

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, LLC3a. Address
2010 Afton Place, Farmington NM 874013b. Phone No. (include area code)
505-787-22184. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 25 T31N R06W NENE Lot 1 1068' FNL & 289' FEL
36.874926, -107.408775 NAD83

7. If Unit of CA/Agreement, Name and/or No.

NMNM78407E

8. Well Name and No.

Rosa Unit 656H

9. API Well No.

30-039-31383

10. Field and Pool or Exploratory Area

Basin Mancos

11. 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 per attached Operation and Directional Drill Plans.

Original TD @ 18052' MD 6825' TVD to new TD @ 18031' MD 7020' TVD.

Geology tops have been updated per changes.

Original KOP @ 6408' MD 6369' TVD to new KOP @ 5970' MD 5898' TVD.

Original Landing Point @ 7489' MD 7071' TVD to new Landing point @ 7621' MD 7002' TVD.

Original 9 5/8" Casing Intermediate @ 5900' or greater MD to new ~6400' or greater MD.

Original 5.5" Casing Production Liner @ surface - 18052' MD to new surface - 18031' MD. Original

9 5/8" Intermediate & 5.5" Production cementing was adjusted per changes.

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

Marie E.Florez

Title Regulatory Specialist

Signature

Marie E. Florez

Date

2/02/2021

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)

Well Name: ROSA UNIT	Well Location: T31N / R6W / SEC 25 / NENE / 36.874926 / 107.408775	County or Parish/State: RIO ARRIBA / NM
Well Number: 656H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF078769	Unit or CA Name: ROSA UNIT-MANCOS PA	Unit or CA Number: NMNM78407E
US Well Number: 3003931383	Well Status: Drilling Shut In	Operator: LOGOS OPERATING LLC

Notice of Intent

Type of Submission: Notice of Intent	Type of Action Other
Date Sundry Submitted: 03/15/2021	Time Sundry Submitted: 08:58
Date proposed operation will begin: 03/15/2021	

Procedure Description: LOGOS Operating LLC, request a change in plans per attached Operation and Directional Drill Plans. Original TD @ 18052' MD 6825' TVD to new TD @ 18031' MD 7020' TVD. Geology tops have been updated per changes. Original KOP @ 6408' MD 6369' TVD to new KOP @ 5970' MD 5898' TVD. Original Landing Point @ 7489' MD 7071' TVD to new Landing point @ 7621' MD 7002' TVD. Original 9 5/8" Casing Intermediate @ 5900' or greater MD to new ~6400' or greater MD. Original 5.5" Casing Production Liner @ surface - 18052' MD to new surface - 18031' MD. Original 9 5/8" Intermediate & 5.5" Production cementing was adjusted per changes.

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

3160_5_Rosa_Unit_656H_Change_in_Operation_and_DDR_plans_20210202_20210315085809.pdf

Well Name: ROSA UNIT	Well Location: T31N / R6W / SEC 25 / NENE / 36.874926 / 107.408775	County or Parish/State: RIO ARRIBA / NM
Well Number: 656H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF078769	Unit or CA Name: ROSA UNIT-MANCOS PA	Unit or CA Number: NMNM78407E
US Well Number: 3003931383	Well Status: Drilling Shut In	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: MARIE FLOREZ	Signed on: MAR 15, 2021 08:57 AM
Name: LOGOS OPERATING LLC	
Title: Regulatory Specialist	
Street Address: 2010 Afton Place	
City: Farmington	State: NM
Phone: (505) 324-4145	
Email address: MFLOREZ@LOGOSRESOURCESLLC.COM	

Field Representative

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

BLM Point of Contact

BLM POC Name: RYAN JOYNER	BLM POC Title: Physical Scientist
BLM POC Phone: 9703851242	BLM POC Email Address: rjoyner@blm.gov
Disposition: Approved	Disposition Date: 04/22/2021
Signature: Ryan Joyner	



LOGOS Operating, LLC Operations Plan

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

Date:	January 3, 2021	Pool:	Basin Mancos
Well Name:	Rosa Unit 656H	Elevation:	6,372'
Surface Location:	Sec 25, T31N, R6W 1068 FNL, 289 FEL (36.874926° N, 107.408775° W – NAD83)	Measured Depth:	18,031
Bottom Hole Location:	Sec 28, T31N, R5W 1380 FNL, 1199 FWL (36.874022° N, 107.372584° W – NAD83)	County:	Rio Arriba

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

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,519	2,500	*POINT LOOKOUT	5,751	5,683
KIRTLAND	2,651	2,630	*MANCOS	6,213	6,140
*FRUITLAND	3,127	3,098	KICKOFF POINT	5,970	5,898
*PICTURED CLIFFS	3,459	3,425	LANDING POINT	7,621	7,002
LEWIS	3,554	3,519			
CHACRA	4,658	4,606			
*CLIFF HOUSE	5,498	5,433			
MENEFEE	5,523	5,458	TD	18,031	7,020

* 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.

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

ROSA UNIT 656H



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, repaired and fall within the 30 day interval of first full test.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	320' or greater	13.375"	54.5 LBS	J-55 or equiv	BTC
INTERMEDIATE	12.25"	~6,400' or greater	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.75"	Surface – ~18,031'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

B. FLOAT EQUIPMENT:

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

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

C. CEMENTING:

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

1. SURFACE: Casing shall be set at ~ 320' and cemented to surface.
2. INTERMEDIATE: The intermediate casing will be cemented in 2 or 3 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage.



Intermediate casing shall be kept fluid filled while running in to the hole to meet BLM minimum collapse requirements. If losses are not observed during the second stage a cancellation plug will be pumped and the remaining cement will be pumped during stage 2. Operator proposes DV tools above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal.

	Top (ft)	Footage (ft)	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement
Stage 1 Tail	5,919	500	0.31318	1.3	221	39	1.1508	192
Stage 1 Lead	4,709	1,210	0.31318	1.3	493	88	2.3139	213
					714	127		405
Stage 2 Tail	4,609	100	0.31318	1.3	45	8	1.1504	39
Stage 2 Lead	3,177	1,432	0.31318	1.3	583	104	2.3139	252
					628	112		291
Stage 3 Tail	3,077	100	0.31318	1.3	45	8	1.1504	39
Stage 3 Lead	331	2,746	0.31318	1.3	1118	199	2.3139	483
Stage 3 Lead	-	331	0.36268	1	120	21	2.3139	52
					1283	229		574

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 at least 150' of cement overlap above intermediate shoe. A CBL or Temperature Survey will be used to determine TOC.

	Top ft	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement
Cased Lead	6,269	150	0.25307	1	38	7	1.1545	33
Open Hole Lead	6,419	11,612	0.25259	1.15	3,382	602	1.1545	2,929
					3,420	609		2,962

Calculations based on 15% excess for open hole and 150' 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.

B. **PRESSURE TEST**

With frac stack installed on wellhead, pressure test 5-1/2" casing to 1550 psi (0.22 psi/ft * 7,020' TVD) for 30 minutes. Increase pressure to Open RSI sleeves.



