b>Local Co-ordinate Reference</b>	Well Rosa Unit 645H - Slot B3
<b>Company:</b>	Logos Operating LLC	<b>TVD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Project:</b>	Rio Arriba, NM NAD83	<b>MD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Site:</b>	Rosa Unit 27	<b>North Reference:</b>	True
<b>Well:</b>	Rosa Unit 645H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

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)	
5,100.00	8.20	5.09	5,055.22	631.77	56.27	108.45	0.00	0.00	0.00	
5,200.00	8.20	5.09	5,154.20	645.98	57.53	110.89	0.00	0.00	0.00	
5,300.00	8.20	5.09	5,253.17	660.19	58.80	113.33	0.00	0.00	0.00	
5,400.00	8.20	5.09	5,352.15	674.40	60.06	115.77	0.00	0.00	0.00	
5,500.00	8.20	5.09	5,451.13	688.61	61.33	118.21	0.00	0.00	0.00	
5,600.00	8.20	5.09	5,550.10	702.83	62.59	120.65	0.00	0.00	0.00	
5,700.00	8.20	5.09	5,649.08	717.04	63.86	123.09	0.00	0.00	0.00	
5,800.00	8.20	5.09	5,748.06	731.25	65.13	125.53	0.00	0.00	0.00	
5,900.00	8.20	5.09	5,847.03	745.46	66.39	127.97	0.00	0.00	0.00	
6,000.00	8.20	5.09	5,946.01	759.67	67.66	130.41	0.00	0.00	0.00	
6,100.00	8.20	5.09	6,044.99	773.89	68.92	132.85	0.00	0.00	0.00	
6,200.00	8.20	5.09	6,143.97	788.10	70.19	135.29	0.00	0.00	0.00	
6,300.00	8.20	5.09	6,242.94	802.31	71.45	137.73	0.00	0.00	0.00	
6,400.00	8.20	5.09	6,341.92	816.52	72.72	140.17	0.00	0.00	0.00	
6,405.98	8.20	5.09	6,347.83	817.37	72.80	140.31	0.00	0.00	0.00	
6,500.00	12.27	48.69	6,440.47	830.67	80.91	149.50	9.00	4.33	46.37	
6,600.00	19.88	66.60	6,536.55	844.47	104.55	174.20	9.00	7.61	17.91	
6,700.00	28.30	74.53	6,627.78	857.58	143.08	213.69	9.00	8.42	7.93	
6,800.00	36.98	79.00	6,711.92	869.67	195.56	266.99	9.00	8.68	4.47	
6,900.00	45.76	81.95	6,786.90	880.44	260.68	332.78	9.00	8.79	2.96	
7,000.00	54.61	84.14	6,850.87	889.64	336.86	409.46	9.00	8.84	2.18	
7,100.00	63.48	85.88	6,902.26	897.03	422.20	495.12	9.00	8.87	1.75	
7,200.00	72.38	87.38	6,939.80	902.44	514.62	587.67	9.00	8.89	1.49	
7,300.00	81.28	88.73	6,962.56	905.72	611.83	684.82	9.00	8.90	1.35	
7,398.22	90.03	90.00	6,970.00	906.80	709.67	782.41	9.00	8.91	1.29	
7,400.00	90.03	90.00	6,970.00	906.80	711.45	784.18	0.00	0.00	0.00	
7,500.00	90.03	90.00	6,969.95	906.81	811.45	883.84	0.00	0.00	0.00	
7,600.00	90.03	90.00	6,969.90	906.82	911.45	983.49	0.00	0.00	0.00	
7,700.00	90.03	90.00	6,969.85	906.83	1,011.45	1,083.15	0.00	0.00	0.00	
7,800.00	90.03	90.00	6,969.80	906.84	1,111.45	1,182.81	0.00	0.00	0.00	
7,900.00	90.03	90.00	6,969.75	906.84	1,211.45	1,282.46	0.00	0.00	0.00	
8,000.00	90.03	90.00	6,969.70	906.85	1,311.45	1,382.12	0.00	0.00	0.00	
8,100.00	90.03	90.00	6,969.65	906.86	1,411.45	1,481.78	0.00	0.00	0.00	
8,200.00	90.03	90.00	6,969.60	906.87	1,511.45	1,581.43	0.00	0.00	0.00	
8,300.00	90.03	90.00	6,969.55	906.88	1,611.45	1,681.09	0.00	0.00	0.00	
8,400.00	90.03	90.00	6,969.50	906.88	1,711.45	1,780.74	0.00	0.00	0.00	
8,500.00	90.03	90.00	6,969.45	906.89	1,811.45	1,880.40	0.00	0.00	0.00	
8,600.00	90.03	90.00	6,969.40	906.90	1,911.45	1,980.06	0.00	0.00	0.00	
8,700.00	90.03	90.00	6,969.35	906.91	2,011.45	2,079.71	0.00	0.00	0.00	
8,800.00	90.03	90.00	6,969.30	906.92	2,111.45	2,179.37	0.00	0.00	0.00	
8,900.00	90.03	90.00	6,969.25	906.93	2,211.45	2,279.03	0.00	0.00	0.00	
9,000.00	90.03	90.00	6,969.20	906.93	2,311.45	2,378.68	0.00	0.00	0.00	
9,100.00	90.03	90.00	6,969.15	906.94	2,411.45	2,478.34	0.00	0.00	0.00	
9,200.00	90.03	90.00	6,969.10	906.95	2,511.45	2,578.00	0.00	0.00	0.00	
9,300.00	90.03	90.00	6,969.05	906.96	2,611.45	2,677.65	0.00	0.00	0.00	
9,400.00	90.03	90.00	6,969.00	906.97	2,711.45	2,777.31	0.00	0.00	0.00	
9,500.00	90.03	90.00	6,968.95	906.97	2,811.45	2,876.96	0.00	0.00	0.00	
9,600.00	90.03	90.00	6,968.90	906.98	2,911.45	2,976.62	0.00	0.00	0.00	
9,700.00	90.03	90.00	6,968.85	906.99	3,011.45	3,076.28	0.00	0.00	0.00	
9,800.00	90.03	90.00	6,968.80	907.00	3,111.45	3,175.93	0.00	0.00	0.00	
9,900.00	90.03	90.00	6,968.76	907.01	3,211.45	3,275.59	0.00	0.00	0.00	
10,000.00	90.03	90.00	6,968.71	907.01	3,311.45	3,375.25	0.00	0.00	0.00	
10,100.00	90.03	90.00	6,968.66	907.02	3,411.45	3,474.90	0.00	0.00	0.00	



