Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.: NMSF0078764

6. If Indian, Allotee or Tribe Name:

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☑ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

7. If Unit or CA Agreement, Name and No.: NMNM 078707E

8. Lease Name and Well No.: ROSA UNIT 662H

2. Name of Operator: LOGOS OPERATING LLC

9. API Well No.: 30-039-31417

3a. Address: 2010 AFTON PLACE, FARMINGTON, NM 87401

3b. Phone No. *(include area code)*: (505) 278-8720

10. Field and Pool, or Exploratory: BASIN/BASIN MANCOS

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface: NESW / 2300 FSL / 946 FWL / LAT 36.869668 / LONG -107.404553

At proposed prod. zone: NESW / 2360 FSL / 2614 FWL / LAT 36.869846 / LONG -107.367741

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 30/T31N/R5W/NMP

14. Distance in miles and direction from nearest town or post office*: 38 miles

12. County or Parish: RIO ARRIBA

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any): 946 feet

16. No of acres in lease:

17. Spacing Unit dedicated to this well: 872.79

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 9 feet

19. Proposed Depth: 6997 feet / 17949 feet

20. BLM/BIA Bond No. in file: FED: NMB001821

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 6394 feet

22. Approximate date work will start*: 09/01/2021

23. Estimated duration: 45 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	ETTA TRUJILLO / Ph: (505) 324-4145	08/27/2021

Title: Regulatory Specialist

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	DAVE J MANKIEWICZ / Ph: (505) 564-7761	03/18/2022

Title	Office
AFM-Minerals	Farmington Field Office

Application approval 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.
Conditions of approval, if any, are attached.

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.

APPROVED WITH CONDITIONS

Approval Date: 03/18/2022

(Continued on page 2)

*(Instructions on page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the wen, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionany drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM conects this information to anow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

(Continued on page 3)

Approval Date: 03/18/2022

Additional Operator Remarks

Location of Well

0. SHL: NESW / 2300 FSL / 946 FWL / TWSP: 31N / RANGE: 5W / SECTION: 30 / LAT: 36.869668 / LONG: -107.404553 (TVD: 0 feet, MD: 0 feet)

PPP: NWSW / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 28 / LAT: 0.0 / LONG: 0.0 (TVD: 0 feet, MD: 0 feet)

PPP: NESE / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 29 / LAT: 0.0 / LONG: 0.0 (TVD: 0 feet, MD: 0 feet)

PPP: NWSW / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 5W / SECTION: 29 / LAT: 0.0 / LONG: 0.0 (TVD: 0 feet, MD: 0 feet)

PPP: LOT 3 / 2508 FSL / 1138 FWL / TWSP: 31N / RANGE: 5W / SECTION: 30 / LAT: 36.870238 / LONG: -107.403895 (TVD: 6987 feet, MD: 7372 feet)

BHL: NESW / 2360 FSL / 2614 FWL / TWSP: 31N / RANGE: 5W / SECTION: 28 / LAT: 36.869846 / LONG: -107.367741 (TVD: 6997 feet, MD: 17949 feet)

BLM Point of Contact

Name: RYAN JOYNER
Title: Physical Scientist
Phone: (970) 385-1242
Email: rjoyner@blm.gov

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Drive
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-039-31417	97232	BASIN MANCOS

[4] Property Code	[5] Property Name	[6] Well Number
320608	ROSA UNIT	662H

[7] OGRID No.	[8] Operator Name	[9] Elevation
289408	LOGOS OPERATING, LLC	6394'

[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
K	30	31N	5W	3	2300	SOUTH	946	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
K	28	31N	5W		2360	SOUTH	2614	WEST	RIO ARRIBA

[12] Dedicated Acres		[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
872.79	S/2 - Sections 28, 29, 30, T31N, R5W			R13457

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Etta Trujillo — 8/12/2021
Signature — Date

Etta Trujillo
Printed Name

etrujillo@logosresourcesllc.com
E-mail Address

[18] SURVEYOR CERTIFICATION

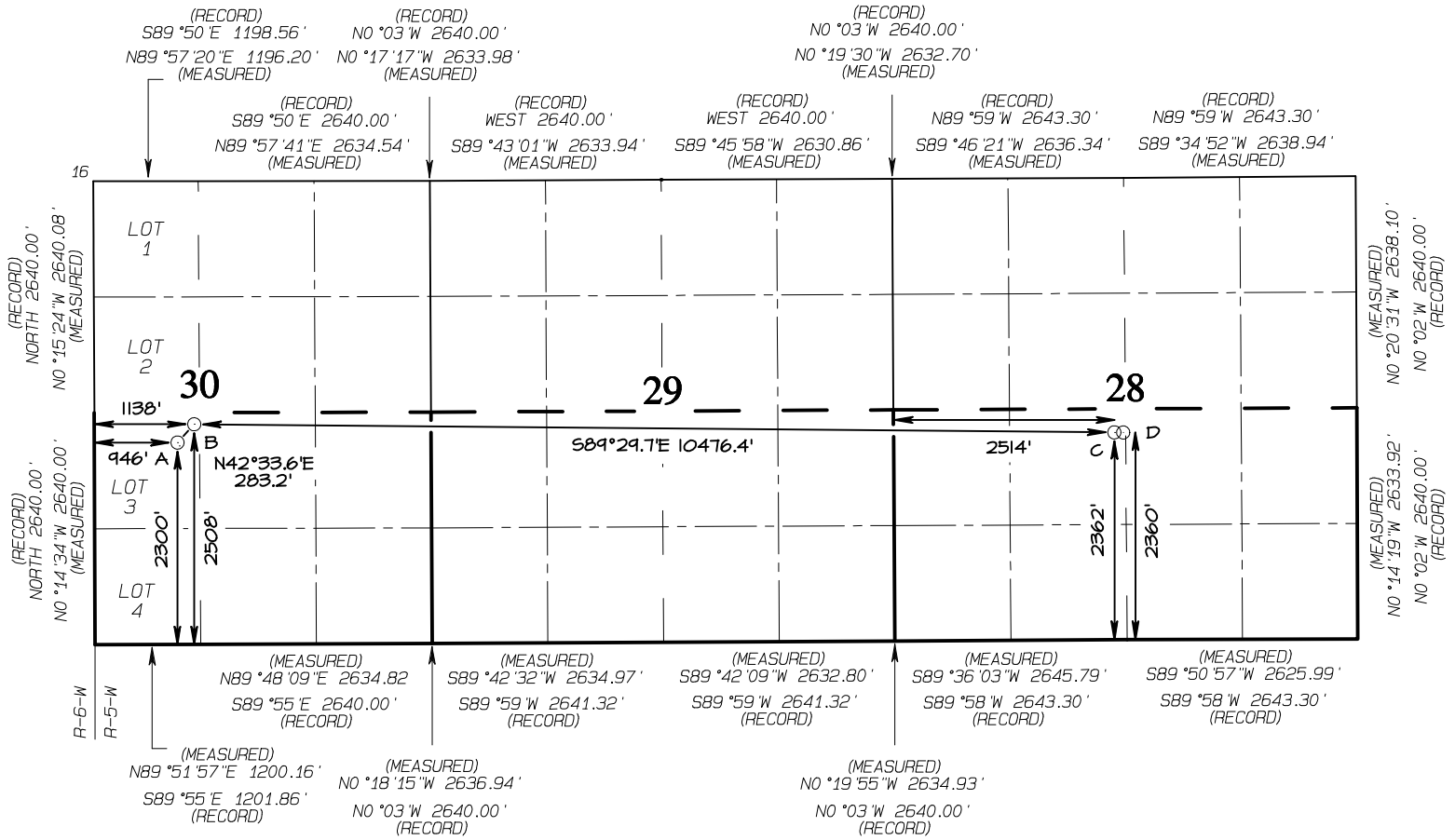
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised: JULY 19, 2021
Survey Date: SEPTEMBER 3, 2015

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269



SURFACE LOCATION (A)
2300' FSL 946' FWL
SEC 30, T31N, R5W
LAT: 36.869662 °N
LONG: 107.403950 °W
DATUM: NAD1927

LAT: 36.869668 °N
LONG: 107.404553 °W
DATUM: NAD1983

N42°33.6'E 283.2'

POINT-OF-ENTRY (B)
2508' FSL 1138' FWL
SEC 30, T31N, R5W
LAT: 36.870232 °N
LONG: 107.403292 °W
DATUM: NAD1927

LAT: 36.870238 °N
LONG: 107.403895 °W
DATUM: NAD1983

S89°29.7'E 10476.4'

FIRST PERFORATION (C)
2362' FSL 2514' FWL
SEC 28, T31N, R5W
LAT: 36.869843 °N
LONG: 107.367481 °W
DATUM: NAD1927

LAT: 36.869850 °N
LONG: 107.368083 °W
DATUM: NAD1983

S89°24.7'E 100.0'

END-OF-LATERAL (D)
2360' FSL 2614' FWL
SEC 28, T31N, R5W
LAT: 36.869840 °N
LONG: 107.367139 °W
DATUM: NAD1927

LAT: 36.869846 °N
LONG: 107.367741 °W
DATUM: NAD1983

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:** 08 / 26 / 2021

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 662H	30-039-	K 30 T31N R5W	2300FSL 946FWL	N/A	12,462	2,400
Rosa Unit 664H	30-039-	K 30 T31N R5W	2260FSL 966FWL	N/A	12,462	2,400
Rosa Unit 665H	30-039-31358	K 30 T31N R5W	2247FSL 973FWL	N/A	10,865	1,800
Rosa Unit 658H	30-039-	K 30 T31N R5W	2317FSL 947FWL	N/A	10,865	1,800

IV. Central Delivery Point Name: A-59 [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 662H	30-039-	2022	Pending	Pending	Pending	Pending
Rosa Unit 664H	30-039-	2022	Pending	Pending	Pending	Pending
Rosa Unit 665H	30-039-31358	8/25/2021	Pending	Pending	Pending	Pending
Rosa Unit 658H	30-039-	2022	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:	Etta Trujillo
Printed Name:	Etta Trujillo
Title:	Regulatory Specialist
E-mail Address:	etrujillo@logosresourcesllc.com
Date:	08/26/2021
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.

LOGOS Operating, LLC
Operations Plan

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

Date:	August 12, 2021	Pool:	Basin Mancos
Well Name:	**Rosa Unit 662H**	GL Elevation:	6,394’
Surface Location:	Sec 30, T31N, R5W 2300 FSL, 946 FWL (36.869668º N, 107.404553º W – NAD83)	Measured Depth:	17,949’ (GL)
Bottom Hole Location:	Sec 28, T31N, R5W 2360 FSL, 2614 FWL (36.869846º N, 107.367741º W – NAD83)	County:	Rio Arriba

Lease Serial # NMSF0078764, CA Serial #NMNM078407E

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,502'	2,496'	*POINT LOOKOUT	5,691'	5,672'
KIRTLAND	2,630'	2,624'	*MANCOS	6,180'	6,158'
*FRUITLAND	3,093'	3,085'	KICKOFF POINT	6,318	6,296
*PICTURED CLIFFS	3,424'	3,414'	LANDING POINT	7,372	6,987
LEWIS	3,518'	3,508'			
CHACRA	4,610'	4,595'			
*CLIFF HOUSE	5,440'	5,422'			
MENEFEE	5,489'	5,470'	TD	17,949	6,997

* 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. Mud weights of 8.8-13 ppg will be used as necessary to maintain sufficient overbalance of reservoir pressure.

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

times.

B. **BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes.** Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes.** Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe and blind rams shall be activated each trip or but not more than once a day. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when initially installed for the first well on the pad or if seals subject to test pressure are broken, following related repairs and at a minimum of 30 day intervals. A BOPE Shell Test only will be conducted for subsequent wells on the pad when seals subject to pressure have not been broken or repaired and fall within the 30 day interval of first full test.

C. **GeoHazards:** There are no Geohazards

D. **Maximum Anticipated Pressure:** 6997' TVD x 0.43 = 3009 psi

E. **H2S Concerns:** There is no record of any naturally occurring H2S in any formation in the Rosa Unit. No H2S is anticipated in this formation or this well.

III. MATERIALS

A. CASING EQUIPMENT;

CASING TYPE	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	LTC/BTC
INTERMEDIATE	12.25"	6,255'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	17,949'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

NOTE: All casing depths are approximate, based on GL elevation 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;

1. SURFACE CASING: 13-3/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (3) 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. Optional use of DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancelation plugs for DV tools may be used if losses while cementing are not encountered.
3. PRODUCTION CASING: Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2" full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) one RSI (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)

1. SURFACE: Casing shall be set at ~ 320' and cemented to surface. TOC at Surface. 263 sks of 15.8 ppg Type Neat G, 1.18 cuft/sk yield or equivalent 223 sks of 14.6 ppg Type III with 1.39 cuf/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	464	0.31318	1.3	206	37	1.15	180	15.8
Stage 1 Lead	4,660	1,131	0.31318	1.3	460	82	2.30	200	12.3
					667	**119**		**385**	
Stage 2 Tail	3,624	1,036	0.31318	1.3	422	75	1.50	281	13.5
Stage 2 Lead	3,144	480	0.31318	1.3	195	35	2.30	85	12.3
					617	**110**		**366**	
Stage 3 Tail	2,394	750	0.31318	1.3	305	54	1.99	153	12.8
Stage 3 Lead	320	2,074	0.31318	1.3	844	150	2.53	334	12
Stage 3 Lead	-	320	0.36268	1	116	21	2.53	46	12
					1,266	**225**		**533**	
All Stage Totals					**2,550**	**454**		**1,279**	

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	6,155	100	0.2531	1	25	5	1.56	16	13
Open Hole Lead	6,255	11,694	0.2291	1.15	3,091	551	1.56	1,982	13
					3,117	**555**		**1,998**	

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. With frac stack installed on wellhead, pressure test 5-1/2" casing to 1550 psi (0.22 psi/ft * 6,997' TVD) for 30 minutes. Increase pressure to Open RSI sleeves.

D. STIMULATION

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

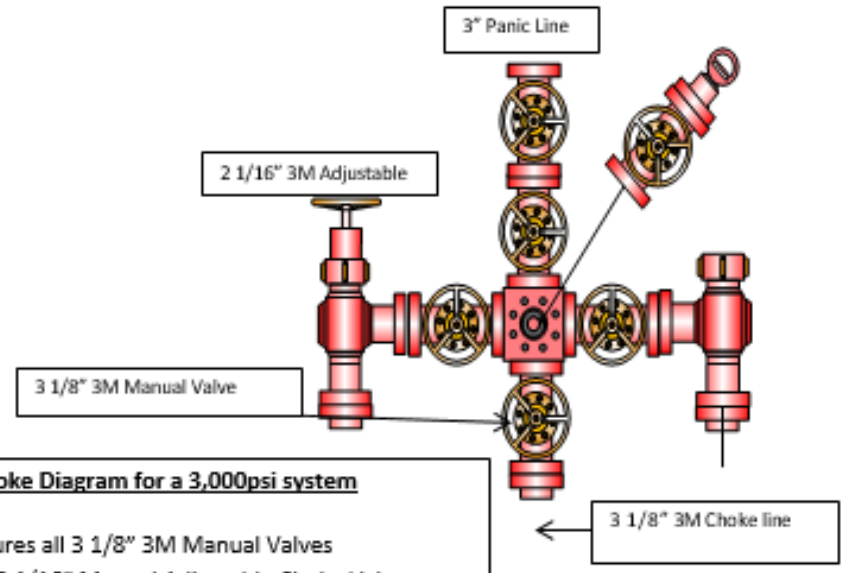
E. PRODUCTION TUBING

2-7/8", 6.5#, J-55, EUE tubing will be run 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.

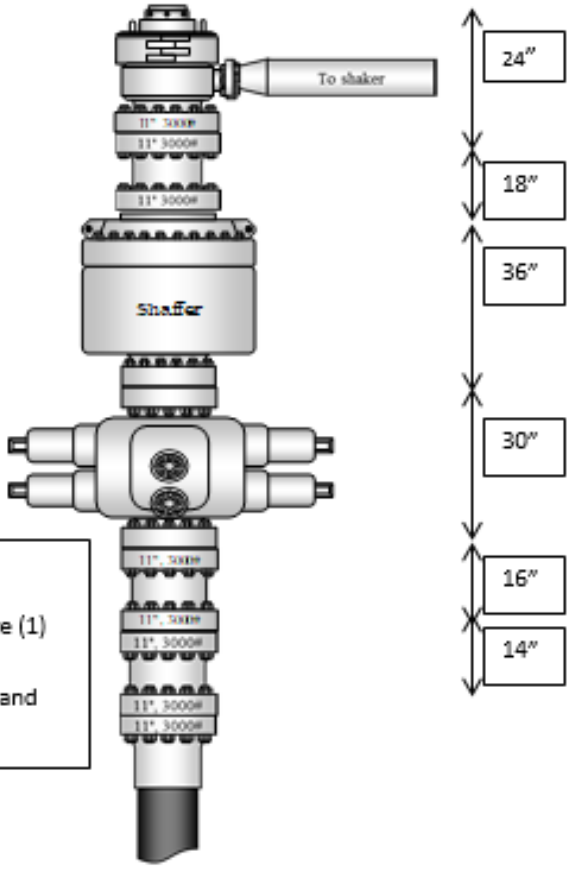
LOGOS RESOURCES II, LLC

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



11" 3,000psi 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 662H

Logos Opersting LLC

Rio Arriba, NM NAD83
Rosa Unit 30
Rosa Unit #662H

OH
Plan #2

Anticollision Report

05 July, 2021

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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:	Stations	**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** 7/5/2021

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	17,948.87	Plan #2 (OH)	MWD	MWD - Standard

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Rosa Unit 30						
Rosa Unit #658H - OH - Plan #2	1,083.43	1,083.32	17.35	9.60	2.237	CC
Rosa Unit #658H - OH - Plan #2	1,100.00	1,099.83	17.38	9.51	2.208	ES
Rosa Unit #658H - OH - Plan #2	7,272.32	7,662.31	106.29	39.07	1.581	SF
Rosa Unit #659H - OH - Plan #1	500.00	500.00	17.49	13.91	4.880	CC, ES
Rosa Unit #659H - OH - Plan #1	600.00	599.38	19.15	14.87	4.471	SF
Rosa Unit #660H - OH - Plan #1	500.00	500.00	31.26	27.68	8.721	CC, ES
Rosa Unit #660H - OH - Plan #1	700.00	697.65	37.85	32.88	7.621	SF
Rosa Unit #663H - OH - Plan #1	500.00	500.00	15.04	11.45	4.194	CC, ES
Rosa Unit #663H - OH - Plan #1	17,948.87	18,132.69	773.85	106.69	1.160	Level 2, SF
Rosa Unit #664H - OH - Plan #2	1,000.00	1,000.00	45.14	37.97	6.296	CC, ES
Rosa Unit #664H - OH - Plan #2	17,948.87	18,294.02	1,438.10	751.77	2.095	SF
Rosa Unit #665H - OH - Plan #2	1,000.00	1,000.00	31.26	24.09	4.360	CC, ES, SF
Sec 29 T31N R5W Offsets						
Rosa Unit #15B - OH - OH	13,623.58	3,800.00	3,250.29	3,190.45	54.319	CC
Rosa Unit #15B - OH - OH	13,700.00	3,800.00	3,251.19	3,190.11	53.225	ES
Rosa Unit #15B - OH - OH	15,900.00	3,800.00	3,968.18	3,838.98	30.712	SF
Sec 30 T31N R5W Offsets						
Rosa Unit #166B - OH - OH	7,753.39	6,980.73	450.82	202.32	1.814	CC, ES, SF
Rosa Unit #233A - OH - OH	375.99	380.00	1,411.22	1,409.14	677.080	CC
Rosa Unit #233A - OH - OH	400.00	396.42	1,411.28	1,409.05	633.231	ES
Rosa Unit #233A - OH - OH	3,400.00	3,147.00	2,143.02	2,119.62	91.552	SF

Offset Design: Rosa Unit 30 - Rosa Unit #658H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	2.88	17.49	0.88	17.51	17.51	0.00	N/A	
100.00	100.00	100.00	100.00	0.36	0.36	2.88	17.49	0.88	17.51	16.80	0.72	24.426	
200.00	200.00	200.00	200.00	0.72	0.72	2.88	17.49	0.88	17.51	16.08	1.43	12.213	
300.00	300.00	300.00	300.00	1.08	1.08	2.88	17.49	0.88	17.51	15.36	2.15	8.142	
400.00	400.00	400.00	400.00	1.43	1.43	2.88	17.49	0.88	17.51	14.64	2.87	6.107	
500.00	500.00	500.00	500.00	1.79	1.79	2.88	17.49	0.88	17.51	13.93	3.58	4.885	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

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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

Offset Design: Rosa Unit 30 - Rosa Unit #658H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
600.00	600.00	600.00	600.00	2.15	2.15	2.88	17.49	0.88	17.51	13.21	4.30	4.071	
700.00	700.00	700.00	700.00	2.51	2.51	2.88	17.49	0.88	17.51	12.49	5.02	3.489	
800.00	800.00	800.00	800.00	2.87	2.87	2.88	17.49	0.88	17.51	11.78	5.74	3.053	
900.00	900.00	900.00	900.00	3.23	3.23	2.88	17.49	0.88	17.51	11.06	6.45	2.714	
1,000.00	1,000.00	1,000.00	1,000.00	3.58	3.58	2.88	17.49	0.88	17.51	10.34	7.17	2.443	
1,083.43	1,083.42	1,083.32	1,083.31	3.88	3.88	77.21	17.54	2.09	17.35	9.60	7.76	2.237 CC	
1,100.00	1,099.98	1,099.83	1,099.81	3.94	3.93	80.61	17.56	2.62	17.38	9.51	7.87	2.208 ES	
1,200.00	1,199.84	1,198.97	1,198.81	4.29	4.28	109.79	17.75	7.78	20.65	12.09	8.56	2.413	
1,266.26	1,265.88	1,263.96	1,263.58	4.53	4.51	127.97	17.95	13.02	27.73	18.72	9.01	3.079	
1,300.00	1,299.47	1,296.79	1,296.26	4.65	4.62	134.72	18.07	16.23	32.85	23.62	9.23	3.559	
1,400.00	1,399.04	1,393.25	1,392.02	5.01	4.97	146.34	18.50	27.81	51.76	41.88	9.88	5.237	
1,500.00	1,498.61	1,488.27	1,485.91	5.37	5.32	151.75	19.05	42.36	74.90	64.38	10.52	7.120	
1,600.00	1,598.18	1,581.68	1,577.70	5.74	5.67	154.58	19.70	59.69	101.57	90.43	11.14	9.117	
1,700.00	1,697.74	1,673.33	1,667.15	6.11	6.04	156.18	20.45	79.59	131.48	119.73	11.75	11.192	
1,800.00	1,797.31	1,765.48	1,756.49	6.49	6.43	157.14	21.30	102.14	164.13	151.75	12.38	13.257	
1,900.00	1,896.88	1,859.82	1,847.85	6.86	6.83	157.80	22.19	125.63	197.23	184.17	13.06	15.097	
2,000.00	1,996.45	1,954.16	1,939.22	7.24	7.25	158.27	23.07	149.12	230.35	216.60	13.75	16.751	
2,100.00	2,096.02	2,048.50	2,030.59	7.61	7.68	158.62	23.96	172.61	263.48	249.03	14.44	18.243	
2,200.00	2,195.59	2,142.85	2,121.96	7.99	8.12	158.90	24.84	196.10	296.61	281.47	15.14	19.594	
2,300.00	2,295.16	2,237.19	2,213.32	8.37	8.56	159.11	25.73	219.59	329.75	313.91	15.83	20.824	
2,400.00	2,394.72	2,331.53	2,304.69	8.75	9.01	159.29	26.61	243.07	362.89	346.35	16.54	21.947	
2,500.00	2,494.29	2,425.87	2,396.06	9.13	9.46	159.44	27.49	266.56	396.03	378.80	17.24	22.976	
2,600.00	2,593.86	2,520.22	2,487.43	9.51	9.92	159.57	28.38	290.05	429.18	411.24	17.94	23.921	
2,700.00	2,693.43	2,614.56	2,578.79	9.90	10.38	159.67	29.26	313.54	462.33	443.68	18.65	24.793	
2,800.00	2,793.00	2,708.90	2,670.16	10.28	10.84	159.77	30.15	337.03	495.48	476.12	19.35	25.600	
2,900.00	2,892.57	2,803.25	2,761.53	10.66	11.30	159.85	31.03	360.52	528.63	508.57	20.06	26.347	
3,000.00	2,992.13	2,897.59	2,852.90	11.05	11.77	159.92	31.92	384.01	561.78	541.01	20.77	27.042	
3,100.00	3,091.70	2,991.93	2,944.27	11.43	12.24	159.98	32.80	407.50	594.93	573.45	21.49	27.690	
3,200.00	3,191.27	3,086.27	3,035.63	11.81	12.71	160.04	33.69	430.99	628.09	605.89	22.20	28.295	
3,300.00	3,290.84	3,180.62	3,127.00	12.20	13.19	160.09	34.57	454.48	661.24	638.33	22.91	28.861	
3,400.00	3,390.41	3,274.96	3,218.37	12.58	13.66	160.14	35.45	477.97	694.39	670.77	23.63	29.392	
3,500.00	3,489.98	3,369.30	3,309.74	12.97	14.14	160.18	36.34	501.45	727.55	703.21	24.34	29.890	
3,600.00	3,589.54	3,463.65	3,401.10	13.35	14.62	160.22	37.22	524.94	760.70	735.64	25.06	30.359	
3,700.00	3,689.11	3,557.99	3,492.47	13.74	15.09	160.25	38.11	548.43	793.86	768.08	25.77	30.802	
3,800.00	3,788.68	3,652.33	3,583.84	14.12	15.57	160.29	38.99	571.92	827.01	800.52	26.49	31.220	
3,900.00	3,888.25	3,746.67	3,675.21	14.51	16.05	160.32	39.88	595.41	860.17	832.96	27.21	31.615	
4,000.00	3,987.82	3,841.02	3,766.57	14.89	16.54	160.34	40.76	618.90	893.32	865.39	27.93	31.989	
4,100.00	4,087.39	3,935.36	3,857.94	15.28	17.02	160.37	41.65	642.39	926.48	897.83	28.65	32.343	
4,200.00	4,186.95	4,029.70	3,949.31	15.67	17.50	160.39	42.53	665.88	959.63	930.27	29.36	32.680	
4,300.00	4,286.52	4,124.05	4,040.68	16.05	17.98	160.42	43.41	689.37	992.79	962.70	30.08	33.000	
4,400.00	4,386.09	4,218.39	4,132.05	16.44	18.47	160.44	44.30	712.86	1,025.94	995.14	30.80	33.305	
4,500.00	4,485.66	4,312.73	4,223.41	16.82	18.95	160.46	45.18	736.34	1,059.10	1,027.57	31.53	33.595	
4,600.00	4,585.23	4,407.07	4,314.78	17.21	19.44	160.48	46.07	759.83	1,092.25	1,060.01	32.25	33.872	
4,700.00	4,684.80	4,501.42	4,406.15	17.60	19.92	160.49	46.95	783.32	1,125.41	1,092.44	32.97	34.137	
4,800.00	4,784.36	4,595.76	4,497.52	17.98	20.41	160.51	47.84	806.81	1,158.57	1,124.88	33.69	34.389	
4,900.00	4,883.93	4,690.10	4,588.88	18.37	20.89	160.52	48.72	830.30	1,191.72	1,157.31	34.41	34.631	
5,000.00	4,983.50	4,784.45	4,680.25	18.76	21.38	160.54	49.61	853.79	1,224.88	1,189.75	35.13	34.863	
5,100.00	5,083.07	4,878.79	4,771.62	19.14	21.87	160.55	50.49	877.28	1,258.04	1,222.18	35.86	35.084	
5,200.00	5,182.64	4,973.13	4,862.99	19.53	22.36	160.57	51.37	900.77	1,291.19	1,254.61	36.58	35.297	
5,300.00	5,282.21	5,067.47	4,954.35	19.92	22.84	160.58	52.26	924.26	1,324.35	1,287.05	37.30	35.501	
5,400.00	5,381.78	5,161.82	5,045.72	20.30	23.33	160.59	53.14	947.75	1,357.51	1,319.48	38.03	35.698	
5,500.00	5,481.34	5,256.16	5,137.09	20.69	23.82	160.60	54.03	971.23	1,390.66	1,351.91	38.75	35.886	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #658H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,600.00	5,580.91	8,137.81	6,991.29	21.08	49.34	-161.75	113.54	-384.39	1,411.32	1,386.59	24.73	57.075	
5,700.00	5,680.48	8,146.20	6,991.27	21.47	49.54	-159.66	113.73	-392.79	1,311.94	1,286.93	25.02	52.442	
5,800.00	5,780.05	8,154.60	6,991.26	21.85	49.73	-157.40	113.92	-401.18	1,212.62	1,187.29	25.33	47.881	
5,900.00	5,879.62	8,163.00	6,991.24	22.24	49.93	-154.93	114.11	-409.58	1,113.35	1,087.69	25.66	43.391	
6,000.00	5,979.19	8,171.40	6,991.22	22.63	50.13	-152.26	114.30	-417.97	1,014.15	988.12	26.03	38.968	
6,100.00	6,078.75	8,179.79	6,991.21	23.02	50.32	-149.35	114.49	-426.37	915.05	888.61	26.44	34.608	
6,200.00	6,178.32	8,188.19	6,991.19	23.40	50.52	-146.21	114.68	-434.76	816.08	789.16	26.93	30.307	
6,300.00	6,277.89	8,196.59	6,991.17	23.79	50.72	-142.82	114.87	-443.16	717.30	689.78	27.53	26.058	
6,318.49	6,296.30	8,198.14	6,991.17	23.86	50.76	-142.16	114.91	-444.71	699.06	671.41	27.66	25.277	
6,350.00	6,327.73	8,200.01	6,991.17	23.98	50.80	-146.92	114.95	-446.58	667.96	640.08	27.89	23.953	
6,400.00	6,377.68	8,199.77	6,991.17	24.15	50.79	145.67	114.95	-446.34	618.60	590.32	28.28	21.873	
6,450.00	6,427.47	8,195.62	6,991.17	24.29	50.70	140.99	114.85	-442.19	569.53	540.80	28.73	19.826	
6,500.00	6,476.79	8,187.57	6,991.19	24.42	50.51	145.70	114.67	-434.14	521.07	491.83	29.24	17.820	
6,550.00	6,525.33	8,175.67	6,991.21	24.54	50.23	149.14	114.40	-422.25	473.57	443.71	29.86	15.860	
6,600.00	6,572.79	8,160.00	6,991.25	24.65	49.86	151.08	114.05	-406.58	427.36	396.74	30.62	13.957	
6,650.00	6,618.89	8,140.66	6,991.28	24.75	49.41	151.87	113.61	-387.24	382.80	351.22	31.58	12.121	
6,700.00	6,663.33	8,117.76	6,991.33	24.84	48.87	151.75	113.09	-364.35	340.24	307.42	32.82	10.368	
6,750.00	6,705.84	8,091.44	6,991.38	24.94	48.26	150.84	112.49	-338.04	300.06	265.64	34.42	8.718	
6,800.00	6,746.17	8,061.87	6,991.44	25.04	47.59	149.15	111.82	-308.47	262.64	226.14	36.50	7.195	
6,850.00	6,784.06	8,029.23	6,991.51	25.16	46.84	146.65	111.08	-275.84	228.41	189.22	39.19	5.828	
6,900.00	6,819.27	7,993.72	6,991.58	25.30	46.04	143.24	110.28	-240.34	197.82	155.23	42.59	4.644	
6,950.00	6,851.60	7,955.56	6,991.66	25.48	45.21	138.83	109.42	-202.19	171.33	124.59	46.75	3.665	
7,000.00	6,880.84	7,914.98	6,991.74	25.70	44.32	133.33	108.50	-161.63	149.40	97.91	51.49	2.902	
7,050.00	6,906.82	7,872.24	6,991.82	25.99	43.41	126.79	107.53	-118.89	132.35	75.94	56.42	2.346	
7,100.00	6,929.36	7,827.60	6,991.91	26.33	42.47	119.49	106.52	-74.26	120.22	59.37	60.86	1.976	
7,150.00	6,948.34	7,781.21	6,992.00	26.75	41.51	111.94	105.47	-27.89	112.59	48.43	64.16	1.755	
7,200.00	6,963.63	7,732.54	6,990.93	27.24	40.55	104.21	104.35	20.76	108.29	42.08	66.21	1.636	
7,250.00	6,975.15	7,683.97	6,987.80	27.80	39.60	96.78	103.20	69.21	106.46	39.33	67.13	1.586	
7,272.32	6,979.05	7,662.31	6,985.74	28.08	39.19	93.66	102.68	90.77	106.29	39.07	67.23	1.581 SF	
7,300.00	6,982.81	7,635.48	6,982.63	28.43	38.68	90.00	102.03	117.41	106.52	39.42	67.10	1.587	
7,350.00	6,986.58	7,587.06	6,975.44	29.11	37.78	84.13	100.83	165.27	107.83	41.40	66.43	1.623	
7,372.48	6,987.00	7,565.31	6,971.55	29.44	37.40	81.82	100.28	186.66	108.67	42.64	66.04	1.646	
7,400.00	6,987.03	7,538.82	6,966.26	29.85	36.94	79.10	99.61	212.61	109.94	44.50	65.45	1.680	
7,500.00	6,987.12	7,444.93	6,942.74	31.50	35.39	67.86	97.19	303.45	118.66	56.79	61.87	1.918	
7,600.00	6,987.22	7,355.49	6,913.49	33.34	34.06	56.24	94.82	387.91	136.10	79.79	56.31	2.417	
7,700.00	6,987.31	7,271.19	6,879.97	35.36	32.94	46.11	92.54	465.20	163.66	113.23	50.43	3.245	
7,800.00	6,987.40	7,192.44	6,843.59	37.52	32.02	38.11	90.40	535.00	200.84	155.05	45.79	4.386	
7,900.00	6,987.50	7,119.37	6,805.63	39.81	31.29	32.08	88.39	597.38	246.33	203.48	42.85	5.749	
8,000.00	6,987.59	7,051.93	6,767.13	42.19	30.71	27.57	86.54	652.71	298.77	257.46	41.31	7.232	
8,100.00	6,987.69	7,000.00	6,735.30	44.65	30.29	24.68	85.12	693.71	357.17	315.92	41.26	8.657	
8,200.00	6,987.78	6,932.97	6,691.53	47.19	29.87	21.58	83.29	744.43	420.08	379.39	40.69	10.323	
8,300.00	6,987.88	6,880.80	6,655.45	49.79	29.56	19.55	81.87	782.08	487.28	446.30	40.99	11.889	
8,400.00	6,987.97	6,832.99	6,620.91	52.44	29.32	17.95	80.59	815.11	558.01	516.56	41.44	13.464	
8,500.00	6,988.07	6,800.00	6,596.29	55.13	29.16	16.97	79.71	837.05	631.90	589.59	42.30	14.937	
8,600.00	6,988.16	6,748.99	6,557.00	57.87	28.97	15.61	78.36	869.55	708.11	665.59	42.52	16.655	
8,700.00	6,988.26	6,700.00	6,517.94	60.63	28.78	14.47	77.08	899.09	786.89	744.12	42.77	18.397	
8,800.00	6,988.35	6,678.13	6,500.11	63.42	28.72	14.00	76.52	911.73	867.34	823.77	43.56	19.910	
8,900.00	6,988.44	6,646.85	6,474.19	66.24	28.63	13.38	75.72	929.22	949.67	905.63	44.04	21.564	
9,000.00	6,988.54	6,600.00	6,434.49	69.08	28.49	12.53	74.54	954.07	1,033.83	989.63	44.20	23.389	
9,100.00	6,988.63	6,600.00	6,434.49	71.94	28.49	12.53	74.54	954.07	1,118.81	1,073.80	45.01	24.858	
9,200.00	6,988.73	6,566.57	6,405.55	74.81	28.41	11.99	73.71	970.80	1,205.15	1,159.88	45.26	26.626	
9,300.00	6,988.82	6,543.61	6,385.41	77.71	28.36	11.63	73.15	981.79	1,292.61	1,247.01	45.60	28.344	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #658H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,400.00	6,988.92	6,500.00	6,346.55	80.61	28.25	11.01	72.10	1,001.56	1,381.42	1,335.72	45.70	30.225	
9,500.00	6,989.01	6,500.00	6,346.55	83.53	28.25	11.01	72.10	1,001.56	1,470.29	1,424.10	46.19	31.831	
9,600.00	6,989.11	6,500.00	6,346.55	86.45	28.25	11.01	72.10	1,001.56	1,560.51	1,513.92	46.60	33.488	
9,700.00	6,989.20	6,466.46	6,316.17	89.39	28.19	10.58	71.31	1,015.75	1,651.03	1,604.31	46.72	35.340	
9,800.00	6,989.30	6,450.20	6,301.30	92.34	28.15	10.38	70.93	1,022.30	1,742.37	1,695.42	46.94	37.115	
9,900.00	6,989.39	6,434.94	6,287.26	95.29	28.12	10.19	70.58	1,028.26	1,834.27	1,787.11	47.15	38.899	
10,000.00	6,989.48	6,400.00	6,254.81	98.25	28.06	9.80	69.78	1,041.20	1,926.98	1,879.73	47.24	40.787	
10,100.00	6,989.58	6,400.00	6,254.81	101.22	28.06	9.80	69.78	1,041.20	2,019.59	1,972.09	47.50	42.518	
10,200.00	6,989.67	6,400.00	6,254.81	104.19	28.06	9.80	69.78	1,041.20	2,112.89	2,065.16	47.73	44.272	
10,300.00	6,989.77	6,400.00	6,254.81	107.17	28.06	9.80	69.78	1,041.20	2,206.76	2,158.84	47.93	46.044	
10,400.00	6,989.86	6,400.00	6,254.81	110.16	28.06	9.80	69.78	1,041.20	2,301.16	2,253.05	48.11	47.833	
10,500.00	6,989.96	6,360.26	6,217.45	113.15	27.98	9.38	68.89	1,054.71	2,394.99	2,346.84	48.15	49.744	
10,600.00	6,990.05	6,350.07	6,207.80	116.14	27.96	9.28	68.67	1,057.97	2,489.67	2,441.40	48.28	51.569	
10,700.00	6,990.15	6,340.40	6,198.61	119.14	27.95	9.19	68.46	1,060.98	2,584.64	2,536.23	48.40	53.397	
10,800.00	6,990.24	6,300.00	6,159.96	122.14	27.87	8.81	67.59	1,072.70	2,680.47	2,632.02	48.45	55.327	
10,900.00	6,990.34	6,300.00	6,159.96	125.15	27.87	8.81	67.59	1,072.70	2,775.63	2,727.04	48.59	57.126	
11,000.00	6,990.43	6,300.00	6,159.96	128.16	27.87	8.81	67.59	1,072.70	2,871.13	2,822.41	48.72	58.932	
11,100.00	6,990.52	6,300.00	6,159.96	131.17	27.87	8.81	67.59	1,072.70	2,966.92	2,918.08	48.84	60.746	
11,200.00	6,990.62	6,300.00	6,159.96	134.18	27.87	8.81	67.59	1,072.70	3,062.98	3,014.02	48.96	62.566	
11,300.00	6,990.71	6,300.00	6,159.96	137.20	27.87	8.81	67.59	1,072.70	3,159.29	3,110.22	49.06	64.392	
11,400.00	6,990.81	6,300.00	6,159.96	140.22	27.87	8.81	67.59	1,072.70	3,255.81	3,206.65	49.17	66.221	
11,500.00	6,990.90	6,300.00	6,159.96	143.24	27.87	8.81	67.59	1,072.70	3,352.54	3,303.28	49.26	68.054	
11,600.00	6,991.00	6,300.00	6,159.96	146.27	27.87	8.81	67.59	1,072.70	3,449.46	3,400.11	49.36	69.889	
11,700.00	6,991.09	6,300.00	6,159.96	149.29	27.87	8.81	67.59	1,072.70	3,546.55	3,497.11	49.45	71.727	
11,800.00	6,991.19	6,259.61	6,120.93	152.32	27.80	8.47	66.75	1,083.06	3,642.86	3,593.38	49.49	73.613	
11,900.00	6,991.28	6,254.00	6,115.49	155.35	27.79	8.42	66.64	1,084.39	3,739.99	3,690.42	49.57	75.451	
12,000.00	6,991.38	6,248.62	6,110.26	158.38	27.78	8.38	66.53	1,085.64	3,837.22	3,787.57	49.65	77.288	
12,100.00	6,991.47	6,243.45	6,105.22	161.41	27.77	8.34	66.42	1,086.82	3,934.57	3,884.84	49.73	79.124	
12,200.00	6,991.56	6,200.00	6,062.72	164.45	27.69	8.00	65.56	1,095.82	4,032.84	3,983.06	49.78	81.021	
12,300.00	6,991.66	6,200.00	6,062.72	167.49	27.69	8.00	65.56	1,095.82	4,130.18	4,080.33	49.86	82.840	
12,400.00	6,991.75	6,200.00	6,062.72	170.52	27.69	8.00	65.56	1,095.82	4,227.65	4,177.72	49.94	84.659	
12,500.00	6,991.85	6,200.00	6,062.72	173.56	27.69	8.00	65.56	1,095.82	4,325.24	4,275.22	50.02	86.478	
12,600.00	6,991.94	6,200.00	6,062.72	176.60	27.69	8.00	65.56	1,095.82	4,422.93	4,372.84	50.09	88.296	
12,700.00	6,992.04	6,200.00	6,062.72	179.64	27.69	8.00	65.56	1,095.82	4,520.72	4,470.56	50.17	90.112	
12,800.00	6,992.13	6,200.00	6,062.72	182.68	27.69	8.00	65.56	1,095.82	4,618.61	4,568.37	50.24	91.927	
12,900.00	6,992.23	6,200.00	6,062.72	185.73	27.69	8.00	65.56	1,095.82	4,716.59	4,666.27	50.32	93.741	
13,000.00	6,992.32	6,200.00	6,062.72	188.77	27.69	8.00	65.56	1,095.82	4,814.65	4,764.26	50.39	95.552	
13,100.00	6,992.42	6,200.00	6,062.72	191.82	27.69	8.00	65.56	1,095.82	4,912.78	4,862.32	50.46	97.361	
13,200.00	6,992.51	6,200.00	6,062.72	194.86	27.69	8.00	65.56	1,095.82	5,010.99	4,960.46	50.53	99.167	
13,300.00	6,992.60	6,200.00	6,062.72	197.91	27.69	8.00	65.56	1,095.82	5,109.28	5,058.67	50.60	100.971	
13,400.00	6,992.70	6,200.00	6,062.72	200.96	27.69	8.00	65.56	1,095.82	5,207.62	5,156.95	50.67	102.772	
13,500.00	6,992.79	6,200.00	6,062.72	204.01	27.69	8.00	65.56	1,095.82	5,306.03	5,255.29	50.74	104.569	
13,600.00	6,992.89	6,200.00	6,062.72	207.05	27.69	8.00	65.56	1,095.82	5,404.50	5,353.68	50.81	106.363	
13,700.00	6,992.98	6,200.00	6,062.72	210.10	27.69	8.00	65.56	1,095.82	5,503.02	5,452.14	50.88	108.154	
13,800.00	6,993.08	6,200.00	6,062.72	213.16	27.69	8.00	65.56	1,095.82	5,601.59	5,550.64	50.95	109.941	
13,900.00	6,993.17	6,200.00	6,062.72	216.21	27.69	8.00	65.56	1,095.82	5,700.22	5,649.20	51.02	111.725	
14,000.00	6,993.27	6,200.00	6,062.72	219.26	27.69	8.00	65.56	1,095.82	5,798.89	5,747.80	51.09	113.504	
14,100.00	6,993.36	6,200.00	6,062.72	222.31	27.69	8.00	65.56	1,095.82	5,897.60	5,846.44	51.16	115.280	
14,200.00	6,993.46	6,200.00	6,062.72	225.36	27.69	8.00	65.56	1,095.82	5,996.36	5,945.13	51.23	117.051	
14,300.00	6,993.55	6,200.00	6,062.72	228.42	27.69	8.00	65.56	1,095.82	6,095.16	6,043.86	51.30	118.818	
14,400.00	6,993.64	6,200.00	6,062.72	231.47	27.69	8.00	65.56	1,095.82	6,194.00	6,142.63	51.37	120.580	
14,500.00	6,993.74	6,200.00	6,062.72	234.53	27.69	8.00	65.56	1,095.82	6,292.87	6,241.43	51.44	122.338	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #658H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Offset Well Error: 0.00 ft