C. STIMULATION

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

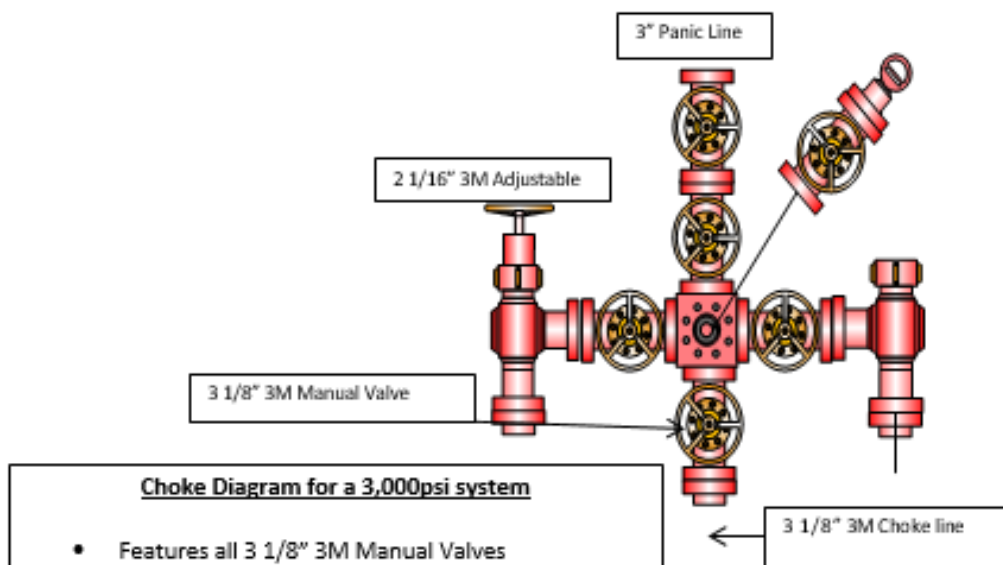
D. PRODUCTION TUBING

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

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

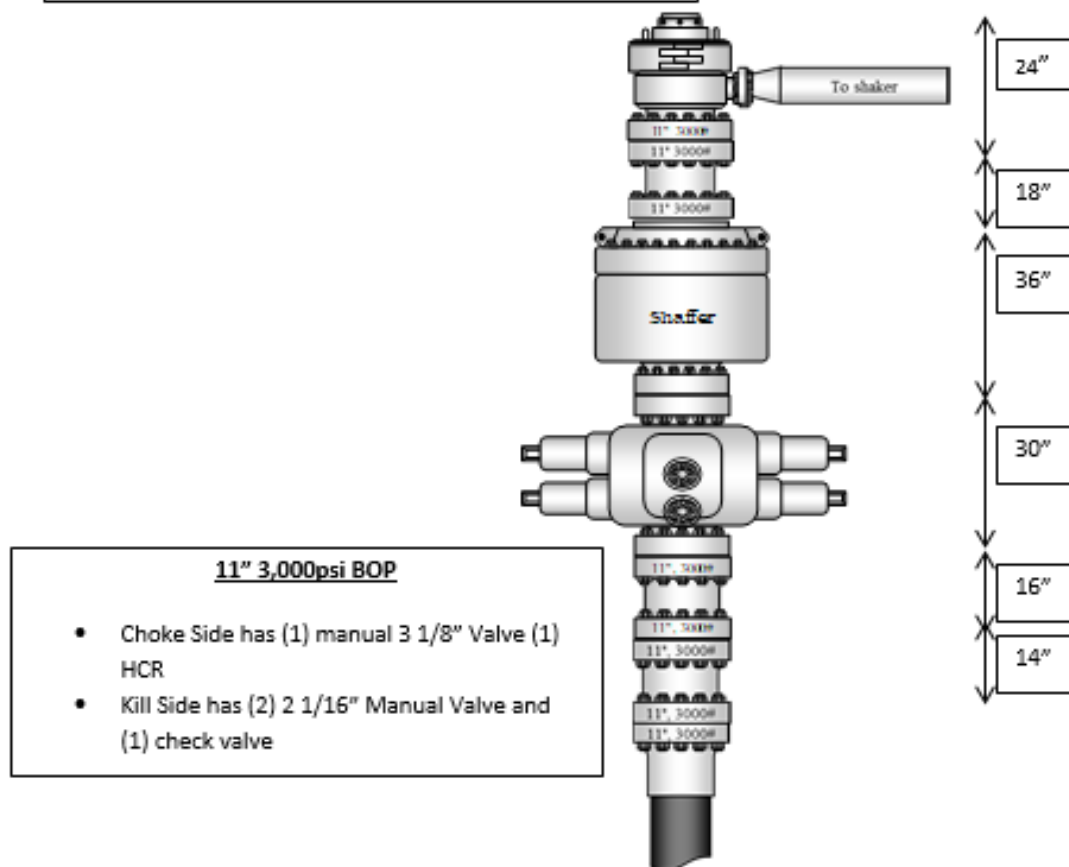


3M 11" B.O.P.E Diagram



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



- Choke Side has (1) manual 3 1/8" Valve (1) HCR
- Kill Side has (2) 2 1/16" Manual Valve and (1) check valve

ROSA UNIT 656H



Company: Logos Operating LLC
 Project: Rio Arriba, NM NAD83
 Site: Rosa Unit 29
 Well: Rosa Unit #656H
 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 #656H

GL 6372' & RKB 25' @ 6397.00ft

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

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

Created By: Janie Collins Date: 12:33, January 13 2021



Azimuths to True North
 Magnetic North: 8

Magnetic Field
 Strength: 49854
 Dip Angle: 63
 Date: 3/6/2009
 Model: HD01A

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Rosa 656H POE Rev 1	7002.00	-415.03	175.78	2137659.65	2847446.86	36.8737860	-107.4081740
Rosa 656H BHL	7020.00	-326.96	10585.83	2137794.01	2857856.39	36.8740224	-107.3725836