**Lonestar Consulting, LLC**

Planning Report



<b>Database:</b>	Grand Junction	<b>Local Co-ordinate Reference</b>	Well Rosa Unit 645H - Slot B3
<b>Company:</b>	Logos Operating LLC	<b>TVD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Project:</b>	Rio Arriba, NM NAD83	<b>MD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Site:</b>	Rosa Unit 27	<b>North Reference:</b>	True
<b>Well:</b>	Rosa Unit 645H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

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)	
10,200.00	90.03	90.00	6,968.61	907.03	3,511.45	3,574.56	0.00	0.00	0.00	
10,300.00	90.03	90.00	6,968.56	907.04	3,611.45	3,674.22	0.00	0.00	0.00	
10,400.00	90.03	90.00	6,968.51	907.05	3,711.45	3,773.87	0.00	0.00	0.00	
10,500.00	90.03	90.00	6,968.46	907.06	3,811.45	3,873.53	0.00	0.00	0.00	
10,600.00	90.03	90.00	6,968.41	907.06	3,911.45	3,973.18	0.00	0.00	0.00	
10,700.00	90.03	90.00	6,968.36	907.07	4,011.45	4,072.84	0.00	0.00	0.00	
10,800.00	90.03	90.00	6,968.31	907.08	4,111.45	4,172.50	0.00	0.00	0.00	
10,900.00	90.03	90.00	6,968.26	907.09	4,211.45	4,272.15	0.00	0.00	0.00	
11,000.00	90.03	90.00	6,968.21	907.10	4,311.45	4,371.81	0.00	0.00	0.00	
11,100.00	90.03	90.00	6,968.16	907.10	4,411.45	4,471.47	0.00	0.00	0.00	
11,200.00	90.03	90.00	6,968.11	907.11	4,511.45	4,571.12	0.00	0.00	0.00	
11,300.00	90.03	90.00	6,968.06	907.12	4,611.45	4,670.78	0.00	0.00	0.00	
11,400.00	90.03	90.00	6,968.01	907.13	4,711.45	4,770.44	0.00	0.00	0.00	
11,500.00	90.03	90.00	6,967.96	907.14	4,811.45	4,870.09	0.00	0.00	0.00	
11,600.00	90.03	90.00	6,967.91	907.14	4,911.45	4,969.75	0.00	0.00	0.00	
11,700.00	90.03	90.00	6,967.86	907.15	5,011.45	5,069.40	0.00	0.00	0.00	
11,800.00	90.03	90.00	6,967.81	907.16	5,111.45	5,169.06	0.00	0.00	0.00	
11,900.00	90.03	90.00	6,967.76	907.17	5,211.45	5,268.72	0.00	0.00	0.00	
12,000.00	90.03	90.00	6,967.71	907.18	5,311.45	5,368.37	0.00	0.00	0.00	
12,100.00	90.03	90.00	6,967.66	907.18	5,411.45	5,468.03	0.00	0.00	0.00	
12,200.00	90.03	90.00	6,967.61	907.19	5,511.45	5,567.69	0.00	0.00	0.00	
12,300.00	90.03	90.00	6,967.56	907.20	5,611.45	5,667.34	0.00	0.00	0.00	
12,400.00	90.03	90.00	6,967.51	907.21	5,711.45	5,767.00	0.00	0.00	0.00	