Rule Assigned:

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,600.00	6,993.83	6,200.00	6,062.72	237.58	27.69	8.00	65.56	1,095.82	6,391.78	6,340.27	51.51	124.092	
14,700.00	6,993.93	6,155.55	6,018.93	240.64	27.60	7.69	64.71	1,103.35	6,489.71	6,438.14	51.57	125.834	
14,800.00	6,994.02	6,153.33	6,016.74	243.69	27.59	7.68	64.67	1,103.68	6,588.58	6,536.94	51.64	127.575	
14,900.00	6,994.12	6,151.17	6,014.60	246.75	27.59	7.66	64.63	1,104.00	6,687.48	6,635.77	51.72	129.312	
15,000.00	6,994.21	6,149.06	6,012.51	249.81	27.59	7.65	64.59	1,104.31	6,786.41	6,734.63	51.79	131.043	
15,100.00	6,994.31	6,147.01	6,010.48	252.86	27.58	7.63	64.55	1,104.60	6,885.37	6,833.51	51.86	132.769	
15,200.00	6,994.40	6,145.00	6,008.49	255.92	27.58	7.62	64.51	1,104.89	6,984.35	6,932.42	51.93	134.490	
15,300.00	6,994.50	6,143.04	6,006.56	258.98	27.57	7.61	64.48	1,105.16	7,083.36	7,031.35	52.00	136.206	
15,400.00	6,994.59	6,100.00	5,963.84	262.04	27.49	7.33	63.70	1,110.37	7,183.24	7,131.17	52.08	137.931	
15,500.00	6,994.68	6,100.00	5,963.84	265.10	27.49	7.33	63.70	1,110.37	7,282.22	7,230.07	52.15	139.634	
15,600.00	6,994.78	6,100.00	5,963.84	268.16	27.49	7.33	63.70	1,110.37	7,381.22	7,329.00	52.23	141.331	
15,700.00	6,994.87	6,100.00	5,963.84	271.22	27.49	7.33	63.70	1,110.37	7,480.25	7,427.95	52.30	143.024	
15,800.00	6,994.97	6,100.00	5,963.84	274.28	27.49	7.33	63.70	1,110.37	7,579.31	7,526.93	52.38	144.711	
15,900.00	6,995.06	6,100.00	5,963.84	277.34	27.49	7.33	63.70	1,110.37	7,678.39	7,625.94	52.45	146.393	
16,000.00	6,995.16	6,100.00	5,963.84	280.40	27.49	7.33	63.70	1,110.37	7,777.49	7,724.97	52.53	148.069	
16,100.00	6,995.25	6,100.00	5,963.84	283.46	27.49	7.33	63.70	1,110.37	7,876.62	7,824.02	52.60	149.740	
16,200.00	6,995.35	6,100.00	5,963.84	286.52	27.49	7.33	63.70	1,110.37	7,975.77	7,923.09	52.68	151.405	
16,300.00	6,995.44	6,100.00	5,963.84	289.58	27.49	7.33	63.70	1,110.37	8,074.93	8,022.18	52.76	153.065	
16,400.00	6,995.54	6,100.00	5,963.84	292.64	27.49	7.33	63.70	1,110.37	8,174.12	8,121.29	52.83	154.719	
16,500.00	6,995.63	6,100.00	5,963.84	295.70	27.49	7.33	63.70	1,110.37	8,273.33	8,220.42	52.91	156.367	
16,600.00	6,995.72	6,100.00	5,963.84	298.76	27.49	7.33	63.70	1,110.37	8,372.56	8,319.57	52.99	158.009	
16,700.00	6,995.82	6,100.00	5,963.84	301.83	27.49	7.33	63.70	1,110.37	8,471.81	8,418.74	53.07	159.646	
16,800.00	6,995.91	6,100.00	5,963.84	304.89	27.49	7.33	63.70	1,110.37	8,571.07	8,517.92	53.14	161.277	
16,900.00	6,996.01	6,100.00	5,963.84	307.95	27.49	7.33	63.70	1,110.37	8,670.35	8,617.13	53.22	162.902	
17,000.00	6,996.10	6,100.00	5,963.84	311.01	27.49	7.33	63.70	1,110.37	8,769.65	8,716.34	53.30	164.521	
17,100.00	6,996.20	6,100.00	5,963.84	314.08	27.49	7.33	63.70	1,110.37	8,868.96	8,815.57	53.38	166.135	
17,200.00	6,996.29	6,100.00	5,963.84	317.14	27.49	7.33	63.70	1,110.37	8,968.29	8,914.82	53.46	167.742	
17,300.00	6,996.39	6,100.00	5,963.84	320.20	27.49	7.33	63.70	1,110.37	9,067.63	9,014.08	53.55	169.343	
17,400.00	6,996.48	6,100.00	5,963.84	323.27	27.49	7.33	63.70	1,110.37	9,166.99	9,113.36	53.63	170.938	
17,500.00	6,996.58	6,100.00	5,963.84	326.33	27.49	7.33	63.70	1,110.37	9,266.36	9,212.65	53.71	172.528	
17,600.00	6,996.67	6,100.00	5,963.84	329.40	27.49	7.33	63.70	1,110.37	9,365.74	9,311.95	53.79	174.111	
17,700.00	6,996.76	6,100.00	5,963.84	332.46	27.49	7.33	63.70	1,110.37	9,465.14	9,411.26	53.87	175.688	
17,800.00	6,996.86	6,100.00	5,963.84	335.52	27.49	7.33	63.70	1,110.37	9,564.55	9,510.59	53.96	177.259	
17,900.00	6,996.95	6,100.00	5,963.84	338.59	27.49	7.33	63.70	1,110.37	9,663.97	9,609.93	54.04	178.823	
17,948.87	6,997.00	6,100.00	5,963.84	340.09	27.49	7.33	63.70	1,110.37	9,712.56	9,658.47	54.08	179.586	

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #659H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Rule Assigned: Distance Between Ellipses (ft)	Rule Assigned: Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	121.23	-9.07	14.96	17.49	17.49	0.00	N/A	
100.00	100.00	100.00	100.00	0.36	0.36	121.23	-9.07	14.96	17.49	16.78	0.72	24.402	
200.00	200.00	200.00	200.00	0.72	0.72	121.23	-9.07	14.96	17.49	16.06	1.43	12.201	
300.00	300.00	300.00	300.00	1.08	1.08	121.23	-9.07	14.96	17.49	15.34	2.15	8.134	
400.00	400.00	400.00	400.00	1.43	1.43	121.23	-9.07	14.96	17.49	14.63	2.87	6.100	
500.00	500.00	500.00	500.00	1.79	1.79	121.23	-9.07	14.96	17.49	13.91	3.58	4.880	CC, ES
600.00	600.00	599.38	599.36	2.15	2.13	122.80	-10.37	16.09	19.15	14.87	4.28	4.471	SF
700.00	700.00	698.52	698.37	2.51	2.47	126.19	-14.25	19.48	24.19	19.22	4.97	4.865	
800.00	800.00	797.19	796.66	2.87	2.81	129.51	-20.68	25.08	32.68	27.02	5.66	5.775	
900.00	900.00	895.16	893.91	3.23	3.17	132.01	-29.58	32.84	44.62	38.28	6.34	7.036	
1,000.00	1,000.00	993.05	990.66	3.58	3.55	133.75	-40.75	42.58	59.67	52.65	7.03	8.491	
1,100.00	1,099.98	1,091.54	1,087.93	3.94	3.94	-158.96	-52.42	52.74	76.94	69.21	7.73	9.953	
1,200.00	1,199.84	1,189.41	1,184.59	4.29	4.34	-159.20	-64.00	62.85	97.40	88.97	8.43	11.554	
1,266.26	1,265.88	1,253.87	1,248.25	4.53	4.60	-159.62	-71.64	69.50	112.72	103.83	8.90	12.669	
1,300.00	1,299.47	1,286.60	1,280.58	4.65	4.74	-159.90	-75.51	72.88	120.88	111.75	9.13	13.234	
1,400.00	1,399.04	1,383.62	1,376.39	5.01	5.14	-160.55	-87.00	82.89	145.08	135.25	9.83	14.757	
1,500.00	1,498.61	1,480.64	1,472.20	5.37	5.55	-161.02	-98.49	92.90	169.30	158.77	10.53	16.075	
1,600.00	1,598.18	1,577.65	1,568.01	5.74	5.97	-161.37	-109.97	102.92	193.52	182.28	11.24	17.224	
1,700.00	1,697.74	1,674.67	1,663.83	6.11	6.38	-161.64	-121.46	112.93	217.74	205.80	11.94	18.234	
1,800.00	1,797.31	1,771.69	1,759.64	6.49	6.80	-161.86	-132.95	122.94	241.97	229.32	12.65	19.129	
1,900.00	1,896.88	1,868.70	1,855.45	6.86	7.22	-162.03	-144.44	132.96	266.21	252.85	13.36	19.927	
2,000.00	1,996.45	1,965.72	1,951.26	7.24	7.64	-162.18	-155.92	142.97	290.44	276.37	14.07	20.641	
2,100.00	2,096.02	2,062.74	2,047.08	7.61	8.06	-162.31	-167.41	152.98	314.68	299.89	14.78	21.286	
2,200.00	2,195.59	2,159.75	2,142.89	7.99	8.49	-162.42	-178.90	163.00	338.91	323.42	15.50	21.869	
2,300.00	2,295.16	2,256.77	2,238.70	8.37	8.91	-162.51	-190.38	173.01	363.15	346.94	16.21	22.400	
2,400.00	2,394.72	2,353.79	2,334.51	8.75	9.33	-162.59	-201.87	183.02	387.39	370.46	16.93	22.885	
2,500.00	2,494.29	2,450.80	2,430.32	9.13	9.76	-162.66	-213.36	193.04	411.63	393.99	17.64	23.330	
2,600.00	2,593.86	2,547.82	2,526.14	9.51	10.18	-162.73	-224.85	203.05	435.87	417.51	18.36	23.739	
2,700.00	2,693.43	2,644.84	2,621.95	9.90	10.61	-162.78	-236.33	213.06	460.11	441.03	19.08	24.116	
2,800.00	2,793.00	2,741.85	2,717.76	10.28	11.04	-162.83	-247.82	223.08	484.35	464.55	19.80	24.466	
2,900.00	2,892.57	2,838.87	2,813.57	10.66	11.47	-162.88	-259.31	233.09	508.59	488.08	20.52	24.790	
3,000.00	2,992.13	2,935.89	2,909.39	11.05	11.89	-162.92	-270.79	243.10	532.83	511.60	21.24	25.092	
3,100.00	3,091.70	3,032.90	3,005.20	11.43	12.32	-162.96	-282.28	253.12	557.07	535.12	21.95	25.374	
3,200.00	3,191.27	3,129.92	3,101.01	11.81	12.75	-163.00	-293.77	263.13	581.32	558.64	22.67	25.637	
3,300.00	3,290.84	3,226.93	3,196.82	12.20	13.18	-163.03	-305.26	273.14	605.56	582.16	23.39	25.884	
3,400.00	3,390.41	3,323.95	3,292.63	12.58	13.61	-163.06	-316.74	283.16	629.80	605.69	24.12	26.116	
3,500.00	3,489.98	3,420.97	3,388.45	12.97	14.03	-163.09	-328.23	293.17	654.04	629.21	24.84	26.334	
3,600.00	3,589.54	3,517.98	3,484.26	13.35	14.46	-163.11	-339.72	303.18	678.29	652.73	25.56	26.539	
3,700.00	3,689.11	3,615.00	3,580.07	13.74	14.89	-163.14	-351.20	313.20	702.53	676.25	26.28	26.733	
3,800.00	3,788.68	3,712.02	3,675.88	14.12	15.32	-163.16	-362.69	323.21	726.77	699.77	27.00	26.917	
3,900.00	3,888.25	3,809.03	3,771.70	14.51	15.75	-163.18	-374.18	333.22	751.01	723.29	27.72	27.090	
4,000.00	3,987.82	3,906.05	3,867.51	14.89	16.18	-163.20	-385.67	343.24	775.26	746.81	28.44	27.255	
4,100.00	4,087.39	4,003.07	3,963.32	15.28	16.61	-163.22	-397.15	353.25	799.50	770.33	29.17	27.411	
4,200.00	4,186.95	4,100.08	4,059.13	15.67	17.04	-163.24	-408.64	363.26	823.74	793.85	29.89	27.560	
4,300.00	4,286.52	4,197.10	4,154.95	16.05	17.47	-163.25	-420.13	373.27	847.99	817.37	30.61	27.701	
4,400.00	4,386.09	4,294.12	4,250.76	16.44	17.90	-163.27	-431.61	383.29	872.23	840.89	31.34	27.836	
4,500.00	4,485.66	4,391.13	4,346.57	16.82	18.33	-163.28	-443.10	393.30	896.47	864.42	32.06	27.964	
4,600.00	4,585.23	4,488.15	4,442.38	17.21	18.76	-163.30	-454.59	403.31	920.72	887.94	32.78	28.087	
4,700.00	4,684.80	4,585.17	4,538.19	17.60	19.19	-163.31	-466.08	413.33	944.96	911.46	33.50	28.204	
4,800.00	4,784.36	4,682.18	4,634.01	17.98	19.62	-163.32	-477.56	423.34	969.20	934.98	34.23	28.316	
4,900.00	4,883.93	4,779.20	4,729.82	18.37	20.05	-163.33	-489.05	433.35	993.45	958.50	34.95	28.423	
5,000.00	4,983.50	4,876.22	4,825.63	18.76	20.48	-163.34	-500.54	443.37	1,017.69	982.01	35.68	28.526	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #659H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.00	5,083.07	4,973.23	4,921.44	19.14	20.91	-163.36	-512.02	453.38	1,041.93	1,005.53	36.40	28.625	
5,200.00	5,182.64	5,070.25	5,017.26	19.53	21.35	-163.37	-523.51	463.39	1,066.18	1,029.05	37.12	28.720	
5,300.00	5,282.21	5,167.27	5,113.07	19.92	21.78	-163.38	-535.00	473.41	1,090.42	1,052.57	37.85	28.811	
5,400.00	5,381.78	5,264.28	5,208.88	20.30	22.21	-163.39	-546.49	483.42	1,114.66	1,076.09	38.57	28.898	
5,500.00	5,481.34	5,361.30	5,304.69	20.69	22.64	-163.39	-557.97	493.43	1,138.91	1,099.61	39.30	28.982	
5,600.00	5,580.91	5,458.32	5,400.51	21.08	23.07	-163.40	-569.46	503.45	1,163.15	1,123.13	40.02	29.064	
5,700.00	5,680.48	5,555.33	5,496.32	21.47	23.50	-163.41	-580.95	513.46	1,187.40	1,146.65	40.75	29.142	
5,800.00	5,780.05	5,652.35	5,592.13	21.85	23.93	-163.42	-592.43	523.47	1,211.64	1,170.17	41.47	29.217	
5,900.00	5,879.62	5,749.37	5,687.94	22.24	24.36	-163.43	-603.92	533.49	1,235.88	1,193.69	42.20	29.290	
6,000.00	5,979.19	5,846.38	5,783.75	22.63	24.79	-163.43	-615.41	543.50	1,260.13	1,217.21	42.92	29.360	
6,100.00	6,078.75	5,943.40	5,879.57	23.02	25.22	-163.44	-626.90	553.51	1,284.37	1,240.73	43.65	29.427	
6,200.00	6,178.32	6,040.42	5,975.38	23.40	25.65	-163.45	-638.38	563.53	1,308.62	1,264.24	44.37	29.493	
6,300.00	6,277.89	8,024.45	7,150.00	23.79	38.25	-116.73	-759.81	-456.15	1,290.06	1,243.01	47.05	27.419	
6,318.49	6,296.30	8,026.04	7,150.00	23.86	38.29	-116.64	-759.78	-457.73	1,278.17	1,230.66	47.52	26.900	
6,350.00	6,327.73	8,027.96	7,150.00	23.98	38.33	-136.20	-759.75	-459.66	1,258.25	1,209.94	48.31	26.047	
6,400.00	6,377.68	8,027.82	7,150.00	24.15	38.33	132.38	-759.75	-459.51	1,227.58	1,178.06	49.52	24.790	
6,450.00	6,427.47	8,023.75	7,150.00	24.29	38.24	111.62	-759.82	-455.45	1,198.32	1,147.66	50.67	23.652	
6,500.00	6,476.79	8,015.79	7,150.00	24.42	38.07	107.82	-759.96	-447.49	1,170.72	1,118.99	51.73	22.630	
6,550.00	6,525.33	8,003.98	7,150.00	24.54	37.81	107.01	-760.16	-435.68	1,144.99	1,092.29	52.70	21.725	
6,600.00	6,572.79	7,988.40	7,150.00	24.65	37.48	106.97	-760.42	-420.10	1,121.32	1,067.74	53.58	20.929	
6,650.00	6,618.89	7,969.14	7,150.00	24.75	37.09	107.07	-760.75	-400.84	1,099.81	1,045.48	54.33	20.243	
6,700.00	6,663.33	7,946.31	7,150.00	24.84	36.62	107.09	-761.14	-378.02	1,080.55	1,025.60	54.95	19.663	
6,750.00	6,705.84	7,920.07	7,150.00	24.94	36.08	106.94	-761.58	-351.78	1,063.55	1,008.12	55.43	19.186	
6,800.00	6,746.17	7,890.58	7,150.00	25.04	35.49	106.60	-762.08	-322.29	1,048.79	993.00	55.79	18.800	
6,850.00	6,784.06	7,858.00	7,150.00	25.16	34.87	106.09	-762.64	-289.72	1,036.18	980.14	56.04	18.491	
6,900.00	6,819.27	7,822.55	7,150.00	25.30	34.20	105.43	-763.24	-254.28	1,025.59	969.42	56.17	18.260	
6,950.00	6,851.60	7,784.45	7,150.00	25.48	33.51	104.65	-763.89	-216.18	1,016.87	960.65	56.22	18.088	
7,000.00	6,880.84	7,743.93	7,150.00	25.70	32.83	103.81	-764.57	-175.66	1,009.83	953.60	56.22	17.961	
7,050.00	6,906.82	7,701.23	7,150.00	25.99	32.12	102.94	-765.30	-132.97	1,004.27	948.10	56.17	17.880	
7,100.00	6,929.36	7,656.63	7,150.00	26.33	31.47	102.09	-766.06	-88.37	1,000.00	943.84	56.16	17.808	
7,150.00	6,948.34	7,610.39	7,150.00	26.75	30.83	101.30	-766.84	-42.14	996.82	940.69	56.12	17.761	
7,200.00	6,963.63	7,539.28	7,148.04	27.24	30.04	100.15	-767.82	28.91	994.23	938.39	55.84	17.804	
7,250.00	6,975.15	7,453.99	7,135.76	27.80	29.42	98.63	-767.80	113.24	990.73	935.13	55.60	17.819	
7,300.00	6,982.81	7,374.97	7,114.48	28.43	29.15	97.13	-766.58	189.28	986.37	930.69	55.68	17.714	
7,350.00	6,986.58	7,301.83	7,086.60	29.11	29.04	95.67	-764.43	256.82	981.40	925.40	56.00	17.525	
7,372.48	6,987.00	7,270.72	7,072.44	29.44	29.02	95.03	-763.23	284.50	979.02	922.81	56.22	17.415	
7,400.00	6,987.03	7,234.48	7,054.28	29.85	29.00	93.97	-761.61	315.81	976.00	919.48	56.52	17.268	
7,500.00	6,987.12	7,122.47	6,987.45	31.50	28.95	90.01	-755.24	405.29	965.03	907.03	58.00	16.639	
7,600.00	6,987.22	7,037.29	6,926.79	33.34	28.90	86.37	-749.08	464.68	956.71	896.92	59.79	16.000	
7,695.22	6,987.31	6,975.20	6,877.91	35.27	28.86	83.41	-743.95	502.57	953.73	892.10	61.63	15.474	
7,700.00	6,987.31	6,972.48	6,875.68	35.36	28.85	83.28	-743.72	504.12	953.74	892.02	61.72	15.452	
7,800.00	6,987.40	6,922.48	6,833.68	37.52	28.80	80.74	-739.21	530.87	957.83	894.16	63.67	15.044	
7,900.00	6,987.50	6,883.17	6,799.29	39.81	28.76	78.67	-735.46	549.51	969.94	904.42	65.53	14.802	
8,000.00	6,987.59	6,850.00	6,769.43	42.19	28.71	76.88	-732.18	563.56	990.45	923.26	67.20	14.740	
8,100.00	6,987.69	6,826.01	6,747.40	44.65	28.67	75.57	-729.73	572.73	1,019.27	950.60	68.67	14.843	
8,200.00	6,987.78	6,800.00	6,723.15	47.19	28.63	74.13	-727.02	581.73	1,056.02	986.20	69.81	15.127	
8,300.00	6,987.88	6,786.87	6,710.78	49.79	28.60	73.40	-725.63	585.89	1,100.02	1,029.22	70.80	15.536	
8,400.00	6,987.97	6,771.67	6,696.34	52.44	28.57	72.56	-724.00	590.38	1,150.63	1,079.13	71.50	16.093	
8,500.00	6,988.07	6,750.00	6,675.60	55.13	28.53	71.35	-721.65	596.19	1,207.16	1,135.27	71.89	16.793	
8,600.00	6,988.16	6,750.00	6,675.60	57.87	28.53	71.35	-721.65	596.19	1,268.69	1,196.35	72.34	17.539	
8,700.00	6,988.26	6,750.00	6,675.60	60.63	28.53	71.35	-721.65	596.19	1,334.88	1,262.26	72.62	18.382	
8,800.00	6,988.35	6,728.49	6,654.83	63.42	28.48	70.15	-719.28	601.25	1,404.64	1,332.10	72.54	19.363	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #659H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,900.00	6,988.44	6,720.67	6,647.24	66.24	28.46	69.72	-718.41	602.91	1,477.90	1,405.37	72.53	20.377	
9,000.00	6,988.54	6,700.00	6,627.08	69.08	28.41	68.57	-716.10	606.86	1,554.21	1,481.91	72.31	21.495	
9,100.00	6,988.63	6,700.00	6,627.08	71.94	28.41	68.57	-716.10	606.86	1,632.73	1,560.47	72.26	22.597	
9,200.00	6,988.73	6,700.00	6,627.08	74.81	28.41	68.57	-716.10	606.86	1,713.48	1,641.32	72.16	23.744	
9,300.00	6,988.82	6,700.00	6,627.08	77.71	28.41	68.57	-716.10	606.86	1,796.18	1,724.14	72.04	24.933	
9,400.00	6,988.92	6,700.00	6,627.08	80.61	28.41	68.57	-716.10	606.86	1,880.55	1,808.65	71.90	26.156	
9,500.00	6,989.01	6,700.00	6,627.08	83.53	28.41	68.57	-716.10	606.86	1,966.39	1,894.65	71.74	27.409	
9,600.00	6,989.11	6,700.00	6,627.08	86.45	28.41	68.57	-716.10	606.86	2,053.51	1,981.94	71.58	28.689	
9,700.00	6,989.20	6,679.85	6,607.32	89.39	28.36	67.46	-713.82	610.06	2,141.38	2,070.14	71.24	30.058	
9,800.00	6,989.30	6,676.46	6,603.98	92.34	28.35	67.27	-713.43	610.54	2,230.48	2,159.43	71.05	31.393	
9,900.00	6,989.39	6,673.31	6,600.89	95.29	28.34	67.10	-713.07	610.97	2,320.45	2,249.59	70.86	32.745	
10,000.00	6,989.48	6,670.38	6,598.00	98.25	28.33	66.94	-712.74	611.35	2,411.20	2,340.52	70.68	34.113	
10,100.00	6,989.58	6,650.00	6,577.89	101.22	28.27	65.83	-710.40	613.66	2,502.92	2,432.56	70.37	35.570	
10,200.00	6,989.67	6,650.00	6,577.89	104.19	28.27	65.83	-710.40	613.66	2,594.90	2,524.68	70.22	36.953	
10,300.00	6,989.77	6,650.00	6,577.89	107.17	28.27	65.83	-710.40	613.66	2,687.45	2,617.37	70.08	38.348	
10,400.00	6,989.86	6,650.00	6,577.89	110.16	28.27	65.83	-710.40	613.66	2,780.52	2,710.57	69.95	39.752	
10,500.00	6,989.96	6,650.00	6,577.89	113.15	28.27	65.83	-710.40	613.66	2,874.05	2,804.24	69.82	41.166	
10,600.00	6,990.05	6,650.00	6,577.89	116.14	28.27	65.83	-710.40	613.66	2,968.01	2,898.31	69.69	42.588	
10,700.00	6,990.15	6,650.00	6,577.89	119.14	28.27	65.83	-710.40	613.66	3,062.34	2,992.77	69.57	44.016	
10,800.00	6,990.24	6,650.00	6,577.89	122.14	28.27	65.83	-710.40	613.66	3,157.03	3,087.57	69.46	45.452	
10,900.00	6,990.34	6,650.00	6,577.89	125.15	28.27	65.83	-710.40	613.66	3,252.03	3,182.68	69.35	46.892	
11,000.00	6,990.43	6,650.00	6,577.89	128.16	28.27	65.83	-710.40	613.66	3,347.33	3,278.08	69.25	48.338	
11,100.00	6,990.52	6,650.00	6,577.89	131.17	28.27	65.83	-710.40	613.66	3,442.89	3,373.74	69.15	49.788	
11,200.00	6,990.62	6,650.00	6,577.89	134.18	28.27	65.83	-710.40	613.66	3,538.70	3,469.64	69.06	51.242	
11,300.00	6,990.71	6,650.00	6,577.89	137.20	28.27	65.83	-710.40	613.66	3,634.73	3,565.76	68.97	52.700	
11,400.00	6,990.81	6,650.00	6,577.89	140.22	28.27	65.83	-710.40	613.66	3,730.97	3,662.09	68.89	54.161	
11,500.00	6,990.90	6,650.00	6,577.89	143.24	28.27	65.83	-710.40	613.66	3,827.41	3,758.60	68.81	55.624	
11,600.00	6,991.00	6,650.00	6,577.89	146.27	28.27	65.83	-710.40	613.66	3,924.02	3,855.29	68.73	57.089	
11,700.00	6,991.09	6,650.00	6,577.89	149.29	28.27	65.83	-710.40	613.66	4,020.80	3,952.13	68.66	58.557	
11,800.00	6,991.19	6,650.00	6,577.89	152.32	28.27	65.83	-710.40	613.66	4,117.73	4,049.13	68.60	60.026	
11,900.00	6,991.28	6,650.00	6,577.89	155.35	28.27	65.83	-710.40	613.66	4,214.81	4,146.27	68.54	61.497	
12,000.00	6,991.38	6,650.00	6,577.89	158.38	28.27	65.83	-710.40	613.66	4,312.02	4,243.54	68.48	62.968	
12,100.00	6,991.47	6,650.00	6,577.89	161.41	28.27	65.83	-710.40	613.66	4,409.35	4,340.92	68.42	64.441	
12,200.00	6,991.56	6,650.00	6,577.89	164.45	28.27	65.83	-710.40	613.66	4,506.80	4,438.43	68.37	65.914	
12,300.00	6,991.66	6,650.00	6,577.89	167.49	28.27	65.83	-710.40	613.66	4,604.36	4,536.03	68.33	67.387	
12,400.00	6,991.75	6,650.00	6,577.89	170.52	28.27	65.83	-710.40	613.66	4,702.02	4,633.74	68.28	68.861	
12,500.00	6,991.85	6,650.00	6,577.89	173.56	28.27	65.83	-710.40	613.66	4,799.78	4,731.54	68.24	70.335	
12,600.00	6,991.94	6,650.00	6,577.89	176.60	28.27	65.83	-710.40	613.66	4,897.63	4,829.43	68.20	71.809	
12,700.00	6,992.04	6,650.00	6,577.89	179.64	28.27	65.83	-710.40	613.66	4,995.57	4,927.40	68.17	73.282	
12,800.00	6,992.13	6,650.00	6,577.89	182.68	28.27	65.83	-710.40	613.66	5,093.58	5,025.44	68.14	74.756	
12,900.00	6,992.23	6,650.00	6,577.89	185.73	28.27	65.83	-710.40	613.66	5,191.67	5,123.56	68.11	76.228	
13,000.00	6,992.32	6,650.00	6,577.89	188.77	28.27	65.83	-710.40	613.66	5,289.83	5,221.75	68.08	77.700	
13,100.00	6,992.42	6,650.00	6,577.89	191.82	28.27	65.83	-710.40	613.66	5,388.06	5,320.01	68.06	79.171	
13,200.00	6,992.51	6,650.00	6,577.89	194.86	28.27	65.83	-710.40	613.66	5,486.36	5,418.32	68.03	80.641	
13,300.00	6,992.60	6,627.07	6,555.18	197.91	28.20	64.59	-707.75	615.47	5,584.26	5,516.38	67.88	82.269	
13,400.00	6,992.70	6,626.47	6,554.59	200.96	28.20	64.55	-707.68	615.51	5,682.65	5,614.79	67.86	83.743	
13,500.00	6,992.79	6,625.89	6,554.01	204.01	28.19	64.52	-707.61	615.54	5,781.09	5,713.25	67.84	85.216	
13,600.00	6,992.89	6,625.33	6,553.46	207.05	28.19	64.49	-707.55	615.57	5,879.58	5,811.76	67.82	86.688	
13,700.00	6,992.98	6,624.78	6,552.92	210.10	28.19	64.46	-707.49	615.61	5,978.13	5,910.32	67.81	88.158	
13,800.00	6,993.08	6,624.25	6,552.39	213.16	28.19	64.44	-707.42	615.64	6,076.72	6,008.92	67.80	89.627	
13,900.00	6,993.17	6,623.74	6,551.88	216.21	28.19	64.41	-707.36	615.66	6,175.36	6,107.57	67.79	91.094	
14,000.00	6,993.27	6,623.24	6,551.39	219.26	28.19	64.38	-707.31	615.69	6,274.04	6,206.25	67.78	92.559	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #659H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Rule Assigned:

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,100.00	6,993.36	6,622.76	6,550.91	222.31	28.18	64.36	-707.25	615.72	6,372.76	6,304.98	67.78	94.022	
14,200.00	6,993.46	6,600.00	6,528.32	225.36	28.11	63.14	-704.60	616.55	6,471.94	6,404.29	67.64	95.675	
14,300.00	6,993.55	6,600.00	6,528.32	228.42	28.11	63.14	-704.60	616.55	6,570.72	6,503.07	67.65	97.133	
14,400.00	6,993.64	6,600.00	6,528.32	231.47	28.11	63.14	-704.60	616.55	6,669.53	6,601.88	67.65	98.588	
14,500.00	6,993.74	6,600.00	6,528.32	234.53	28.11	63.14	-704.60	616.55	6,768.38	6,700.73	67.66	100.042	
14,600.00	6,993.83	6,600.00	6,528.32	237.58	28.11	63.14	-704.60	616.55	6,867.26	6,799.60	67.66	101.494	
14,700.00	6,993.93	6,600.00	6,528.32	240.64	28.11	63.14	-704.60	616.55	6,966.18	6,898.51	67.67	102.943	
14,800.00	6,994.02	6,600.00	6,528.32	243.69	28.11	63.14	-704.60	616.55	7,065.13	6,997.44	67.68	104.390	
14,900.00	6,994.12	6,600.00	6,528.32	246.75	28.11	63.14	-704.60	616.55	7,164.10	7,096.41	67.69	105.835	
15,000.00	6,994.21	6,600.00	6,528.32	249.81	28.11	63.14	-704.60	616.55	7,263.10	7,195.40	67.70	107.277	
15,100.00	6,994.31	6,600.00	6,528.32	252.86	28.11	63.14	-704.60	616.55	7,362.13	7,294.41	67.72	108.717	
15,200.00	6,994.40	6,600.00	6,528.32	255.92	28.11	63.14	-704.60	616.55	7,461.19	7,393.45	67.73	110.155	
15,300.00	6,994.50	6,600.00	6,528.32	258.98	28.11	63.14	-704.60	616.55	7,560.27	7,492.52	67.75	111.590	
15,400.00	6,994.59	6,600.00	6,528.32	262.04	28.11	63.14	-704.60	616.55	7,659.37	7,591.60	67.77	113.022	
15,500.00	6,994.68	6,600.00	6,528.32	265.10	28.11	63.14	-704.60	616.55	7,758.50	7,690.71	67.79	114.452	
15,600.00	6,994.78	6,600.00	6,528.32	268.16	28.11	63.14	-704.60	616.55	7,857.65	7,789.84	67.81	115.879	
15,700.00	6,994.87	6,600.00	6,528.32	271.22	28.11	63.14	-704.60	616.55	7,956.82	7,888.99	67.83	117.304	
15,800.00	6,994.97	6,600.00	6,528.32	274.28	28.11	63.14	-704.60	616.55	8,056.01	7,988.16	67.85	118.725	
15,900.00	6,995.06	6,600.00	6,528.32	277.34	28.11	63.14	-704.60	616.55	8,155.22	8,087.34	67.88	120.144	
16,000.00	6,995.16	6,600.00	6,528.32	280.40	28.11	63.14	-704.60	616.55	8,254.45	8,186.55	67.90	121.560	
16,100.00	6,995.25	6,600.00	6,528.32	283.46	28.11	63.14	-704.60	616.55	8,353.70	8,285.77	67.93	122.974	
16,200.00	6,995.35	6,600.00	6,528.32	286.52	28.11	63.14	-704.60	616.55	8,452.97	8,385.01	67.96	124.384	
16,300.00	6,995.44	6,600.00	6,528.32	289.58	28.11	63.14	-704.60	616.55	8,552.25	8,484.26	67.99	125.791	
16,400.00	6,995.54	6,600.00	6,528.32	292.64	28.11	63.14	-704.60	616.55	8,651.55	8,583.53	68.02	127.196	
16,500.00	6,995.63	6,600.00	6,528.32	295.70	28.11	63.14	-704.60	616.55	8,750.87	8,682.82	68.05	128.597	
16,600.00	6,995.72	6,600.00	6,528.32	298.76	28.11	63.14	-704.60	616.55	8,850.20	8,782.12	68.08	129.995	
16,700.00	6,995.82	6,600.00	6,528.32	301.83	28.11	63.14	-704.60	616.55	8,949.54	8,881.43	68.11	131.390	
16,800.00	6,995.91	6,600.00	6,528.32	304.89	28.11	63.14	-704.60	616.55	9,048.90	8,980.75	68.15	132.782	
16,900.00	6,996.01	6,600.00	6,528.32	307.95	28.11	63.14	-704.60	616.55	9,148.28	9,080.09	68.18	134.171	
17,000.00	6,996.10	6,600.00	6,528.32	311.01	28.11	63.14	-704.60	616.55	9,247.67	9,179.45	68.22	135.557	
17,100.00	6,996.20	6,600.00	6,528.32	314.08	28.11	63.14	-704.60	616.55	9,347.07	9,278.81	68.26	136.939	
17,200.00	6,996.29	6,600.00	6,528.32	317.14	28.11	63.14	-704.60	616.55	9,446.48	9,378.18	68.30	138.319	
17,300.00	6,996.39	6,600.00	6,528.32	320.20	28.11	63.14	-704.60	616.55	9,545.91	9,477.57	68.33	139.695	
17,400.00	6,996.48	6,600.00	6,528.32	323.27	28.11	63.14	-704.60	616.55	9,645.34	9,576.97	68.37	141.067	
17,500.00	6,996.58	6,600.00	6,528.32	326.33	28.11	63.14	-704.60	616.55	9,744.79	9,676.38	68.41	142.437	
17,600.00	6,996.67	6,600.00	6,528.32	329.40	28.11	63.14	-704.60	616.55	9,844.25	9,775.80	68.46	143.803	
17,700.00	6,996.76	6,600.00	6,528.32	332.46	28.11	63.14	-704.60	616.55	9,943.72	9,875.22	68.50	145.165	

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #660H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Rule Assigned:

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	136.30	-22.60	21.60	31.26				
100.00	100.00	100.00	100.00	0.36	0.36	136.30	-22.60	21.60	31.26	30.55	0.72	43.605	
200.00	200.00	200.00	200.00	0.72	0.72	136.30	-22.60	21.60	31.26	29.83	1.43	21.802	
300.00	300.00	300.00	300.00	1.08	1.08	136.30	-22.60	21.60	31.26	29.11	2.15	14.535	
400.00	400.00	400.00	400.00	1.43	1.43	136.30	-22.60	21.60	31.26	28.39	2.87	10.901	
500.00	500.00	500.00	500.00	1.79	1.79	136.30	-22.60	21.60	31.26	27.68	3.58	8.721	CC, ES
600.00	600.00	598.94	598.92	2.15	2.13	137.28	-24.16	22.31	32.90	28.62	4.28	7.684	
700.00	700.00	697.65	697.49	2.51	2.46	139.71	-28.81	24.42	37.85	32.88	4.97	7.621	SF
800.00	800.00	795.88	795.36	2.87	2.80	142.60	-36.50	27.91	46.18	40.53	5.65	8.174	
900.00	900.00	893.43	892.19	3.23	3.16	145.22	-47.16	32.75	57.95	51.62	6.33	9.154	
1,000.00	1,000.00	990.07	987.68	3.58	3.52	147.34	-60.67	38.89	73.11	66.11	7.00	10.440	
1,100.00	1,099.98	1,085.31	1,081.25	3.94	3.91	-144.84	-76.86	46.23	93.02	85.36	7.67	12.135	
1,200.00	1,199.84	1,178.49	1,172.16	4.29	4.32	-144.69	-95.42	54.66	118.90	110.58	8.32	14.293	
1,266.26	1,265.88	1,238.85	1,230.68	4.53	4.59	-144.88	-108.87	60.77	139.24	130.50	8.74	15.928	
1,300.00	1,299.47	1,270.62	1,261.40	4.65	4.75	-145.13	-116.27	64.13	150.26	141.29	8.97	16.743	
1,400.00	1,399.04	1,365.12	1,352.75	5.01	5.21	-145.71	-138.28	74.13	182.94	173.28	9.67	18.926	
1,500.00	1,498.61	1,459.61	1,444.10	5.37	5.68	-146.11	-160.30	84.12	215.64	205.27	10.36	20.805	
1,600.00	1,598.18	1,554.11	1,535.45	5.74	6.16	-146.41	-182.31	94.11	248.34	237.27	11.07	22.436	
1,700.00	1,697.74	1,648.60	1,626.80	6.11	6.65	-146.63	-204.32	104.11	281.05	269.27	11.78	23.864	
1,800.00	1,797.31	1,743.10	1,718.15	6.49	7.15	-146.81	-226.33	114.10	313.76	301.27	12.49	25.122	
1,900.00	1,896.88	1,837.59	1,809.50	6.86	7.65	-146.96	-248.34	124.09	346.47	333.26	13.20	26.238	
2,000.00	1,996.45	1,932.09	1,900.86	7.24	8.15	-147.08	-270.35	134.09	379.18	365.26	13.92	27.234	
2,100.00	2,096.02	2,026.58	1,992.21	7.61	8.66	-147.18	-292.36	144.08	411.90	397.25	14.64	28.127	
2,200.00	2,195.59	2,121.08	2,083.56	7.99	9.17	-147.27	-314.37	154.08	444.61	429.24	15.37	28.933	
2,300.00	2,295.16	2,215.57	2,174.91	8.37	9.68	-147.34	-336.38	164.07	477.33	461.24	16.09	29.664	
2,400.00	2,394.72	2,310.07	2,266.26	8.75	10.20	-147.41	-358.39	174.06	510.04	493.23	16.82	30.328	
2,500.00	2,494.29	2,404.56	2,357.61	9.13	10.71	-147.46	-380.40	184.06	542.76	525.22	17.54	30.935	
2,600.00	2,593.86	2,499.06	2,448.96	9.51	11.23	-147.51	-402.41	194.05	575.48	557.21	18.27	31.492	
2,700.00	2,693.43	2,593.55	2,540.31	9.90	11.75	-147.56	-424.42	204.04	608.20	589.19	19.00	32.004	
2,800.00	2,793.00	2,688.05	2,631.66	10.28	12.27	-147.60	-446.44	214.04	640.92	621.18	19.73	32.477	
2,900.00	2,892.57	2,782.54	2,723.01	10.66	12.79	-147.64	-468.45	224.03	673.63	653.17	20.47	32.915	
3,000.00	2,992.13	2,877.04	2,814.36	11.05	13.31	-147.67	-490.46	234.02	706.35	685.15	21.20	33.321	
3,100.00	3,091.70	2,971.53	2,905.71	11.43	13.83	-147.70	-512.47	244.02	739.07	717.14	21.93	33.699	
3,200.00	3,191.27	3,066.03	2,997.07	11.81	14.36	-147.73	-534.48	254.01	771.79	749.13	22.67	34.051	
3,300.00	3,290.84	3,160.52	3,088.42	12.20	14.88	-147.75	-556.49	264.01	804.51	781.11	23.40	34.381	
3,400.00	3,390.41	3,255.02	3,179.77	12.58	15.41	-147.78	-578.50	274.00	837.23	813.10	24.14	34.689	
3,500.00	3,489.98	3,349.51	3,271.12	12.97	15.93	-147.80	-600.51	283.99	869.95	845.08	24.87	34.979	
3,600.00	3,589.54	3,444.01	3,362.47	13.35	16.46	-147.82	-622.52	293.99	902.67	877.06	25.61	35.251	
3,700.00	3,689.11	3,538.50	3,453.82	13.74	16.98	-147.84	-644.53	303.98	935.39	909.05	26.34	35.508	
3,800.00	3,788.68	3,633.00	3,545.17	14.12	17.51	-147.85	-666.54	313.97	968.11	941.03	27.08	35.750	
3,900.00	3,888.25	3,727.49	3,636.52	14.51	18.03	-147.87	-688.55	323.97	1,000.83	973.01	27.82	35.978	
4,000.00	3,987.82	3,821.99	3,727.87	14.89	18.56	-147.89	-710.57	333.96	1,033.55	1,005.00	28.56	36.195	
4,100.00	4,087.39	3,916.48	3,819.22	15.28	19.09	-147.90	-732.58	343.96	1,066.27	1,036.98	29.29	36.400	
4,200.00	4,186.95	4,010.98	3,910.57	15.67	19.61	-147.91	-754.59	353.95	1,098.99	1,068.96	30.03	36.595	
4,300.00	4,286.52	4,105.47	4,001.92	16.05	20.14	-147.93	-776.60	363.94	1,131.71	1,100.94	30.77	36.779	
4,400.00	4,386.09	4,199.97	4,093.28	16.44	20.67	-147.94	-798.61	373.94	1,164.43	1,132.92	31.51	36.955	
4,500.00	4,485.66	4,294.46	4,184.63	16.82	21.20	-147.95	-820.62	383.93	1,197.15	1,164.90	32.25	37.123	
4,600.00	4,585.23	4,388.96	4,275.98	17.21	21.72	-147.96	-842.63	393.92	1,229.87	1,196.88	32.99	37.282	
4,700.00	4,684.80	4,483.45	4,367.33	17.60	22.25	-147.97	-864.64	403.92	1,262.59	1,228.87	33.73	37.435	
4,800.00	4,784.36	4,577.95	4,458.68	17.98	22.78	-147.98	-886.65	413.91	1,295.31	1,260.85	34.47	37.580	
4,900.00	4,883.93	4,672.44	4,550.03	18.37	23.31	-147.99	-908.66	423.91	1,328.03	1,292.83	35.21	37.719	
5,000.00	4,983.50	4,766.94	4,641.38	18.76	23.84	-148.00	-930.67	433.90	1,360.75	1,324.81	35.95	37.853	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #660H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.00	5,083.07	4,861.43	4,732.73	19.14	24.37	-148.01	-952.68	443.89	1,393.48	1,356.79	36.69	37.980	
5,200.00	5,182.64	4,955.93	4,824.08	19.53	24.90	-148.02	-974.70	453.89	1,426.20	1,388.76	37.43	38.102	
5,300.00	5,282.21	5,050.42	4,915.43	19.92	25.42	-148.02	-996.71	463.88	1,458.92	1,420.74	38.17	38.220	
5,400.00	5,381.78	5,144.92	5,006.78	20.30	25.95	-148.03	-1,018.72	473.87	1,491.64	1,452.72	38.91	38.332	
5,500.00	5,481.34	5,239.42	5,098.13	20.69	26.48	-148.04	-1,040.73	483.87	1,524.36	1,484.70	39.66	38.440	
5,600.00	5,580.91	5,333.91	5,189.49	21.08	27.01	-148.04	-1,062.74	493.86	1,557.08	1,516.68	40.40	38.544	
5,700.00	5,680.48	5,428.41	5,280.84	21.47	27.54	-148.05	-1,084.75	503.86	1,589.80	1,548.66	41.14	38.644	
5,800.00	5,780.05	5,522.90	5,372.19	21.85	28.07	-148.06	-1,106.76	513.85	1,622.52	1,580.64	41.88	38.740	
5,900.00	5,879.62	5,617.40	5,463.54	22.24	28.60	-148.06	-1,128.77	523.84	1,655.24	1,612.62	42.62	38.833	
6,000.00	5,979.19	5,711.89	5,554.89	22.63	29.13	-148.07	-1,150.78	533.84	1,687.96	1,644.59	43.37	38.923	
6,100.00	6,078.75	5,806.39	5,646.24	23.02	29.66	-148.07	-1,172.79	543.83	1,720.68	1,676.57	44.11	39.009	
6,200.00	6,178.32	5,900.88	5,737.59	23.40	30.19	-148.08	-1,194.80	553.82	1,753.40	1,708.55	44.85	39.092	
6,300.00	6,277.89	5,995.38	5,828.94	23.79	30.72	-148.08	-1,216.81	563.82	1,786.12	1,740.53	45.60	39.172	
6,318.49	6,296.30	6,012.85	5,845.84	23.86	30.82	-148.08	-1,220.88	565.67	1,792.17	1,746.44	45.73	39.187	
6,350.00	6,327.73	8,020.02	7,000.00	23.98	39.33	-135.25	-1,478.56	-472.78	1,801.47	1,743.94	57.53	31.313	
6,400.00	6,377.68	8,019.87	7,000.00	24.15	39.33	131.39	-1,478.56	-472.64	1,785.11	1,726.81	58.30	30.617	
6,450.00	6,427.47	8,015.81	7,000.00	24.29	39.24	108.91	-1,478.63	-468.57	1,770.08	1,711.12	58.95	30.026	
6,500.00	6,476.79	8,007.85	7,000.00	24.42	39.06	103.61	-1,478.77	-460.61	1,756.47	1,696.99	59.48	29.533	
6,550.00	6,525.33	7,996.04	7,000.00	24.54	38.80	101.52	-1,478.98	-448.81	1,744.35	1,684.48	59.87	29.133	
6,600.00	6,572.79	7,980.46	7,000.00	24.65	38.47	100.42	-1,479.25	-433.23	1,733.75	1,673.59	60.16	28.820	
6,650.00	6,618.89	7,961.20	7,000.00	24.75	38.07	99.64	-1,479.59	-413.97	1,724.67	1,664.35	60.32	28.594	
6,700.00	6,663.33	7,938.38	7,000.00	24.84	37.59	98.96	-1,479.99	-391.15	1,717.05	1,656.70	60.35	28.450	
6,750.00	6,705.84	7,912.14	7,000.00	24.94	37.04	98.27	-1,480.45	-364.91	1,710.84	1,650.56	60.27	28.384	
6,800.00	6,746.17	7,882.64	7,000.00	25.04	36.44	97.54	-1,480.97	-335.42	1,705.92	1,645.80	60.12	28.375	
6,850.00	6,784.06	7,850.07	7,000.00	25.16	35.81	96.76	-1,481.54	-302.85	1,702.18	1,642.28	59.90	28.419	
6,900.00	6,819.27	7,814.62	7,000.00	25.30	35.14	95.94	-1,482.16	-267.41	1,699.48	1,639.88	59.60	28.514	
6,950.00	6,851.60	7,776.52	7,000.00	25.48	34.80	95.09	-1,482.83	-229.32	1,697.66	1,638.36	59.30	28.630	
7,000.00	6,880.84	7,735.99	7,000.00	25.70	34.80	94.24	-1,483.54	-188.80	1,696.57	1,637.58	58.99	28.762	
7,050.00	6,906.82	7,693.30	7,000.00	25.99	34.84	93.42	-1,484.29	-146.11	1,696.05	1,637.37	58.68	28.903	
7,088.27	6,924.39	7,659.31	7,000.00	26.25	34.86	92.83	-1,484.88	-112.13	1,695.95	1,637.44	58.51	28.985	
7,100.00	6,929.36	7,648.69	7,000.00	26.33	34.87	92.66	-1,485.07	-101.51	1,695.96	1,637.51	58.45	29.014	
7,150.00	6,948.34	7,602.46	7,000.00	26.75	34.92	91.98	-1,485.88	-55.28	1,696.15	1,637.90	58.25	29.120	
7,200.00	6,963.63	7,531.89	6,999.11	27.24	34.99	91.16	-1,486.90	15.26	1,696.42	1,638.60	57.83	29.335	
7,250.00	6,975.15	7,395.75	6,978.00	27.80	35.11	89.51	-1,484.21	149.46	1,694.94	1,638.12	56.83	29.826	
7,300.00	6,982.81	7,278.92	6,938.12	28.43	35.17	87.89	-1,476.60	258.84	1,691.41	1,634.90	56.50	29.935	
7,350.00	6,986.58	7,179.63	6,889.44	29.11	35.18	86.44	-1,466.46	344.67	1,686.34	1,629.73	56.62	29.784	
7,372.48	6,987.00	7,139.89	6,866.42	29.44	35.18	85.86	-1,461.52	376.67	1,683.69	1,626.93	56.76	29.662	
7,400.00	6,987.03	7,095.57	6,838.52	29.85	35.16	84.88	-1,455.45	410.56	1,680.25	1,623.25	57.00	29.479	
7,500.00	6,987.12	6,972.49	6,749.88	31.50	35.05	81.76	-1,435.71	493.34	1,667.81	1,609.55	58.26	28.626	
7,600.00	6,987.22	6,891.34	6,683.68	33.34	34.93	79.41	-1,420.67	537.71	1,657.63	1,597.70	59.93	27.661	
7,700.00	6,987.31	6,835.48	6,635.19	35.36	34.82	77.68	-1,409.52	563.06	1,651.41	1,589.54	61.87	26.692	
7,776.72	6,987.38	6,803.56	6,606.58	37.02	34.75	76.66	-1,402.90	575.55	1,649.90	1,586.39	63.51	25.977	
7,800.00	6,987.40	6,795.26	6,599.04	37.52	34.73	76.39	-1,401.15	578.56	1,650.04	1,586.03	64.02	25.776	
7,900.00	6,987.50	6,765.13	6,571.38	39.81	34.64	75.40	-1,394.72	588.62	1,653.98	1,587.69	66.29	24.952	
8,000.00	6,987.59	6,741.82	6,549.69	42.19	34.58	74.63	-1,389.65	595.48	1,663.43	1,594.81	68.62	24.242	
8,100.00	6,987.69	6,723.29	6,532.28	44.65	34.52	74.00	-1,385.57	600.35	1,678.45	1,607.51	70.94	23.659	
8,200.00	6,987.78	6,700.00	6,510.22	47.19	34.45	73.22	-1,380.40	605.72	1,699.03	1,625.90	73.13	23.233	
8,300.00	6,987.88	6,700.00	6,510.22	49.79	34.45	73.22	-1,380.40	605.72	1,724.94	1,649.48	75.45	22.861	
8,400.00	6,987.97	6,685.29	6,496.20	52.44	34.39	72.72	-1,377.10	608.69	1,756.04	1,678.58	77.46	22.670	
8,500.00	6,988.07	6,676.36	6,487.66	55.13	34.36	72.42	-1,375.08	610.33	1,792.10	1,712.73	79.37	22.578	
8,600.00	6,988.16	6,668.66	6,480.27	57.87	34.33	72.16	-1,373.34	611.64	1,832.84	1,751.71	81.13	22.591	
8,700.00	6,988.26	6,650.00	6,462.32	60.63	34.26	71.52	-1,369.10	614.44	1,878.05	1,795.48	82.58	22.743	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #660H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,800.00	6,988.35	6,650.00	6,462.32	63.42	34.26	71.52	-1,369.10	614.44	1,927.20	1,843.11	84.09	22.920	
8,900.00	6,988.44	6,650.00	6,462.32	66.24	34.26	71.52	-1,369.10	614.44	1,980.17	1,894.74	85.43	23.179	
9,000.00	6,988.54	6,650.00	6,462.32	69.08	34.26	71.52	-1,369.10	614.44	2,036.68	1,950.06	86.62	23.512	
9,100.00	6,988.63	6,650.00	6,462.32	71.94	34.26	71.52	-1,369.10	614.44	2,096.44	2,008.77	87.67	23.913	
9,200.00	6,988.73	6,650.00	6,462.32	74.81	34.26	71.52	-1,369.10	614.44	2,159.18	2,070.60	88.59	24.374	
9,300.00	6,988.82	6,650.00	6,462.32	77.71	34.26	71.52	-1,369.10	614.44	2,224.65	2,135.27	89.38	24.888	
9,400.00	6,988.92	6,631.80	6,444.73	80.61	34.19	70.90	-1,364.93	616.65	2,292.36	2,202.51	89.85	25.514	
9,500.00	6,989.01	6,628.96	6,441.99	83.53	34.17	70.80	-1,364.28	616.95	2,362.51	2,272.10	90.41	26.131	
9,600.00	6,989.11	6,626.36	6,439.47	86.45	34.16	70.71	-1,363.69	617.21	2,434.74	2,343.84	90.89	26.786	
9,700.00	6,989.20	6,623.97	6,437.15	89.39	34.15	70.63	-1,363.14	617.44	2,508.86	2,417.55	91.31	27.477	
9,800.00	6,989.30	6,621.75	6,435.01	92.34	34.14	70.55	-1,362.63	617.65	2,584.72	2,493.06	91.66	28.200	
9,900.00	6,989.39	6,619.70	6,433.02	95.29	34.14	70.48	-1,362.15	617.83	2,662.17	2,570.21	91.95	28.952	
10,000.00	6,989.48	6,600.00	6,413.91	98.25	34.05	69.81	-1,357.61	619.27	2,741.32	2,649.35	91.97	29.807	
10,100.00	6,989.58	6,600.00	6,413.91	101.22	34.05	69.81	-1,357.61	619.27	2,821.51	2,729.31	92.20	30.602	
10,200.00	6,989.67	6,600.00	6,413.91	104.19	34.05	69.81	-1,357.61	619.27	2,902.93	2,810.54	92.39	31.419	
10,300.00	6,989.77	6,600.00	6,413.91	107.17	34.05	69.81	-1,357.61	619.27	2,985.48	2,892.92	92.55	32.257	
10,400.00	6,989.86	6,600.00	6,413.91	110.16	34.05	69.81	-1,357.61	619.27	3,069.06	2,976.38	92.68	33.113	
10,500.00	6,989.96	6,600.00	6,413.91	113.15	34.05	69.81	-1,357.61	619.27	3,153.60	3,060.81	92.79	33.987	
10,600.00	6,990.05	6,600.00	6,413.91	116.14	34.05	69.81	-1,357.61	619.27	3,239.03	3,146.15	92.87	34.876	
10,700.00	6,990.15	6,600.00	6,413.91	119.14	34.05	69.81	-1,357.61	619.27	3,325.26	3,232.32	92.94	35.779	
10,800.00	6,990.24	6,600.00	6,413.91	122.14	34.05	69.81	-1,357.61	619.27	3,412.25	3,319.26	92.99	36.695	
10,900.00	6,990.34	6,600.00	6,413.91	125.15	34.05	69.81	-1,357.61	619.27	3,499.93	3,406.90	93.02	37.624	
11,000.00	6,990.43	6,600.00	6,413.91	128.16	34.05	69.81	-1,357.61	619.27	3,588.25	3,495.21	93.05	38.564	
11,100.00	6,990.52	6,600.00	6,413.91	131.17	34.05	69.81	-1,357.61	619.27	3,677.18	3,584.12	93.06	39.513	
11,200.00	6,990.62	6,600.00	6,413.91	134.18	34.05	69.81	-1,357.61	619.27	3,766.66	3,673.59	93.07	40.473	
11,300.00	6,990.71	6,600.00	6,413.91	137.20	34.05	69.81	-1,357.61	619.27	3,856.65	3,763.59	93.06	41.441	
11,400.00	6,990.81	6,600.00	6,413.91	140.22	34.05	69.81	-1,357.61	619.27	3,947.13	3,854.08	93.05	42.418	
11,500.00	6,990.90	6,600.00	6,413.91	143.24	34.05	69.81	-1,357.61	619.27	4,038.06	3,945.02	93.04	43.402	
11,600.00	6,991.00	6,600.00	6,413.91	146.27	34.05	69.81	-1,357.61	619.27	4,129.41	4,036.39	93.02	44.393	
11,700.00	6,991.09	6,600.00	6,413.91	149.29	34.05	69.81	-1,357.61	619.27	4,221.14	4,128.15	93.00	45.390	
11,800.00	6,991.19	6,600.00	6,413.91	152.32	34.05	69.81	-1,357.61	619.27	4,313.25	4,220.28	92.97	46.394	
11,900.00	6,991.28	6,600.00	6,413.91	155.35	34.05	69.81	-1,357.61	619.27	4,405.70	4,312.76	92.94	47.403	
12,000.00	6,991.38	6,600.00	6,413.91	158.38	34.05	69.81	-1,357.61	619.27	4,498.47	4,405.56	92.91	48.417	
12,100.00	6,991.47	6,600.00	6,413.91	161.41	34.05	69.81	-1,357.61	619.27	4,591.55	4,498.67	92.88	49.436	
12,200.00	6,991.56	6,600.00	6,413.91	164.45	34.05	69.81	-1,357.61	619.27	4,684.91	4,592.07	92.84	50.460	
12,300.00	6,991.66	6,600.00	6,413.91	167.49	34.05	69.81	-1,357.61	619.27	4,778.54	4,685.73	92.81	51.488	
12,400.00	6,991.75	6,600.00	6,413.91	170.52	34.05	69.81	-1,357.61	619.27	4,872.43	4,779.65	92.77	52.519	
12,500.00	6,991.85	6,600.00	6,413.91	173.56	34.05	69.81	-1,357.61	619.27	4,966.55	4,873.81	92.74	53.555	
12,600.00	6,991.94	6,600.00	6,413.91	176.60	34.05	69.81	-1,357.61	619.27	5,060.90	4,968.20	92.70	54.593	
12,700.00	6,992.04	6,600.00	6,413.91	179.64	34.05	69.81	-1,357.61	619.27	5,155.46	5,062.79	92.67	55.635	
12,800.00	6,992.13	6,600.00	6,413.91	182.68	34.05	69.81	-1,357.61	619.27	5,250.22	5,157.59	92.63	56.679	
12,900.00	6,992.23	6,600.00	6,413.91	185.73	34.05	69.81	-1,357.61	619.27	5,345.18	5,252.58	92.59	57.727	
13,000.00	6,992.32	6,600.00	6,413.91	188.77	34.05	69.81	-1,357.61	619.27	5,440.31	5,347.75	92.56	58.776	
13,100.00	6,992.42	6,600.00	6,413.91	191.82	34.05	69.81	-1,357.61	619.27	5,535.62	5,443.09	92.53	59.828	
13,200.00	6,992.51	6,600.00	6,413.91	194.86	34.05	69.81	-1,357.61	619.27	5,631.09	5,538.59	92.49	60.882	
13,300.00	6,992.60	6,600.00	6,413.91	197.91	34.05	69.81	-1,357.61	619.27	5,726.71	5,634.25	92.46	61.938	
13,400.00	6,992.70	6,600.00	6,413.91	200.96	34.05	69.81	-1,357.61	619.27	5,822.48	5,730.05	92.43	62.996	
13,500.00	6,992.79	6,600.00	6,413.91	204.01	34.05	69.81	-1,357.61	619.27	5,918.39	5,826.00	92.39	64.056	
13,600.00	6,992.89	6,600.00	6,413.91	207.05	34.05	69.81	-1,357.61	619.27	6,014.43	5,922.07	92.36	65.117	
13,700.00	6,992.98	6,600.00	6,413.91	210.10	34.05	69.81	-1,357.61	619.27	6,110.60	6,018.27	92.33	66.179	
13,800.00	6,993.08	6,600.00	6,413.91	213.16	34.05	69.81	-1,357.61	619.27	6,206.90	6,114.59	92.31	67.243	
13,900.00	6,993.17	6,600.00	6,413.91	216.21	34.05	69.81	-1,357.61	619.27	6,303.30	6,211.02	92.28	68.308	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #660H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Rule Assigned:

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,000.00	6,993.27	6,600.00	6,413.91	219.26	34.05	69.81	-1,357.61	619.27	6,399.82	6,307.57	92.25	69.373	
14,100.00	6,993.36	6,600.00	6,413.91	222.31	34.05	69.81	-1,357.61	619.27	6,496.44	6,404.22	92.23	70.440	
14,200.00	6,993.46	6,600.00	6,413.91	225.36	34.05	69.81	-1,357.61	619.27	6,593.17	6,500.96	92.20	71.508	
14,300.00	6,993.55	6,600.00	6,413.91	228.42	34.05	69.81	-1,357.61	619.27	6,689.99	6,597.81	92.18	72.576	
14,400.00	6,993.64	6,600.00	6,413.91	231.47	34.05	69.81	-1,357.61	619.27	6,786.90	6,694.74	92.16	73.645	
14,500.00	6,993.74	6,600.00	6,413.91	234.53	34.05	69.81	-1,357.61	619.27	6,883.90	6,791.76	92.14	74.714	
14,600.00	6,993.83	6,600.00	6,413.91	237.58	34.05	69.81	-1,357.61	619.27	6,980.98	6,888.87	92.12	75.784	
14,700.00	6,993.93	6,600.00	6,413.91	240.64	34.05	69.81	-1,357.61	619.27	7,078.15	6,986.05	92.10	76.855	
14,800.00	6,994.02	6,600.00	6,413.91	243.69	34.05	69.81	-1,357.61	619.27	7,175.39	7,083.31	92.08	77.925	
14,900.00	6,994.12	6,600.00	6,413.91	246.75	34.05	69.81	-1,357.61	619.27	7,272.71	7,180.65	92.06	78.996	
15,000.00	6,994.21	6,600.00	6,413.91	249.81	34.05	69.81	-1,357.61	619.27	7,370.10	7,278.05	92.05	80.067	
15,100.00	6,994.31	6,600.00	6,413.91	252.86	34.05	69.81	-1,357.61	619.27	7,467.56	7,375.53	92.03	81.138	
15,200.00	6,994.40	6,600.00	6,413.91	255.92	34.05	69.81	-1,357.61	619.27	7,565.09	7,473.06	92.02	82.210	
15,300.00	6,994.50	6,600.00	6,413.91	258.98	34.05	69.81	-1,357.61	619.27	7,662.68	7,570.67	92.01	83.281	
15,400.00	6,994.59	6,600.00	6,413.91	262.04	34.05	69.81	-1,357.61	619.27	7,760.33	7,668.33	92.00	84.352	
15,500.00	6,994.68	6,600.00	6,413.91	265.10	34.05	69.81	-1,357.61	619.27	7,858.04	7,766.05	91.99	85.423	
15,600.00	6,994.78	6,600.00	6,413.91	268.16	34.05	69.81	-1,357.61	619.27	7,955.80	7,863.82	91.98	86.494	
15,700.00	6,994.87	6,600.00	6,413.91	271.22	34.05	69.81	-1,357.61	619.27	8,053.63	7,961.65	91.97	87.564	
15,800.00	6,994.97	6,600.00	6,413.91	274.28	34.05	69.81	-1,357.61	619.27	8,151.50	8,059.53	91.97	88.635	
15,900.00	6,995.06	6,600.00	6,413.91	277.34	34.05	69.81	-1,357.61	619.27	8,249.43	8,157.46	91.96	89.705	
16,000.00	6,995.16	6,600.00	6,413.91	280.40	34.05	69.81	-1,357.61	619.27	8,347.40	8,255.44	91.96	90.774	
16,100.00	6,995.25	6,600.00	6,413.91	283.46	34.05	69.81	-1,357.61	619.27	8,445.42	8,353.47	91.95	91.843	
16,200.00	6,995.35	6,600.00	6,413.91	286.52	34.05	69.81	-1,357.61	619.27	8,543.49	8,451.54	91.95	92.912	
16,300.00	6,995.44	6,600.00	6,413.91	289.58	34.05	69.81	-1,357.61	619.27	8,641.60	8,549.65	91.95	93.980	
16,400.00	6,995.54	6,600.00	6,413.91	292.64	34.05	69.81	-1,357.61	619.27	8,739.76	8,647.81	91.95	95.048	
16,500.00	6,995.63	6,600.00	6,413.91	295.70	34.05	69.81	-1,357.61	619.27	8,837.96	8,746.00	91.95	96.115	
16,600.00	6,995.72	6,600.00	6,413.91	298.76	34.05	69.81	-1,357.61	619.27	8,936.19	8,844.24	91.95	97.181	
16,700.00	6,995.82	6,600.00	6,413.91	301.83	34.05	69.81	-1,357.61	619.27	9,034.47	8,942.51	91.96	98.247	
16,800.00	6,995.91	6,600.00	6,413.91	304.89	34.05	69.81	-1,357.61	619.27	9,132.78	9,040.82	91.96	99.311	
16,900.00	6,996.01	6,600.00	6,413.91	307.95	34.05	69.81	-1,357.61	619.27	9,231.13	9,139.16	91.97	100.376	
17,000.00	6,996.10	6,600.00	6,413.91	311.01	34.05	69.81	-1,357.61	619.27	9,329.51	9,237.54	91.97	101.439	
17,100.00	6,996.20	6,600.00	6,413.91	314.08	34.05	69.81	-1,357.61	619.27	9,427.93	9,335.95	91.98	102.502	
17,200.00	6,996.29	6,600.00	6,413.91	317.14	34.05	69.81	-1,357.61	619.27	9,526.38	9,434.40	91.99	103.563	
17,300.00	6,996.39	6,600.00	6,413.91	320.20	34.05	69.81	-1,357.61	619.27	9,624.87	9,532.87	91.99	104.624	
17,400.00	6,996.48	6,600.00	6,413.91	323.27	34.05	69.81	-1,357.61	619.27	9,723.38	9,631.37	92.00	105.684	
17,500.00	6,996.58	6,600.00	6,413.91	326.33	34.05	69.81	-1,357.61	619.27	9,821.92	9,729.91	92.01	106.743	
17,600.00	6,996.67	6,600.00	6,413.91	329.40	34.05	69.81	-1,357.61	619.27	9,920.50	9,828.47	92.03	107.801	

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #663H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	153.37	-13.44	6.74	15.04	15.04	0.00	N/A	
100.00	100.00	100.00	100.00	0.36	0.36	153.37	-13.44	6.74	15.04	14.32	0.72	20.971	
200.00	200.00	200.00	200.00	0.72	0.72	153.37	-13.44	6.74	15.04	13.60	1.43	10.486	
300.00	300.00	300.00	300.00	1.08	1.08	153.37	-13.44	6.74	15.04	12.88	2.15	6.990	
400.00	400.00	400.00	400.00	1.43	1.43	153.37	-13.44	6.74	15.04	12.17	2.87	5.243	
500.00	500.00	500.00	500.00	1.79	1.79	153.37	-13.44	6.74	15.04	11.45	3.58	4.194	CC, ES
600.00	600.00	599.74	599.72	2.15	2.14	159.10	-14.79	5.65	15.83	11.55	4.29	3.694	
700.00	700.00	699.25	699.09	2.51	2.47	172.80	-18.82	2.38	18.99	14.01	4.98	3.816	
800.00	800.00	798.27	797.73	2.87	2.82	-173.22	-25.49	-3.03	25.77	20.10	5.67	4.546	
900.00	900.00	897.12	895.89	3.23	3.17	-163.32	-34.51	-10.34	36.26	29.89	6.36	5.700	
1,000.00	1,000.00	996.36	994.39	3.58	3.55	-157.74	-43.94	-17.99	47.81	40.75	7.06	6.769	
1,100.00	1,099.98	1,095.65	1,092.93	3.94	3.93	-89.22	-53.38	-25.64	59.59	51.83	7.77	7.674	
1,200.00	1,199.84	1,194.93	1,191.47	4.29	4.31	-90.66	-62.82	-33.29	71.38	62.91	8.47	8.426	
1,266.26	1,265.88	1,260.65	1,256.69	4.53	4.57	-92.74	-69.07	-38.36	79.29	70.35	8.95	8.862	
1,300.00	1,299.47	1,294.09	1,289.89	4.65	4.70	-93.98	-72.25	-40.94	83.39	74.20	9.19	9.072	
1,400.00	1,399.04	1,393.22	1,388.27	5.01	5.09	-97.03	-81.67	-48.58	95.71	85.79	9.92	9.649	
1,500.00	1,498.61	1,492.35	1,486.65	5.37	5.49	-99.38	-91.09	-56.22	108.23	97.58	10.65	10.160	
1,600.00	1,598.18	1,591.47	1,585.03	5.74	5.88	-101.25	-100.52	-63.86	120.90	109.51	11.39	10.614	
1,700.00	1,697.74	1,690.60	1,683.41	6.11	6.28	-102.75	-109.94	-71.50	133.68	121.54	12.13	11.017	
1,800.00	1,797.31	1,789.72	1,781.79	6.49	6.68	-104.00	-119.36	-79.14	146.52	133.64	12.88	11.377	
1,900.00	1,896.88	1,888.85	1,880.17	6.86	7.08	-105.04	-128.79	-86.78	159.43	145.80	13.63	11.700	
2,000.00	1,996.45	1,987.97	1,978.55	7.24	7.48	-105.93	-138.21	-94.42	172.38	158.00	14.38	11.990	
2,100.00	2,096.02	2,087.10	2,076.93	7.61	7.89	-106.69	-147.63	-102.06	185.36	170.23	15.13	12.253	
2,200.00	2,195.59	2,186.22	2,175.31	7.99	8.29	-107.36	-157.06	-109.70	198.37	182.49	15.88	12.491	
2,300.00	2,295.16	2,285.35	2,273.69	8.37	8.69	-107.94	-166.48	-117.34	211.40	194.77	16.64	12.708	
2,400.00	2,394.72	2,384.47	2,372.07	8.75	9.10	-108.45	-175.90	-124.98	224.46	207.07	17.39	12.906	
2,500.00	2,494.29	2,483.60	2,470.45	9.13	9.50	-108.91	-185.33	-132.62	237.53	219.38	18.15	13.088	
2,600.00	2,593.86	2,582.73	2,568.83	9.51	9.91	-109.32	-194.75	-140.26	250.61	231.70	18.91	13.256	
2,700.00	2,693.43	2,681.85	2,667.21	9.90	10.32	-109.69	-204.17	-147.90	263.70	244.04	19.66	13.410	
2,800.00	2,793.00	2,780.98	2,765.59	10.28	10.72	-110.02	-213.60	-155.54	276.81	256.38	20.42	13.553	
2,900.00	2,892.57	2,880.10	2,863.97	10.66	11.13	-110.33	-223.02	-163.18	289.92	268.74	21.18	13.686	
3,000.00	2,992.13	2,979.23	2,962.35	11.05	11.53	-110.61	-232.44	-170.82	303.04	281.10	21.94	13.810	
3,100.00	3,091.70	3,078.35	3,060.73	11.43	11.94	-110.86	-241.87	-178.46	316.17	293.46	22.70	13.925	
3,200.00	3,191.27	3,177.48	3,159.11	11.81	12.35	-111.09	-251.29	-186.10	329.30	305.83	23.47	14.033	
3,300.00	3,290.84	3,276.60	3,257.49	12.20	12.76	-111.31	-260.72	-193.74	342.43	318.21	24.23	14.134	
3,400.00	3,390.41	3,375.73	3,355.87	12.58	13.16	-111.51	-270.14	-201.38	355.57	330.58	24.99	14.229	
3,500.00	3,489.98	3,474.85	3,454.25	12.97	13.57	-111.70	-279.56	-209.02	368.72	342.97	25.75	14.318	
3,600.00	3,589.54	3,573.98	3,552.63	13.35	13.98	-111.87	-288.99	-216.66	381.87	355.35	26.51	14.402	
3,700.00	3,689.11	3,673.10	3,651.01	13.74	14.39	-112.03	-298.41	-224.30	395.02	367.74	27.28	14.482	
3,800.00	3,788.68	3,772.23	3,749.39	14.12	14.79	-112.18	-307.83	-231.94	408.17	380.13	28.04	14.557	
3,900.00	3,888.25	3,871.36	3,847.77	14.51	15.20	-112.33	-317.26	-239.58	421.33	392.53	28.80	14.628	
4,000.00	3,987.82	3,970.48	3,946.15	14.89	15.61	-112.46	-326.68	-247.22	434.49	404.92	29.57	14.695	
4,100.00	4,087.39	4,069.61	4,044.53	15.28	16.02	-112.58	-336.10	-254.86	447.65	417.32	30.33	14.759	
4,200.00	4,186.95	4,168.73	4,142.91	15.67	16.43	-112.70	-345.53	-262.50	460.82	429.72	31.10	14.819	
4,300.00	4,286.52	4,267.86	4,241.29	16.05	16.83	-112.81	-354.95	-270.14	473.98	442.12	31.86	14.877	
4,400.00	4,386.09	4,366.98	4,339.67	16.44	17.24	-112.92	-364.37	-277.78	487.15	454.52	32.62	14.932	
4,500.00	4,485.66	4,466.11	4,438.05	16.82	17.65	-113.02	-373.80	-285.42	500.32	466.93	33.39	14.984	
4,600.00	4,585.23	4,565.23	4,536.44	17.21	18.06	-113.11	-383.22	-293.06	513.49	479.33	34.15	15.035	
4,700.00	4,684.80	4,664.36	4,634.82	17.60	18.47	-113.21	-392.64	-300.70	526.66	491.74	34.92	15.082	
4,800.00	4,784.36	4,763.48	4,733.20	17.98	18.88	-113.29	-402.07	-308.34	539.83	504.15	35.68	15.128	
4,900.00	4,883.93	4,862.61	4,831.58	18.37	19.28	-113.37	-411.49	-315.98	553.01	516.56	36.45	15.172	
5,000.00	4,983.50	4,961.74	4,929.96	18.76	19.69	-113.45	-420.91	-323.62	566.18	528.97	37.21	15.214	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #663H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.00	5,083.07	5,060.86	5,028.34	19.14	20.10	-113.53	-430.34	-331.26	579.36	541.38	37.98	15.254	
5,200.00	5,182.64	5,159.99	5,126.72	19.53	20.51	-113.60	-439.76	-338.90	592.53	553.79	38.75	15.293	
5,300.00	5,282.21	5,259.11	5,225.10	19.92	20.92	-113.66	-449.19	-346.54	605.71	566.20	39.51	15.330	
5,400.00	5,381.78	5,358.24	5,323.48	20.30	21.33	-113.73	-458.61	-354.18	618.89	578.61	40.28	15.366	
5,500.00	5,481.34	5,457.36	5,421.86	20.69	21.74	-113.79	-468.03	-361.82	632.07	591.03	41.04	15.400	
5,600.00	5,580.91	5,556.49	5,520.24	21.08	22.15	-113.85	-477.46	-369.46	645.25	603.44	41.81	15.433	
5,700.00	5,680.48	5,655.61	5,618.62	21.47	22.56	-113.91	-486.88	-377.10	658.43	615.85	42.57	15.465	
5,800.00	5,780.05	5,754.74	5,717.00	21.85	22.96	-113.96	-496.30	-384.74	671.61	628.27	43.34	15.496	
5,900.00	5,879.62	5,853.86	5,815.38	22.24	23.37	-114.02	-505.73	-392.38	684.79	640.69	44.11	15.526	
6,000.00	5,979.19	5,952.99	5,913.76	22.63	23.78	-114.07	-515.15	-400.02	697.97	653.10	44.87	15.554	
6,100.00	6,078.75	6,052.12	6,012.14	23.02	24.19	-114.12	-524.57	-407.66	711.16	665.52	45.64	15.582	
6,200.00	6,178.32	6,151.24	6,110.52	23.40	24.60	-114.16	-534.00	-415.30	724.34	677.94	46.41	15.609	
6,300.00	6,277.89	6,250.37	6,208.90	23.79	25.01	-114.21	-543.42	-422.94	737.52	690.35	47.17	15.635	
6,318.49	6,296.30	6,268.70	6,227.09	23.86	25.08	-114.22	-545.16	-424.36	739.96	692.65	47.31	15.639	
6,350.00	6,327.73	6,299.92	6,258.08	23.98	25.21	-136.53	-548.13	-426.76	744.10	696.55	47.55	15.649	
6,400.00	6,377.68	6,349.32	6,307.11	24.15	25.42	128.29	-552.83	-430.57	750.56	702.67	47.90	15.670	
6,450.00	6,427.47	6,398.25	6,355.67	24.29	25.62	104.55	-557.48	-434.34	756.94	708.73	48.21	15.700	
6,500.00	6,476.79	6,446.42	6,403.48	24.42	25.82	98.53	-562.06	-438.05	763.32	714.81	48.50	15.737	
6,550.00	6,525.33	6,493.54	6,450.24	24.54	26.01	96.22	-566.54	-441.69	769.82	721.05	48.77	15.785	
6,600.00	6,572.79	6,541.04	6,497.43	24.65	26.20	95.33	-571.06	-444.65	776.59	727.57	49.02	15.842	
6,650.00	6,618.89	6,590.57	6,546.71	24.75	26.38	95.06	-575.80	-444.22	783.60	734.34	49.26	15.907	
6,700.00	6,663.33	6,641.77	6,597.47	24.84	26.55	95.11	-580.71	-439.74	790.81	741.31	49.50	15.977	
6,750.00	6,705.84	6,694.81	6,649.49	24.94	26.69	95.36	-585.76	-430.79	798.14	748.41	49.73	16.050	
6,800.00	6,746.17	6,749.88	6,702.52	25.04	26.83	95.74	-590.93	-416.93	805.52	755.57	49.96	16.125	
6,850.00	6,784.06	6,807.16	6,756.19	25.16	26.94	96.20	-596.19	-397.68	812.88	762.70	50.19	16.197	
6,900.00	6,819.27	6,866.83	6,810.03	25.30	27.05	96.72	-601.50	-372.57	820.12	769.70	50.43	16.264	
6,950.00	6,851.60	6,929.04	6,863.41	25.48	27.14	97.28	-606.80	-341.12	827.14	776.45	50.69	16.319	
7,000.00	6,880.84	6,993.93	6,915.56	25.70	27.21	97.86	-612.01	-302.90	833.81	782.83	50.98	16.355	
7,050.00	6,906.82	7,061.58	6,965.50	25.99	27.27	98.45	-617.05	-257.59	840.02	788.67	51.35	16.360	
7,100.00	6,929.36	7,132.00	7,012.10	26.33	27.31	99.01	-621.80	-205.05	845.63	793.82	51.81	16.320	
7,150.00	6,948.34	7,205.11	7,054.06	26.75	27.36	99.54	-626.15	-145.39	850.51	798.09	52.43	16.222	
7,200.00	6,963.63	7,280.69	7,089.98	27.24	27.43	100.00	-629.95	-79.05	854.54	801.28	53.25	16.046	
7,250.00	6,975.15	7,358.40	7,118.49	27.80	27.67	100.40	-633.06	-6.87	857.59	803.26	54.32	15.787	
7,300.00	6,982.81	7,437.79	7,138.36	28.43	28.33	100.69	-635.37	69.89	859.56	803.89	55.67	15.440	
7,350.00	6,986.58	7,518.24	7,148.64	29.11	29.32	100.87	-636.77	149.63	860.40	803.11	57.29	15.019	
7,372.48	6,987.00	7,554.59	7,149.98	29.44	29.82	100.92	-637.09	185.94	860.39	802.30	58.09	14.811	
7,400.00	6,987.03	7,584.18	7,150.00	29.85	30.26	100.92	-637.24	215.53	860.16	801.24	58.92	14.599	
7,500.00	6,987.12	7,684.17	7,150.00	31.50	31.89	100.93	-637.76	315.52	859.35	797.23	62.11	13.835	
7,600.00	6,987.22	7,784.17	7,150.00	33.34	33.71	100.93	-638.27	415.52	858.53	792.83	65.70	13.068	
7,700.00	6,987.31	7,884.17	7,150.00	35.36	35.70	100.93	-638.79	515.51	857.71	788.09	69.62	12.319	
7,800.00	6,987.40	7,984.16	7,150.00	37.52	37.84	100.94	-639.31	615.51	856.89	783.06	73.84	11.605	
7,900.00	6,987.50	8,084.16	7,150.00	39.81	40.09	100.94	-639.82	715.50	856.07	777.79	78.29	10.935	
8,000.00	6,987.59	8,184.16	7,150.00	42.19	42.45	100.95	-640.34	815.50	855.25	772.32	82.94	10.312	
8,100.00	6,987.69	8,284.15	7,150.00	44.65	44.89	100.95	-640.86	915.49	854.44	766.68	87.76	9.736	
8,200.00	6,987.78	8,384.15	7,150.00	47.19	47.40	100.95	-641.37	1,015.49	853.62	760.89	92.72	9.206	
8,300.00	6,987.88	8,484.15	7,150.00	49.79	49.97	100.96	-641.89	1,115.49	852.80	754.99	97.81	8.719	
8,400.00	6,987.97	8,584.14	7,150.00	52.44	52.60	100.96	-642.41	1,215.48	851.98	748.98	103.00	8.272	
8,500.00	6,988.07	8,684.14	7,150.00	55.13	55.27	100.97	-642.92	1,315.48	851.16	742.89	108.28	7.861	
8,600.00	6,988.16	8,784.14	7,150.00	57.87	57.99	100.97	-643.44	1,415.47	850.34	736.71	113.63	7.484	
8,700.00	6,988.26	8,884.13	7,150.00	60.63	60.73	100.98	-643.96	1,515.47	849.52	730.48	119.05	7.136	
8,800.00	6,988.35	8,984.13	7,150.00	63.42	63.51	100.98	-644.47	1,615.46	848.71	724.18	124.52	6.816	
8,900.00	6,988.44	9,084.13	7,150.00	66.24	66.31	100.98	-644.99	1,715.46	847.89	717.84	130.05	6.520	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #663H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,000.00	6,988.54	9,184.12	7,150.00	69.08	69.13	100.99	-645.51	1,815.45	847.07	711.45	135.62	6.246	
9,100.00	6,988.63	9,284.12	7,150.00	71.94	71.97	100.99	-646.02	1,915.45	846.25	705.03	141.22	5.992	
9,200.00	6,988.73	9,384.12	7,150.00	74.81	74.84	101.00	-646.54	2,015.44	845.43	698.57	146.86	5.757	
9,300.00	6,988.82	9,484.11	7,150.00	77.71	77.71	101.00	-647.06	2,115.44	844.61	692.08	152.54	5.537	
9,400.00	6,988.92	9,584.11	7,150.00	80.61	80.60	101.01	-647.57	2,215.43	843.80	685.56	158.24	5.333	
9,500.00	6,989.01	9,684.11	7,150.00	83.53	83.51	101.01	-648.09	2,315.43	842.98	679.02	163.96	5.141	
9,600.00	6,989.11	9,784.10	7,150.00	86.45	86.42	101.01	-648.60	2,415.42	842.16	672.46	169.70	4.963	
9,700.00	6,989.20	9,884.10	7,150.00	89.39	89.35	101.02	-649.12	2,515.42	841.34	665.87	175.47	4.795	
9,800.00	6,989.30	9,984.10	7,150.00	92.34	92.29	101.02	-649.64	2,615.42	840.52	659.27	181.25	4.637	
9,900.00	6,989.39	10,084.09	7,150.00	95.29	95.23	101.03	-650.15	2,715.41	839.70	652.66	187.05	4.489	
10,000.00	6,989.48	10,184.09	7,150.00	98.25	98.18	101.03	-650.67	2,815.41	838.89	646.03	192.86	4.350	
10,100.00	6,989.58	10,284.09	7,150.00	101.22	101.14	101.04	-651.19	2,915.40	838.07	639.38	198.68	4.218	
10,200.00	6,989.67	10,384.08	7,150.00	104.19	104.10	101.04	-651.70	3,015.40	837.25	632.73	204.52	4.094	
10,300.00	6,989.77	10,484.08	7,150.00	107.17	107.08	101.04	-652.22	3,115.39	836.43	626.06	210.37	3.976	
10,400.00	6,989.86	10,584.08	7,150.00	110.16	110.05	101.05	-652.74	3,215.39	835.61	619.38	216.23	3.864	
10,500.00	6,989.96	10,684.07	7,150.00	113.15	113.03	101.05	-653.25	3,315.38	834.79	612.70	222.10	3.759	
10,600.00	6,990.05	10,784.07	7,150.00	116.14	116.02	101.06	-653.77	3,415.38	833.98	606.00	227.97	3.658	
10,700.00	6,990.15	10,884.07	7,150.00	119.14	119.01	101.06	-654.29	3,515.37	833.16	599.30	233.86	3.563	
10,800.00	6,990.24	10,984.06	7,150.00	122.14	122.00	101.07	-654.80	3,615.37	832.34	592.59	239.75	3.472	
10,900.00	6,990.34	11,084.06	7,150.00	125.15	125.00	101.07	-655.32	3,715.36	831.52	585.87	245.65	3.385	
11,000.00	6,990.43	11,184.06	7,150.00	128.16	128.00	101.07	-655.84	3,815.36	830.70	579.15	251.56	3.302	
11,100.00	6,990.52	11,284.05	7,150.00	131.17	131.01	101.08	-656.35	3,915.35	829.88	572.42	257.47	3.223	
11,200.00	6,990.62	11,384.05	7,150.00	134.18	134.01	101.08	-656.87	4,015.35	829.07	565.68	263.38	3.148	
11,300.00	6,990.71	11,484.05	7,150.00	137.20	137.02	101.09	-657.39	4,115.34	828.25	558.94	269.31	3.075	
11,400.00	6,990.81	11,584.04	7,150.00	140.22	140.04	101.09	-657.90	4,215.34	827.43	552.20	275.23	3.006	
11,500.00	6,990.90	11,684.04	7,150.00	143.24	143.05	101.10	-658.42	4,315.34	826.61	545.45	281.16	2.940	
11,600.00	6,991.00	11,784.04	7,150.00	146.27	146.07	101.10	-658.94	4,415.33	825.79	538.70	287.10	2.876	
11,700.00	6,991.09	11,884.03	7,150.00	149.29	149.09	101.11	-659.45	4,515.33	824.97	531.94	293.04	2.815	
11,800.00	6,991.19	11,984.03	7,150.00	152.32	152.11	101.11	-659.97	4,615.32	824.16	525.18	298.98	2.757	
11,900.00	6,991.28	12,084.03	7,150.00	155.35	155.14	101.11	-660.49	4,715.32	823.34	518.41	304.92	2.700	
12,000.00	6,991.38	12,184.02	7,150.00	158.38	158.16	101.12	-661.00	4,815.31	822.52	511.65	310.87	2.646	
12,100.00	6,991.47	12,284.02	7,150.00	161.41	161.19	101.12	-661.52	4,915.31	821.70	504.88	316.83	2.594	
12,200.00	6,991.56	12,384.02	7,150.00	164.45	164.22	101.13	-662.04	5,015.30	820.88	498.10	322.78	2.543	
12,300.00	6,991.66	12,484.01	7,150.00	167.49	167.25	101.13	-662.55	5,115.30	820.06	491.33	328.74	2.495	
12,400.00	6,991.75	12,584.01	7,150.00	170.52	170.28	101.14	-663.07	5,215.29	819.25	484.55	334.70	2.448	
12,500.00	6,991.85	12,684.01	7,150.00	173.56	173.31	101.14	-663.58	5,315.29	818.43	477.77	340.66	2.402	
12,600.00	6,991.94	12,784.00	7,150.00	176.60	176.35	101.15	-664.10	5,415.28	817.61	470.98	346.63	2.359	
12,700.00	6,992.04	12,884.00	7,150.00	179.64	179.38	101.15	-664.62	5,515.28	816.79	464.20	352.59	2.317	
12,800.00	6,992.13	12,984.00	7,150.00	182.68	182.42	101.16	-665.13	5,615.27	815.97	457.41	358.56	2.276	
12,900.00	6,992.23	13,083.99	7,150.00	185.73	185.46	101.16	-665.65	5,715.27	815.16	450.62	364.53	2.236	
13,000.00	6,992.32	13,183.99	7,150.00	188.77	188.50	101.16	-666.17	5,815.26	814.34	443.83	370.51	2.198	
13,100.00	6,992.42	13,283.99	7,150.00	191.82	191.54	101.17	-666.68	5,915.26	813.52	437.04	376.48	2.161	
13,200.00	6,992.51	13,383.98	7,150.00	194.86	194.58	101.17	-667.20	6,015.26	812.70	430.24	382.46	2.125	
13,300.00	6,992.60	13,483.98	7,150.00	197.91	197.62	101.18	-667.72	6,115.25	811.88	423.45	388.43	2.090	
13,400.00	6,992.70	13,583.98	7,150.00	200.96	200.66	101.18	-668.23	6,215.25	811.06	416.65	394.41	2.056	
13,500.00	6,992.79	13,683.97	7,150.00	204.01	203.70	101.19	-668.75	6,315.24	810.25	409.85	400.39	2.024	
13,600.00	6,992.89	13,783.97	7,150.00	207.05	206.75	101.19	-669.27	6,415.24	809.43	403.05	406.37	1.992	
13,700.00	6,992.98	13,883.97	7,150.00	210.10	209.79	101.20	-669.78	6,515.23	808.61	396.25	412.36	1.961	
13,800.00	6,993.08	13,983.96	7,150.00	213.16	212.84	101.20	-670.30	6,615.23	807.79	389.45	418.34	1.931	
13,900.00	6,993.17	14,083.96	7,150.00	216.21	215.89	101.21	-670.82	6,715.22	806.97	382.65	424.33	1.902	
14,000.00	6,993.27	14,183.96	7,150.00	219.26	218.93	101.21	-671.33	6,815.22	806.16	375.84	430.31	1.873	
14,100.00	6,993.36	14,283.95	7,150.00	222.31	221.98	101.22	-671.85	6,915.21	805.34	369.04	436.30	1.846	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #663H - OH - Plan #1

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,200.00	6,993.46	14,383.95	7,150.00	225.36	225.03	101.22	-672.37	7,015.21	804.52	362.23	442.29	1.819	
14,300.00	6,993.55	14,483.95	7,150.00	228.42	228.08	101.22	-672.88	7,115.20	803.70	355.42	448.28	1.793	
14,400.00	6,993.64	14,583.94	7,150.00	231.47	231.13	101.23	-673.40	7,215.20	802.88	348.62	454.27	1.767	
14,500.00	6,993.74	14,683.94	7,150.00	234.53	234.18	101.23	-673.92	7,315.19	802.06	341.81	460.26	1.743	
14,600.00	6,993.83	14,783.94	7,150.00	237.58	237.23	101.24	-674.43	7,415.19	801.25	335.00	466.25	1.718	
14,700.00	6,993.93	14,883.93	7,150.00	240.64	240.28	101.24	-674.95	7,515.18	800.43	328.19	472.24	1.695	
14,800.00	6,994.02	14,983.93	7,150.00	243.69	243.33	101.25	-675.47	7,615.18	799.61	321.38	478.24	1.672	
14,900.00	6,994.12	15,083.92	7,150.00	246.75	246.38	101.25	-675.98	7,715.18	798.79	314.56	484.23	1.650	
15,000.00	6,994.21	15,183.92	7,150.00	249.81	249.44	101.26	-676.50	7,815.17	797.97	307.75	490.22	1.628	
15,100.00	6,994.31	15,283.92	7,150.00	252.86	252.49	101.26	-677.02	7,915.17	797.16	300.94	496.22	1.606	
15,200.00	6,994.40	15,383.91	7,150.00	255.92	255.54	101.27	-677.53	8,015.16	796.34	294.12	502.21	1.586	
15,300.00	6,994.50	15,483.91	7,150.00	258.98	258.60	101.27	-678.05	8,115.16	795.52	287.31	508.21	1.565	
15,400.00	6,994.59	15,583.91	7,150.00	262.04	261.65	101.28	-678.56	8,215.15	794.70	280.50	514.21	1.545	
15,500.00	6,994.68	15,683.90	7,150.00	265.10	264.70	101.28	-679.08	8,315.15	793.88	273.68	520.20	1.526	
15,600.00	6,994.78	15,783.90	7,150.00	268.16	267.76	101.29	-679.60	8,415.14	793.07	266.86	526.20	1.507	
15,700.00	6,994.87	15,883.90	7,150.00	271.22	270.82	101.29	-680.11	8,515.14	792.25	260.05	532.20	1.489	Level 3
15,800.00	6,994.97	15,983.89	7,150.00	274.28	273.87	101.30	-680.63	8,615.13	791.43	253.23	538.20	1.471	Level 3
15,900.00	6,995.06	16,083.89	7,150.00	277.34	276.93	101.30	-681.15	8,715.13	790.61	246.41	544.20	1.453	Level 3
16,000.00	6,995.16	16,183.89	7,150.00	280.40	279.98	101.31	-681.66	8,815.12	789.79	239.60	550.20	1.435	Level 3
16,100.00	6,995.25	16,283.88	7,150.00	283.46	283.04	101.31	-682.18	8,915.12	788.98	232.78	556.20	1.419	Level 3
16,200.00	6,995.35	16,383.88	7,150.00	286.52	286.10	101.32	-682.70	9,015.11	788.16	225.96	562.20	1.402	Level 3
16,300.00	6,995.44	16,483.88	7,150.00	289.58	289.15	101.32	-683.21	9,115.11	787.34	219.14	568.20	1.386	Level 3
16,400.00	6,995.54	16,583.87	7,150.00	292.64	292.21	101.33	-683.73	9,215.10	786.52	212.32	574.20	1.370	Level 3
16,500.00	6,995.63	16,683.87	7,150.00	295.70	295.27	101.33	-684.25	9,315.10	785.70	205.51	580.20	1.354	Level 3
16,600.00	6,995.72	16,783.87	7,150.00	298.76	298.33	101.34	-684.76	9,415.10	784.89	198.69	586.20	1.339	Level 3
16,700.00	6,995.82	16,883.86	7,150.00	301.83	301.38	101.34	-685.28	9,515.09	784.07	191.87	592.20	1.324	Level 3
16,800.00	6,995.91	16,983.86	7,150.00	304.89	304.44	101.35	-685.80	9,615.09	783.25	185.05	598.20	1.309	Level 3
16,900.00	6,996.01	17,083.86	7,150.00	307.95	307.50	101.35	-686.31	9,715.08	782.43	178.23	604.20	1.295	Level 3
17,000.00	6,996.10	17,183.85	7,150.00	311.01	310.56	101.36	-686.83	9,815.08	781.61	171.41	610.21	1.281	Level 3
17,100.00	6,996.20	17,283.85	7,150.00	314.08	313.62	101.36	-687.35	9,915.07	780.80	164.59	616.21	1.267	Level 3
17,200.00	6,996.29	17,383.85	7,150.00	317.14	316.68	101.37	-687.86	10,015.07	779.98	157.77	622.21	1.254	Level 3
17,300.00	6,996.39	17,483.84	7,150.00	320.20	319.74	101.37	-688.38	10,115.06	779.16	150.95	628.21	1.240	Level 2
17,400.00	6,996.48	17,583.84	7,150.00	323.27	322.80	101.38	-688.90	10,215.06	778.34	144.13	634.22	1.227	Level 2
17,500.00	6,996.58	17,683.84	7,150.00	326.33	325.86	101.38	-689.41	10,315.05	777.52	137.30	640.22	1.214	Level 2
17,600.00	6,996.67	17,783.83	7,150.00	329.40	328.92	101.39	-689.93	10,415.05	776.71	130.48	646.22	1.202	Level 2
17,700.00	6,996.76	17,883.83	7,150.00	332.46	331.98	101.39	-690.45	10,515.04	775.89	123.66	652.23	1.190	Level 2
17,800.00	6,996.86	17,983.83	7,150.00	335.52	335.04	101.40	-690.96	10,615.04	775.07	116.84	658.23	1.178	Level 2
17,900.00	6,996.95	18,083.82	7,150.00	338.59	338.10	101.40	-691.48	10,715.03	774.25	110.02	664.23	1.166	Level 2
17,948.87	6,997.00	18,132.69	7,150.00	340.09	339.60	101.40	-691.73	10,763.90	773.85	106.69	667.17	1.160	Level 2, SF