SECTION DETAILS

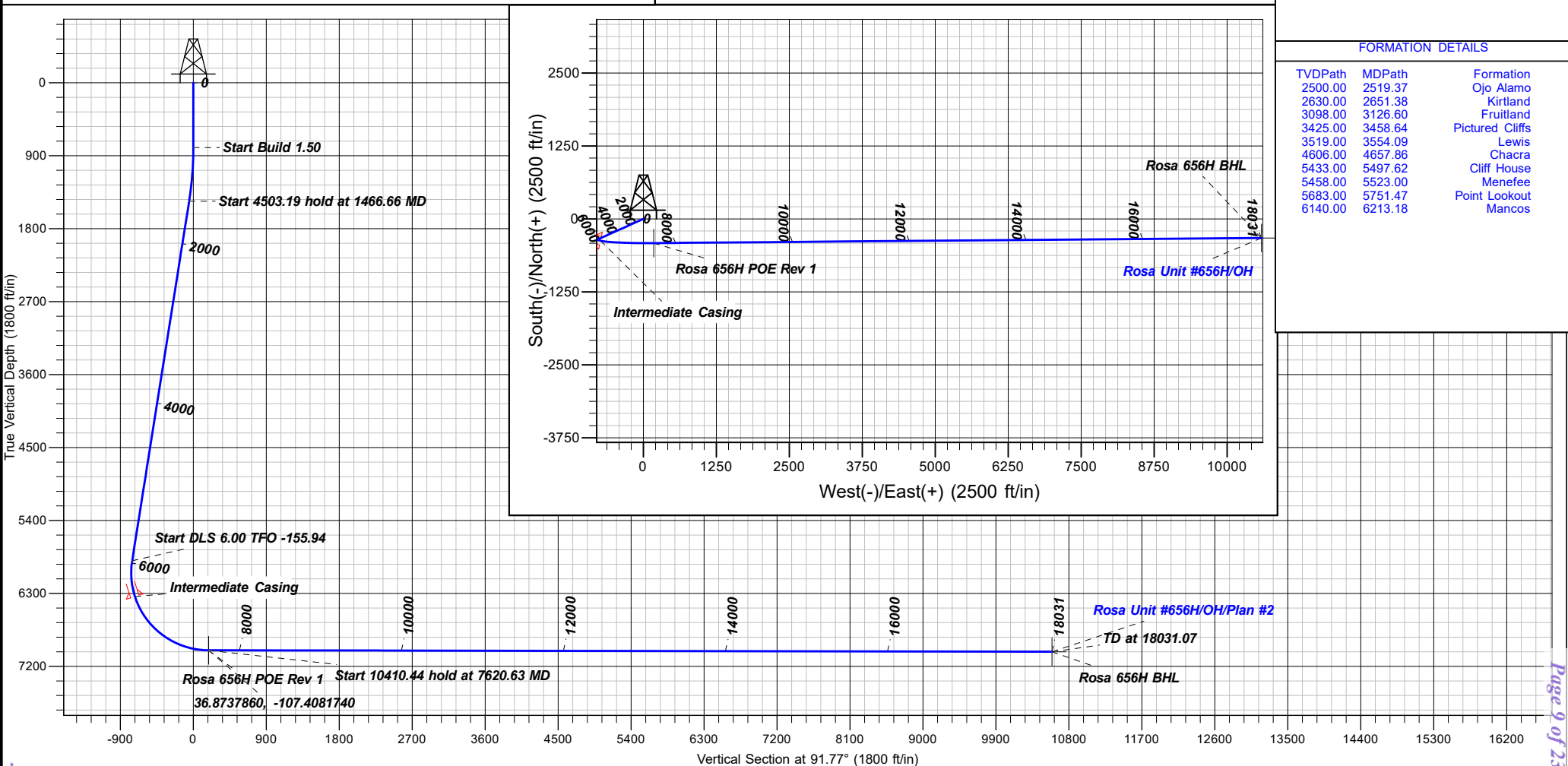
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	
1466.66	10.00	245.77	1463.28	-23.82	-52.92	1.50	245.77	-52.16	
5969.85	10.00	245.77	5898.06	-344.75	-765.99	0.00	0.00	-754.98	
7620.63	89.90	89.52	7002.00	-415.03	175.78	6.00	-155.94	188.81	Rosa 656H POE Rev 1
18031.07	89.90	89.52	7020.00	-326.96	10585.83	0.00	0.00	10590.87	Rosa 656H BHL

CASING DETAILS

TVD	MD	Name
6340.00	6418.27	Intermediate Casing

FORMATION DETAILS

TVDPATH	MDPATH	FORMATION
2500.00	2519.37	Ojo Alamo
2630.00	2651.38	Kirtland
3098.00	3126.60	Fruitland
3425.00	3458.64	Pictured Cliffs
3519.00	3554.09	Lewis
4606.00	4657.86	Chacra
5433.00	5497.62	Cliff House
5458.00	5523.00	Menefee
5683.00	5751.47	Point Lookout
6140.00	6213.18	Mancos





Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 29

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

OH

Plan: Plan #2

Standard Planning Report

13 January, 2021





Lonestar Consulting

Planning Report



Database:	EDM _16.0	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Company:	Logos Operating LLC	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site:	Rosa Unit 29	North Reference:	True
Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

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

Site	Rosa Unit 29				
Site Position:		Northing:	2,138,126.53 usft	Latitude:	36.8750715
From:	Map	Easting:	2,847,195.58 usft	Longitude:	-107.4090261
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in		

Well	Rosa Unit #656H - Slot B3 (656H)					
Well Position	+N/-S	0.00 ft	Northing:	2,138,073.89 usft	Latitude:	36.8749260
	+E/-W	0.00 ft	Easting:	2,847,269.24 usft	Longitude:	-107.4087750
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	6,372.00 ft
Grid Convergence:		0.25 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/6/2019	8.88	63.43	49,854.20000000

Design	Plan #2			
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	91.77

Plan Survey Tool Program	Date	1/13/2021		
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	18,031.07 Plan #2 (OH)	MWD+HDGM	
			OWSG MWD + HDGM	

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	
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,466.66	10.00	245.77	1,463.28	-23.82	-52.92	1.50	1.50	0.00	245.77	
5,969.85	10.00	245.77	5,898.06	-344.75	-765.99	0.00	0.00	0.00	0.00	
7,620.63	89.90	89.52	7,002.00	-415.03	175.78	6.00	4.84	-9.47	-155.94	Rosa 656H POE Rev
18,031.07	89.90	89.52	7,020.00	-326.96	10,585.83	0.00	0.00	0.00	0.00	Rosa 656H BHL