12,500.00	90.03	90.00	6,967.46	907.22	5,811.45	5,866.66	0.00	0.00	0.00	
12,600.00	90.03	90.00	6,967.41	907.23	5,911.45	5,966.31	0.00	0.00	0.00	
12,700.00	90.03	90.00	6,967.36	907.23	6,011.45	6,065.97	0.00	0.00	0.00	
12,800.00	90.03	90.00	6,967.31	907.24	6,111.45	6,165.62	0.00	0.00	0.00	
12,900.00	90.03	90.00	6,967.26	907.25	6,211.45	6,265.28	0.00	0.00	0.00	
13,000.00	90.03	90.00	6,967.21	907.26	6,311.45	6,364.94	0.00	0.00	0.00	
13,100.00	90.03	90.00	6,967.16	907.27	6,411.45	6,464.59	0.00	0.00	0.00	
13,200.00	90.03	90.00	6,967.11	907.27	6,511.45	6,564.25	0.00	0.00	0.00	
13,300.00	90.03	90.00	6,967.06	907.28	6,611.45	6,663.91	0.00	0.00	0.00	
13,400.00	90.03	90.00	6,967.01	907.29	6,711.45	6,763.56	0.00	0.00	0.00	
13,500.00	90.03	90.00	6,966.96	907.30	6,811.45	6,863.22	0.00	0.00	0.00	
13,600.00	90.03	90.00	6,966.91	907.31	6,911.45	6,962.88	0.00	0.00	0.00	
13,700.00	90.03	90.00	6,966.86	907.31	7,011.45	7,062.53	0.00	0.00	0.00	
13,800.00	90.03	90.00	6,966.81	907.32	7,111.45	7,162.19	0.00	0.00	0.00	
13,900.00	90.03	90.00	6,966.76	907.33	7,211.45	7,261.84	0.00	0.00	0.00	
14,000.00	90.03	90.00	6,966.71	907.34	7,311.45	7,361.50	0.00	0.00	0.00	
14,100.00	90.03	90.00	6,966.66	907.35	7,411.45	7,461.16	0.00	0.00	0.00	
14,200.00	90.03	90.00	6,966.61	907.35	7,511.45	7,560.81	0.00	0.00	0.00	
14,300.00	90.03	90.00	6,966.57	907.36	7,611.45	7,660.47	0.00	0.00	0.00	
14,400.00	90.03	90.00	6,966.52	907.37	7,711.45	7,760.13	0.00	0.00	0.00	
14,500.00	90.03	90.00	6,966.47	907.38	7,811.45	7,859.78	0.00	0.00	0.00	
14,600.00	90.03	90.00	6,966.42	907.39	7,911.45	7,959.44	0.00	0.00	0.00	
14,700.00	90.03	90.00	6,966.37	907.40	8,011.45	8,059.10	0.00	0.00	0.00	
14,800.00	90.03	90.00	6,966.32	907.40	8,111.45	8,158.75	0.00	0.00	0.00	
14,900.00	90.03	90.00	6,966.27	907.41	8,211.45	8,258.41	0.00	0.00	0.00	
15,000.00	90.03	90.00	6,966.22	907.42	8,311.45	8,358.06	0.00	0.00	0.00	
15,100.00	90.03	90.00	6,966.17	907.43	8,411.45	8,457.72	0.00	0.00	0.00	
15,200.00	90.03	90.00	6,966.12	907.44	8,511.45	8,557.38	0.00	0.00	0.00	
15,300.00	90.03	90.00	6,966.07	907.44	8,611.45	8,657.03	0.00	0.00	0.00	
15,400.00	90.03	90.00	6,966.02	907.45	8,711.45	8,756.69	0.00	0.00	0.00	