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	152.67	-40.10	20.72	45.14				
100.00	100.00	100.00	100.00	0.36	0.36	152.67	-40.10	20.72	45.14	44.42	0.72	62.957	
200.00	200.00	200.00	200.00	0.72	0.72	152.67	-40.10	20.72	45.14	43.70	1.43	31.479	
300.00	300.00	300.00	300.00	1.08	1.08	152.67	-40.10	20.72	45.14	42.99	2.15	20.986	
400.00	400.00	400.00	400.00	1.43	1.43	152.67	-40.10	20.72	45.14	42.27	2.87	15.739	
500.00	500.00	500.00	500.00	1.79	1.79	152.67	-40.10	20.72	45.14	41.55	3.58	12.591	
600.00	600.00	600.00	600.00	2.15	2.15	152.67	-40.10	20.72	45.14	40.84	4.30	10.493	
700.00	700.00	700.00	700.00	2.51	2.51	152.67	-40.10	20.72	45.14	40.12	5.02	8.994	
800.00	800.00	800.00	800.00	2.87	2.87	152.67	-40.10	20.72	45.14	39.40	5.74	7.870	
900.00	900.00	900.00	900.00	3.23	3.23	152.67	-40.10	20.72	45.14	38.68	6.45	6.995	
1,000.00	1,000.00	1,000.00	1,000.00	3.58	3.58	152.67	-40.10	20.72	45.14	37.97	7.17	6.296	CC, ES
1,100.00	1,099.98	1,099.23	1,099.21	3.94	3.92	-140.21	-41.51	19.73	47.29	39.43	7.86	6.015	
1,200.00	1,199.84	1,198.17	1,198.01	4.29	4.25	-138.83	-45.71	16.79	53.78	45.24	8.54	6.298	
1,266.26	1,265.88	1,263.43	1,263.06	4.53	4.47	-137.72	-50.01	13.78	60.47	51.48	8.99	6.724	
1,300.00	1,299.47	1,296.55	1,296.02	4.65	4.59	-137.07	-52.66	11.92	64.46	55.24	9.22	6.989	
1,400.00	1,399.04	1,394.32	1,393.07	5.01	4.93	-134.16	-62.29	5.18	77.59	67.68	9.91	7.832	
1,500.00	1,498.61	1,491.29	1,488.88	5.37	5.28	-130.44	-74.52	-3.38	92.88	82.29	10.59	8.770	
1,600.00	1,598.18	1,587.26	1,583.15	5.74	5.64	-126.49	-89.23	-13.68	110.64	99.37	11.27	9.817	
1,700.00	1,697.74	1,682.03	1,675.61	6.11	6.03	-122.64	-106.29	-25.63	131.10	119.15	11.94	10.977	
1,800.00	1,797.31	1,778.51	1,769.23	6.49	6.44	-119.23	-125.36	-38.98	153.62	140.97	12.65	12.143	
1,900.00	1,896.88	1,875.57	1,863.41	6.86	6.87	-116.66	-144.60	-52.45	176.58	163.20	13.38	13.199	
2,000.00	1,996.45	1,972.63	1,957.59	7.24	7.31	-114.69	-163.83	-65.92	199.80	185.69	14.11	14.157	
2,100.00	2,096.02	2,069.69	2,051.76	7.61	7.76	-113.12	-183.07	-79.39	223.20	208.35	14.85	15.026	
2,200.00	2,195.59	2,166.75	2,145.94	7.99	8.22	-111.85	-202.30	-92.86	246.73	231.13	15.60	15.816	
2,300.00	2,295.16	2,263.81	2,240.12	8.37	8.69	-110.80	-221.54	-106.32	270.35	254.00	16.35	16.536	
2,400.00	2,394.72	2,360.87	2,334.30	8.75	9.17	-109.93	-240.77	-119.79	294.05	276.95	17.10	17.193	
2,500.00	2,494.29	2,457.93	2,428.48	9.13	9.65	-109.18	-260.01	-133.26	317.80	299.94	17.86	17.795	
2,600.00	2,593.86	2,555.00	2,522.65	9.51	10.13	-108.53	-279.24	-146.73	341.59	322.97	18.62	18.347	
2,700.00	2,693.43	2,652.06	2,616.83	9.90	10.62	-107.97	-298.48	-160.20	365.42	346.04	19.38	18.856	
2,800.00	2,793.00	2,749.12	2,711.01	10.28	11.11	-107.48	-317.71	-173.67	389.28	369.14	20.14	19.327	
2,900.00	2,892.57	2,846.18	2,805.19	10.66	11.60	-107.05	-336.95	-187.13	413.16	392.26	20.91	19.762	
3,000.00	2,992.13	2,943.24	2,899.37	11.05	12.10	-106.66	-356.18	-200.60	437.07	415.39	21.67	20.166	
3,100.00	3,091.70	3,040.30	2,993.54	11.43	12.60	-106.31	-375.42	-214.07	460.99	438.55	22.44	20.542	
3,200.00	3,191.27	3,137.36	3,087.72	11.81	13.10	-106.00	-394.65	-227.54	484.92	461.71	23.21	20.892	
3,300.00	3,290.84	3,234.42	3,181.90	12.20	13.60	-105.71	-413.89	-241.01	508.87	484.89	23.98	21.220	
3,400.00	3,390.41	3,331.48	3,276.08	12.58	14.11	-105.46	-433.12	-254.47	532.82	508.07	24.75	21.527	
3,500.00	3,489.98	3,428.55	3,370.26	12.97	14.61	-105.22	-452.35	-267.94	556.79	531.27	25.52	21.814	
3,600.00	3,589.54	3,525.61	3,464.43	13.35	15.12	-105.00	-471.59	-281.41	580.77	554.47	26.30	22.085	
3,700.00	3,689.11	3,622.67	3,558.61	13.74	15.63	-104.80	-490.82	-294.88	604.75	577.68	27.07	22.339	
3,800.00	3,788.68	3,719.73	3,652.79	14.12	16.14	-104.62	-510.06	-308.35	628.74	600.89	27.85	22.580	
3,900.00	3,888.25	3,816.79	3,746.97	14.51	16.65	-104.45	-529.29	-321.82	652.73	624.11	28.62	22.806	
4,000.00	3,987.82	3,913.85	3,841.15	14.89	17.16	-104.29	-548.53	-335.28	676.73	647.33	29.40	23.021	
4,100.00	4,087.39	4,010.91	3,935.32	15.28	17.67	-104.14	-567.76	-348.75	700.73	670.56	30.17	23.224	
4,200.00	4,186.95	4,107.97	4,029.50	15.67	18.18	-104.01	-587.00	-362.22	724.74	693.79	30.95	23.417	
4,300.00	4,286.52	4,205.04	4,123.68	16.05	18.70	-103.88	-606.23	-375.69	748.75	717.02	31.73	23.600	
4,400.00	4,386.09	4,302.10	4,217.86	16.44	19.21	-103.76	-625.47	-389.16	772.77	740.26	32.51	23.774	
4,500.00	4,485.66	4,399.16	4,312.04	16.82	19.73	-103.64	-644.70	-402.63	796.78	763.50	33.28	23.939	
4,600.00	4,585.23	4,496.22	4,406.21	17.21	20.24	-103.53	-663.94	-416.09	820.80	786.74	34.06	24.097	
4,700.00	4,684.80	4,593.28	4,500.39	17.60	20.76	-103.43	-683.17	-429.56	844.83	809.98	34.84	24.248	
4,800.00	4,784.36	4,690.34	4,594.57	17.98	21.27	-103.34	-702.41	-443.03	868.85	833.23	35.62	24.392	
4,900.00	4,883.93	4,787.40	4,688.75	18.37	21.79	-103.25	-721.64	-456.50	892.88	856.48	36.40	24.529	
5,000.00	4,983.50	4,884.46	4,782.93	18.76	22.31	-103.16	-740.87	-469.97	916.91	879.73	37.18	24.661	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.00	5,083.07	4,981.52	4,877.10	19.14	22.82	-103.08	-760.11	-483.44	940.94	902.98	37.96	24.787	
5,200.00	5,182.64	5,078.59	4,971.28	19.53	23.34	-103.00	-779.34	-496.90	964.97	926.23	38.74	24.907	
5,300.00	5,282.21	5,175.65	5,065.46	19.92	23.86	-102.93	-798.58	-510.37	989.01	949.48	39.52	25.023	
5,400.00	5,381.78	5,272.71	5,159.64	20.30	24.38	-102.86	-817.81	-523.84	1,013.04	972.74	40.30	25.135	
5,500.00	5,481.34	5,369.77	5,253.82	20.69	24.90	-102.79	-837.05	-537.31	1,037.08	995.99	41.09	25.241	
5,600.00	5,580.91	5,466.83	5,347.99	21.08	25.41	-102.73	-856.28	-550.78	1,061.12	1,019.25	41.87	25.344	
5,700.00	5,680.48	5,563.89	5,442.17	21.47	25.93	-102.67	-875.52	-564.24	1,085.16	1,042.51	42.65	25.443	
5,800.00	5,780.05	5,660.95	5,536.35	21.85	26.45	-102.61	-894.75	-577.71	1,109.20	1,065.77	43.43	25.538	
5,900.00	5,879.62	5,758.01	5,630.53	22.24	26.97	-102.56	-913.99	-591.18	1,133.24	1,089.03	44.22	25.630	
6,000.00	5,979.19	5,855.07	5,724.71	22.63	27.49	-102.50	-933.22	-604.65	1,157.29	1,112.29	45.00	25.719	
6,100.00	6,078.75	5,952.14	5,818.88	23.02	28.01	-102.45	-952.46	-618.12	1,181.33	1,135.55	45.78	25.804	
6,200.00	6,178.32	6,049.20	5,913.06	23.40	28.53	-102.40	-971.69	-631.59	1,205.37	1,158.81	46.56	25.886	
6,300.00	6,277.89	6,146.26	6,007.24	23.79	29.05	-102.36	-990.93	-645.05	1,229.42	1,182.07	47.35	25.966	
6,318.49	6,296.30	6,164.21	6,024.66	23.86	29.15	-102.35	-994.48	-647.55	1,233.87	1,186.37	47.49	25.980	
6,350.00	6,327.73	6,194.73	6,054.28	23.98	29.31	-124.98	-1,000.53	-651.78	1,241.58	1,193.84	47.73	26.011	
6,400.00	6,377.68	6,242.83	6,100.94	24.15	29.57	139.16	-1,010.06	-658.45	1,254.34	1,206.26	48.08	26.088	
6,450.00	6,427.47	6,290.22	6,146.93	24.29	29.82	114.56	-1,019.46	-665.03	1,267.72	1,219.33	48.39	26.198	
6,500.00	6,476.79	6,336.64	6,191.96	24.42	30.07	107.50	-1,028.65	-671.47	1,281.71	1,233.05	48.67	26.337	
6,550.00	6,525.33	6,381.78	6,235.76	24.54	30.31	104.00	-1,037.60	-677.74	1,296.33	1,247.42	48.91	26.503	
6,600.00	6,572.79	6,438.23	6,290.61	24.65	30.61	102.03	-1,048.79	-685.03	1,311.55	1,262.31	49.23	26.639	
6,650.00	6,618.89	6,528.20	6,378.70	24.75	31.01	101.15	-1,066.54	-687.49	1,326.33	1,276.56	49.77	26.650	
6,700.00	6,663.33	6,627.14	6,474.95	24.84	31.35	100.54	-1,085.60	-675.57	1,340.05	1,289.79	50.26	26.663	
6,750.00	6,705.84	6,734.93	6,576.43	24.94	31.60	99.98	-1,105.28	-645.48	1,352.34	1,301.66	50.68	26.682	
6,800.00	6,746.17	6,850.32	6,677.95	25.04	31.76	99.32	-1,124.48	-594.48	1,362.84	1,311.79	51.05	26.695	
6,850.00	6,784.06	6,970.66	6,772.51	25.16	31.82	98.45	-1,141.79	-522.37	1,371.28	1,319.84	51.44	26.656	
6,900.00	6,819.27	7,092.20	6,852.88	25.30	31.81	97.32	-1,155.84	-432.53	1,377.50	1,325.51	51.99	26.495	
6,950.00	6,851.60	7,190.06	6,904.29	25.48	31.77	96.10	-1,164.23	-349.82	1,381.49	1,328.78	52.71	26.210	
7,000.00	6,880.84	7,323.28	6,953.86	25.70	31.69	94.40	-1,171.30	-226.67	1,383.46	1,329.39	54.07	25.586	
7,050.00	6,906.82	7,427.29	6,974.25	25.99	31.69	92.79	-1,173.02	-124.81	1,383.63	1,328.04	55.59	24.892	
7,100.00	6,929.36	7,508.61	6,978.84	26.33	31.84	91.45	-1,172.04	-43.68	1,382.37	1,325.30	57.07	24.221	
7,150.00	6,948.34	7,555.08	6,979.44	26.75	32.09	90.80	-1,171.07	2.78	1,380.93	1,322.72	58.21	23.722	
7,200.00	6,963.63	7,602.85	6,980.05	27.24	32.50	90.29	-1,170.08	50.54	1,379.60	1,320.18	59.43	23.214	
7,250.00	6,975.15	7,651.62	6,980.67	27.80	33.14	89.93	-1,169.06	99.29	1,378.27	1,317.46	60.81	22.664	
7,300.00	6,982.81	7,701.09	6,981.31	28.43	33.87	89.74	-1,168.03	148.75	1,376.85	1,314.58	62.27	22.113	
7,350.00	6,986.58	7,750.95	6,981.94	29.11	34.73	89.74	-1,166.99	198.60	1,375.29	1,311.44	63.84	21.541	
7,372.48	6,987.00	7,767.70	6,982.15	29.44	35.03	89.80	-1,166.67	215.33	1,374.57	1,310.09	64.48	21.319	
7,400.00	6,987.03	7,786.53	6,982.35	29.85	35.38	89.80	-1,166.42	234.17	1,373.83	1,308.59	65.24	21.058	
7,500.00	6,987.12	7,855.01	6,982.79	31.50	36.72	89.82	-1,166.49	302.64	1,372.61	1,304.39	68.22	20.121	
7,503.30	6,987.12	7,857.27	6,982.79	31.56	36.76	89.82	-1,166.52	304.90	1,372.61	1,304.28	68.32	20.090	
7,600.00	6,987.22	7,945.35	6,982.89	33.34	38.60	89.82	-1,168.19	392.97	1,373.13	1,301.19	71.94	19.086	
7,700.00	6,987.31	8,045.35	6,982.98	35.36	40.82	89.82	-1,170.15	492.95	1,373.76	1,297.60	76.16	18.039	
7,800.00	6,987.40	8,145.35	6,983.06	37.52	43.14	89.82	-1,172.11	592.93	1,374.38	1,293.76	80.62	17.047	
7,900.00	6,987.50	8,245.35	6,983.15	39.81	45.55	89.82	-1,174.07	692.91	1,375.01	1,289.71	85.30	16.120	
8,000.00	6,987.59	8,345.35	6,983.24	42.19	48.04	89.82	-1,176.03	792.88	1,375.64	1,285.49	90.15	15.259	
8,100.00	6,987.69	8,445.34	6,983.33	44.65	50.59	89.82	-1,177.99	892.86	1,376.27	1,281.11	95.16	14.463	
8,200.00	6,987.78	8,545.34	6,983.41	47.19	53.19	89.82	-1,179.95	992.84	1,376.90	1,276.60	100.29	13.729	
8,300.00	6,987.88	8,645.34	6,983.50	49.79	55.85	89.82	-1,181.91	1,092.82	1,377.52	1,271.99	105.54	13.053	
8,400.00	6,987.97	8,745.34	6,983.59	52.44	58.54	89.82	-1,183.87	1,192.80	1,378.15	1,267.28	110.87	12.430	
8,500.00	6,988.07	8,845.34	6,983.68	55.13	61.27	89.82	-1,185.83	1,292.78	1,378.78	1,262.49	116.29	11.856	
8,600.00	6,988.16	8,945.33	6,983.77	57.87	64.03	89.82	-1,187.78	1,392.76	1,379.41	1,257.63	121.78	11.327	
8,700.00	6,988.26	9,045.33	6,983.85	60.63	66.82	89.82	-1,189.74	1,492.74	1,380.03	1,252.71	127.33	10.839	
8,800.00	6,988.35	9,145.33	6,983.94	63.42	69.63	89.82	-1,191.70	1,592.71	1,380.66	1,247.73	132.93	10.387	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,900.00	6,988.44	9,245.33	6,984.03	66.24	72.46	89.82	-1,193.66	1,692.69	1,381.29	1,242.71	138.58	9.968	
9,000.00	6,988.54	9,345.33	6,984.12	69.08	75.31	89.82	-1,195.62	1,792.67	1,381.92	1,237.65	144.27	9.579	
9,100.00	6,988.63	9,445.32	6,984.20	71.94	78.18	89.82	-1,197.58	1,892.65	1,382.55	1,232.55	149.99	9.217	
9,200.00	6,988.73	9,545.32	6,984.29	74.81	81.06	89.82	-1,199.54	1,992.63	1,383.17	1,227.42	155.75	8.881	
9,300.00	6,988.82	9,645.32	6,984.38	77.71	83.96	89.82	-1,201.50	2,092.61	1,383.80	1,222.27	161.54	8.566	
9,400.00	6,988.92	9,745.32	6,984.47	80.61	86.87	89.82	-1,203.46	2,192.59	1,384.43	1,217.08	167.35	8.273	
9,500.00	6,989.01	9,845.32	6,984.56	83.53	89.79	89.82	-1,205.42	2,292.57	1,385.06	1,211.87	173.19	7.998	
9,600.00	6,989.11	9,945.32	6,984.64	86.45	92.72	89.82	-1,207.38	2,392.54	1,385.69	1,206.64	179.04	7.739	
9,700.00	6,989.20	10,045.31	6,984.73	89.39	95.66	89.82	-1,209.34	2,492.52	1,386.31	1,201.39	184.92	7.497	
9,800.00	6,989.30	10,145.31	6,984.82	92.34	98.60	89.82	-1,211.30	2,592.50	1,386.94	1,196.13	190.81	7.269	
9,900.00	6,989.39	10,245.31	6,984.91	95.29	101.56	89.82	-1,213.26	2,692.48	1,387.57	1,190.85	196.72	7.053	
10,000.00	6,989.48	10,345.31	6,985.00	98.25	104.52	89.82	-1,215.22	2,792.46	1,388.20	1,185.55	202.65	6.850	
10,100.00	6,989.58	10,445.31	6,985.08	101.22	107.48	89.81	-1,217.18	2,892.44	1,388.82	1,180.24	208.58	6.658	
10,200.00	6,989.67	10,545.30	6,985.17	104.19	110.46	89.81	-1,219.14	2,992.42	1,389.45	1,174.92	214.53	6.477	
10,300.00	6,989.77	10,645.30	6,985.26	107.17	113.44	89.81	-1,221.10	3,092.40	1,390.08	1,169.59	220.49	6.304	
10,400.00	6,989.86	10,745.30	6,985.35	110.16	116.42	89.81	-1,223.06	3,192.37	1,390.71	1,164.25	226.46	6.141	
10,500.00	6,989.96	10,845.30	6,985.43	113.15	119.41	89.81	-1,225.02	3,292.35	1,391.34	1,158.90	232.44	5.986	
10,600.00	6,990.05	10,945.30	6,985.52	116.14	122.40	89.81	-1,226.98	3,392.33	1,391.96	1,153.54	238.43	5.838	
10,700.00	6,990.15	11,045.29	6,985.61	119.14	125.40	89.81	-1,228.94	3,492.31	1,392.59	1,148.17	244.42	5.697	
10,800.00	6,990.24	11,145.29	6,985.70	122.14	128.40	89.81	-1,230.90	3,592.29	1,393.22	1,142.79	250.43	5.563	
10,900.00	6,990.34	11,245.29	6,985.79	125.15	131.40	89.81	-1,232.86	3,692.27	1,393.85	1,137.41	256.44	5.435	
11,000.00	6,990.43	11,345.29	6,985.87	128.16	134.41	89.81	-1,234.81	3,792.25	1,394.48	1,132.02	262.45	5.313	
11,100.00	6,990.52	11,445.29	6,985.96	131.17	137.42	89.81	-1,236.77	3,892.23	1,395.10	1,126.63	268.48	5.196	
11,200.00	6,990.62	11,545.28	6,986.05	134.18	140.43	89.81	-1,238.73	3,992.21	1,395.73	1,121.23	274.51	5.085	
11,300.00	6,990.71	11,645.28	6,986.14	137.20	143.45	89.81	-1,240.69	4,092.18	1,396.36	1,115.82	280.54	4.977	
11,400.00	6,990.81	11,745.28	6,986.22	140.22	146.46	89.81	-1,242.65	4,192.16	1,396.99	1,110.41	286.58	4.875	
11,500.00	6,990.90	11,845.28	6,986.31	143.24	149.48	89.81	-1,244.61	4,292.14	1,397.61	1,104.99	292.62	4.776	
11,600.00	6,991.00	11,945.28	6,986.40	146.27	152.51	89.81	-1,246.57	4,392.12	1,398.24	1,099.57	298.67	4.682	
11,700.00	6,991.09	12,045.27	6,986.49	149.29	155.53	89.81	-1,248.53	4,492.10	1,398.87	1,094.15	304.72	4.591	
11,800.00	6,991.19	12,145.27	6,986.58	152.32	158.56	89.81	-1,250.49	4,592.08	1,399.50	1,088.72	310.78	4.503	
11,900.00	6,991.28	12,245.27	6,986.66	155.35	161.59	89.81	-1,252.45	4,692.06	1,400.13	1,083.29	316.83	4.419	
12,000.00	6,991.38	12,345.27	6,986.75	158.38	164.62	89.81	-1,254.41	4,792.04	1,400.75	1,077.86	322.90	4.338	
12,100.00	6,991.47	12,445.27	6,986.84	161.41	167.65	89.81	-1,256.37	4,892.01	1,401.38	1,072.42	328.96	4.260	
12,200.00	6,991.56	12,545.26	6,986.93	164.45	170.68	89.81	-1,258.33	4,991.99	1,402.01	1,066.98	335.03	4.185	
12,300.00	6,991.66	12,645.26	6,987.02	167.49	173.72	89.81	-1,260.29	5,091.97	1,402.64	1,061.53	341.10	4.112	
12,400.00	6,991.75	12,745.26	6,987.10	170.52	176.75	89.81	-1,262.25	5,191.95	1,403.26	1,056.09	347.18	4.042	
12,500.00	6,991.85	12,845.26	6,987.19	173.56	179.79	89.81	-1,264.21	5,291.93	1,403.89	1,050.64	353.25	3.974	
12,600.00	6,991.94	12,945.26	6,987.28	176.60	182.83	89.81	-1,266.17	5,391.91	1,404.52	1,045.19	359.33	3.909	
12,700.00	6,992.04	13,045.25	6,987.37	179.64	185.87	89.81	-1,268.13	5,491.89	1,405.15	1,039.73	365.42	3.845	
12,800.00	6,992.13	13,145.25	6,987.45	182.68	188.91	89.81	-1,270.09	5,591.87	1,405.78	1,034.28	371.50	3.784	
12,900.00	6,992.23	13,245.25	6,987.54	185.73	191.95	89.81	-1,272.05	5,691.84	1,406.40	1,028.82	377.59	3.725	
13,000.00	6,992.32	13,345.25	6,987.63	188.77	194.99	89.81	-1,274.01	5,791.82	1,407.03	1,023.36	383.67	3.667	
13,100.00	6,992.42	13,445.25	6,987.72	191.82	198.04	89.81	-1,275.97	5,891.80	1,407.66	1,017.90	389.76	3.612	
13,200.00	6,992.51	13,545.24	6,987.81	194.86	201.08	89.81	-1,277.93	5,991.78	1,408.29	1,012.43	395.86	3.558	
13,300.00	6,992.60	13,645.24	6,987.89	197.91	204.13	89.81	-1,279.89	6,091.76	1,408.92	1,006.97	401.95	3.505	
13,400.00	6,992.70	13,745.24	6,987.98	200.96	207.18	89.81	-1,281.84	6,191.74	1,409.54	1,001.50	408.05	3.454	
13,500.00	6,992.79	13,845.24	6,988.07	204.01	210.23	89.81	-1,283.80	6,291.72	1,410.17	996.03	414.14	3.405	
13,600.00	6,992.89	13,945.24	6,988.16	207.05	213.27	89.81	-1,285.76	6,391.70	1,410.80	990.56	420.24	3.357	
13,700.00	6,992.98	14,045.23	6,988.24	210.10	216.32	89.81	-1,287.72	6,491.68	1,411.43	985.09	426.34	3.311	
13,800.00	6,993.08	14,145.23	6,988.33	213.16	219.37	89.81	-1,289.68	6,591.65	1,412.05	979.61	432.44	3.265	
13,900.00	6,993.17	14,245.23	6,988.42	216.21	222.42	89.81	-1,291.64	6,691.63	1,412.68	974.14	438.54	3.221	
14,000.00	6,993.27	14,345.23	6,988.51	219.26	225.48	89.81	-1,293.60	6,791.61	1,413.31	968.66	444.65	3.178	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD

Offset Well Error: 0.00 ft

Rule Assigned:

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,100.00	6,993.36	14,445.23	6,988.60	222.31	228.53	89.81	-1,295.56	6,891.59	1,413.94	963.18	450.75	3.137	
14,200.00	6,993.46	14,545.22	6,988.68	225.36	231.58	89.81	-1,297.52	6,991.57	1,414.57	957.71	456.86	3.096	
14,300.00	6,993.55	14,645.22	6,988.77	228.42	234.63	89.81	-1,299.48	7,091.55	1,415.19	952.23	462.97	3.057	
14,400.00	6,993.64	14,745.22	6,988.86	231.47	237.69	89.81	-1,301.44	7,191.53	1,415.82	946.75	469.08	3.018	
14,500.00	6,993.74	14,845.22	6,988.95	234.53	240.74	89.81	-1,303.40	7,291.51	1,416.45	941.26	475.19	2.981	
14,600.00	6,993.83	14,945.22	6,989.03	237.58	243.80	89.81	-1,305.36	7,391.48	1,417.08	935.78	481.30	2.944	
14,700.00	6,993.93	15,045.21	6,989.12	240.64	246.85	89.81	-1,307.32	7,491.46	1,417.71	930.30	487.41	2.909	
14,800.00	6,994.02	15,145.21	6,989.21	243.69	249.91	89.81	-1,309.28	7,591.44	1,418.33	924.81	493.52	2.874	
14,900.00	6,994.12	15,245.21	6,989.30	246.75	252.97	89.81	-1,311.24	7,691.42	1,418.96	919.33	499.64	2.840	
15,000.00	6,994.21	15,345.21	6,989.39	249.81	256.02	89.81	-1,313.20	7,791.40	1,419.59	913.84	505.75	2.807	
15,100.00	6,994.31	15,445.21	6,989.47	252.86	259.08	89.81	-1,315.16	7,891.38	1,420.22	908.35	511.86	2.775	
15,200.00	6,994.40	15,545.20	6,989.56	255.92	262.14	89.81	-1,317.12	7,991.36	1,420.84	902.86	517.98	2.743	
15,300.00	6,994.50	15,645.20	6,989.65	258.98	265.20	89.81	-1,319.08	8,091.34	1,421.47	897.37	524.10	2.712	
15,400.00	6,994.59	15,745.20	6,989.74	262.04	268.26	89.80	-1,321.04	8,191.31	1,422.10	891.88	530.22	2.682	
15,500.00	6,994.68	15,845.20	6,989.83	265.10	271.31	89.80	-1,323.00	8,291.29	1,422.73	886.39	536.33	2.653	
15,600.00	6,994.78	15,945.20	6,989.91	268.16	274.37	89.80	-1,324.96	8,391.27	1,423.36	880.90	542.45	2.624	
15,700.00	6,994.87	16,045.19	6,990.00	271.22	277.43	89.80	-1,326.92	8,491.25	1,423.98	875.41	548.57	2.596	
15,800.00	6,994.97	16,145.19	6,990.09	274.28	280.49	89.80	-1,328.87	8,591.23	1,424.61	869.92	554.69	2.568	
15,900.00	6,995.06	16,245.19	6,990.18	277.34	283.55	89.80	-1,330.83	8,691.21	1,425.24	864.43	560.81	2.541	
16,000.00	6,995.16	16,345.19	6,990.26	280.40	286.62	89.80	-1,332.79	8,791.19	1,425.87	858.93	566.94	2.515	
16,100.00	6,995.25	16,445.19	6,990.35	283.46	289.68	89.80	-1,334.75	8,891.17	1,426.50	853.44	573.06	2.489	
16,200.00	6,995.35	16,545.19	6,990.44	286.52	292.74	89.80	-1,336.71	8,991.14	1,427.12	847.94	579.18	2.464	
16,300.00	6,995.44	16,645.18	6,990.53	289.58	295.80	89.80	-1,338.67	9,091.12	1,427.75	842.45	585.30	2.439	
16,400.00	6,995.54	16,745.18	6,990.62	292.64	298.86	89.80	-1,340.63	9,191.10	1,428.38	836.95	591.43	2.415	
16,500.00	6,995.63	16,845.18	6,990.70	295.70	301.92	89.80	-1,342.59	9,291.08	1,429.01	831.45	597.55	2.391	
16,600.00	6,995.72	16,945.18	6,990.79	298.76	304.99	89.80	-1,344.55	9,391.06	1,429.63	825.96	603.68	2.368	
16,700.00	6,995.82	17,045.18	6,990.88	301.83	308.05	89.80	-1,346.51	9,491.04	1,430.26	820.46	609.80	2.345	
16,800.00	6,995.91	17,145.17	6,990.97	304.89	311.11	89.80	-1,348.47	9,591.02	1,430.89	814.96	615.93	2.323	
16,900.00	6,996.01	17,245.17	6,991.05	307.95	314.18	89.80	-1,350.43	9,691.00	1,431.52	809.46	622.06	2.301	
17,000.00	6,996.10	17,345.17	6,991.14	311.01	317.24	89.80	-1,352.39	9,790.98	1,432.15	803.96	628.18	2.280	
17,100.00	6,996.20	17,445.17	6,991.23	314.08	320.30	89.80	-1,354.35	9,890.95	1,432.77	798.46	634.31	2.259	
17,200.00	6,996.29	17,545.17	6,991.32	317.14	323.37	89.80	-1,356.31	9,990.93	1,433.40	792.96	640.44	2.238	
17,300.00	6,996.39	17,645.16	6,991.41	320.20	326.43	89.80	-1,358.27	10,090.91	1,434.03	787.46	646.57	2.218	
17,400.00	6,996.48	17,745.16	6,991.49	323.27	329.50	89.80	-1,360.23	10,190.89	1,434.66	781.96	652.69	2.198	
17,500.00	6,996.58	17,845.16	6,991.58	326.33	332.56	89.80	-1,362.19	10,290.87	1,435.29	776.46	658.82	2.179	
17,600.00	6,996.67	17,945.16	6,991.67	329.40	335.63	89.80	-1,364.15	10,390.85	1,435.91	770.96	664.95	2.159	
17,700.00	6,996.76	18,045.16	6,991.76	332.46	338.69	89.80	-1,366.11	10,490.83	1,436.54	765.46	671.08	2.141	
17,800.00	6,996.86	18,145.15	6,991.85	335.52	341.76	89.80	-1,368.07	10,590.81	1,437.17	759.96	677.21	2.122	
17,900.00	6,996.95	18,245.15	6,991.93	338.59	344.82	89.80	-1,370.03	10,690.78	1,437.80	754.45	683.34	2.104	
17,948.87	6,997.00	18,294.02	6,991.98	340.09	346.32	89.80	-1,370.98	10,739.64	1,438.10	751.77	686.34	2.095	SF