Lonestar Consulting

Planning Report



Database:	EDM _16.0	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Company:	Logos Operating LLC	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site:	Rosa Unit 29	North Reference:	True
Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	1.50	245.77	899.99	-0.54	-1.19	-1.18	1.50	1.50	0.00
1,000.00	3.00	245.77	999.91	-2.15	-4.77	-4.70	1.50	1.50	0.00
1,100.00	4.50	245.77	1,099.69	-4.83	-10.74	-10.58	1.50	1.50	0.00
1,200.00	6.00	245.77	1,199.27	-8.59	-19.08	-18.81	1.50	1.50	0.00
1,300.00	7.50	245.77	1,298.57	-13.41	-29.80	-29.37	1.50	1.50	0.00
1,400.00	9.00	245.77	1,397.54	-19.30	-42.88	-42.27	1.50	1.50	0.00
1,466.66	10.00	245.77	1,463.28	-23.82	-52.92	-52.16	1.50	1.50	0.00
1,500.00	10.00	245.77	1,496.11	-26.19	-58.20	-57.36	0.00	0.00	0.00
1,600.00	10.00	245.77	1,594.59	-33.32	-74.03	-72.97	0.00	0.00	0.00
1,700.00	10.00	245.77	1,693.08	-40.45	-89.87	-88.57	0.00	0.00	0.00
1,800.00	10.00	245.77	1,791.56	-47.57	-105.70	-104.18	0.00	0.00	0.00
1,900.00	10.00	245.77	1,890.04	-54.70	-121.54	-119.79	0.00	0.00	0.00
2,000.00	10.00	245.77	1,988.52	-61.83	-137.37	-135.40	0.00	0.00	0.00
2,100.00	10.00	245.77	2,087.00	-68.95	-153.21	-151.00	0.00	0.00	0.00
2,200.00	10.00	245.77	2,185.48	-76.08	-169.04	-166.61	0.00	0.00	0.00
2,300.00	10.00	245.77	2,283.96	-83.21	-184.87	-182.22	0.00	0.00	0.00
2,400.00	10.00	245.77	2,382.44	-90.33	-200.71	-197.83	0.00	0.00	0.00
2,500.00	10.00	245.77	2,480.92	-97.46	-216.54	-213.43	0.00	0.00	0.00
2,600.00	10.00	245.77	2,579.40	-104.59	-232.38	-229.04	0.00	0.00	0.00
2,700.00	10.00	245.77	2,677.88	-111.71	-248.21	-244.65	0.00	0.00	0.00
2,800.00	10.00	245.77	2,776.36	-118.84	-264.05	-260.25	0.00	0.00	0.00
2,900.00	10.00	245.77	2,874.85	-125.97	-279.88	-275.86	0.00	0.00	0.00
3,000.00	10.00	245.77	2,973.33	-133.09	-295.72	-291.47	0.00	0.00	0.00
3,100.00	10.00	245.77	3,071.81	-140.22	-311.55	-307.08	0.00	0.00	0.00
3,200.00	10.00	245.77	3,170.29	-147.35	-327.39	-322.68	0.00	0.00	0.00
3,300.00	10.00	245.77	3,268.77	-154.47	-343.22	-338.29	0.00	0.00	0.00
3,400.00	10.00	245.77	3,367.25	-161.60	-359.06	-353.90	0.00	0.00	0.00
3,500.00	10.00	245.77	3,465.73	-168.73	-374.89	-369.51	0.00	0.00	0.00
3,600.00	10.00	245.77	3,564.21	-175.85	-390.73	-385.11	0.00	0.00	0.00
3,700.00	10.00	245.77	3,662.69	-182.98	-406.56	-400.72	0.00	0.00	0.00
3,800.00	10.00	245.77	3,761.17	-190.11	-422.40	-416.33	0.00	0.00	0.00
3,900.00	10.00	245.77	3,859.65	-197.23	-438.23	-431.94	0.00	0.00	0.00
4,000.00	10.00	245.77	3,958.13	-204.36	-454.07	-447.54	0.00	0.00	0.00
4,100.00	10.00	245.77	4,056.61	-211.49	-469.90	-463.15	0.00	0.00	0.00
4,200.00	10.00	245.77	4,155.10	-218.61	-485.74	-478.76	0.00	0.00	0.00
4,300.00	10.00	245.77	4,253.58	-225.74	-501.57	-494.36	0.00	0.00	0.00
4,400.00	10.00	245.77	4,352.06	-232.87	-517.41	-509.97	0.00	0.00	0.00
4,500.00	10.00	245.77	4,450.54	-240.00	-533.24	-525.58	0.00	0.00	0.00
4,600.00	10.00	245.77	4,549.02	-247.12	-549.08	-541.19	0.00	0.00	0.00
4,700.00	10.00	245.77	4,647.50	-254.25	-564.91	-556.79	0.00	0.00	0.00
4,800.00	10.00	245.77	4,745.98	-261.38	-580.75	-572.40	0.00	0.00	0.00
4,900.00	10.00	245.77	4,844.46	-268.50	-596.58	-588.01	0.00	0.00	0.00
5,000.00	10.00	245.77	4,942.94	-275.63	-612.42	-603.62	0.00	0.00	0.00
5,100.00	10.00	245.77	5,041.42	-282.76	-628.25	-619.22	0.00	0.00	0.00
5,200.00	10.00	245.77	5,139.90	-289.88	-644.09	-634.83	0.00	0.00	0.00



Lonestar Consulting

Planning Report



Database:	EDM _16.0	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Company:	Logos Operating LLC	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site:	Rosa Unit 29	North Reference:	True
Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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)
5,300.00	10.00	245.77	5,238.38	-297.01	-659.92	-650.44	0.00	0.00	0.00
5,400.00	10.00	245.77	5,336.87	-304.14	-675.76	-666.04	0.00	0.00	0.00
5,500.00	10.00	245.77	5,435.35	-311.26	-691.59	-681.65	0.00	0.00	0.00
5,600.00	10.00	245.77	5,533.83	-318.39	-707.43	-697.26	0.00	0.00	0.00
5,700.00	10.00	245.77	5,632.31	-325.52	-723.26	-712.87	0.00	0.00	0.00
5,800.00	10.00	245.77	5,730.79	-332.64	-739.10	-728.47	0.00	0.00	0.00
5,900.00	10.00	245.77	5,829.27	-339.77	-754.93	-744.08	0.00	0.00	0.00
5,969.85	10.00	245.77	5,898.06	-344.75	-765.99	-754.98	0.00	0.00	0.00
6,000.00	8.38	240.70	5,927.82	-346.90	-770.29	-759.22	6.00	-5.37	-16.81
6,100.00	4.27	197.76	6,027.24	-354.02	-777.79	-766.49	6.00	-4.11	-42.95
6,200.00	6.18	130.47	6,126.90	-361.07	-774.83	-763.32	6.00	1.91	-67.28
6,300.00	11.40	110.12	6,225.71	-367.97	-761.44	-749.72	6.00	5.22	-20.35
6,400.00	17.14	102.82	6,322.59	-374.64	-737.78	-725.86	6.00	5.74	-7.30
6,500.00	23.00	99.13	6,416.48	-381.02	-704.09	-691.99	6.00	5.87	-3.69
6,600.00	28.92	96.89	6,506.35	-387.03	-660.75	-648.48	6.00	5.92	-2.24
6,700.00	34.87	95.35	6,591.22	-392.60	-608.23	-595.82	6.00	5.95	-1.53
6,800.00	40.83	94.22	6,670.14	-397.68	-547.11	-534.57	6.00	5.96	-1.13
6,900.00	46.80	93.33	6,742.27	-402.20	-478.06	-465.42	6.00	5.97	-0.89
7,000.00	52.77	92.60	6,806.81	-406.13	-401.83	-389.10	6.00	5.97	-0.73
7,100.00	58.75	91.98	6,863.05	-409.42	-319.27	-306.48	6.00	5.98	-0.62
7,200.00	64.73	91.43	6,910.37	-412.02	-231.26	-218.43	6.00	5.98	-0.55
7,300.00	70.71	90.93	6,948.26	-413.92	-138.79	-125.95	6.00	5.98	-0.50
7,400.00	76.70	90.47	6,976.31	-415.08	-42.86	-30.02	6.00	5.98	-0.46
7,500.00	82.68	90.03	6,994.20	-415.51	55.48	68.28	6.00	5.98	-0.44
7,600.00	88.67	89.60	7,001.74	-415.19	155.15	167.89	6.00	5.98	-0.43
7,620.63	89.90	89.52	7,002.00	-415.03	175.78	188.51	6.00	5.98	-0.42
7,700.00	89.90	89.52	7,002.14	-414.36	255.14	267.81	0.00	0.00	0.00
7,800.00	89.90	89.52	7,002.31	-413.51	355.14	367.74	0.00	0.00	0.00
7,900.00	89.90	89.52	7,002.48	-412.67	455.14	467.66	0.00	0.00	0.00
8,000.00	89.90	89.52	7,002.66	-411.82	555.13	567.58	0.00	0.00	0.00
8,100.00	89.90	89.52	7,002.83	-410.97	655.13	667.50	0.00	0.00	0.00
8,200.00	89.90	89.52	7,003.00	-410.13	755.13	767.43	0.00	0.00	0.00
8,300.00	89.90	89.52	7,003.17	-409.28	855.12	867.35	0.00	0.00	0.00
8,400.00	89.90	89.52	7,003.35	-408.44	955.12	967.27	0.00	0.00	0.00
8,500.00	89.90	89.52	7,003.52	-407.59	1,055.11	1,067.19	0.00	0.00	0.00
8,600.00	89.90	89.52	7,003.69	-406.74	1,155.11	1,167.12	0.00	0.00	0.00
8,700.00	89.90	89.52	7,003.87	-405.90	1,255.11	1,267.04	0.00	0.00	0.00
8,800.00	89.90	89.52	7,004.04	-405.05	1,355.10	1,366.96	0.00	0.00	0.00
8,900.00	89.90	89.52	7,004.21	-404.21	1,455.10	1,466.88	0.00	0.00	0.00
9,000.00	89.90	89.52	7,004.39	-403.36	1,555.10	1,566.81	0.00	0.00	0.00
9,100.00	89.90	89.52	7,004.56	-402.51	1,655.09	1,666.73	0.00	0.00	0.00
9,200.00	89.90	89.52	7,004.73	-401.67	1,755.09	1,766.65	0.00	0.00	0.00
9,300.00	89.90	89.52	7,004.90	-400.82	1,855.08	1,866.57	0.00	0.00	0.00
9,400.00	89.90	89.52	7,005.08	-399.98	1,955.08	1,966.50	0.00	0.00	0.00
9,500.00	89.90	89.52	7,005.25	-399.13	2,055.08	2,066.42	0.00	0.00	0.00
9,600.00	89.90	89.52	7,005.42	-398.28	2,155.07	2,166.34	0.00	0.00	0.00
9,700.00	89.90	89.52	7,005.60	-397.44	2,255.07	2,266.26	0.00	0.00	0.00
9,800.00	89.90	89.52	7,005.77	-396.59	2,355.07	2,366.19	0.00	0.00	0.00
9,900.00	89.90	89.52	7,005.94	-395.75	2,455.06	2,466.11	0.00	0.00	0.00
10,000.00	89.90	89.52	7,006.11	-394.90	2,555.06	2,566.03	0.00	0.00	0.00
10,100.00	89.90	89.52	7,006.29	-394.05	2,655.05	2,665.95	0.00	0.00	0.00
10,200.00	89.90	89.52	7,006.46	-393.21	2,755.05	2,765.88	0.00	0.00	0.00
10,300.00	89.90	89.52	7,006.63	-392.36	2,855.05	2,865.80	0.00	0.00	0.00
10,400.00	89.90	89.52	7,006.81	-391.52	2,955.04	2,965.72	0.00	0.00	0.00