**Lonestar Consulting, LLC**

Planning Report



<b>Database:</b>	Grand Junction	<b>Local Co-ordinate Reference</b>	Well Rosa Unit 645H - Slot B3
<b>Company:</b>	Logos Operating LLC	<b>TVD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Project:</b>	Rio Arriba, NM NAD83	<b>MD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Site:</b>	Rosa Unit 27	<b>North Reference:</b>	True
<b>Well:</b>	Rosa Unit 645H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

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)	
15,500.00	90.03	90.00	6,965.97	907.46	8,811.45	8,856.35	0.00	0.00	0.00	
15,600.00	90.03	90.00	6,965.92	907.47	8,911.45	8,956.00	0.00	0.00	0.00	
15,700.00	90.03	90.00	6,965.87	907.48	9,011.45	9,055.66	0.00	0.00	0.00	
15,800.00	90.03	90.00	6,965.82	907.48	9,111.45	9,155.32	0.00	0.00	0.00	
15,900.00	90.03	90.00	6,965.77	907.49	9,211.45	9,254.97	0.00	0.00	0.00	
16,000.00	90.03	90.00	6,965.72	907.50	9,311.45	9,354.63	0.00	0.00	0.00	
16,100.00	90.03	90.00	6,965.67	907.51	9,411.45	9,454.28	0.00	0.00	0.00	
16,200.00	90.03	90.00	6,965.62	907.52	9,511.45	9,553.94	0.00	0.00	0.00	
16,300.00	90.03	90.00	6,965.57	907.52	9,611.45	9,653.60	0.00	0.00	0.00	
16,400.00	90.03	90.00	6,965.52	907.53	9,711.45	9,753.25	0.00	0.00	0.00	
16,500.00	90.03	90.00	6,965.47	907.54	9,811.45	9,852.91	0.00	0.00	0.00	
16,600.00	90.03	90.00	6,965.42	907.55	9,911.45	9,952.57	0.00	0.00	0.00	
16,700.00	90.03	90.00	6,965.37	907.56	10,011.45	10,052.22	0.00	0.00	0.00	
16,800.00	90.03	90.00	6,965.32	907.57	10,111.45	10,151.88	0.00	0.00	0.00	
16,900.00	90.03	90.00	6,965.27	907.57	10,211.45	10,251.54	0.00	0.00	0.00	
17,000.00	90.03	90.00	6,965.22	907.58	10,311.45	10,351.19	0.00	0.00	0.00	
17,100.00	90.03	90.00	6,965.17	907.59	10,411.45	10,450.85	0.00	0.00	0.00	
17,200.00	90.03	90.00	6,965.12	907.60	10,511.45	10,550.50	0.00	0.00	0.00	
17,300.00	90.03	90.00	6,965.07	907.61	10,611.45	10,650.16	0.00	0.00	0.00	
17,400.00	90.03	90.00	6,965.02	907.61	10,711.45	10,749.82	0.00	0.00	0.00	
17,500.00	90.03	90.00	6,964.97	907.62	10,811.45	10,849.47	0.00	0.00	0.00	
17,598.07	90.03	90.00	6,965.00	907.63	10,909.52	10,947.21	0.00	0.00	0.00	

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
645H BHL Rev 1 - hit/miss target - Shape - Point	0.00	0.00	6,965.00	907.63	10,909.52	2,144,410.35	2,858,939.07	36.8921811	-107.3687720
645H POE Rev 1 - plan hits target center - Point	0.00	0.00	6,970.00	906.80	709.67	2,144,363.86	2,848,739.35	36.8921846	-107.4036521