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #665H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	136.30	-22.60	21.60	31.26				
100.00	100.00	100.00	100.00	0.36	0.36	136.30	-22.60	21.60	31.26	30.55	0.72	43.605	
200.00	200.00	200.00	200.00	0.72	0.72	136.30	-22.60	21.60	31.26	29.83	1.43	21.802	
300.00	300.00	300.00	300.00	1.08	1.08	136.30	-22.60	21.60	31.26	29.11	2.15	14.535	
400.00	400.00	400.00	400.00	1.43	1.43	136.30	-22.60	21.60	31.26	28.39	2.87	10.901	
500.00	500.00	500.00	500.00	1.79	1.79	136.30	-22.60	21.60	31.26	27.68	3.58	8.721	
600.00	600.00	600.00	600.00	2.15	2.15	136.30	-22.60	21.60	31.26	26.96	4.30	7.267	
700.00	700.00	700.00	700.00	2.51	2.51	136.30	-22.60	21.60	31.26	26.24	5.02	6.229	
800.00	800.00	800.00	800.00	2.87	2.87	136.30	-22.60	21.60	31.26	25.53	5.74	5.451	
900.00	900.00	900.00	900.00	3.23	3.23	136.30	-22.60	21.60	31.26	24.81	6.45	4.845	
1,000.00	1,000.00	1,000.00	1,000.00	3.58	3.58	136.30	-22.60	21.60	31.26	24.09	7.17	4.360	CC, ES, SF
1,100.00	1,099.98	1,098.83	1,098.81	3.94	3.92	-157.70	-24.03	22.53	34.57	26.71	7.86	4.399	
1,200.00	1,199.84	1,197.01	1,196.85	4.29	4.25	-158.89	-28.27	25.31	44.47	35.95	8.53	5.217	
1,266.26	1,265.88	1,261.39	1,261.03	4.53	4.47	-159.65	-32.57	28.12	54.65	45.68	8.97	6.095	
1,300.00	1,299.47	1,293.94	1,293.42	4.65	4.58	-159.97	-35.21	29.85	60.74	51.56	9.19	6.612	
1,400.00	1,399.04	1,389.58	1,388.38	5.01	4.91	-160.24	-44.74	36.07	80.94	71.11	9.83	8.233	
1,500.00	1,498.61	1,483.86	1,481.57	5.37	5.24	-159.98	-56.72	43.91	104.29	93.82	10.46	9.966	
1,600.00	1,598.18	1,576.61	1,572.72	5.74	5.59	-159.49	-71.00	53.25	130.71	119.63	11.08	11.793	
1,700.00	1,697.74	1,667.66	1,661.64	6.11	5.94	-158.92	-87.42	63.98	160.15	148.46	11.69	13.700	
1,800.00	1,797.31	1,756.90	1,748.12	6.49	6.30	-158.34	-105.80	76.00	192.52	180.24	12.28	15.677	
1,900.00	1,896.88	1,844.20	1,832.03	6.86	6.68	-157.79	-125.96	89.18	227.75	214.89	12.85	17.717	
2,000.00	1,996.45	1,929.47	1,913.25	7.24	7.07	-157.27	-147.70	103.39	265.74	252.33	13.41	19.812	
2,100.00	2,096.02	2,014.48	1,993.43	7.61	7.49	-156.78	-171.32	118.84	306.35	292.37	13.98	21.907	
2,200.00	2,195.59	2,105.46	2,078.98	7.99	7.95	-156.35	-197.25	135.79	347.79	333.13	14.66	23.719	
2,300.00	2,295.16	2,196.45	2,164.53	8.37	8.43	-156.01	-223.17	152.74	389.24	373.89	15.35	25.362	
2,400.00	2,394.72	2,287.43	2,250.08	8.75	8.92	-155.73	-249.09	169.69	430.70	414.66	16.04	26.855	
2,500.00	2,494.29	2,378.41	2,335.63	9.13	9.42	-155.51	-275.02	186.64	472.16	455.43	16.73	28.218	
2,600.00	2,593.86	2,469.40	2,421.18	9.51	9.93	-155.32	-300.94	203.59	513.63	496.20	17.43	29.465	
2,700.00	2,693.43	2,560.38	2,506.73	9.90	10.45	-155.16	-326.86	220.54	555.10	536.97	18.13	30.611	
2,800.00	2,793.00	2,651.37	2,592.28	10.28	10.98	-155.02	-352.78	237.49	596.58	577.74	18.84	31.667	
2,900.00	2,892.57	2,742.35	2,677.83	10.66	11.51	-154.90	-378.71	254.44	638.06	618.51	19.55	32.642	
3,000.00	2,992.13	2,833.33	2,763.38	11.05	12.04	-154.79	-404.63	271.39	679.54	659.29	20.26	33.545	
3,100.00	3,091.70	2,924.32	2,848.93	11.43	12.58	-154.70	-430.55	288.34	721.03	700.06	20.97	34.383	
3,200.00	3,191.27	3,015.30	2,934.48	11.81	13.12	-154.61	-456.48	305.29	762.51	740.83	21.69	35.163	
3,300.00	3,290.84	3,106.28	3,020.03	12.20	13.67	-154.54	-482.40	322.24	804.00	781.60	22.40	35.890	
3,400.00	3,390.41	3,197.27	3,105.58	12.58	14.22	-154.47	-508.32	339.19	845.48	822.36	23.12	36.569	
3,500.00	3,489.98	3,288.25	3,191.13	12.97	14.77	-154.41	-534.25	356.14	886.97	863.13	23.84	37.205	
3,600.00	3,589.54	3,379.24	3,276.68	13.35	15.32	-154.35	-560.17	373.09	928.46	903.90	24.56	37.802	
3,700.00	3,689.11	3,470.22	3,362.23	13.74	15.88	-154.30	-586.09	390.04	969.95	944.67	25.28	38.363	
3,800.00	3,788.68	3,561.20	3,447.78	14.12	16.44	-154.26	-612.02	406.99	1,011.44	985.43	26.01	38.890	
3,900.00	3,888.25	3,652.19	3,533.33	14.51	17.00	-154.21	-637.94	423.94	1,052.93	1,026.20	26.73	39.388	
4,000.00	3,987.82	3,743.17	3,618.88	14.89	17.56	-154.17	-663.86	440.89	1,094.42	1,066.96	27.46	39.858	
4,100.00	4,087.39	3,834.15	3,704.43	15.28	18.12	-154.14	-689.78	457.84	1,135.91	1,107.73	28.18	40.302	
4,200.00	4,186.95	3,925.14	3,789.97	15.67	18.68	-154.10	-715.71	474.78	1,177.40	1,148.49	28.91	40.723	
4,300.00	4,286.52	4,016.12	3,875.52	16.05	19.25	-154.07	-741.63	491.73	1,218.90	1,189.26	29.64	41.122	
4,400.00	4,386.09	4,107.11	3,961.07	16.44	19.81	-154.04	-767.55	508.68	1,260.39	1,230.02	30.37	41.500	
4,500.00	4,485.66	4,198.09	4,046.62	16.82	20.38	-154.01	-793.48	525.63	1,301.88	1,270.78	31.10	41.860	
4,600.00	4,585.23	4,289.07	4,132.17	17.21	20.95	-153.98	-819.40	542.58	1,343.37	1,311.54	31.83	42.203	
4,700.00	4,684.80	4,380.06	4,217.72	17.60	21.52	-153.96	-845.32	559.53	1,384.87	1,352.30	32.56	42.529	
4,800.00	4,784.36	4,471.04	4,303.27	17.98	22.09	-153.94	-871.25	576.48	1,426.36	1,393.06	33.30	42.840	
4,900.00	4,883.93	4,562.02	4,388.82	18.37	22.66	-153.91	-897.17	593.43	1,467.85	1,433.83	34.03	43.137	
5,000.00	4,983.50	4,653.01	4,474.37	18.76	23.23	-153.89	-923.09	610.38	1,509.35	1,474.59	34.76	43.420	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #665H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Rule Assigned: Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,100.00	5,083.07	4,743.99	4,559.92	19.14	23.80	-153.87	-949.01	627.33	1,550.84	1,515.35	35.50	43.692	
5,200.00	5,182.64	4,834.98	4,645.47	19.53	24.37	-153.86	-974.94	644.28	1,592.33	1,556.10	36.23	43.951	
5,300.00	5,282.21	4,925.96	4,731.02	19.92	24.94	-153.84	-1,000.86	661.23	1,633.83	1,596.86	36.96	44.200	
5,400.00	5,381.78	5,016.94	4,816.57	20.30	25.51	-153.82	-1,026.78	678.18	1,675.32	1,637.62	37.70	44.438	
5,500.00	5,481.34	5,107.93	4,902.12	20.69	26.09	-153.81	-1,052.71	695.13	1,716.82	1,678.38	38.44	44.667	
5,600.00	5,580.91	5,198.91	4,987.67	21.08	26.66	-153.79	-1,078.63	712.08	1,758.31	1,719.14	39.17	44.886	
5,700.00	5,680.48	5,289.89	5,073.22	21.47	27.23	-153.78	-1,104.55	729.03	1,799.81	1,759.90	39.91	45.097	
5,800.00	5,780.05	5,380.88	5,158.77	21.85	27.81	-153.76	-1,130.48	745.98	1,841.30	1,800.65	40.65	45.300	
5,900.00	5,879.62	5,471.86	5,244.32	22.24	28.38	-153.75	-1,156.40	762.93	1,882.79	1,841.41	41.39	45.495	
6,000.00	5,979.19	5,562.85	5,329.87	22.63	28.96	-153.74	-1,182.32	779.88	1,924.29	1,882.17	42.12	45.682	
6,100.00	6,078.75	5,653.83	5,415.42	23.02	29.53	-153.72	-1,208.25	796.83	1,965.78	1,922.92	42.86	45.863	
6,200.00	6,178.32	8,244.29	6,982.99	23.40	46.31	-112.82	-1,609.42	-517.01	1,970.24	1,907.76	62.48	31.535	
6,300.00	6,277.89	8,252.67	6,982.96	23.79	46.50	-112.55	-1,609.03	-525.39	1,934.77	1,870.46	64.31	30.086	
6,318.49	6,296.30	8,254.23	6,982.96	23.86	46.53	-112.51	-1,608.96	-526.94	1,928.70	1,864.06	64.64	29.837	
6,350.00	6,327.73	8,256.09	6,982.95	23.98	46.57	-133.49	-1,608.87	-528.80	1,918.74	1,853.56	65.18	29.436	
6,400.00	6,377.68	8,255.85	6,982.95	24.15	46.57	132.99	-1,608.88	-528.57	1,903.97	1,838.03	65.94	28.875	
6,450.00	6,427.47	8,251.70	6,982.97	24.29	46.47	110.35	-1,609.07	-524.42	1,890.57	1,824.00	66.56	28.402	
6,500.00	6,476.79	8,243.65	6,982.99	24.42	46.29	104.89	-1,609.45	-516.38	1,878.63	1,811.58	67.06	28.015	
6,550.00	6,525.33	8,231.76	6,983.02	24.54	46.03	102.66	-1,610.00	-504.50	1,868.21	1,800.80	67.42	27.712	
6,600.00	6,572.79	8,216.09	6,983.07	24.65	45.68	101.43	-1,610.72	-488.85	1,859.33	1,791.69	67.64	27.490	
6,650.00	6,618.89	8,196.76	6,983.13	24.75	45.25	100.53	-1,611.61	-469.53	1,851.96	1,784.23	67.73	27.345	
6,700.00	6,663.33	8,173.86	6,983.19	24.84	44.76	99.74	-1,612.67	-446.67	1,846.06	1,778.35	67.70	27.267	
6,750.00	6,705.84	8,147.56	6,983.27	24.94	44.20	98.95	-1,613.89	-420.39	1,841.54	1,773.98	67.56	27.258	
6,800.00	6,746.17	8,118.00	6,983.35	25.04	43.57	98.13	-1,615.26	-390.86	1,838.31	1,771.00	67.31	27.311	
6,850.00	6,784.06	8,085.38	6,983.45	25.16	42.89	97.25	-1,616.77	-358.27	1,836.23	1,769.25	66.98	27.414	
6,900.00	6,819.27	8,049.88	6,983.55	25.30	42.18	96.34	-1,618.41	-322.82	1,835.17	1,768.58	66.59	27.557	
6,937.25	6,843.64	8,021.71	6,983.63	25.43	41.63	95.65	-1,619.71	-294.67	1,834.95	1,768.68	66.27	27.687	
6,950.00	6,851.60	8,011.74	6,983.66	25.48	41.43	95.41	-1,620.17	-284.72	1,834.98	1,768.82	66.15	27.738	
7,000.00	6,880.84	7,971.18	6,983.78	25.70	40.68	94.48	-1,622.05	-244.20	1,835.49	1,769.78	65.71	27.934	
7,050.00	6,906.82	7,928.46	6,983.91	25.99	39.91	93.58	-1,624.02	-201.53	1,836.56	1,771.30	65.26	28.143	
7,100.00	6,929.36	7,869.48	6,983.76	26.33	38.94	92.53	-1,626.66	-142.61	1,837.99	1,773.45	64.53	28.480	
7,150.00	6,948.34	7,772.47	6,977.37	26.75	37.57	91.06	-1,629.18	-45.87	1,838.74	1,775.58	63.16	29.112	
7,200.00	6,963.63	7,679.90	6,963.25	27.24	36.61	89.74	-1,629.18	45.58	1,838.47	1,776.41	62.06	29.625	
7,250.00	6,975.15	7,591.43	6,942.53	27.80	35.99	88.57	-1,627.00	131.54	1,837.20	1,775.97	61.23	30.006	
7,300.00	6,982.81	7,506.71	6,916.22	28.43	35.62	87.54	-1,622.92	211.94	1,834.94	1,774.28	60.67	30.246	
7,350.00	6,986.58	7,425.42	6,885.18	29.11	35.40	86.66	-1,617.19	286.83	1,831.73	1,771.37	60.36	30.345	
7,372.48	6,987.00	7,389.91	6,869.89	29.44	35.32	86.31	-1,614.15	318.73	1,829.98	1,769.70	60.28	30.358	
7,400.00	6,987.03	7,347.73	6,850.39	29.85	35.25	85.69	-1,610.11	355.91	1,827.64	1,767.37	60.27	30.324	
7,500.00	6,987.12	7,209.91	6,776.97	31.50	35.07	83.33	-1,593.76	471.28	1,818.30	1,757.60	60.70	29.954	
7,600.00	6,987.22	7,094.96	6,705.07	33.34	34.95	80.98	-1,576.62	559.24	1,808.87	1,747.09	61.78	29.277	
7,700.00	6,987.31	6,999.80	6,638.89	35.36	34.86	78.81	-1,560.18	625.55	1,800.71	1,737.42	63.29	28.454	
7,800.00	6,987.40	6,920.97	6,579.89	37.52	34.77	76.86	-1,545.10	675.60	1,794.87	1,729.80	65.07	27.582	
7,900.00	6,987.50	6,855.29	6,528.13	39.81	34.69	75.15	-1,531.62	713.68	1,792.17	1,725.13	67.04	26.732	
7,924.24	6,987.52	6,841.04	6,516.61	40.38	34.67	74.76	-1,528.58	721.50	1,792.06	1,724.51	67.55	26.530	
8,000.00	6,987.59	6,800.14	6,482.98	42.19	34.62	73.65	-1,519.68	743.01	1,793.20	1,724.07	69.13	25.941	
8,100.00	6,987.69	6,753.42	6,443.64	44.65	34.54	72.35	-1,509.15	765.90	1,798.35	1,727.07	71.28	25.228	
8,200.00	6,987.78	6,713.48	6,409.28	47.19	34.48	71.21	-1,499.87	784.00	1,807.91	1,734.46	73.45	24.613	
8,300.00	6,987.88	6,679.05	6,379.15	49.79	34.42	70.21	-1,491.67	798.50	1,822.03	1,746.43	75.60	24.100	
8,400.00	6,987.97	6,649.12	6,352.60	52.44	34.36	69.34	-1,484.40	810.27	1,840.78	1,763.09	77.69	23.693	
8,500.00	6,988.07	6,622.91	6,329.10	55.13	34.31	68.56	-1,477.93	819.92	1,864.15	1,784.45	79.70	23.390	
8,600.00	6,988.16	6,600.00	6,308.39	57.87	34.26	67.88	-1,472.20	827.85	1,892.06	1,810.46	81.60	23.188	
8,700.00	6,988.26	6,579.25	6,289.49	60.63	34.21	67.26	-1,466.95	834.62	1,924.38	1,841.02	83.36	23.085	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #665H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Rule Assigned: Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,800.00	6,988.35	6,560.91	6,272.69	63.42	34.17	66.71	-1,462.27	840.28	1,960.97	1,875.98	85.00	23.071	
8,900.00	6,988.44	6,544.44	6,257.52	66.24	34.13	66.22	-1,458.03	845.11	2,001.64	1,915.15	86.49	23.143	
9,000.00	6,988.54	6,529.58	6,243.78	69.08	34.09	65.77	-1,454.18	849.24	2,046.17	1,958.33	87.84	23.294	
9,100.00	6,988.63	6,500.00	6,216.27	71.94	34.02	64.88	-1,446.43	856.87	2,094.47	2,005.66	88.81	23.583	
9,200.00	6,988.73	6,500.00	6,216.27	74.81	34.02	64.88	-1,446.43	856.87	2,145.97	2,055.89	90.08	23.824	
9,300.00	6,988.82	6,500.00	6,216.27	77.71	34.02	64.88	-1,446.43	856.87	2,200.80	2,109.61	91.19	24.133	
9,400.00	6,988.92	6,500.00	6,216.27	80.61	34.02	64.88	-1,446.43	856.87	2,258.73	2,166.56	92.18	24.504	
9,500.00	6,989.01	6,500.00	6,216.27	83.53	34.02	64.88	-1,446.43	856.87	2,319.53	2,226.49	93.04	24.931	
9,600.00	6,989.11	6,464.09	6,182.62	86.45	33.91	63.79	-1,436.91	865.03	2,382.32	2,289.05	93.27	25.543	
9,700.00	6,989.20	6,455.98	6,175.00	89.39	33.89	63.55	-1,434.75	866.71	2,447.86	2,354.06	93.80	26.095	
9,800.00	6,989.30	6,448.46	6,167.90	92.34	33.87	63.32	-1,432.73	868.21	2,515.61	2,421.35	94.26	26.687	
9,900.00	6,989.39	6,441.45	6,161.29	95.29	33.84	63.11	-1,430.85	869.56	2,585.40	2,490.75	94.65	27.316	
10,000.00	6,989.48	6,434.91	6,155.11	98.25	33.82	62.91	-1,429.08	870.78	2,657.08	2,562.10	94.97	27.978	
10,100.00	6,989.58	6,400.00	6,122.02	101.22	33.72	61.85	-1,419.62	876.59	2,730.93	2,636.13	94.81	28.805	
10,200.00	6,989.67	6,400.00	6,122.02	104.19	33.72	61.85	-1,419.62	876.59	2,805.80	2,710.68	95.12	29.499	
10,300.00	6,989.77	6,400.00	6,122.02	107.17	33.72	61.85	-1,419.62	876.59	2,882.19	2,786.81	95.37	30.220	
10,400.00	6,989.86	6,400.00	6,122.02	110.16	33.72	61.85	-1,419.62	876.59	2,959.98	2,864.40	95.59	30.966	
10,500.00	6,989.96	6,400.00	6,122.02	113.15	33.72	61.85	-1,419.62	876.59	3,039.08	2,943.32	95.76	31.736	
10,600.00	6,990.05	6,400.00	6,122.02	116.14	33.72	61.85	-1,419.62	876.59	3,119.37	3,023.47	95.90	32.527	
10,700.00	6,990.15	6,400.00	6,122.02	119.14	33.72	61.85	-1,419.62	876.59	3,200.78	3,104.77	96.01	33.337	
10,800.00	6,990.24	6,400.00	6,122.02	122.14	33.72	61.85	-1,419.62	876.59	3,283.21	3,187.12	96.10	34.165	
10,900.00	6,990.34	6,400.00	6,122.02	125.15	33.72	61.85	-1,419.62	876.59	3,366.60	3,270.44	96.16	35.010	
11,000.00	6,990.43	6,400.00	6,122.02	128.16	33.72	61.85	-1,419.62	876.59	3,450.87	3,354.66	96.21	35.870	
11,100.00	6,990.52	6,400.00	6,122.02	131.17	33.72	61.85	-1,419.62	876.59	3,535.96	3,439.73	96.23	36.744	
11,200.00	6,990.62	6,400.00	6,122.02	134.18	33.72	61.85	-1,419.62	876.59	3,621.81	3,525.56	96.24	37.631	
11,300.00	6,990.71	6,400.00	6,122.02	137.20	33.72	61.85	-1,419.62	876.59	3,708.37	3,612.13	96.24	38.531	
11,400.00	6,990.81	6,400.00	6,122.02	140.22	33.72	61.85	-1,419.62	876.59	3,795.59	3,699.36	96.23	39.442	
11,500.00	6,990.90	6,400.00	6,122.02	143.24	33.72	61.85	-1,419.62	876.59	3,883.43	3,787.21	96.21	40.363	
11,600.00	6,991.00	6,400.00	6,122.02	146.27	33.72	61.85	-1,419.62	876.59	3,971.84	3,875.65	96.18	41.294	
11,700.00	6,991.09	6,400.00	6,122.02	149.29	33.72	61.85	-1,419.62	876.59	4,060.79	3,964.64	96.15	42.234	
11,800.00	6,991.19	6,400.00	6,122.02	152.32	33.72	61.85	-1,419.62	876.59	4,150.24	4,054.13	96.11	43.182	
11,900.00	6,991.28	6,400.00	6,122.02	155.35	33.72	61.85	-1,419.62	876.59	4,240.17	4,144.10	96.06	44.139	
12,000.00	6,991.38	6,359.25	6,083.20	158.38	33.57	60.62	-1,408.45	881.92	4,329.63	4,234.15	95.47	45.349	
12,100.00	6,991.47	6,357.04	6,081.08	161.41	33.56	60.56	-1,407.84	882.17	4,420.31	4,324.91	95.39	46.337	
12,200.00	6,991.56	6,354.91	6,079.05	164.45	33.55	60.49	-1,407.25	882.40	4,511.38	4,416.06	95.31	47.331	
12,300.00	6,991.66	6,352.86	6,077.09	167.49	33.54	60.43	-1,406.68	882.62	4,602.81	4,507.58	95.23	48.331	
12,400.00	6,991.75	6,350.89	6,075.21	170.52	33.54	60.37	-1,406.14	882.82	4,694.59	4,599.44	95.15	49.337	
12,500.00	6,991.85	6,348.99	6,073.39	173.56	33.53	60.32	-1,405.61	883.02	4,786.70	4,691.62	95.07	50.348	
12,600.00	6,991.94	6,347.16	6,071.64	176.60	33.52	60.26	-1,405.11	883.20	4,879.11	4,784.12	94.99	51.363	
12,700.00	6,992.04	6,345.39	6,069.95	179.64	33.52	60.21	-1,404.62	883.38	4,971.81	4,876.90	94.91	52.383	
12,800.00	6,992.13	6,343.69	6,068.32	182.68	33.51	60.16	-1,404.15	883.54	5,064.79	4,969.96	94.83	53.407	
12,900.00	6,992.23	6,342.04	6,066.75	185.73	33.50	60.11	-1,403.69	883.70	5,158.03	5,063.27	94.75	54.436	
13,000.00	6,992.32	6,300.00	6,026.49	188.77	33.35	58.85	-1,392.00	886.85	5,252.40	5,158.26	94.14	55.794	
13,100.00	6,992.42	6,300.00	6,026.49	191.82	33.35	58.85	-1,392.00	886.85	5,346.05	5,251.96	94.09	56.821	
13,200.00	6,992.51	6,300.00	6,026.49	194.86	33.35	58.85	-1,392.00	886.85	5,439.92	5,345.89	94.03	57.851	
13,300.00	6,992.60	6,300.00	6,026.49	197.91	33.35	58.85	-1,392.00	886.85	5,534.01	5,440.03	93.98	58.885	
13,400.00	6,992.70	6,300.00	6,026.49	200.96	33.35	58.85	-1,392.00	886.85	5,628.31	5,534.38	93.93	59.921	
13,500.00	6,992.79	6,300.00	6,026.49	204.01	33.35	58.85	-1,392.00	886.85	5,722.79	5,628.92	93.88	60.960	
13,600.00	6,992.89	6,300.00	6,026.49	207.05	33.35	58.85	-1,392.00	886.85	5,817.47	5,723.64	93.83	62.002	
13,700.00	6,992.98	6,300.00	6,026.49	210.10	33.35	58.85	-1,392.00	886.85	5,912.31	5,818.54	93.78	63.046	
13,800.00	6,993.08	6,300.00	6,026.49	213.16	33.35	58.85	-1,392.00	886.85	6,007.33	5,913.60	93.73	64.093	
13,900.00	6,993.17	6,300.00	6,026.49	216.21	33.35	58.85	-1,392.00	886.85	6,102.50	6,008.82	93.68	65.141	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Rosa Unit 30 - Rosa Unit #665H - OH - Plan #2

Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,000.00	6,993.27	6,300.00	6,026.49	219.26	33.35	58.85	-1,392.00	886.85	6,197.83	6,104.19	93.64	66.191	
14,100.00	6,993.36	6,300.00	6,026.49	222.31	33.35	58.85	-1,392.00	886.85	6,293.30	6,199.71	93.59	67.243	
14,200.00	6,993.46	6,300.00	6,026.49	225.36	33.35	58.85	-1,392.00	886.85	6,388.91	6,295.36	93.55	68.296	
14,300.00	6,993.55	6,300.00	6,026.49	228.42	33.35	58.85	-1,392.00	886.85	6,484.65	6,391.15	93.50	69.352	
14,400.00	6,993.64	6,300.00	6,026.49	231.47	33.35	58.85	-1,392.00	886.85	6,580.52	6,487.06	93.46	70.408	
14,500.00	6,993.74	6,300.00	6,026.49	234.53	33.35	58.85	-1,392.00	886.85	6,676.51	6,583.09	93.42	71.466	
14,600.00	6,993.83	6,300.00	6,026.49	237.58	33.35	58.85	-1,392.00	886.85	6,772.62	6,679.23	93.38	72.524	
14,700.00	6,993.93	6,300.00	6,026.49	240.64	33.35	58.85	-1,392.00	886.85	6,868.83	6,775.49	93.35	73.584	
14,800.00	6,994.02	6,300.00	6,026.49	243.69	33.35	58.85	-1,392.00	886.85	6,965.16	6,871.85	93.31	74.645	
14,900.00	6,994.12	6,300.00	6,026.49	246.75	33.35	58.85	-1,392.00	886.85	7,061.58	6,968.31	93.28	75.707	
15,000.00	6,994.21	6,300.00	6,026.49	249.81	33.35	58.85	-1,392.00	886.85	7,158.11	7,064.87	93.24	76.769	
15,100.00	6,994.31	6,300.00	6,026.49	252.86	33.35	58.85	-1,392.00	886.85	7,254.73	7,161.52	93.21	77.832	
15,200.00	6,994.40	6,300.00	6,026.49	255.92	33.35	58.85	-1,392.00	886.85	7,351.43	7,258.26	93.18	78.896	
15,300.00	6,994.50	6,300.00	6,026.49	258.98	33.35	58.85	-1,392.00	886.85	7,448.23	7,355.08	93.15	79.960	
15,400.00	6,994.59	6,300.00	6,026.49	262.04	33.35	58.85	-1,392.00	886.85	7,545.11	7,451.99	93.12	81.024	
15,500.00	6,994.68	6,300.00	6,026.49	265.10	33.35	58.85	-1,392.00	886.85	7,642.07	7,548.97	93.09	82.089	
15,600.00	6,994.78	6,300.00	6,026.49	268.16	33.35	58.85	-1,392.00	886.85	7,739.11	7,646.04	93.07	83.154	
15,700.00	6,994.87	6,300.00	6,026.49	271.22	33.35	58.85	-1,392.00	886.85	7,836.22	7,743.17	93.05	84.220	
15,800.00	6,994.97	6,300.00	6,026.49	274.28	33.35	58.85	-1,392.00	886.85	7,933.40	7,840.38	93.02	85.285	
15,900.00	6,995.06	6,300.00	6,026.49	277.34	33.35	58.85	-1,392.00	886.85	8,030.65	7,937.65	93.00	86.351	
16,000.00	6,995.16	6,300.00	6,026.49	280.40	33.35	58.85	-1,392.00	886.85	8,127.97	8,034.99	92.98	87.416	
16,100.00	6,995.25	6,300.00	6,026.49	283.46	33.35	58.85	-1,392.00	886.85	8,225.36	8,132.39	92.96	88.482	
16,200.00	6,995.35	6,300.00	6,026.49	286.52	33.35	58.85	-1,392.00	886.85	8,322.80	8,229.86	92.94	89.547	
16,300.00	6,995.44	6,300.00	6,026.49	289.58	33.35	58.85	-1,392.00	886.85	8,420.31	8,327.38	92.93	90.613	
16,400.00	6,995.54	6,300.00	6,026.49	292.64	33.35	58.85	-1,392.00	886.85	8,517.87	8,424.96	92.91	91.678	
16,500.00	6,995.63	6,300.00	6,026.49	295.70	33.35	58.85	-1,392.00	886.85	8,615.49	8,522.59	92.90	92.743	
16,600.00	6,995.72	6,300.00	6,026.49	298.76	33.35	58.85	-1,392.00	886.85	8,713.16	8,620.28	92.88	93.808	
16,700.00	6,995.82	6,300.00	6,026.49	301.83	33.35	58.85	-1,392.00	886.85	8,810.89	8,718.02	92.87	94.872	
16,800.00	6,995.91	6,300.00	6,026.49	304.89	33.35	58.85	-1,392.00	886.85	8,908.66	8,815.80	92.86	95.936	
16,900.00	6,996.01	6,300.00	6,026.49	307.95	33.35	58.85	-1,392.00	886.85	9,006.49	8,913.64	92.85	96.999	
17,000.00	6,996.10	6,300.00	6,026.49	311.01	33.35	58.85	-1,392.00	886.85	9,104.36	9,011.52	92.84	98.062	
17,100.00	6,996.20	6,300.00	6,026.49	314.08	33.35	58.85	-1,392.00	886.85	9,202.28	9,109.44	92.84	99.125	
17,200.00	6,996.29	6,300.00	6,026.49	317.14	33.35	58.85	-1,392.00	886.85	9,300.24	9,207.41	92.83	100.187	
17,300.00	6,996.39	6,300.00	6,026.49	320.20	33.35	58.85	-1,392.00	886.85	9,398.24	9,305.42	92.82	101.248	
17,400.00	6,996.48	6,300.00	6,026.49	323.27	33.35	58.85	-1,392.00	886.85	9,496.29	9,403.47	92.82	102.309	
17,500.00	6,996.58	6,300.00	6,026.49	326.33	33.35	58.85	-1,392.00	886.85	9,594.38	9,501.56	92.82	103.369	
17,600.00	6,996.67	6,300.00	6,026.49	329.40	33.35	58.85	-1,392.00	886.85	9,692.50	9,599.69	92.82	104.428	
17,700.00	6,996.76	6,300.00	6,026.49	332.46	33.35	58.85	-1,392.00	886.85	9,790.67	9,697.85	92.81	105.486	
17,800.00	6,996.86	6,300.00	6,026.49	335.52	33.35	58.85	-1,392.00	886.85	9,888.87	9,796.05	92.81	106.544	
17,900.00	6,996.95	6,300.00	6,026.49	338.59	33.35	58.85	-1,392.00	886.85	9,987.10	9,894.29	92.82	107.601	

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 29 T31N R5W Offsets - Rosa Unit #15B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 130-INCLINOMETER

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	57.00	57.00	0.00	1.73	88.68	149.01	6,446.31	6,448.04	6,446.31	1.73	3,724.756	
100.00	100.00	157.00	157.00	0.36	4.77	88.68	149.01	6,446.31	6,448.04	6,442.91	5.13	1,257.792	
200.00	200.00	257.92	257.91	0.72	7.83	88.68	149.04	6,446.31	6,448.04	6,439.49	8.55	754.193	
236.74	236.74	293.76	293.74	0.85	8.92	88.68	149.01	6,446.31	6,448.04	6,438.27	9.77	660.003	
300.00	300.00	357.02	357.00	1.08	10.84	88.68	149.01	6,446.31	6,448.04	6,436.12	11.92	541.051	
400.00	400.00	457.02	457.00	1.43	13.88	88.68	149.01	6,446.31	6,448.04	6,432.72	15.31	421.084	
500.00	500.00	557.15	557.12	1.79	16.92	88.67	150.18	6,446.31	6,448.06	6,429.35	18.71	344.591	
600.00	600.00	657.65	657.62	2.15	19.97	88.67	149.93	6,446.31	6,448.06	6,425.93	22.12	291.466	
700.00	700.00	758.16	758.12	2.51	23.02	88.67	149.35	6,446.31	6,448.04	6,422.51	25.53	252.531	
800.00	800.00	857.10	857.00	2.87	26.03	88.68	149.01	6,446.31	6,448.04	6,419.14	28.90	223.140	
900.00	900.00	957.10	957.00	3.23	29.07	88.68	149.01	6,446.31	6,448.04	6,415.74	32.29	199.678	
1,000.00	1,000.00	1,057.14	1,057.03	3.58	32.10	88.67	150.10	6,446.31	6,448.06	6,412.37	35.69	180.675	
1,000.02	1,000.02	1,057.16	1,057.05	3.58	32.10	88.67	150.10	6,446.31	6,448.06	6,412.37	35.69	180.672	
1,100.00	1,099.98	1,157.66	1,157.54	3.94	35.16	155.23	149.90	6,446.31	6,449.64	6,410.55	39.09	164.976	
1,200.00	1,199.84	1,258.04	1,257.92	4.29	38.21	155.22	149.34	6,446.31	6,454.38	6,411.89	42.49	151.892	
1,266.26	1,265.88	1,323.04	1,322.88	4.53	40.18	155.20	149.01	6,446.31	6,459.27	6,414.57	44.70	144.500	
1,300.00	1,299.47	1,356.63	1,356.47	4.65	41.20	155.21	149.01	6,446.31	6,462.11	6,416.27	45.84	140.971	
1,400.00	1,399.04	1,456.20	1,456.04	5.01	44.22	155.24	149.01	6,446.31	6,470.55	6,421.33	49.22	131.475	
1,500.00	1,498.61	1,555.77	1,555.61	5.37	47.25	155.27	149.85	6,446.31	6,479.00	6,426.41	52.59	123.192	
1,600.00	1,598.18	1,655.69	1,655.52	5.74	50.28	155.31	149.72	6,446.31	6,487.43	6,431.45	55.98	115.885	
1,700.00	1,697.74	1,755.58	1,755.41	6.11	53.31	155.34	149.33	6,446.31	6,495.86	6,436.49	59.37	109.410	
1,800.00	1,797.31	1,854.50	1,854.31	6.49	56.32	155.38	149.01	6,446.31	6,504.30	6,441.57	62.73	103.682	
1,900.00	1,896.88	1,954.07	1,953.88	6.86	59.34	155.42	149.01	6,446.31	6,512.75	6,446.63	66.12	98.506	
2,000.00	1,996.45	2,053.64	2,053.45	7.24	62.37	155.45	149.01	6,446.31	6,521.19	6,451.69	69.50	93.832	
2,100.00	2,096.02	2,153.38	2,153.18	7.61	65.39	155.48	149.51	6,446.31	6,529.65	6,456.76	72.89	89.586	
2,200.00	2,195.59	2,253.13	2,252.93	7.99	68.42	155.51	149.28	6,446.31	6,538.10	6,461.82	76.28	85.715	
2,300.00	2,295.16	2,352.36	2,352.16	8.37	71.44	155.55	149.01	6,446.31	6,546.55	6,466.90	79.65	82.190	
2,400.00	2,394.72	2,451.93	2,451.72	8.75	74.46	155.58	149.01	6,446.31	6,555.00	6,471.97	83.04	78.942	
2,500.00	2,494.29	2,551.49	2,551.29	9.13	77.48	155.62	149.01	6,446.31	6,563.46	6,477.04	86.42	75.947	
2,600.00	2,593.86	2,651.14	2,650.94	9.51	80.51	155.65	149.23	6,446.31	6,571.93	6,482.12	89.81	73.176	
2,700.00	2,693.43	2,750.79	2,750.59	9.90	83.54	155.68	149.10	6,446.31	6,580.39	6,487.19	93.20	70.606	
2,800.00	2,793.00	2,850.21	2,850.00	10.28	86.56	155.72	149.01	6,446.31	6,588.85	6,492.27	96.58	68.222	
2,900.00	2,892.57	2,949.78	2,949.57	10.66	89.58	155.75	149.01	6,446.31	6,597.32	6,497.35	99.97	65.995	
3,000.00	2,992.13	3,049.35	3,049.13	11.05	92.60	155.78	149.57	6,446.31	6,605.79	6,502.44	103.35	63.914	
3,100.00	3,091.70	3,149.05	3,148.83	11.43	95.63	155.81	149.49	6,446.31	6,614.26	6,507.52	106.74	61.963	
3,200.00	3,191.27	3,248.74	3,248.52	11.81	98.66	155.85	149.23	6,446.31	6,622.73	6,512.60	110.14	60.133	
3,300.00	3,290.84	3,348.08	3,347.84	12.20	101.68	155.88	149.01	6,446.31	6,631.21	6,517.69	113.52	58.416	
3,400.00	3,390.41	3,447.65	3,447.41	12.58	104.70	155.91	149.01	6,446.31	6,639.68	6,522.78	116.90	56.796	
3,500.00	3,489.98	3,547.22	3,546.98	12.97	107.72	155.95	149.01	6,446.31	6,648.17	6,527.87	120.29	55.267	
3,600.00	3,589.54	3,646.79	3,646.54	13.35	110.75	155.98	149.01	6,446.31	6,656.65	6,532.97	123.68	53.822	
3,700.00	3,689.11	3,746.36	3,746.11	13.74	113.77	156.01	149.01	6,446.31	6,665.13	6,538.07	127.07	52.454	
3,800.00	3,788.68	3,800.00	3,799.71	14.12	115.40	156.03	149.01	6,446.31	6,673.78	6,544.72	129.05	51.714	
3,900.00	3,888.25	3,800.00	3,799.71	14.51	115.40	156.03	149.01	6,446.31	6,683.69	6,554.31	129.38	51.660	
4,000.00	3,987.82	3,800.00	3,799.71	14.89	115.40	156.03	149.01	6,446.31	6,695.09	6,565.41	129.68	51.629	
4,100.00	4,087.39	3,800.00	3,799.71	15.28	115.40	156.03	149.01	6,446.31	6,707.95	6,578.01	129.95	51.621	
4,200.00	4,186.95	3,800.00	3,799.71	15.67	115.40	156.03	149.01	6,446.31	6,722.28	6,592.09	130.19	51.636	
4,300.00	4,286.52	3,800.00	3,799.71	16.05	115.40	156.03	149.01	6,446.31	6,738.06	6,607.66	130.40	51.673	
4,400.00	4,386.09	3,800.00	3,799.71	16.44	115.40	156.03	149.01	6,446.31	6,755.29	6,624.71	130.58	51.732	
4,500.00	4,485.66	3,800.00	3,799.71	16.82	115.40	156.03	149.01	6,446.31	6,773.95	6,643.21	130.74	51.812	
4,600.00	4,585.23	3,800.00	3,799.71	17.21	115.40	156.03	149.01	6,446.31	6,794.03	6,663.16	130.87	51.914	
4,700.00	4,684.80	3,800.00	3,799.71	17.60	115.40	156.03	149.01	6,446.31	6,815.51	6,684.54	130.97	52.038	
4,800.00	4,784.36	3,800.00	3,799.71	17.98	115.40	156.03	149.01	6,446.31	6,838.40	6,707.35	131.05	52.182	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 29 T31N R5W Offsets - Rosa Unit #15B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 130-INCLINOMETER