Lonestar Consulting

Planning Report



Database:	EDM _16.0	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Company:	Logos Operating LLC	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site:	Rosa Unit 29	North Reference:	True
Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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)
10,500.00	89.90	89.52	7,006.98	-390.67	3,055.04	3,065.64	0.00	0.00	0.00
10,600.00	89.90	89.52	7,007.15	-389.82	3,155.04	3,165.57	0.00	0.00	0.00
10,700.00	89.90	89.52	7,007.32	-388.98	3,255.03	3,265.49	0.00	0.00	0.00
10,800.00	89.90	89.52	7,007.50	-388.13	3,355.03	3,365.41	0.00	0.00	0.00
10,900.00	89.90	89.52	7,007.67	-387.29	3,455.02	3,465.33	0.00	0.00	0.00
11,000.00	89.90	89.52	7,007.84	-386.44	3,555.02	3,565.26	0.00	0.00	0.00
11,100.00	89.90	89.52	7,008.02	-385.59	3,655.02	3,665.18	0.00	0.00	0.00
11,200.00	89.90	89.52	7,008.19	-384.75	3,755.01	3,765.10	0.00	0.00	0.00
11,300.00	89.90	89.52	7,008.36	-383.90	3,855.01	3,865.02	0.00	0.00	0.00
11,400.00	89.90	89.52	7,008.53	-383.06	3,955.01	3,964.95	0.00	0.00	0.00
11,500.00	89.90	89.52	7,008.71	-382.21	4,055.00	4,064.87	0.00	0.00	0.00
11,600.00	89.90	89.52	7,008.88	-381.36	4,155.00	4,164.79	0.00	0.00	0.00
11,700.00	89.90	89.52	7,009.05	-380.52	4,254.99	4,264.71	0.00	0.00	0.00
11,800.00	89.90	89.52	7,009.23	-379.67	4,354.99	4,364.64	0.00	0.00	0.00
11,900.00	89.90	89.52	7,009.40	-378.83	4,454.99	4,464.56	0.00	0.00	0.00
12,000.00	89.90	89.52	7,009.57	-377.98	4,554.98	4,564.48	0.00	0.00	0.00
12,100.00	89.90	89.52	7,009.75	-377.13	4,654.98	4,664.40	0.00	0.00	0.00
12,200.00	89.90	89.52	7,009.92	-376.29	4,754.98	4,764.33	0.00	0.00	0.00
12,300.00	89.90	89.52	7,010.09	-375.44	4,854.97	4,864.25	0.00	0.00	0.00
12,400.00	89.90	89.52	7,010.26	-374.60	4,954.97	4,964.17	0.00	0.00	0.00
12,500.00	89.90	89.52	7,010.44	-373.75	5,054.96	5,064.09	0.00	0.00	0.00
12,600.00	89.90	89.52	7,010.61	-372.90	5,154.96	5,164.02	0.00	0.00	0.00
12,700.00	89.90	89.52	7,010.78	-372.06	5,254.96	5,263.94	0.00	0.00	0.00
12,800.00	89.90	89.52	7,010.96	-371.21	5,354.95	5,363.86	0.00	0.00	0.00
12,900.00	89.90	89.52	7,011.13	-370.37	5,454.95	5,463.78	0.00	0.00	0.00
13,000.00	89.90	89.52	7,011.30	-369.52	5,554.95	5,563.71	0.00	0.00	0.00
13,100.00	89.90	89.52	7,011.47	-368.67	5,654.94	5,663.63	0.00	0.00	0.00
13,200.00	89.90	89.52	7,011.65	-367.83	5,754.94	5,763.55	0.00	0.00	0.00
13,300.00	89.90	89.52	7,011.82	-366.98	5,854.94	5,863.47	0.00	0.00	0.00
13,400.00	89.90	89.52	7,011.99	-366.14	5,954.93	5,963.40	0.00	0.00	0.00
13,500.00	89.90	89.52	7,012.17	-365.29	6,054.93	6,063.32	0.00	0.00	0.00
13,600.00	89.90	89.52	7,012.34	-364.44	6,154.92	6,163.24	0.00	0.00	0.00
13,700.00	89.90	89.52	7,012.51	-363.60	6,254.92	6,263.16	0.00	0.00	0.00
13,800.00	89.90	89.52	7,012.68	-362.75	6,354.92	6,363.09	0.00	0.00	0.00
13,900.00	89.90	89.52	7,012.86	-361.91	6,454.91	6,463.01	0.00	0.00	0.00
14,000.00	89.90	89.52	7,013.03	-361.06	6,554.91	6,562.93	0.00	0.00	0.00
14,100.00	89.90	89.52	7,013.20	-360.21	6,654.91	6,662.85	0.00	0.00	0.00
14,200.00	89.90	89.52	7,013.38	-359.37	6,754.90	6,762.78	0.00	0.00	0.00
14,300.00	89.90	89.52	7,013.55	-358.52	6,854.90	6,862.70	0.00	0.00	0.00
14,400.00	89.90	89.52	7,013.72	-357.68	6,954.89	6,962.62	0.00	0.00	0.00
14,500.00	89.90	89.52	7,013.89	-356.83	7,054.89	7,062.54	0.00	0.00	0.00
14,600.00	89.90	89.52	7,014.07	-355.98	7,154.89	7,162.47	0.00	0.00	0.00
14,700.00	89.90	89.52	7,014.24	-355.14	7,254.88	7,262.39	0.00	0.00	0.00
14,800.00	89.90	89.52	7,014.41	-354.29	7,354.88	7,362.31	0.00	0.00	0.00
14,900.00	89.90	89.52	7,014.59	-353.45	7,454.88	7,462.23	0.00	0.00	0.00
15,000.00	89.90	89.52	7,014.76	-352.60	7,554.87	7,562.16	0.00	0.00	0.00
15,100.00	89.90	89.52	7,014.93	-351.75	7,654.87	7,662.08	0.00	0.00	0.00
15,200.00	89.90	89.52	7,015.11	-350.91	7,754.86	7,762.00	0.00	0.00	0.00
15,300.00	89.90	89.52	7,015.28	-350.06	7,854.86	7,861.92	0.00	0.00	0.00
15,400.00	89.90	89.52	7,015.45	-349.22	7,954.86	7,961.85	0.00	0.00	0.00
15,500.00	89.90	89.52	7,015.62	-348.37	8,054.85	8,061.77	0.00	0.00	0.00
15,600.00	89.90	89.52	7,015.80	-347.52	8,154.85	8,161.69	0.00	0.00	0.00
15,700.00	89.90	89.52	7,015.97	-346.68	8,254.85	8,261.61	0.00	0.00	0.00
15,800.00	89.90	89.52	7,016.14	-345.83	8,354.84	8,361.54	0.00	0.00	0.00