**Lonestar Consulting, LLC**  
 Planning Report



<b>Database:</b>	Grand Junction	<b>Local Co-ordinate Reference</b>	Well Rosa Unit 645H - Slot B3
<b>Company:</b>	Logos Operating LLC	<b>TVD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Project:</b>	Rio Arriba, NM NAD83	<b>MD Reference:</b>	GL 6305' & RKB 25' @ 6330.00ft
<b>Site:</b>	Rosa Unit 27	<b>North Reference:</b>	True
<b>Well:</b>	Rosa Unit 645H	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH		
<b>Design:</b>	Plan #2		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,400.16	2,383.00	Ojo Alamo		0.00	0.00	
2,546.66	2,528.00	Kirtland		0.00	0.00	
3,056.88	3,033.00	Fruitland		0.00	0.00	
3,374.12	3,347.00	Pictured Cliffs		0.00	0.00	
3,489.30	3,461.00	Lewis		0.00	0.00	
4,605.72	4,566.00	Chacra		0.00	0.00	
5,412.98	5,365.00	Cliff House		0.00	0.00	
5,460.47	5,412.00	Menefee		0.00	0.00	
5,690.83	5,640.00	Point Lookout		0.00	0.00	
6,192.96	6,137.00	Mancos		0.00	0.00	



## LOGOS Operating, LLC Operations Plan

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

Date:	December 17, 2021	Pool:	Basin Mancos
Well Name:	Rosa Unit 645H	GL Elevation:	6,305'
Surface Location:	Sec 19, T31N, R5W 960 FNL, 497 FWL (36.889694° N, 107.406079° W – NAD83)	Measured Depth:	17,598' (KB)
Bottom Hole Location:	Sec 21, T31N, R5W 52 FNL, 2320 FWL (36.892181° N, 107.368772° 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	2400	2383	*POINT LOOKOUT	5691	5640
KIRTLAND	2547	2528	*MANCOS	6193	6137
*FRUITLAND	3057	3033	KICKOFF POINT	6406	6348
*PICTURED CLIFFS	3374	3347	LANDING POINT	7398	6970
LEWIS	3489	3461			
CHACRA	4606	4566			
*CLIFF HOUSE	5413	5365			
MENEFEE	5461	5412	TD	17598	6965

\* 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.

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 times.

ROSA UNIT 645H



- 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.

### 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"	6,268'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	17,598'	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.

#### C. CEMENTING:

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

- 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	5,791	477	0.31318	1.3	212	38	1.15	184	15.8
Stage 1 Lead	4,657	1,134	0.31318	1.3	462	82	2.30	201	12.3
					673	120		385	
Stage 2 Tail	3,574	1,083	0.31318	1.3	441	79	1.50	294	13.5
Stage 2 Lead	3,107	467	0.31318	1.3	190	34	2.30	83	12.3
					631	112		377	
Stage 3 Tail	2,357	750	0.31318	1.3	305	54	1.99	153	12.8
Stage 3 Lead	320	2,037	0.31318	1.3	829	148	2.53	328	12
Stage 3 Lead	-	320	0.36268	1	116	21	2.53	46	12
					1,251	223		527	
<b>All Stage Totals</b>					<b>2,555</b>	<b>455</b>		<b>1,289</b>	

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	6,168	100	0.2531	1	25	5	1.56	16	13
Open Hole Lead	6,268	11,330	0.2291	1.15	2,996	534	1.56	1,920	13
					3,021	538		1,936	

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 1532 psi (0.22 psi/ft \* 6,965' TVD) for 30 minutes. Increase pressure to Open RSI sleeves.