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Rule Assigned: Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.00	4,883.93	3,800.00	3,799.71	18.37	115.40	156.03	149.01	6,446.31	6,862.66	6,731.56	131.10	52.346	
5,000.00	4,983.50	3,800.00	3,799.71	18.76	115.40	156.03	149.01	6,446.31	6,888.29	6,757.16	131.13	52.531	
5,100.00	5,083.07	3,800.00	3,799.71	19.14	115.40	156.03	149.01	6,446.31	6,915.27	6,784.14	131.13	52.736	
5,200.00	5,182.64	3,800.00	3,799.71	19.53	115.40	156.03	149.01	6,446.31	6,943.59	6,812.48	131.11	52.961	
5,300.00	5,282.21	3,800.00	3,799.71	19.92	115.40	156.03	149.01	6,446.31	6,973.23	6,842.16	131.06	53.206	
5,400.00	5,381.78	3,800.00	3,799.71	20.30	115.40	156.03	149.01	6,446.31	7,004.16	6,873.17	130.99	53.469	
5,500.00	5,481.34	3,800.00	3,799.71	20.69	115.40	156.03	149.01	6,446.31	7,036.39	6,905.48	130.90	53.752	
5,600.00	5,580.91	3,800.00	3,799.71	21.08	115.40	156.03	149.01	6,446.31	7,069.88	6,939.08	130.79	54.053	
5,700.00	5,680.48	3,800.00	3,799.71	21.47	115.40	156.03	149.01	6,446.31	7,104.62	6,973.96	130.66	54.373	
5,800.00	5,780.05	3,800.00	3,799.71	21.85	115.40	156.03	149.01	6,446.31	7,140.59	7,010.08	130.52	54.711	
5,900.00	5,879.62	3,800.00	3,799.71	22.24	115.40	156.03	149.01	6,446.31	7,177.78	7,047.43	130.35	55.067	
6,000.00	5,979.19	3,800.00	3,799.71	22.63	115.40	156.03	149.01	6,446.31	7,216.16	7,086.00	130.16	55.440	
6,100.00	6,078.75	3,800.00	3,799.71	23.02	115.40	156.03	149.01	6,446.31	7,255.71	7,125.76	129.96	55.831	
6,200.00	6,178.32	3,800.00	3,799.71	23.40	115.40	156.03	149.01	6,446.31	7,296.43	7,166.69	129.74	56.239	
6,300.00	6,277.89	3,800.00	3,799.71	23.79	115.40	156.03	149.01	6,446.31	7,338.27	7,208.77	129.50	56.664	
6,318.49	6,296.30	3,800.00	3,799.71	23.86	115.40	156.03	149.01	6,446.31	7,346.14	7,216.68	129.46	56.745	
6,350.00	6,327.73	3,800.00	3,799.71	23.98	115.40	134.07	149.01	6,446.31	7,358.91	7,229.53	129.38	56.879	
6,400.00	6,377.68	3,800.00	3,799.71	24.15	115.40	39.20	149.01	6,446.31	7,376.45	7,247.22	129.23	57.080	
6,450.00	6,427.47	3,800.00	3,799.71	24.29	115.40	15.46	149.01	6,446.31	7,390.58	7,261.52	129.06	57.264	
6,500.00	6,476.79	3,800.00	3,799.71	24.42	115.40	9.17	149.01	6,446.31	7,401.22	7,272.34	128.88	57.428	
6,550.00	6,525.33	3,800.00	3,799.71	24.54	115.40	6.36	149.01	6,446.31	7,408.33	7,279.65	128.68	57.572	
6,600.00	6,572.79	3,800.00	3,799.71	24.65	115.40	4.78	149.01	6,446.31	7,411.86	7,283.40	128.47	57.695	
6,650.00	6,618.89	3,800.00	3,799.71	24.75	115.40	3.78	149.01	6,446.31	7,411.82	7,283.58	128.24	57.796	
6,700.00	6,663.33	3,800.00	3,799.71	24.84	115.40	3.08	149.01	6,446.31	7,408.18	7,280.18	128.00	57.875	
6,750.00	6,705.84	3,800.00	3,799.71	24.94	115.40	2.57	149.01	6,446.31	7,400.98	7,273.23	127.75	57.932	
6,800.00	6,746.17	3,800.00	3,799.71	25.04	115.40	2.18	149.01	6,446.31	7,390.25	7,262.75	127.49	57.965	
6,850.00	6,784.06	3,800.00	3,799.71	25.16	115.40	1.86	149.01	6,446.31	7,376.03	7,248.80	127.23	57.975	
6,900.00	6,819.27	3,800.00	3,799.71	25.30	115.40	1.60	149.01	6,446.31	7,358.39	7,231.44	126.95	57.961	
6,950.00	6,851.60	3,800.00	3,799.71	25.48	115.40	1.38	149.01	6,446.31	7,337.43	7,210.75	126.68	57.922	
7,000.00	6,880.84	3,800.00	3,799.71	25.70	115.40	1.18	149.01	6,446.31	7,313.23	7,186.83	126.40	57.858	
7,050.00	6,906.82	3,800.00	3,799.71	25.99	115.40	0.99	149.01	6,446.31	7,285.92	7,159.80	126.12	57.769	
7,100.00	6,929.36	3,800.00	3,799.71	26.33	115.40	0.82	149.01	6,446.31	7,255.64	7,129.79	125.85	57.654	
7,150.00	6,948.34	3,800.00	3,799.71	26.75	115.40	0.64	149.01	6,446.31	7,222.53	7,096.95	125.58	57.514	
7,200.00	6,963.63	3,800.00	3,799.71	27.24	115.40	0.46	149.01	6,446.31	7,186.76	7,061.44	125.32	57.348	
7,250.00	6,975.15	3,800.00	3,799.71	27.80	115.40	0.25	149.01	6,446.31	7,148.51	7,023.44	125.07	57.156	
7,300.00	6,982.81	3,800.00	3,799.71	28.43	115.40	0.02	149.01	6,446.31	7,107.97	6,983.14	124.83	56.939	
7,350.00	6,986.58	3,800.00	3,799.71	29.11	115.40	-0.28	149.01	6,446.31	7,065.38	6,940.76	124.61	56.698	
7,372.48	6,987.00	3,800.00	3,799.71	29.44	115.40	-0.43	149.01	6,446.31	7,045.61	6,921.09	124.52	56.580	
7,400.00	6,987.03	3,800.00	3,799.71	29.85	115.40	-0.43	149.01	6,446.31	7,021.20	6,896.79	124.41	56.435	
7,500.00	6,987.12	3,800.00	3,799.71	31.50	115.40	-0.43	149.01	6,446.31	6,932.72	6,808.73	123.99	55.915	
7,600.00	6,987.22	3,800.00	3,799.71	33.34	115.40	-0.43	149.01	6,446.31	6,844.55	6,721.00	123.55	55.397	
7,700.00	6,987.31	3,800.00	3,799.71	35.36	115.40	-0.43	149.01	6,446.31	6,756.71	6,633.60	123.11	54.882	
7,800.00	6,987.40	3,800.00	3,799.71	37.52	115.40	-0.43	149.01	6,446.31	6,669.22	6,546.55	122.67	54.369	
7,900.00	6,987.50	3,800.00	3,799.71	39.81	115.40	-0.43	149.01	6,446.31	6,582.08	6,459.87	122.21	53.859	
8,000.00	6,987.59	3,800.00	3,799.71	42.19	115.40	-0.43	149.01	6,446.31	6,495.31	6,373.56	121.74	53.353	
8,100.00	6,987.69	3,800.00	3,799.71	44.65	115.40	-0.43	149.01	6,446.31	6,408.92	6,287.65	121.27	52.849	
8,200.00	6,987.78	3,800.00	3,799.71	47.19	115.40	-0.43	149.01	6,446.31	6,322.94	6,202.16	120.79	52.348	
8,300.00	6,987.88	3,800.00	3,799.71	49.79	115.40	-0.43	149.01	6,446.31	6,237.38	6,117.08	120.29	51.851	
8,400.00	6,987.97	3,800.00	3,799.71	52.44	115.40	-0.43	149.01	6,446.31	6,152.25	6,032.45	119.79	51.357	
8,500.00	6,988.07	3,800.00	3,799.71	55.13	115.40	-0.43	149.01	6,446.31	6,067.57	5,948.29	119.28	50.867	
8,600.00	6,988.16	3,800.00	3,799.71	57.87	115.40	-0.43	149.01	6,446.31	5,983.37	5,864.61	118.76	50.380	
8,700.00	6,988.26	3,800.00	3,799.71	60.63	115.40	-0.43	149.01	6,446.31	5,899.66	5,781.43	118.24	49.898	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 29 T31N R5W Offsets - Rosa Unit #15B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 130-INCLINOMETER

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,800.00	6,988.35	3,800.00	3,799.71	63.42	115.40	-0.43	149.01	6,446.31	5,816.47	5,698.77	117.70	49.419	
8,900.00	6,988.44	3,800.00	3,799.71	66.24	115.40	-0.43	149.01	6,446.31	5,733.81	5,616.66	117.15	48.945	
9,000.00	6,988.54	3,800.00	3,799.71	69.08	115.40	-0.43	149.01	6,446.31	5,651.71	5,535.12	116.59	48.476	
9,100.00	6,988.63	3,800.00	3,799.71	71.94	115.40	-0.43	149.01	6,446.31	5,570.20	5,454.18	116.02	48.011	
9,200.00	6,988.73	3,800.00	3,799.71	74.81	115.40	-0.43	149.01	6,446.31	5,489.30	5,373.86	115.44	47.552	
9,300.00	6,988.82	3,800.00	3,799.71	77.71	115.40	-0.43	149.01	6,446.31	5,409.04	5,294.19	114.85	47.098	
9,400.00	6,988.92	3,800.00	3,799.71	80.61	115.40	-0.43	149.01	6,446.31	5,329.45	5,215.20	114.24	46.651	
9,500.00	6,989.01	3,800.00	3,799.71	83.53	115.40	-0.43	149.01	6,446.31	5,250.55	5,136.93	113.62	46.210	
9,600.00	6,989.11	3,800.00	3,799.71	86.45	115.40	-0.43	149.01	6,446.31	5,172.39	5,059.39	112.99	45.776	
9,700.00	6,989.20	3,800.00	3,799.71	89.39	115.40	-0.43	149.01	6,446.31	5,094.98	4,982.63	112.35	45.349	
9,800.00	6,989.30	3,800.00	3,799.71	92.34	115.40	-0.43	149.01	6,446.31	5,018.38	4,906.69	111.69	44.931	
9,900.00	6,989.39	3,800.00	3,799.71	95.29	115.40	-0.43	149.01	6,446.31	4,942.61	4,831.60	111.02	44.522	
10,000.00	6,989.48	3,800.00	3,799.71	98.25	115.40	-0.43	149.01	6,446.31	4,867.72	4,757.40	110.32	44.122	
10,100.00	6,989.58	3,800.00	3,799.71	101.22	115.40	-0.43	149.01	6,446.31	4,793.74	4,684.13	109.61	43.734	
10,200.00	6,989.67	3,800.00	3,799.71	104.19	115.40	-0.43	149.01	6,446.31	4,720.73	4,611.85	108.88	43.356	
10,300.00	6,989.77	3,800.00	3,799.71	107.17	115.40	-0.43	149.01	6,446.31	4,648.72	4,540.59	108.13	42.992	
10,400.00	6,989.86	3,800.00	3,799.71	110.16	115.40	-0.43	149.01	6,446.31	4,577.76	4,470.40	107.35	42.641	
10,500.00	6,989.96	3,800.00	3,799.71	113.15	115.40	-0.43	149.01	6,446.31	4,507.90	4,401.34	106.55	42.306	
10,600.00	6,990.05	3,800.00	3,799.71	116.14	115.40	-0.43	149.01	6,446.31	4,439.19	4,333.46	105.73	41.987	
10,700.00	6,990.15	3,800.00	3,799.71	119.14	115.40	-0.43	149.01	6,446.31	4,371.69	4,266.82	104.87	41.686	
10,800.00	6,990.24	3,800.00	3,799.71	122.14	115.40	-0.43	149.01	6,446.31	4,305.46	4,201.48	103.98	41.405	
10,900.00	6,990.34	3,800.00	3,799.71	125.15	115.40	-0.43	149.01	6,446.31	4,240.55	4,137.49	103.06	41.146	
11,000.00	6,990.43	3,800.00	3,799.71	128.16	115.40	-0.43	149.01	6,446.31	4,177.03	4,074.93	102.10	40.911	
11,100.00	6,990.52	3,800.00	3,799.71	131.17	115.40	-0.43	149.01	6,446.31	4,114.95	4,013.85	101.10	40.701	
11,200.00	6,990.62	3,800.00	3,799.71	134.18	115.40	-0.43	149.01	6,446.31	4,054.40	3,954.34	100.06	40.520	
11,300.00	6,990.71	3,800.00	3,799.71	137.20	115.40	-0.43	149.01	6,446.31	3,995.42	3,896.45	98.97	40.369	
11,400.00	6,990.81	3,800.00	3,799.71	140.22	115.40	-0.43	149.01	6,446.31	3,938.11	3,840.27	97.83	40.253	
11,500.00	6,990.90	3,800.00	3,799.71	143.24	115.40	-0.43	149.01	6,446.31	3,882.52	3,785.88	96.65	40.173	
11,600.00	6,991.00	3,800.00	3,799.71	146.27	115.40	-0.43	149.01	6,446.31	3,828.74	3,733.34	95.40	40.133	
11,700.00	6,991.09	3,800.00	3,799.71	149.29	115.40	-0.43	149.01	6,446.31	3,776.84	3,682.75	94.10	40.138	
11,800.00	6,991.19	3,800.00	3,799.71	152.32	115.40	-0.43	149.01	6,446.31	3,726.91	3,634.17	92.73	40.190	
11,900.00	6,991.28	3,800.00	3,799.71	155.35	115.40	-0.43	149.01	6,446.31	3,679.01	3,587.71	91.30	40.295	
12,000.00	6,991.38	3,800.00	3,799.71	158.38	115.40	-0.43	149.01	6,446.31	3,633.23	3,543.43	89.81	40.457	
12,100.00	6,991.47	3,800.00	3,799.71	161.41	115.40	-0.43	149.01	6,446.31	3,589.66	3,501.42	88.24	40.681	
12,200.00	6,991.56	3,800.00	3,799.71	164.45	115.40	-0.43	149.01	6,446.31	3,548.37	3,461.77	86.60	40.974	
12,300.00	6,991.66	3,800.00	3,799.71	167.49	115.40	-0.43	149.01	6,446.31	3,509.45	3,424.56	84.89	41.341	
12,400.00	6,991.75	3,800.00	3,799.71	170.52	115.40	-0.43	149.01	6,446.31	3,472.97	3,389.87	83.10	41.791	
12,500.00	6,991.85	3,800.00	3,799.71	173.56	115.40	-0.43	149.01	6,446.31	3,439.01	3,357.77	81.24	42.330	
12,600.00	6,991.94	3,800.00	3,799.71	176.60	115.40	-0.43	149.01	6,446.31	3,407.65	3,328.34	79.31	42.967	
12,700.00	6,992.04	3,800.00	3,799.71	179.64	115.40	-0.43	149.01	6,446.31	3,378.96	3,301.66	77.30	43.711	
12,800.00	6,992.13	3,800.00	3,799.71	182.68	115.40	-0.43	149.01	6,446.31	3,353.01	3,277.78	75.23	44.572	
12,900.00	6,992.23	3,800.00	3,799.71	185.73	115.40	-0.43	149.01	6,446.31	3,329.86	3,256.77	73.09	45.560	
13,000.00	6,992.32	3,800.00	3,799.71	188.77	115.40	-0.43	149.01	6,446.31	3,309.57	3,238.67	70.89	46.684	
13,100.00	6,992.42	3,800.00	3,799.71	191.82	115.40	-0.43	149.01	6,446.31	3,292.19	3,223.53	68.66	47.951	
13,200.00	6,992.51	3,800.00	3,799.71	194.86	115.40	-0.43	149.01	6,446.31	3,277.77	3,211.37	66.40	49.361	
13,300.00	6,992.60	3,800.00	3,799.71	197.91	115.40	-0.43	149.01	6,446.31	3,266.36	3,202.18	64.18	50.896	
13,400.00	6,992.70	3,800.00	3,799.71	200.96	115.40	-0.43	149.01	6,446.31	3,257.97	3,195.90	62.08	52.483	
13,500.00	6,992.79	3,800.00	3,799.71	204.01	115.40	-0.43	149.01	6,446.31	3,252.64	3,192.28	60.36	53.889	
13,600.00	6,992.89	3,800.00	3,799.71	207.05	115.40	-0.43	149.01	6,446.31	3,250.38	3,190.66	59.71	54.434	
13,623.58	6,992.91	3,800.00	3,799.71	207.77	115.40	-0.43	149.01	6,446.31	3,250.29	3,190.45	59.84	54.319	CC
13,700.00	6,992.98	3,800.00	3,799.71	210.10	115.40	-0.43	149.01	6,446.31	3,251.19	3,190.11	61.08	53.225	ES
13,800.00	6,993.08	3,800.00	3,799.71	213.16	115.40	-0.43	149.01	6,446.31	3,255.08	3,190.99	64.09	50.791	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 29 T31N R5W Offsets - Rosa Unit #15B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 130-INCLINOMETER

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Rule Assigned: Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,900.00	6,993.17	3,800.00	3,799.71	216.21	115.40	-0.43	149.01	6,446.31	3,262.02	3,194.27	67.75	48.145	
14,000.00	6,993.27	3,800.00	3,799.71	219.26	115.40	-0.43	149.01	6,446.31	3,272.02	3,200.38	71.64	45.675	
14,100.00	6,993.36	3,800.00	3,799.71	222.31	115.40	-0.43	149.01	6,446.31	3,285.02	3,209.45	75.57	43.472	
14,200.00	6,993.46	3,800.00	3,799.71	225.36	115.40	-0.43	149.01	6,446.31	3,301.01	3,221.53	79.47	41.536	
14,300.00	6,993.55	3,800.00	3,799.71	228.42	115.40	-0.43	149.01	6,446.31	3,319.93	3,236.61	83.32	39.847	
14,400.00	6,993.64	3,800.00	3,799.71	231.47	115.40	-0.43	149.01	6,446.31	3,341.74	3,254.66	87.08	38.377	
14,500.00	6,993.74	3,800.00	3,799.71	234.53	115.40	-0.43	149.01	6,446.31	3,366.38	3,275.64	90.74	37.100	
14,600.00	6,993.83	3,800.00	3,799.71	237.58	115.40	-0.43	149.01	6,446.31	3,393.79	3,299.50	94.29	35.994	
14,700.00	6,993.93	3,800.00	3,799.71	240.64	115.40	-0.43	149.01	6,446.31	3,423.90	3,326.18	97.72	35.037	
14,800.00	6,994.02	3,800.00	3,799.71	243.69	115.40	-0.43	149.01	6,446.31	3,456.64	3,355.61	101.03	34.213	
14,900.00	6,994.12	3,800.00	3,799.71	246.75	115.40	-0.43	149.01	6,446.31	3,491.94	3,387.72	104.22	33.506	
15,000.00	6,994.21	3,800.00	3,799.71	249.81	115.40	-0.43	149.01	6,446.31	3,529.72	3,422.44	107.28	32.903	
15,100.00	6,994.31	3,800.00	3,799.71	252.86	115.40	-0.43	149.01	6,446.31	3,569.90	3,459.70	110.21	32.393	
15,200.00	6,994.40	3,800.00	3,799.71	255.92	115.40	-0.43	149.01	6,446.31	3,612.41	3,499.40	113.01	31.966	
15,300.00	6,994.50	3,800.00	3,799.71	258.98	115.40	-0.43	149.01	6,446.31	3,657.16	3,541.47	115.68	31.614	
15,400.00	6,994.59	3,800.00	3,799.71	262.04	115.40	-0.43	149.01	6,446.31	3,704.06	3,585.83	118.23	31.329	
15,500.00	6,994.68	3,800.00	3,799.71	265.10	115.40	-0.43	149.01	6,446.31	3,753.05	3,632.39	120.66	31.105	
15,600.00	6,994.78	3,800.00	3,799.71	268.16	115.40	-0.43	149.01	6,446.31	3,804.03	3,681.06	122.97	30.936	
15,700.00	6,994.87	3,800.00	3,799.71	271.22	115.40	-0.43	149.01	6,446.31	3,856.93	3,731.77	125.16	30.817	
15,800.00	6,994.97	3,800.00	3,799.71	274.28	115.40	-0.43	149.01	6,446.31	3,911.68	3,784.44	127.24	30.744	
15,900.00	6,995.06	3,800.00	3,799.71	277.34	115.40	-0.43	149.01	6,446.31	3,968.18	3,838.98	129.21	30.712 SF	
16,000.00	6,995.16	3,800.00	3,799.71	280.40	115.40	-0.43	149.01	6,446.31	4,026.38	3,895.31	131.07	30.719	
16,100.00	6,995.25	3,800.00	3,799.71	283.46	115.40	-0.43	149.01	6,446.31	4,086.20	3,953.37	132.84	30.761	
16,200.00	6,995.35	3,800.00	3,799.71	286.52	115.40	-0.43	149.01	6,446.31	4,147.57	4,013.06	134.51	30.835	
16,300.00	6,995.44	3,800.00	3,799.71	289.58	115.40	-0.43	149.01	6,446.31	4,210.42	4,074.33	136.09	30.939	
16,400.00	6,995.54	3,800.00	3,799.71	292.64	115.40	-0.43	149.01	6,446.31	4,274.68	4,137.10	137.58	31.070	
16,500.00	6,995.63	3,800.00	3,799.71	295.70	115.40	-0.43	149.01	6,446.31	4,340.30	4,201.31	138.99	31.227	
16,600.00	6,995.72	3,800.00	3,799.71	298.76	115.40	-0.43	149.01	6,446.31	4,407.21	4,266.88	140.33	31.407	
16,700.00	6,995.82	3,800.00	3,799.71	301.83	115.40	-0.43	149.01	6,446.31	4,475.35	4,333.76	141.59	31.609	
16,800.00	6,995.91	3,800.00	3,799.71	304.89	115.40	-0.43	149.01	6,446.31	4,544.67	4,401.90	142.78	31.831	
16,900.00	6,996.01	3,800.00	3,799.71	307.95	115.40	-0.43	149.01	6,446.31	4,615.12	4,471.22	143.90	32.072	
17,000.00	6,996.10	3,800.00	3,799.71	311.01	115.40	-0.43	149.01	6,446.31	4,686.64	4,541.68	144.96	32.331	
17,100.00	6,996.20	3,800.00	3,799.71	314.08	115.40	-0.43	149.01	6,446.31	4,759.19	4,613.23	145.96	32.606	
17,200.00	6,996.29	3,800.00	3,799.71	317.14	115.40	-0.43	149.01	6,446.31	4,832.72	4,685.81	146.91	32.896	
17,300.00	6,996.39	3,800.00	3,799.71	320.20	115.40	-0.43	149.01	6,446.31	4,907.19	4,759.38	147.80	33.201	
17,400.00	6,996.48	3,800.00	3,799.71	323.27	115.40	-0.43	149.01	6,446.31	4,982.55	4,833.90	148.65	33.519	
17,500.00	6,996.58	3,800.00	3,799.71	326.33	115.40	-0.43	149.01	6,446.31	5,058.76	4,909.31	149.45	33.850	
17,600.00	6,996.67	3,800.00	3,799.71	329.40	115.40	-0.43	149.01	6,446.31	5,135.79	4,985.59	150.20	34.193	
17,700.00	6,996.76	3,800.00	3,799.71	332.46	115.40	-0.43	149.01	6,446.31	5,213.60	5,062.68	150.91	34.547	
17,800.00	6,996.86	3,800.00	3,799.71	335.52	115.40	-0.43	149.01	6,446.31	5,292.15	5,140.56	151.59	34.911	
17,900.00	6,996.95	3,800.00	3,799.71	338.59	115.40	-0.43	149.01	6,446.31	5,371.42	5,219.19	152.23	35.285	
17,948.87	6,997.00	3,800.00	3,799.71	340.09	115.40	-0.43	149.01	6,446.31	5,410.41	5,257.88	152.53	35.471	

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #166B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 102-INCLINOMETER

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	41.60	652.44	579.25	872.52				
100.00	100.00	91.00	91.00	0.36	2.76	41.60	652.44	579.25	872.47	869.35	3.12	279.455	
200.00	200.00	191.71	191.70	0.72	5.82	41.60	652.49	579.25	872.51	865.97	6.54	133.436	
300.00	300.00	291.00	291.00	1.08	8.84	41.60	652.44	579.25	872.47	862.56	9.91	88.015	
400.00	400.00	392.30	392.30	1.43	11.91	41.60	652.46	579.25	872.48	859.14	13.35	65.366	
440.36	440.36	431.36	431.36	1.58	13.10	41.60	652.44	579.25	872.47	857.79	14.68	59.439	
500.00	500.00	491.00	491.00	1.79	14.91	41.60	652.44	579.25	872.47	855.77	16.70	52.233	
600.00	600.00	591.02	591.01	2.15	17.95	41.59	652.65	579.25	872.63	852.53	20.10	43.416	
700.00	700.00	691.78	691.77	2.51	21.01	41.59	652.59	579.25	872.58	849.06	23.52	37.104	
800.00	800.00	791.03	791.00	2.87	24.02	41.60	652.44	579.25	872.47	845.58	26.89	32.446	
900.00	900.00	891.03	891.00	3.23	27.06	41.60	652.44	579.25	872.47	842.19	30.29	28.809	
1,000.00	1,000.00	991.80	991.76	3.58	30.12	41.56	653.25	579.25	873.08	839.37	33.70	25.904	
1,012.03	1,012.03	1,004.20	1,004.16	3.63	30.50	108.14	653.23	579.25	873.07	838.95	34.12	25.586	
1,100.00	1,099.98	1,094.91	1,094.87	3.94	33.25	108.26	652.88	579.25	873.35	836.17	37.19	23.485	
1,200.00	1,199.84	1,190.92	1,190.84	4.29	36.17	108.56	652.44	579.25	874.67	834.22	40.46	21.621	
1,266.26	1,265.88	1,256.96	1,256.88	4.53	38.17	108.86	652.44	579.25	876.41	833.71	42.70	20.527	
1,300.00	1,299.47	1,290.56	1,290.47	4.65	39.19	109.06	652.44	579.25	877.43	833.59	43.84	20.016	
1,400.00	1,399.04	1,391.00	1,390.90	5.01	42.24	109.59	653.31	579.25	881.15	833.90	47.25	18.650	
1,500.00	1,498.61	1,493.37	1,493.27	5.37	45.35	110.19	652.95	579.25	884.06	833.34	50.72	17.431	
1,600.00	1,598.18	1,589.32	1,589.18	5.74	48.26	110.75	652.44	579.25	886.94	832.95	54.00	16.426	
1,700.00	1,697.74	1,688.89	1,688.74	6.11	51.29	111.31	652.44	579.25	890.29	832.90	57.39	15.513	
1,800.00	1,797.31	1,788.97	1,788.81	6.49	54.33	111.82	653.33	579.25	894.34	833.54	60.80	14.710	
1,900.00	1,896.88	1,891.26	1,891.10	6.86	57.43	112.40	653.03	579.25	897.64	833.36	64.27	13.966	
2,000.00	1,996.45	1,987.66	1,987.45	7.24	60.36	112.95	652.44	579.25	900.81	833.24	67.57	13.331	
2,100.00	2,096.02	2,087.23	2,087.02	7.61	63.39	113.49	652.44	579.25	904.49	833.52	70.97	12.745	
2,200.00	2,195.59	2,187.50	2,187.28	7.99	66.43	113.99	653.24	579.25	908.78	834.39	74.39	12.217	
2,300.00	2,295.16	2,290.01	2,289.78	8.37	69.54	114.55	652.88	579.25	912.37	834.50	77.87	11.716	
2,400.00	2,394.72	2,385.98	2,385.72	8.75	72.46	115.08	652.44	579.25	915.98	834.82	81.16	11.286	
2,500.00	2,494.29	2,485.55	2,485.29	9.13	75.48	115.60	652.44	579.25	919.96	835.41	84.56	10.880	
2,600.00	2,593.86	2,585.12	2,584.86	9.51	78.51	116.12	652.44	579.25	924.03	836.07	87.96	10.506	
2,700.00	2,693.43	2,685.92	2,685.66	9.90	81.57	116.60	653.19	579.25	928.65	837.26	91.39	10.161	
2,800.00	2,793.00	2,787.02	2,786.76	10.28	84.64	117.13	652.85	579.25	932.64	837.81	94.84	9.834	
2,900.00	2,892.57	2,883.95	2,883.57	10.66	87.58	117.64	652.44	579.25	936.66	838.51	98.15	9.543	
3,000.00	2,992.13	2,983.52	2,983.13	11.05	90.60	118.14	652.44	579.25	941.02	839.47	101.55	9.266	
3,100.00	3,091.70	3,084.02	3,083.61	11.43	93.66	118.57	653.96	579.25	946.38	841.40	104.98	9.015	
3,200.00	3,191.27	3,188.19	3,187.77	11.81	96.82	119.11	653.39	579.25	950.53	842.02	108.52	8.759	
3,300.00	3,290.84	3,282.38	3,281.84	12.20	99.68	119.61	652.44	579.25	954.51	842.76	111.75	8.541	
3,400.00	3,390.41	3,381.95	3,381.41	12.58	102.70	120.09	652.44	579.25	959.14	844.00	115.15	8.330	
3,500.00	3,489.98	3,481.52	3,480.98	12.97	105.73	120.57	652.44	579.25	963.85	845.30	118.54	8.131	
3,600.00	3,589.54	3,584.39	3,583.81	13.35	108.85	121.00	653.60	579.25	969.30	847.25	122.04	7.942	
3,700.00	3,689.11	3,687.40	3,686.80	13.74	111.98	121.52	652.69	579.25	973.62	848.07	125.54	7.755	
3,800.00	3,788.68	3,780.47	3,779.68	14.12	114.80	121.97	652.44	579.25	978.34	849.60	128.74	7.599	
3,900.00	3,888.25	3,880.04	3,879.25	14.51	117.83	122.43	652.44	579.25	983.30	851.17	132.14	7.441	
4,000.00	3,987.82	3,981.06	3,980.22	14.89	120.89	122.77	654.76	579.25	989.62	854.03	135.58	7.299	
4,100.00	4,087.39	4,085.36	4,084.49	15.28	124.06	123.28	654.05	579.25	994.31	855.19	139.12	7.147	
4,200.00	4,186.95	4,189.62	4,188.71	15.67	127.23	123.82	652.45	579.25	998.62	855.96	142.66	7.000	
4,300.00	4,286.52	4,278.51	4,277.52	16.05	129.93	124.21	652.44	579.25	1,003.76	858.03	145.73	6.888	
4,400.00	4,386.09	4,378.08	4,377.09	16.44	132.95	124.64	652.44	579.25	1,009.02	859.90	149.13	6.766	
4,500.00	4,485.66	4,478.10	4,477.10	16.82	135.99	125.02	653.57	579.25	1,014.93	862.40	152.54	6.654	
4,600.00	4,585.23	4,579.46	4,578.45	17.21	139.07	125.47	653.32	579.25	1,020.17	864.19	155.99	6.540	
4,700.00	4,684.80	4,680.80	4,679.78	17.60	142.14	125.92	652.72	579.25	1,025.30	865.87	159.44	6.431	
4,800.00	4,784.36	4,776.51	4,775.36	17.98	145.05	126.34	652.44	579.25	1,030.64	867.93	162.71	6.334	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #166B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 102-INCLINOMETER

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.00	4,883.93	4,876.08	4,874.93	18.37	148.07	126.75	652.44	579.25	1,036.18	870.07	166.11	6.238	
5,000.00	4,983.50	4,976.62	4,975.44	18.76	151.13	127.08	654.19	579.25	1,042.63	873.10	169.53	6.150	
5,100.00	5,083.07	5,079.67	5,078.48	19.14	154.26	127.52	653.65	579.25	1,048.02	874.98	173.03	6.057	
5,200.00	5,182.64	5,182.69	5,181.48	19.53	157.38	127.99	652.41	579.25	1,053.14	876.61	176.53	5.966	
5,300.00	5,282.21	5,274.49	5,273.21	19.92	160.17	128.35	652.44	579.25	1,058.87	879.18	179.69	5.893	
5,400.00	5,381.78	5,374.06	5,372.78	20.30	163.20	128.75	652.44	579.25	1,064.67	881.59	183.08	5.815	
5,500.00	5,481.34	5,474.69	5,473.39	20.69	166.25	129.09	653.41	579.25	1,070.96	884.46	186.51	5.742	
5,600.00	5,580.91	5,576.10	5,574.80	21.08	169.33	129.50	653.00	579.25	1,076.67	886.72	189.96	5.668	
5,700.00	5,680.48	5,672.88	5,671.48	21.47	172.27	129.89	652.44	579.25	1,082.36	889.09	193.26	5.600	
5,800.00	5,780.05	5,772.44	5,771.05	21.85	175.29	130.27	652.44	579.25	1,088.35	891.69	196.66	5.534	
5,900.00	5,879.62	5,875.18	5,873.76	22.24	178.41	130.61	653.16	579.25	1,094.71	894.56	200.15	5.470	
6,000.00	5,979.19	5,971.65	5,970.19	22.63	181.34	131.00	652.44	579.25	1,100.47	897.02	203.44	5.409	
6,100.00	6,078.75	6,071.22	6,069.75	23.02	184.37	131.36	652.44	579.25	1,106.59	899.76	206.84	5.350	
6,200.00	6,178.32	6,170.79	6,169.32	23.40	187.39	131.72	652.44	579.25	1,112.76	902.54	210.23	5.293	
6,300.00	6,277.89	6,271.13	6,269.65	23.79	190.44	132.02	653.58	579.25	1,119.45	905.80	213.64	5.240	
6,318.49	6,296.30	6,289.82	6,288.34	23.86	191.01	132.09	653.54	579.25	1,120.58	906.31	214.28	5.230	
6,350.00	6,327.73	6,321.72	6,320.24	23.98	191.97	110.25	653.46	579.25	1,121.81	906.45	215.36	5.209	
6,400.00	6,377.68	6,372.43	6,370.95	24.15	193.51	15.40	653.25	579.25	1,120.83	903.76	217.07	5.163	
6,450.00	6,427.47	6,422.97	6,421.48	24.29	195.05	-8.53	652.96	579.25	1,116.27	897.50	218.77	5.103	
6,500.00	6,476.79	6,473.02	6,471.53	24.42	196.57	-15.24	652.59	579.25	1,108.15	887.72	220.43	5.027	
6,550.00	6,525.33	6,517.83	6,516.33	24.54	197.93	-18.68	652.44	579.25	1,096.64	874.71	221.93	4.941	
6,600.00	6,572.79	6,565.29	6,563.79	24.65	199.37	-21.17	652.44	579.25	1,081.82	858.31	223.50	4.840	
6,650.00	6,618.89	6,611.54	6,610.04	24.75	200.78	-23.38	652.55	579.25	1,063.78	838.75	225.03	4.727	
6,700.00	6,663.33	6,656.40	6,654.90	24.84	202.14	-25.61	652.52	579.25	1,042.55	816.05	226.50	4.603	
6,750.00	6,705.84	6,699.32	6,697.81	24.94	203.44	-28.02	652.44	579.25	1,018.36	790.45	227.91	4.468	
6,800.00	6,746.17	6,738.68	6,737.17	25.04	204.64	-30.73	652.44	579.25	991.45	762.26	229.20	4.326	
6,850.00	6,784.06	6,776.57	6,775.06	25.16	205.79	-33.87	652.44	579.25	962.04	731.60	230.44	4.175	
6,900.00	6,819.27	6,811.79	6,810.27	25.30	206.86	-37.54	652.44	579.25	930.38	698.78	231.60	4.017	
6,950.00	6,851.60	6,844.12	6,842.60	25.48	207.84	-41.80	652.44	579.25	896.76	664.09	232.67	3.854	
7,000.00	6,880.84	6,873.36	6,871.84	25.70	208.73	-46.72	652.44	579.25	861.52	627.86	233.66	3.687	
7,050.00	6,906.82	6,899.33	6,897.82	25.99	209.52	-52.29	652.44	579.25	825.02	590.45	234.57	3.517	
7,100.00	6,929.36	6,921.88	6,920.36	26.33	210.20	-58.43	652.44	579.25	787.64	552.23	235.41	3.346	
7,150.00	6,948.34	6,941.03	6,939.50	26.75	210.78	-64.99	653.45	579.25	750.43	514.23	236.19	3.177	
7,200.00	6,963.63	6,956.58	6,955.06	27.24	211.25	-71.56	653.44	579.25	712.67	475.74	236.93	3.008	
7,250.00	6,975.15	6,968.30	6,966.77	27.80	211.61	-77.84	653.42	579.25	675.47	437.83	237.64	2.842	
7,300.00	6,982.81	6,976.09	6,974.57	28.43	211.85	-83.48	653.41	579.25	639.36	401.03	238.33	2.683	
7,350.00	6,986.58	6,979.93	6,978.40	29.11	211.96	-88.24	653.40	579.25	604.95	365.91	239.04	2.531	
7,372.48	6,987.00	6,980.36	6,978.83	29.44	211.98	-90.06	653.40	579.25	590.19	350.82	239.37	2.466	
7,400.00	6,987.03	6,980.38	6,978.86	29.85	211.98	-90.06	653.40	579.25	572.81	333.02	239.79	2.389	
7,500.00	6,987.12	6,980.48	6,978.95	31.50	211.98	-90.08	653.40	579.25	517.14	275.37	241.78	2.139	
7,600.00	6,987.22	6,980.58	6,979.05	33.34	211.98	-90.09	653.40	579.25	476.20	231.84	244.36	1.949	
7,700.00	6,987.31	6,980.68	6,979.15	35.36	211.99	-90.10	653.40	579.25	453.97	206.83	247.14	1.837	
7,753.39	6,987.36	6,980.73	6,979.20	36.52	211.99	-90.11	653.40	579.25	450.82	202.32	248.49	1.814	CC, ES, SF
7,800.00	6,987.40	6,980.78	6,979.25	37.52	211.99	-90.11	653.40	579.25	453.22	203.76	249.46	1.817	
7,900.00	6,987.50	6,980.88	6,979.35	39.81	211.99	-90.13	653.40	579.25	474.06	223.24	250.82	1.890	
8,000.00	6,987.59	6,980.98	6,979.45	42.19	211.99	-90.14	653.40	579.25	513.86	262.66	251.20	2.046	
8,100.00	6,987.69	6,981.07	6,979.55	44.65	212.00	-90.15	653.40	579.25	568.66	317.74	250.92	2.266	
8,200.00	6,987.78	6,981.17	6,979.65	47.19	212.00	-90.16	653.40	579.25	634.59	384.28	250.30	2.535	
8,300.00	6,987.88	6,981.27	6,979.74	49.79	212.00	-90.18	653.40	579.25	708.54	458.97	249.57	2.839	
8,400.00	6,987.97	6,981.37	6,979.84	52.44	212.01	-90.19	653.40	579.25	788.25	539.41	248.84	3.168	
8,500.00	6,988.07	6,981.47	6,979.94	55.13	212.01	-90.20	653.40	579.25	872.16	623.99	248.17	3.514	
8,600.00	6,988.16	6,981.57	6,980.04	57.87	212.01	-90.21	653.40	579.25	959.16	711.59	247.57	3.874	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #166B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 102-INCLINOMETER