Lonestar Consulting

Planning Report



Database:	EDM _16.0	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Company:	Logos Operating LLC	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site:	Rosa Unit 29	North Reference:	True
Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	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)	
15,900.00	89.90	89.52	7,016.32	-344.99	8,454.84	8,461.46	0.00	0.00	0.00	
16,000.00	89.90	89.52	7,016.49	-344.14	8,554.83	8,561.38	0.00	0.00	0.00	
16,100.00	89.90	89.52	7,016.66	-343.29	8,654.83	8,661.30	0.00	0.00	0.00	
16,200.00	89.90	89.52	7,016.83	-342.45	8,754.83	8,761.23	0.00	0.00	0.00	
16,300.00	89.90	89.52	7,017.01	-341.60	8,854.82	8,861.15	0.00	0.00	0.00	
16,400.00	89.90	89.52	7,017.18	-340.76	8,954.82	8,961.07	0.00	0.00	0.00	
16,500.00	89.90	89.52	7,017.35	-339.91	9,054.82	9,060.99	0.00	0.00	0.00	
16,600.00	89.90	89.52	7,017.53	-339.06	9,154.81	9,160.92	0.00	0.00	0.00	
16,700.00	89.90	89.52	7,017.70	-338.22	9,254.81	9,260.84	0.00	0.00	0.00	
16,800.00	89.90	89.52	7,017.87	-337.37	9,354.80	9,360.76	0.00	0.00	0.00	
16,900.00	89.90	89.52	7,018.04	-336.53	9,454.80	9,460.68	0.00	0.00	0.00	
17,000.00	89.90	89.52	7,018.22	-335.68	9,554.80	9,560.61	0.00	0.00	0.00	
17,100.00	89.90	89.52	7,018.39	-334.83	9,654.79	9,660.53	0.00	0.00	0.00	
17,200.00	89.90	89.52	7,018.56	-333.99	9,754.79	9,760.45	0.00	0.00	0.00	
17,300.00	89.90	89.52	7,018.74	-333.14	9,854.79	9,860.37	0.00	0.00	0.00	
17,400.00	89.90	89.52	7,018.91	-332.29	9,954.78	9,960.30	0.00	0.00	0.00	
17,500.00	89.90	89.52	7,019.08	-331.45	10,054.78	10,060.22	0.00	0.00	0.00	
17,600.00	89.90	89.52	7,019.25	-330.60	10,154.77	10,160.14	0.00	0.00	0.00	
17,700.00	89.90	89.52	7,019.43	-329.76	10,254.77	10,260.06	0.00	0.00	0.00	
17,800.00	89.90	89.52	7,019.60	-328.91	10,354.77	10,359.99	0.00	0.00	0.00	
17,900.00	89.90	89.52	7,019.77	-328.06	10,454.76	10,459.91	0.00	0.00	0.00	
18,000.00	89.90	89.52	7,019.95	-327.22	10,554.76	10,559.83	0.00	0.00	0.00	
18,031.07	89.90	89.52	7,020.00	-326.96	10,585.83	10,590.88	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	
Rosa 656H POE Rev 1 - plan hits target center - Point	0.00	0.00	7,002.00	-415.03	175.78	2,137,659.64	2,847,446.86	36.8737860	-107.4081741	
Rosa 656H BHL - plan hits target center - Point	0.00	0.00	7,020.00	-326.96	10,585.83	2,137,794.01	2,857,856.39	36.8740224	-107.3725836	

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)	
6,418.27	6,340.00	Intermediate Casing	7.000	8.750	



Lonestar Consulting
Planning Report



Database:	EDM _16.0	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Company:	Logos Operating LLC	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site:	Rosa Unit 29	North Reference:	True
Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,519.37	2,500.00	Ojo Alamo		0.00	0.00	
2,651.38	2,630.00	Kirtland		0.00	0.00	
3,126.60	3,098.00	Fruitland		0.00	0.00	
3,458.64	3,425.00	Pictured Cliffs		0.00	0.00	
3,554.09	3,519.00	Lewis		0.00	0.00	
4,657.86	4,606.00	Chacra		0.00	0.00	
5,497.62	5,433.00	Cliff House		0.00	0.00	
5,523.00	5,458.00	Menefee		0.00	0.00	
5,751.47	5,683.00	Point Lookout		0.00	0.00	
6,213.19	6,140.00	Mancos		0.00	0.00	

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
800.00	800.00	0.00	0.00	Start Build 1.50	
1,466.66	1,463.28	-23.82	-52.92	Start 4503.19 hold at 1466.66 MD	
5,969.85	5,898.06	-344.75	-765.99	Start DLS 6.00 TFO -155.94	
7,620.63	7,002.00	-415.03	175.78	POE @ 7620' MD / 7002' TVD	
7,620.63	7,002.00	-415.03	175.78	36.8737860, -107.4081740	
7,620.63	7,002.00	-415.03	175.78	Start 10410.44 hold at 7620.63 MD	
18,031.07	7,020.00	-326.96	10,585.83	TD at 18031.07	