ROSA UNIT 645H



**D. STIMULATION**

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

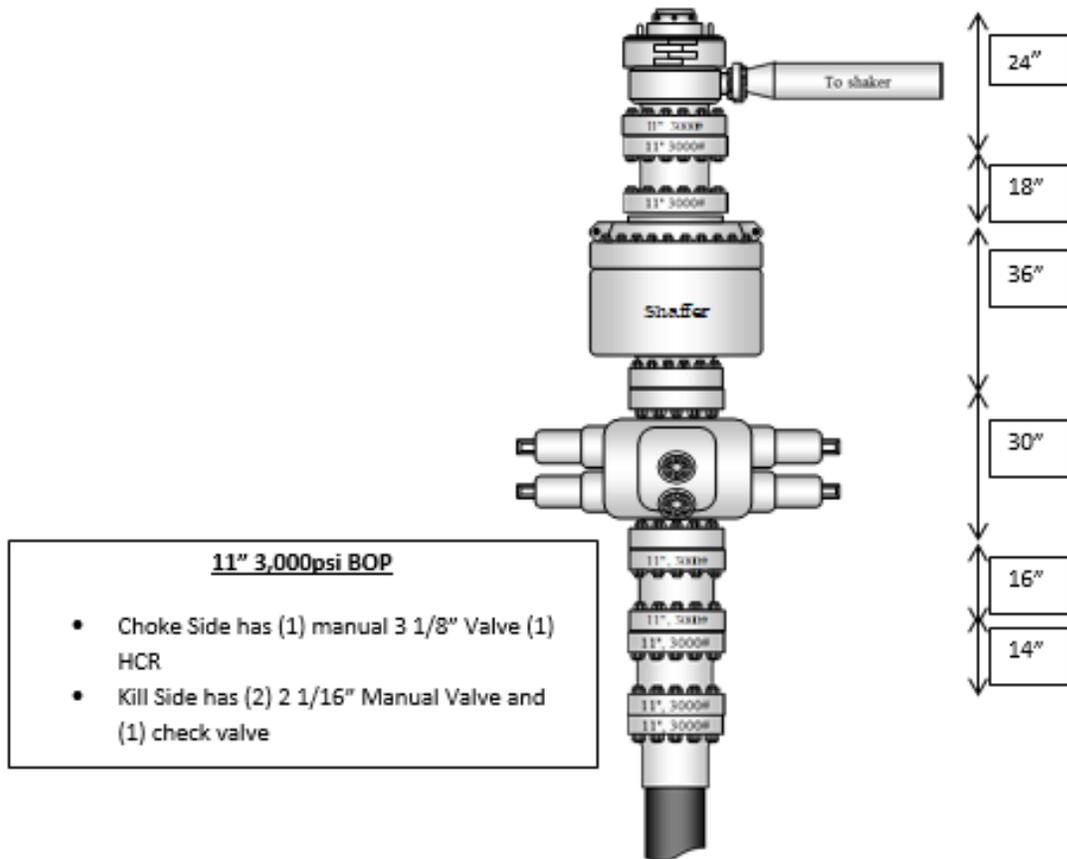
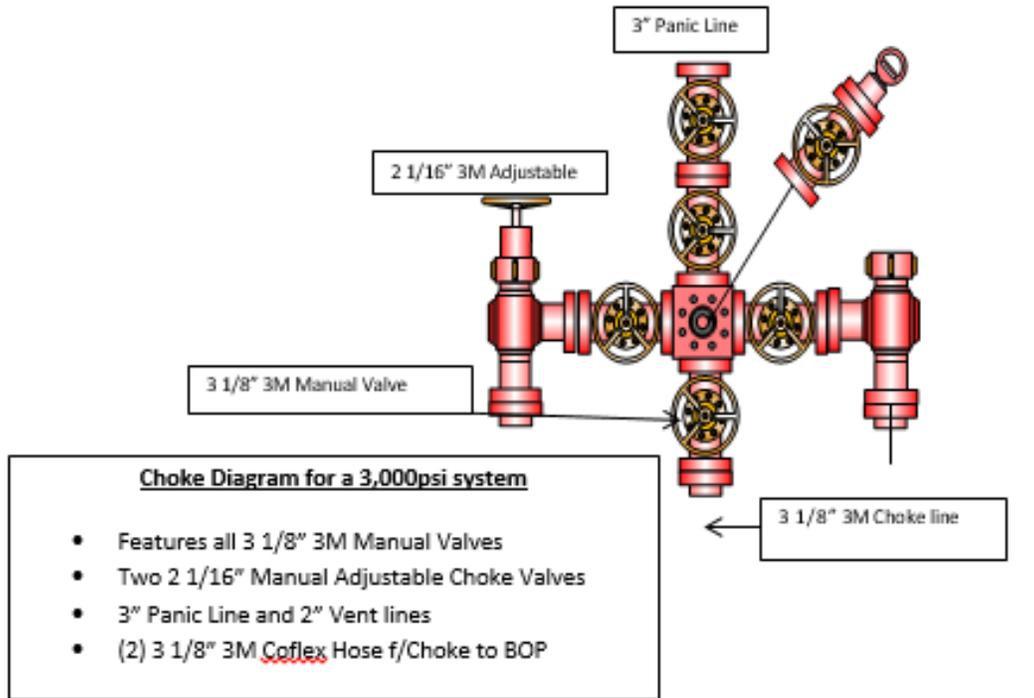
**E. PRODUCTION TUBING**