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 29

Rosa Unit #656H

OH

Plan #2

Anticollision Summary Report

26 January, 2021





Lonestar Consulting

Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Reference Site:	Rosa Unit 29	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM _16.0
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Reference	Plan #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum centre distance of 10,000.00ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/13/2021		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	18,031.07	Plan #2 (OH)	MWD+HDGM	OWSG MWD + HDGM	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rosa Unit 29						
Rosa Unit #650H - OH - Plan #4 15Apr19 jcsdi	316.66	316.68	8.96	7.14	4.919	CC
Rosa Unit #650H - OH - Plan #4 15Apr19 jcsdi	400.00	400.00	8.96	6.54	3.705	ES
Rosa Unit #650H - OH - Plan #4 15Apr19 jcsdi	500.00	499.46	11.56	8.38	3.641	SF
Rosa Unit #651H - OH - Plan #3 11Mar19 jcsdi	316.66	316.68	9.80	7.98	5.380	CC
Rosa Unit #651H - OH - Plan #3 11Mar19 jcsdi	400.00	400.00	9.80	7.38	4.051	ES
Rosa Unit #651H - OH - Plan #3 11Mar19 jcsdi	500.00	499.43	12.35	9.18	3.896	SF
Rosa Unit #652H - OH - Plan #4 15Apr19 jcsdi	316.66	316.68	31.28	29.46	17.165	CC
Rosa Unit #652H - OH - Plan #4 15Apr19 jcsdi	400.00	400.00	31.28	28.86	12.927	ES
Rosa Unit #652H - OH - Plan #4 15Apr19 jcsdi	7,600.00	7,138.78	195.97	135.13	3.221	SF
Rosa Unit #653H - OH - Plan #3 11Mar19 jcsdi	316.66	316.68	21.57	19.75	11.839	CC
Rosa Unit #653H - OH - Plan #3 11Mar19 jcsdi	400.00	400.00	21.57	19.15	8.916	ES
Rosa Unit #653H - OH - Plan #3 11Mar19 jcsdi	7,900.00	7,011.82	439.93	372.83	6.556	SF
Rosa Unit #654H - OH - Plan #2	905.58	905.57	17.42	11.39	2.889	CC
Rosa Unit #654H - OH - Plan #2	1,000.00	999.91	17.83	11.14	2.665	ES
Rosa Unit #654H - OH - Plan #2	18,031.07	18,262.84	1,463.54	783.20	2.151	SF
Rosa Unit #655H - OH - Plan #3 11Mar19 jcsdi	316.66	316.68	24.18	22.35	13.267	CC
Rosa Unit #655H - OH - Plan #3 11Mar19 jcsdi	400.00	400.00	24.18	21.76	9.991	ES
Rosa Unit #655H - OH - Plan #3 11Mar19 jcsdi	18,031.07	18,257.60	907.09	251.29	1.383	Level 3, SF
Rosa Unit #657H - OH - Plan #3 11Mar19 jcsdi	526.05	526.08	5.76	2.45	1.741	CC, ES
Rosa Unit #657H - OH - Plan #3 11Mar19 jcsdi	18,031.07	18,322.23	808.36	151.92	1.231	Level 2, SF
Sec 25 T31N R6W Offsets						
Rosa Unit #165A - OH - OH	4,123.16	4,053.13	83.67	-55.73	0.600	Level 1, CC
Rosa Unit #165A - OH - OH	4,200.00	4,128.99	84.64	-57.34	0.596	Level 1, ES, SF
Rosa Unit #256 - OH - OH	3,200.00	3,045.00	1,045.05	941.84	10.126	SF
Rosa Unit #256 - OH - OH	3,264.50	3,045.00	1,043.06	940.44	10.165	CC, ES
Rosa Unit #256A - OH - OH	3,240.80	5,087.86	842.49	773.12	12.146	CC, ES, SF

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



Lonestar Consulting

Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Reference Site:	Rosa Unit 29	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM _16.0
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec 29 T31N R5W Offsets						
Rosa Unit #15 - OH - OH	15,726.51	5,913.00	1,144.39	984.33	7.150	CC
Rosa Unit #15 - OH - OH	15,800.00	5,913.00	1,146.74	984.18	7.054	ES
Rosa Unit #15 - OH - OH	16,400.00	5,913.00	1,327.86	1,102.54	5.893	SF
Rosa Unit #200 - OH - OH	15,359.10	3,100.00	3,908.67	3,834.38	52.618	CC
Rosa Unit #200 - OH - OH	15,400.00	3,100.00	3,908.88	3,834.17	52.322	ES
Rosa Unit #200 - OH - OH	17,800.00	3,100.00	4,608.22	4,479.70	35.857	SF
Rosa Unit #229 - OH - OH	12,417.91	5,063.92	3,767.12	3,705.59	61.228	CC, ES
Rosa Unit #229 - OH - OH	15,100.00	4,843.00	4,612.78	4,502.92	41.987	SF
Rosa Unit #229A - OH - OH	13,534.02	3,053.00	3,936.58	3,875.44	64.385	CC
Rosa Unit #229A - OH - OH	13,600.00	3,053.00	3,937.13	3,875.25	63.625	ES
Rosa Unit #229A - OH - OH	16,200.00	3,053.00	4,754.38	4,635.06	39.845	SF
Rosa Unit #23B - OH - OH	12,212.18	6,141.00	870.00	815.79	16.051	CC
Rosa Unit #23B - OH - OH	12,400.00	6,141.00	890.04	803.63	10.300	ES
Rosa Unit #23B - OH - OH	12,900.00	6,141.00	1,109.05	948.49	6.907	SF
Rosa Unit #64 - OH - OH	16,054.81	7,028.20	591.17	99.34	1.202	Level 2, CC, ES, SF
Rosa Unit #64M - OH - OH	13,359.38	7,010.10	447.59	37.10	1.090	Level 2, CC, ES, SF

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



Lonestar Consulting

Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Reference Site:	Rosa Unit 29	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM _16.0
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6372' & RKB 25' @ 6397.00ft

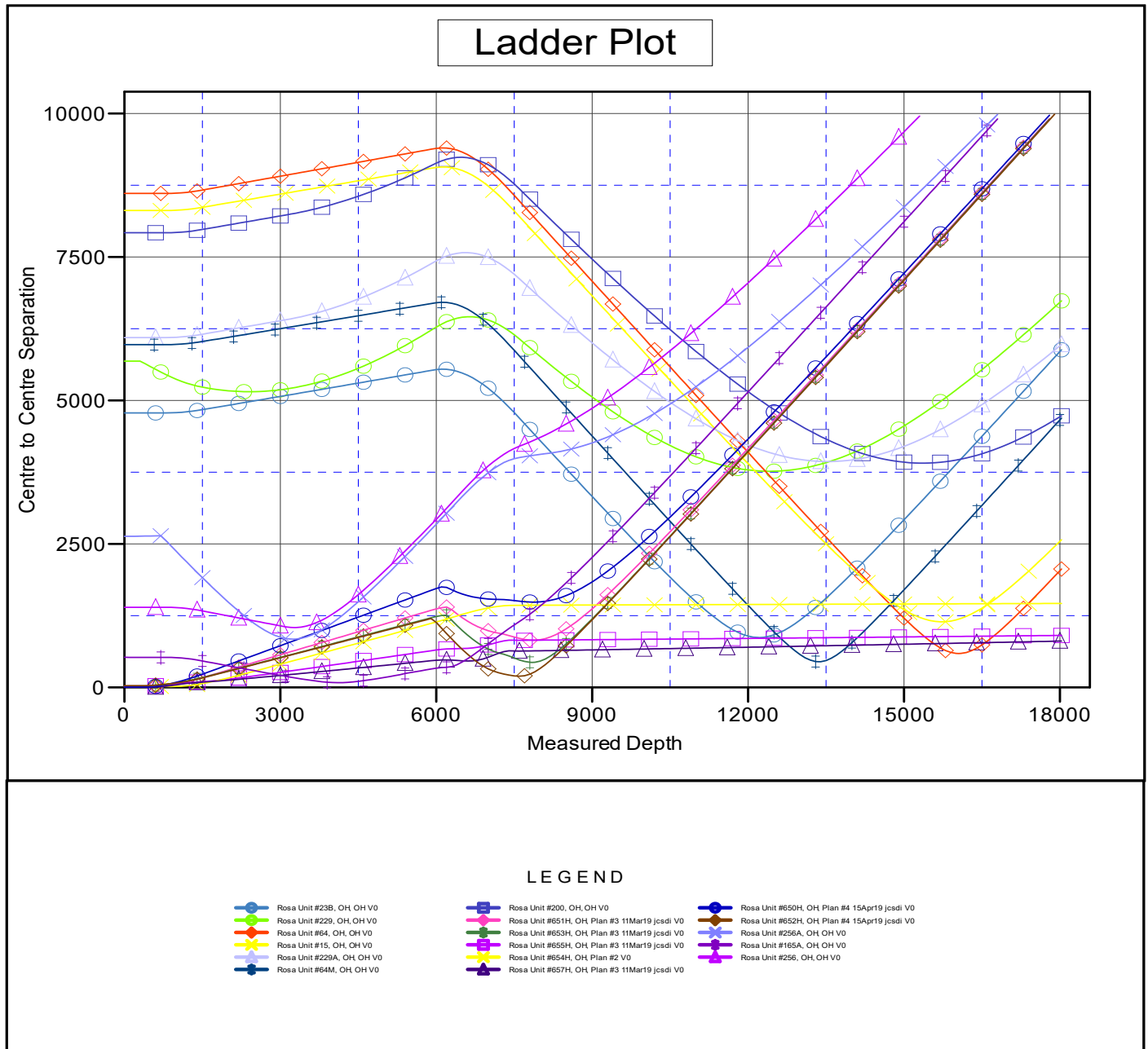
Offset Depths are relative to Offset Datum

Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #656H - Slot B3 (656H)

Coordinate System is US State Plane 1983, New Mexico Western Zone

Grid Convergence at Surface is: 0.25°



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



Lonestar Consulting

Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #656H - Slot B3 (656H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Reference Site:	Rosa Unit 29	MD Reference:	GL 6372' & RKB 25' @ 6397.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #656H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM _16.0
Reference Design:	Plan #2	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6372' & RKB 25' @ 6397.00ft

Offset Depths are relative to Offset Datum

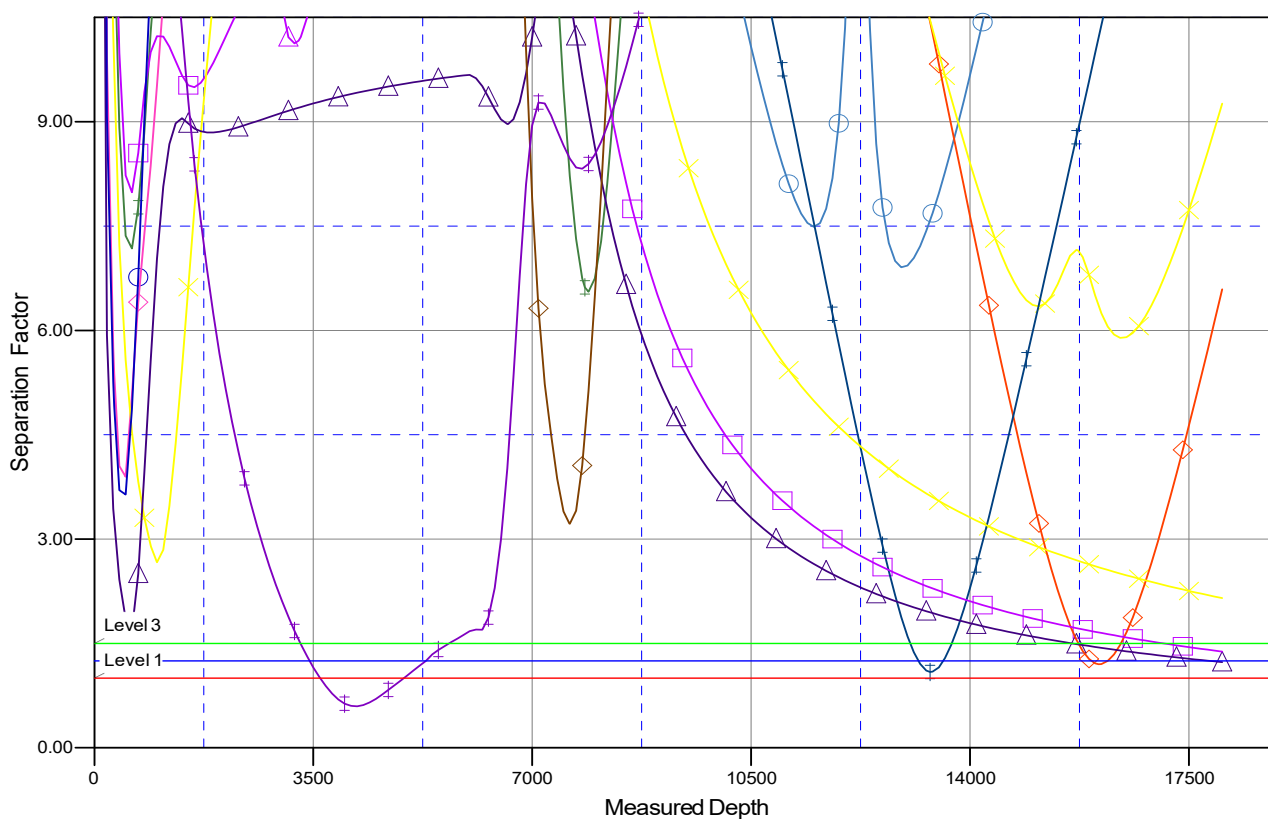
Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #656H - Slot B3 (656H)

Coordinate System is US State Plane 1983, New Mexico Western Zone

Grid Convergence at Surface is: 0.25°

Separation Factor Plot



LEGEND

Rosa Unit #238, OH OH V0	Rosa Unit #200, OH OH V0	Rosa Unit #650H, OH Plan #4 15Apr19 jcsdi V0
Rosa Unit #229, OH OH V0	Rosa Unit #651H, OH Plan #3 11Mar19 jcsdi V0	Rosa Unit #652H, OH Plan #4 15Apr19 jcsdi V0
Rosa Unit #64, OH OH V0	Rosa Unit #653H, OH Plan #3 11Mar19 jcsdi V0	Rosa Unit #256A, OH OH V0
Rosa Unit #15, OH OH V0	Rosa Unit #655H, OH Plan #3 11Mar19 jcsdi V0	Rosa Unit #165A, OH OH V0
Rosa Unit #229A, OH OH V0	Rosa Unit #654H, OH Plan #2 V0	Rosa Unit #256, OH OH V0
Rosa Unit #64M, OH OH V0	Rosa Unit #657H, OH Plan #3 11Mar19 jcsdi V0	

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

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

COMMENTS

Action 26502

COMMENTS

Operator:				OGRID:	Action Number:	Action Type:
	LOGOS OPERATING, LLC	2010 Afton Place	Farmington, NM87401	289408	26502	C-103A

Created By	Comment	Comment Date
kpickford	KP GEO Review 5/5/2021	05/05/2021

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 26502

CONDITIONS OF APPROVAL

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM87401			OGRID: 289408	Action Number: 26502	Action Type: C-103A
OCD Reviewer			Condition		
jagarcia			None		