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



ROSA UNIT 645H

State of New Mexico  
 Energy, Minerals and Natural Resources Department

Submit Electronically  
 Via E-permitting

Oil Conservation Division  
 1220 South St. Francis Dr.  
 Santa Fe, NM 87505

## NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

### Section 1 – Plan Description Effective May 25, 2021

**I. Operator:** LOGOS Operating, LLC **OGRID:** 289408 **Date:** 03/11/2022

**II. Type:**  Original  Amendment due to  19.15.27.9.D(6)(a) NMAC  19.15.27.9.D(6)(b) NMAC  Other.

If Other, please describe: \_\_\_\_\_

**III. Well(s):** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Rosa Unit 645H	30-039-31415	C 19 T31N R5W	960FNL 497FWL	N/A	11,205	508
Rosa Unit 647H	30-039-31411	C 19 T31N R5W	952FNL 422FWL	N/A	11,205	506
Rosa Unit 649H	30-039-31410	C 19 T31N R5W	965FNL 480FWL	N/A	11,205	506

**IV. Central Delivery Point Name:** Harvest Gathering System [See 19.15.27.9(D)(1) NMAC]

**V. Anticipated Schedule:** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Rosa Unit 645H	30-039-31415	Pending	Pending	Pending	Pending	Pending
Rosa Unit 647H	30-039-31411	Pending	Pending	Pending	Pending	Pending
Rosa Unit 649H	30-039-31410	Pending	Pending	Pending	Pending	Pending

**VI. Separation Equipment:**  Attach a complete description of how Operator will size separation equipment to optimize gas capture.

**VII. Operational Practices:**  Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

**VIII. Best Management Practices:**  Attach a complete description of Operator’s best management practices to minimize venting during active and planned maintenance.

### Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system.

**If Operator checks this box, Operator will select one of the following:**

**Well Shut-In.**  Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

**Venting and Flaring Plan.**  Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- (a) power generation on lease;
- (b) power generation for grid;
- (c) compression on lease;
- (d) liquids removal on lease;
- (e) reinjection for underground storage;
- (f) reinjection for temporary storage;
- (g) reinjection for enhanced oil recovery;
- (h) fuel cell production; and
- (i) other alternative beneficial uses approved by the division.

### Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:	<i>Etta Trujillo</i>
Printed Name:	Etta Trujillo
Title:	Regulatory Specialist
E-mail Address:	etrujillo@logosresourcesllc.com
Date:	03/11/2022
Phone:	(505) 324-4154

**OIL CONSERVATION DIVISION**  
**(Only applicable when submitted as a standalone form)**

Approved By:
Title:
Approval Date:
Conditions of Approval:

## LOGOS Operating, LLC

### VI. Separation Equipment

The operator will select separation equipment for the maximum anticipated throughput and pressure to optimize gas capture. Separation equipment is sized according to manufacturer's design specifications. Separation vessels are built following the A.S.M.E. section VII division 1 codes for pressure vessel design, fabrication, inspection, testing and certification. Anticipated well pressures and production rates are evaluated to select separation equipment according to the equipment's designed operating pressure and throughput.

After completion, the operator utilizes flowback equipment, including separators, to manage wellbore fluids and solids during the initial separation period. After the initial flowback period is complete the operator utilizes iterative facility separation equipment to ensure that optimal separation is achieved.

### VII. Operational Practices 19.15.27.8 NMAC A through F

- A. The operator will maximize the recovery of natural gas and minimize the amount of gas vented or flared when technically and safely feasible as further described and detailed within the following subsections (B-F of 19.15.27.8). In all cases where natural gas venting and flaring requires regulatory reporting, reporting will be submitted accurately and within the required time frames.
- B. Venting and flaring during drilling operations:
  - a. New Drill HZ Gas Wells: The operator drills wells in the area by utilizing a balanced mud to safely drill the wellbore. This technique prevents gas from coming to surface during the drilling process. If there is an emergency or malfunction and natural gas does come to surface the natural gas will be captured and routed to sales if technically and safely feasible.
- C. Venting and flaring during completion or recompletion operations:
  - a. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. The natural gas will be utilized on site as needed for fuel gas and natural gas will be sold.
- D. Venting and flaring during production operations:
  - a. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible.

Operations will effectively manage the following scenarios to minimize the quantity of natural gas that is vented or flared:

- (a) If there is an emergency or malfunction vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore needs to be unloaded to atmosphere the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low-pressure vessel, automatic tank gauges will be the primary means of gauging. The formation is only anticipated to produce water and therefore tank emissions are anticipated to be negligible.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will always utilize the water transfer systems when available. Water loading emissions are anticipated to be negligible.
- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) No dehydration or amine units are anticipated to be set on location.
- (h) Compressors, compressor engines, turbines, flanges, connectors, valves, storage tanks, and other low-pressure vessels and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operations.
- (i) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
- (j) If natural gas does not meet gathering pipeline specifications gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
- (k) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.

- E. Performance standards:
  - a. The production facilities are designed to handle the maximum throughput and pressures from producing wellbores and will be designed to minimize waste. The amount of gas vented and flared will be minimized when technically and safely feasible.
  - b. All tanks that are routed to a control device that is installed after 5/25/2021 will have an automatic gauging system to minimize the amount of vented natural gas.
  - c. If a flare stack is installed or replaced after 5/25/2021 it will be equipped with an automatic ignitor or continuous pilot. The flare stack will be properly sized and designed to ensure proper combustion efficiency. The flare stack will be located 100 feet away from the nearest wellhead or storage tank.
  - d. AVO inspections will be conducted weekly for the year after completion and for all wells producing greater than 60,000 cubic feet of natural gas daily. The AVO inspection will include all components, including flare stacks, thief hatches, closed vent systems, pumps, compressors, pressure relief devices, valves, lines, flanges, connectors, and associated pipeline to identify any leaks and releases by comprehensive auditory, visual, and olfactory inspection. The AVO inspection records will be maintained for 5 years which will be available at the department's request. Identified leaks will be repaired as soon as feasible to minimize the amount of vented natural gas.
- F. Measurement or estimation of vented and flared natural gas.
  - a. The volume of natural gas that is vented, flared or consumed for beneficial use will be measured when possible, or estimated, during drilling, completions, or production operations.
  - b. Equipment will be installed to measure the volume of natural gas flared for all APD's issued after 5/25/2021 on facilities that will have an average daily gas rate greater than 60,000 cubic feet of natural gas. Measurement equipment will conform to API MPMS Chapter 14.10 regulations. The measurement equipment will not have a manifold that allows the diversion of natural gas around the metering element except for the sole purpose of inspecting and servicing the measurement equipment. If metering is not practical then the volume of gas will be estimated.

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

**Notice of Intent**

**Sundry ID:** 2656755

**Type of Submission:** Notice of Intent

**Type of Action:** Other

**Date Sundry Submitted:** 02/11/2022

**Time Sundry Submitted:** 03:30

**Date proposed operation will begin:** 04/01/2022

**Procedure Description:** LOGOS Operating request a change in plans for the following: Original surface-hole location from 953' FNL & 468' FWL to new surface-hole location 960' FNL & 497' FWL Original bottom-hole location from 73' FNL & 1930' FWL to new bottom-hole location 52' FNL & 2320' FWL Original TD @ 18,121' MD 6920' TVD to new TD @ 17,598' MD 6965' TVD. Geology tops have been updated per changes. Original KOP @ 6336' MD 6236' TVD to new KOP @ 6406' MD 6348' TVD Original Landing point @ 7560' MD 7035' TVD to new Landing point @ 7398' MD 6970' TVD Original 12.25" OH size, 9.625" Surface casing @ 320' to new 17.5" OH size, 13.375" casing @ 320' MD Original 8.75" OH size, 7" Intermediate casing @ 6336' MD to new 12.25" OH size, 9.625" casing @ 6268' MD 6211' TVD Original 6.125" OH size, 4.5" Production liner @ 18,121' MD to new 8.5" OH size, 5.5" casing @ 17,598' MD 6965' 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\_SURF\_INT\_PROD\_20220211\_20220211152840.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 Certification**

*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 submission of Form 3160-5 or a Sundry Notice.*

**Operator Electronic Signature:** ETTA TRUJILLO

**Signed on:** FEB 11, 2022 03:29 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**

**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:** 03/10/2022

**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 89772

**CONDITIONS**

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 89772
	Action Type: [C-103] NOI Change of Plans (C-103A)

**CONDITIONS**

Created By	Condition	Condition Date
kpickford	Adhere to previous NMOCD Conditions of Approval.	3/15/2022