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,700.00	6,988.26	6,981.67	6,980.14	60.63	212.02	-90.23	653.40	579.25	1,048.48	801.44	247.04	4.244	
8,800.00	6,988.35	6,981.77	6,980.24	63.42	212.02	-90.24	653.40	579.25	1,139.58	892.99	246.59	4.621	
8,900.00	6,988.44	6,981.87	6,980.34	66.24	212.02	-90.25	653.40	579.25	1,232.05	985.87	246.19	5.005	
9,000.00	6,988.54	6,981.96	6,980.44	69.08	212.02	-90.26	653.40	579.25	1,325.62	1,079.79	245.84	5.392	
9,100.00	6,988.63	6,982.06	6,980.53	71.94	212.03	-90.28	653.40	579.25	1,420.07	1,174.54	245.54	5.784	
9,200.00	6,988.73	6,982.16	6,980.63	74.81	212.03	-90.29	653.40	579.25	1,515.23	1,269.96	245.27	6.178	
9,300.00	6,988.82	6,982.26	6,980.73	77.71	212.03	-90.30	653.40	579.25	1,610.98	1,365.94	245.04	6.574	
9,400.00	6,988.92	6,982.36	6,980.83	80.61	212.04	-90.31	653.40	579.25	1,707.21	1,462.38	244.83	6.973	
9,500.00	6,989.01	6,982.46	6,980.93	83.53	212.04	-90.33	653.40	579.25	1,803.86	1,559.21	244.65	7.373	
9,600.00	6,989.11	6,982.56	6,981.03	86.45	212.04	-90.34	653.40	579.25	1,900.85	1,656.36	244.49	7.775	
9,700.00	6,989.20	6,982.66	6,981.13	89.39	212.05	-90.35	653.40	579.25	1,998.13	1,753.79	244.34	8.178	
9,800.00	6,989.30	6,982.76	6,981.23	92.34	212.05	-90.36	653.40	579.25	2,095.68	1,851.46	244.22	8.581	
9,900.00	6,989.39	6,982.85	6,981.33	95.29	212.05	-90.38	653.40	579.25	2,193.44	1,949.34	244.10	8.986	
10,000.00	6,989.48	6,982.95	6,981.43	98.25	212.05	-90.39	653.40	579.25	2,291.40	2,047.39	244.00	9.391	
10,100.00	6,989.58	6,983.05	6,981.52	101.22	212.06	-90.40	653.40	579.25	2,389.53	2,145.61	243.91	9.797	
10,200.00	6,989.67	6,983.15	6,981.62	104.19	212.06	-90.41	653.40	579.25	2,487.80	2,243.97	243.84	10.203	
10,300.00	6,989.77	6,983.25	6,981.72	107.17	212.06	-90.43	653.40	579.25	2,586.21	2,342.44	243.76	10.609	
10,400.00	6,989.86	6,983.35	6,981.82	110.16	212.07	-90.44	653.40	579.25	2,684.73	2,441.03	243.70	11.016	
10,500.00	6,989.96	6,983.45	6,981.92	113.15	212.07	-90.45	653.40	579.25	2,783.36	2,539.72	243.65	11.424	
10,600.00	6,990.05	6,983.55	6,982.02	116.14	212.07	-90.47	653.40	579.25	2,882.09	2,638.49	243.60	11.831	
10,700.00	6,990.15	6,983.65	6,982.12	119.14	212.08	-90.48	653.40	579.25	2,980.90	2,737.34	243.56	12.239	
10,800.00	6,990.24	6,983.75	6,982.22	122.14	212.08	-90.49	653.40	579.25	3,079.79	2,836.27	243.52	12.647	
10,900.00	6,990.34	6,983.84	6,982.32	125.15	212.08	-90.50	653.39	579.25	3,178.74	2,935.26	243.49	13.055	
11,000.00	6,990.43	6,983.94	6,982.42	128.16	212.08	-90.52	653.39	579.25	3,277.76	3,034.30	243.46	13.463	
11,100.00	6,990.52	6,984.04	6,982.51	131.17	212.09	-90.53	653.39	579.25	3,376.84	3,133.40	243.44	13.871	
11,200.00	6,990.62	6,984.14	6,982.61	134.18	212.09	-90.54	653.39	579.25	3,475.97	3,232.55	243.42	14.280	
11,300.00	6,990.71	6,984.24	6,982.71	137.20	212.09	-90.55	653.39	579.25	3,575.15	3,331.75	243.40	14.688	
11,400.00	6,990.81	6,984.34	6,982.81	140.22	212.10	-90.57	653.39	579.25	3,674.37	3,430.98	243.39	15.096	
11,500.00	6,990.90	6,984.44	6,982.91	143.24	212.10	-90.58	653.39	579.25	3,773.64	3,530.25	243.39	15.505	
11,600.00	6,991.00	6,984.54	6,983.01	146.27	212.10	-90.59	653.39	579.25	3,872.94	3,629.56	243.38	15.913	
11,700.00	6,991.09	6,984.64	6,983.11	149.29	212.11	-90.60	653.39	579.25	3,972.28	3,728.90	243.38	16.321	
11,800.00	6,991.19	6,984.74	6,983.21	152.32	212.11	-90.62	653.39	579.25	4,071.65	3,828.27	243.38	16.730	
11,900.00	6,991.28	6,984.84	6,983.31	155.35	212.11	-90.63	653.39	579.25	4,171.05	3,927.66	243.38	17.138	
12,000.00	6,991.38	6,984.94	6,983.41	158.38	212.11	-90.64	653.39	579.25	4,270.47	4,027.08	243.39	17.546	
12,100.00	6,991.47	6,985.03	6,983.51	161.41	212.12	-90.65	653.39	579.25	4,369.93	4,126.53	243.40	17.954	
12,200.00	6,991.56	6,985.13	6,983.61	164.45	212.12	-90.67	653.39	579.25	4,469.41	4,226.00	243.41	18.362	
12,300.00	6,991.66	6,985.23	6,983.70	167.49	212.12	-90.68	653.39	579.25	4,568.91	4,325.49	243.42	18.769	
12,400.00	6,991.75	6,985.33	6,983.80	170.52	212.13	-90.69	653.39	579.25	4,668.43	4,424.99	243.44	19.177	
12,500.00	6,991.85	6,985.43	6,983.90	173.56	212.13	-90.70	653.39	579.25	4,767.97	4,524.52	243.45	19.585	
12,600.00	6,991.94	6,985.53	6,984.00	176.60	212.13	-90.72	653.39	579.25	4,867.53	4,624.06	243.47	19.992	
12,700.00	6,992.04	6,985.63	6,984.10	179.64	212.14	-90.73	653.39	579.25	4,967.11	4,723.62	243.49	20.399	
12,800.00	6,992.13	6,985.73	6,984.20	182.68	212.14	-90.74	653.39	579.25	5,066.71	4,823.19	243.52	20.806	
12,900.00	6,992.23	6,985.83	6,984.30	185.73	212.14	-90.75	653.39	579.25	5,166.32	4,922.78	243.54	21.213	
13,000.00	6,992.32	6,985.93	6,984.40	188.77	212.14	-90.77	653.39	579.25	5,265.94	5,022.38	243.57	21.620	
13,100.00	6,992.42	6,986.03	6,984.50	191.82	212.15	-90.78	653.39	579.25	5,365.58	5,121.99	243.60	22.027	
13,200.00	6,992.51	6,986.13	6,984.60	194.86	212.15	-90.79	653.39	579.25	5,465.24	5,221.61	243.62	22.433	
13,300.00	6,992.60	6,986.23	6,984.70	197.91	212.15	-90.81	653.39	579.25	5,564.90	5,321.25	243.65	22.839	
13,400.00	6,992.70	6,986.32	6,984.80	200.96	212.16	-90.82	653.39	579.25	5,664.58	5,420.89	243.69	23.245	
13,500.00	6,992.79	6,986.42	6,984.90	204.01	212.16	-90.83	653.39	579.25	5,764.27	5,520.55	243.72	23.651	
13,600.00	6,992.89	6,986.52	6,985.00	207.05	212.16	-90.84	653.39	579.25	5,863.97	5,620.21	243.75	24.057	
13,700.00	6,992.98	6,986.62	6,985.09	210.10	212.17	-90.86	653.39	579.25	5,963.68	5,719.88	243.79	24.462	
13,800.00	6,993.08	6,986.72	6,985.19	213.16	212.17	-90.87	653.39	579.25	6,063.39	5,819.57	243.83	24.867	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #166B - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 102-INCLINOMETER

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,900.00	6,993.17	6,986.82	6,985.29	216.21	212.17	-90.88	653.39	579.25	6,163.12	5,919.25	243.87	25.272	
14,000.00	6,993.27	6,986.92	6,985.39	219.26	212.18	-90.89	653.39	579.25	6,262.86	6,018.95	243.91	25.677	
14,100.00	6,993.36	6,987.02	6,985.49	222.31	212.18	-90.91	653.39	579.25	6,362.60	6,118.65	243.95	26.082	
14,200.00	6,993.46	6,987.12	6,985.59	225.36	212.18	-90.92	653.39	579.25	6,462.36	6,218.37	243.99	26.486	
14,300.00	6,993.55	6,987.22	6,985.69	228.42	212.18	-90.93	653.39	579.25	6,562.12	6,318.08	244.03	26.890	
14,400.00	6,993.64	6,987.32	6,985.79	231.47	212.19	-90.94	653.39	579.25	6,661.88	6,417.80	244.08	27.294	
14,500.00	6,993.74	6,987.42	6,985.89	234.53	212.19	-90.96	653.39	579.25	6,761.66	6,517.53	244.12	27.698	
14,600.00	6,993.83	6,987.52	6,985.99	237.58	212.19	-90.97	653.39	579.25	6,861.44	6,617.27	244.17	28.101	
14,700.00	6,993.93	6,987.62	6,986.09	240.64	212.20	-90.98	653.39	579.25	6,961.22	6,717.01	244.22	28.504	
14,800.00	6,994.02	6,987.72	6,986.19	243.69	212.20	-90.99	653.39	579.25	7,061.02	6,816.75	244.27	28.907	
14,900.00	6,994.12	6,987.82	6,986.29	246.75	212.20	-91.01	653.39	579.25	7,160.82	6,916.50	244.32	29.310	
15,000.00	6,994.21	6,987.92	6,986.39	249.81	212.21	-91.02	653.39	579.25	7,260.62	7,016.25	244.37	29.712	
15,100.00	6,994.31	6,988.01	6,986.49	252.86	212.21	-91.03	653.39	579.25	7,360.43	7,116.01	244.42	30.114	
15,200.00	6,994.40	6,988.11	6,986.59	255.92	212.21	-91.05	653.39	579.25	7,460.24	7,215.77	244.47	30.516	
15,300.00	6,994.50	6,988.21	6,986.69	258.98	212.21	-91.06	653.39	579.25	7,560.06	7,315.54	244.53	30.917	
15,400.00	6,994.59	6,988.31	6,986.79	262.04	212.22	-91.07	653.39	579.25	7,659.89	7,415.31	244.58	31.318	
15,500.00	6,994.68	6,988.41	6,986.88	265.10	212.22	-91.08	653.39	579.25	7,759.72	7,515.08	244.64	31.719	
15,600.00	6,994.78	6,988.51	6,986.98	268.16	212.22	-91.10	653.39	579.25	7,859.55	7,614.86	244.69	32.120	
15,700.00	6,994.87	6,988.61	6,987.08	271.22	212.23	-91.11	653.38	579.25	7,959.39	7,714.64	244.75	32.520	
15,800.00	6,994.97	6,988.71	6,987.18	274.28	212.23	-91.12	653.38	579.25	8,059.23	7,814.42	244.81	32.921	
15,900.00	6,995.06	6,988.81	6,987.28	277.34	212.23	-91.13	653.38	579.25	8,159.08	7,914.21	244.87	33.320	
16,000.00	6,995.16	6,988.91	6,987.38	280.40	212.24	-91.15	653.38	579.25	8,258.92	8,014.00	244.93	33.720	
16,100.00	6,995.25	6,989.01	6,987.48	283.46	212.24	-91.16	653.38	579.25	8,358.78	8,113.79	244.99	34.119	
16,200.00	6,995.35	6,989.11	6,987.58	286.52	212.24	-91.17	653.38	579.25	8,458.63	8,213.58	245.05	34.518	
16,300.00	6,995.44	6,989.21	6,987.68	289.58	212.24	-91.18	653.38	579.25	8,558.49	8,313.38	245.11	34.917	
16,400.00	6,995.54	6,989.31	6,987.78	292.64	212.25	-91.20	653.38	579.25	8,658.36	8,413.18	245.18	35.315	
16,500.00	6,995.63	6,989.41	6,987.88	295.70	212.25	-91.21	653.38	579.25	8,758.22	8,512.98	245.24	35.713	
16,600.00	6,995.72	6,989.51	6,987.98	298.76	212.25	-91.22	653.38	579.25	8,858.09	8,612.79	245.30	36.111	
16,700.00	6,995.82	6,989.61	6,988.08	301.83	212.26	-91.24	653.38	579.25	8,957.96	8,712.59	245.37	36.508	
16,800.00	6,995.91	6,989.71	6,988.18	304.89	212.26	-91.25	653.38	579.25	9,057.84	8,812.40	245.44	36.905	
16,900.00	6,996.01	6,989.81	6,988.28	307.95	212.26	-91.26	653.38	579.25	9,157.71	8,912.21	245.50	37.302	
17,000.00	6,996.10	6,989.91	6,988.38	311.01	212.27	-91.27	653.38	579.25	9,257.59	9,012.02	245.57	37.698	
17,100.00	6,996.20	6,990.01	6,988.48	314.08	212.27	-91.29	653.38	579.25	9,357.48	9,111.84	245.64	38.094	
17,200.00	6,996.29	6,990.11	6,988.58	317.14	212.27	-91.30	653.38	579.25	9,457.36	9,211.65	245.71	38.490	
17,300.00	6,996.39	6,990.21	6,988.68	320.20	212.27	-91.31	653.38	579.25	9,557.25	9,311.47	245.78	38.886	
17,400.00	6,996.48	6,990.31	6,988.78	323.27	212.28	-91.32	653.38	579.25	9,657.14	9,411.29	245.85	39.281	
17,500.00	6,996.58	6,990.41	6,988.88	326.33	212.28	-91.34	653.38	579.25	9,757.03	9,511.11	245.92	39.676	
17,600.00	6,996.67	6,990.51	6,988.98	329.40	212.28	-91.35	653.38	579.25	9,856.92	9,610.93	245.99	40.070	
17,700.00	6,996.76	6,990.61	6,989.08	332.46	212.29	-91.36	653.38	579.25	9,956.82	9,710.76	246.07	40.464	

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #233A - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 349-MWD

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Rule Assigned: Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	4.02	4.02	0.00	0.01	106.12	-391.94	1,355.90	1,411.41				
100.00	100.00	104.41	104.41	0.36	0.19	106.12	-391.85	1,355.91	1,411.39	1,410.85	0.55	2,586.425	
200.00	200.00	204.79	204.79	0.72	0.37	106.11	-391.60	1,355.94	1,411.35	1,410.27	1.08	1,301.995	
300.00	300.00	305.18	305.18	1.08	0.55	106.09	-391.19	1,355.98	1,411.28	1,409.66	1.62	869.932	
375.99	375.99	380.00	380.00	1.35	0.74	106.08	-390.77	1,356.04	1,411.22	1,409.14	2.08	677.080 CC	
400.00	400.00	396.42	396.42	1.43	0.80	106.07	-390.66	1,356.11	1,411.28	1,409.05	2.23	633.231 ES	
500.00	500.00	461.38	461.36	1.79	1.02	106.04	-390.25	1,357.33	1,412.96	1,410.14	2.82	501.654	
600.00	600.00	518.27	518.18	2.15	1.23	106.01	-390.15	1,360.09	1,417.54	1,414.17	3.37	420.037	
700.00	700.00	580.51	580.24	2.51	1.46	105.95	-390.10	1,364.90	1,424.94	1,420.98	3.95	360.706	
800.00	800.00	643.06	642.46	2.87	1.68	105.88	-390.19	1,371.28	1,434.84	1,430.31	4.53	317.043	
900.00	900.00	701.71	700.58	3.23	1.91	105.80	-390.17	1,379.08	1,447.58	1,442.49	5.08	284.711	
1,000.00	1,000.00	761.56	759.66	3.58	2.15	105.68	-389.71	1,388.67	1,462.87	1,457.22	5.65	259.131	
1,100.00	1,099.98	812.00	809.16	3.94	2.37	172.05	-388.71	1,398.29	1,482.65	1,476.49	6.16	240.550	
1,200.00	1,199.84	887.64	882.92	4.29	2.72	171.72	-385.96	1,414.80	1,507.95	1,501.16	6.79	222.116	
1,266.26	1,265.88	939.49	933.24	4.53	2.96	171.47	-383.44	1,427.06	1,527.47	1,520.26	7.21	211.719	
1,300.00	1,299.47	971.12	963.88	4.65	3.12	171.34	-381.71	1,434.71	1,537.91	1,530.45	7.46	206.271	
1,400.00	1,399.04	1,080.89	1,070.29	5.01	3.68	170.90	-375.30	1,460.89	1,568.51	1,560.27	8.24	190.339	
1,500.00	1,498.61	1,183.00	1,169.80	5.37	4.18	170.64	-372.25	1,483.52	1,598.16	1,589.17	8.98	177.873	
1,600.00	1,598.18	1,258.33	1,243.22	5.74	4.56	170.50	-371.50	1,500.35	1,628.47	1,618.87	9.60	169.572	
1,700.00	1,697.74	1,368.13	1,350.03	6.11	5.13	170.26	-369.31	1,525.70	1,659.34	1,648.95	10.39	159.701	
1,800.00	1,797.31	1,478.70	1,457.90	6.49	5.69	170.01	-366.16	1,549.79	1,688.72	1,677.53	11.18	150.994	
1,900.00	1,896.88	1,584.87	1,561.59	6.86	6.22	169.76	-362.66	1,572.34	1,717.52	1,705.56	11.96	143.626	
2,000.00	1,996.45	1,642.67	1,618.05	7.24	6.52	169.66	-361.43	1,584.61	1,746.83	1,734.33	12.50	139.782	
2,100.00	2,096.02	1,683.00	1,657.11	7.61	6.74	169.57	-360.51	1,594.62	1,779.15	1,766.21	12.94	137.502	
2,200.00	2,195.59	1,830.67	1,800.42	7.99	7.53	169.23	-355.74	1,629.87	1,810.07	1,796.13	13.94	129.840	
2,300.00	2,295.16	1,980.33	1,946.47	8.37	8.29	168.92	-350.53	1,662.03	1,838.98	1,824.04	14.94	123.094	
2,400.00	2,394.72	2,058.00	2,022.56	8.75	8.67	168.84	-350.13	1,677.60	1,867.35	1,851.78	15.57	119.942	
2,500.00	2,494.29	2,122.00	2,085.09	9.13	8.99	168.80	-350.51	1,691.24	1,897.12	1,881.00	16.13	117.637	
2,600.00	2,593.86	2,201.69	2,162.68	9.51	9.41	168.73	-350.84	1,709.43	1,928.27	1,911.51	16.77	115.016	
2,700.00	2,693.43	2,298.48	2,256.83	9.90	9.92	168.60	-349.42	1,731.82	1,959.38	1,941.88	17.50	111.975	
2,800.00	2,793.00	2,425.52	2,380.55	10.28	10.59	168.41	-347.07	1,760.55	1,989.95	1,971.56	18.39	108.202	
2,900.00	2,892.57	2,508.88	2,461.93	10.66	11.02	168.32	-346.22	1,778.59	2,019.76	2,000.71	19.05	106.020	
3,000.00	2,992.13	2,581.08	2,532.17	11.05	11.40	168.22	-344.66	1,795.22	2,050.66	2,031.00	19.65	104.335	
3,100.00	3,091.70	2,679.29	2,627.49	11.43	11.93	168.05	-341.85	1,818.67	2,082.28	2,061.87	20.40	102.061	
3,200.00	3,191.27	3,105.00	3,047.47	11.81	13.79	167.68	-333.04	1,883.82	2,105.30	2,082.69	22.62	93.089	
3,300.00	3,290.84	3,147.00	3,089.35	12.20	13.94	167.67	-332.35	1,886.96	2,122.10	2,098.99	23.11	91.830	
3,400.00	3,390.41	3,147.00	3,089.35	12.58	13.94	167.67	-332.35	1,886.96	2,143.02	2,119.62	23.41	91.552 SF	
3,500.00	3,489.98	3,147.00	3,089.35	12.97	13.94	167.67	-332.35	1,886.96	2,168.36	2,144.70	23.66	91.642	
3,600.00	3,589.54	3,147.00	3,089.35	13.35	13.94	167.67	-332.35	1,886.96	2,197.96	2,174.09	23.87	92.076	
3,700.00	3,689.11	3,147.00	3,089.35	13.74	13.94	167.67	-332.35	1,886.96	2,231.66	2,207.62	24.04	92.830	
3,800.00	3,788.68	3,147.00	3,089.35	14.12	13.94	167.67	-332.35	1,886.96	2,269.26	2,245.09	24.17	93.881	
3,900.00	3,888.25	3,147.00	3,089.35	14.51	13.94	167.67	-332.35	1,886.96	2,310.58	2,286.31	24.27	95.209	
4,000.00	3,987.82	3,147.00	3,089.35	14.89	13.94	167.67	-332.35	1,886.96	2,355.42	2,331.09	24.33	96.793	
4,100.00	4,087.39	3,147.00	3,089.35	15.28	13.94	167.67	-332.35	1,886.96	2,403.59	2,379.22	24.37	98.614	
4,200.00	4,186.95	3,147.00	3,089.35	15.67	13.94	167.67	-332.35	1,886.96	2,454.90	2,430.51	24.39	100.654	
4,300.00	4,286.52	3,147.00	3,089.35	16.05	13.94	167.67	-332.35	1,886.96	2,509.13	2,484.75	24.39	102.896	
4,400.00	4,386.09	3,147.00	3,089.35	16.44	13.94	167.67	-332.35	1,886.96	2,566.13	2,541.76	24.36	105.322	
4,500.00	4,485.66	3,147.00	3,089.35	16.82	13.94	167.67	-332.35	1,886.96	2,625.69	2,601.36	24.33	107.917	
4,600.00	4,585.23	3,147.00	3,089.35	17.21	13.94	167.67	-332.35	1,886.96	2,687.65	2,663.37	24.29	110.667	
4,700.00	4,684.80	3,147.00	3,089.35	17.60	13.94	167.67	-332.35	1,886.96	2,751.86	2,727.63	24.23	113.557	
4,800.00	4,784.36	3,147.00	3,089.35	17.98	13.94	167.67	-332.35	1,886.96	2,818.15	2,793.98	24.18	116.572	
4,900.00	4,883.93	3,147.00	3,089.35	18.37	13.94	167.67	-332.35	1,886.96	2,886.39	2,862.27	24.11	119.701	

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

LOGOS RESOURCES II, LLC

Lonestar Consulting

Anticollision Report

LONESTAR CONSULTING

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #233A - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 349-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
5,000.00	4,983.50	3,147.00	3,089.35	18.76	13.94	167.67	-332.35	1,886.96	2,956.43	2,932.38	24.05	122.930	
5,100.00	5,083.07	3,147.00	3,089.35	19.14	13.94	167.67	-332.35	1,886.96	3,028.15	3,004.17	23.99	126.248	
5,200.00	5,182.64	3,147.00	3,089.35	19.53	13.94	167.67	-332.35	1,886.96	3,101.44	3,077.52	23.92	129.644	
5,300.00	5,282.21	3,147.00	3,089.35	19.92	13.94	167.67	-332.35	1,886.96	3,176.19	3,152.33	23.86	133.105	
5,400.00	5,381.78	3,147.00	3,089.35	20.30	13.94	167.67	-332.35	1,886.96	3,252.30	3,228.49	23.80	136.623	
5,500.00	5,481.34	3,147.00	3,089.35	20.69	13.94	167.67	-332.35	1,886.96	3,329.67	3,305.92	23.75	140.187	
5,600.00	5,580.91	3,147.00	3,089.35	21.08	13.94	167.67	-332.35	1,886.96	3,408.22	3,384.51	23.70	143.788	
5,700.00	5,680.48	3,147.00	3,089.35	21.47	13.94	167.67	-332.35	1,886.96	3,487.86	3,464.20	23.66	147.416	
5,800.00	5,780.05	3,147.00	3,089.35	21.85	13.94	167.67	-332.35	1,886.96	3,568.53	3,544.91	23.62	151.064	
5,900.00	5,879.62	3,147.00	3,089.35	22.24	13.94	167.67	-332.35	1,886.96	3,650.16	3,626.57	23.59	154.723	
6,000.00	5,979.19	3,147.00	3,089.35	22.63	13.94	167.67	-332.35	1,886.96	3,732.68	3,709.11	23.57	158.385	
6,100.00	6,078.75	3,147.00	3,089.35	23.02	13.94	167.67	-332.35	1,886.96	3,816.04	3,792.49	23.55	162.044	
6,200.00	6,178.32	3,147.00	3,089.35	23.40	13.94	167.67	-332.35	1,886.96	3,900.18	3,876.64	23.54	165.692	
6,300.00	6,277.89	3,147.00	3,089.35	23.79	13.94	167.67	-332.35	1,886.96	3,985.05	3,961.52	23.54	169.323	
6,318.49	6,296.30	3,147.00	3,089.35	23.86	13.94	167.67	-332.35	1,886.96	4,000.82	3,977.29	23.54	169.992	
6,350.00	6,327.73	3,147.00	3,089.35	23.98	13.94	144.91	-332.35	1,886.96	4,027.34	4,003.81	23.53	171.156	
6,400.00	6,377.68	3,147.00	3,089.35	24.15	13.94	49.02	-332.35	1,886.96	4,067.80	4,044.29	23.51	173.034	
6,450.00	6,427.47	3,147.00	3,089.35	24.29	13.94	24.48	-332.35	1,886.96	4,106.10	4,082.63	23.47	174.935	
6,500.00	6,476.79	3,147.00	3,089.35	24.42	13.94	17.55	-332.35	1,886.96	4,142.08	4,118.65	23.42	176.828	
6,550.00	6,525.33	3,147.00	3,089.35	24.54	13.94	14.24	-332.35	1,886.96	4,175.56	4,152.20	23.37	178.708	
6,600.00	6,572.79	3,147.00	3,089.35	24.65	13.94	12.25	-332.35	1,886.96	4,206.42	4,183.12	23.30	180.569	
6,650.00	6,618.89	3,147.00	3,089.35	24.75	13.94	10.91	-332.35	1,886.96	4,234.51	4,211.30	23.21	182.410	
6,700.00	6,663.33	3,147.00	3,089.35	24.84	13.94	9.95	-332.35	1,886.96	4,259.72	4,236.60	23.12	184.223	
6,750.00	6,705.84	3,147.00	3,089.35	24.94	13.94	9.23	-332.35	1,886.96	4,281.95	4,258.93	23.02	186.000	
6,800.00	6,746.17	3,147.00	3,089.35	25.04	13.94	8.68	-332.35	1,886.96	4,301.11	4,278.20	22.91	187.730	
6,850.00	6,784.06	3,147.00	3,089.35	25.16	13.94	8.25	-332.35	1,886.96	4,317.12	4,294.32	22.79	189.402	
6,900.00	6,819.27	3,147.00	3,089.35	25.30	13.94	7.92	-332.35	1,886.96	4,329.91	4,307.24	22.67	190.998	
6,950.00	6,851.60	3,147.00	3,089.35	25.48	13.94	7.66	-332.35	1,886.96	4,339.44	4,316.90	22.54	192.501	
7,000.00	6,880.84	3,147.00	3,089.35	25.70	13.94	7.47	-332.35	1,886.96	4,345.67	4,323.26	22.41	193.892	
7,050.00	6,906.82	3,147.00	3,089.35	25.99	13.94	7.33	-332.35	1,886.96	4,348.58	4,326.30	22.28	195.150	
7,100.00	6,929.36	3,147.00	3,089.35	26.33	13.94	7.24	-332.35	1,886.96	4,348.15	4,326.00	22.16	196.255	
7,150.00	6,948.34	3,147.00	3,089.35	26.75	13.94	7.20	-332.35	1,886.96	4,344.39	4,322.36	22.03	197.186	
7,200.00	6,963.63	3,147.00	3,089.35	27.24	13.94	7.20	-332.35	1,886.96	4,337.31	4,315.40	21.91	197.926	
7,250.00	6,975.15	3,147.00	3,089.35	27.80	13.94	7.25	-332.35	1,886.96	4,326.94	4,305.14	21.80	198.459	
7,300.00	6,982.81	3,147.00	3,089.35	28.43	13.94	7.34	-332.35	1,886.96	4,313.32	4,291.62	21.70	198.772	
7,350.00	6,986.58	3,147.00	3,089.35	29.11	13.94	7.47	-332.35	1,886.96	4,296.50	4,274.89	21.61	198.857	
7,372.48	6,987.00	3,147.00	3,089.35	29.44	13.94	7.55	-332.35	1,886.96	4,287.91	4,266.34	21.57	198.794	
7,400.00	6,987.03	3,147.00	3,089.35	29.85	13.94	7.55	-332.35	1,886.96	4,277.09	4,255.56	21.52	198.735	
7,500.00	6,987.12	3,147.00	3,089.35	31.50	13.94	7.55	-332.35	1,886.96	4,239.03	4,217.65	21.38	198.277	
7,600.00	6,987.22	3,147.00	3,089.35	33.34	13.94	7.55	-332.35	1,886.96	4,203.01	4,181.71	21.30	197.287	
7,700.00	6,987.31	3,147.00	3,089.35	35.36	13.94	7.55	-332.35	1,886.96	4,169.08	4,147.78	21.30	195.745	
7,800.00	6,987.40	3,147.00	3,089.35	37.52	13.94	7.55	-332.35	1,886.96	4,137.29	4,115.92	21.36	193.657	
7,900.00	6,987.50	3,147.00	3,089.35	39.81	13.94	7.55	-332.35	1,886.96	4,107.68	4,086.18	21.50	191.052	
8,000.00	6,987.59	3,147.00	3,089.35	42.19	13.94	7.55	-332.35	1,886.96	4,080.31	4,058.61	21.71	187.979	
8,100.00	6,987.69	3,147.00	3,089.35	44.65	13.94	7.55	-332.35	1,886.96	4,055.23	4,033.25	21.98	184.502	
8,200.00	6,987.78	3,147.00	3,089.35	47.19	13.94	7.55	-332.35	1,886.96	4,032.47	4,010.15	22.32	180.698	
8,300.00	6,987.88	3,147.00	3,089.35	49.79	13.94	7.55	-332.35	1,886.96	4,012.07	3,989.36	22.71	176.647	
8,400.00	6,987.97	3,147.00	3,089.35	52.44	13.94	7.55	-332.35	1,886.96	3,994.07	3,970.91	23.16	172.427	
8,500.00	6,988.07	3,147.00	3,089.35	55.13	13.94	7.55	-332.35	1,886.96	3,978.51	3,954.84	23.67	168.111	
8,600.00	6,988.16	3,147.00	3,089.35	57.87	13.94	7.55	-332.35	1,886.96	3,965.41	3,941.19	24.21	163.767	
8,700.00	6,988.26	3,147.00	3,089.35	60.63	13.94	7.55	-332.35	1,886.96	3,954.79	3,929.99	24.80	159.451	
8,800.00	6,988.35	3,147.00	3,089.35	63.42	13.94	7.55	-332.35	1,886.96	3,946.68	3,921.25	25.43	155.210	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #233A - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 349-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,900.00	6,988.44	3,147.00	3,089.35	66.24	13.94	7.55	-332.35	1,886.96	3,941.09	3,915.01	26.09	151.082	
9,000.00	6,988.54	3,147.00	3,089.35	69.08	13.94	7.55	-332.35	1,886.96	3,938.04	3,911.26	26.77	147.095	
9,070.42	6,988.61	3,147.00	3,089.35	71.09	13.94	7.55	-332.35	1,886.96	3,937.41	3,910.14	27.27	144.380	
9,100.00	6,988.63	3,147.00	3,089.35	71.94	13.94	7.55	-332.35	1,886.96	3,937.52	3,910.03	27.48	143.271	
9,200.00	6,988.73	3,147.00	3,089.35	74.81	13.94	7.55	-332.35	1,886.96	3,939.54	3,911.32	28.22	139.625	
9,300.00	6,988.82	3,147.00	3,089.35	77.71	13.94	7.55	-332.35	1,886.96	3,944.09	3,915.13	28.97	136.166	
9,400.00	6,988.92	3,147.00	3,089.35	80.61	13.94	7.55	-332.35	1,886.96	3,951.18	3,921.45	29.73	132.899	
9,500.00	6,989.01	3,147.00	3,089.35	83.53	13.94	7.55	-332.35	1,886.96	3,960.77	3,930.26	30.51	129.827	
9,600.00	6,989.11	3,147.00	3,089.35	86.45	13.94	7.55	-332.35	1,886.96	3,972.86	3,941.57	31.29	126.949	
9,700.00	6,989.20	3,147.00	3,089.35	89.39	13.94	7.55	-332.35	1,886.96	3,987.42	3,955.33	32.09	124.263	
9,800.00	6,989.30	3,147.00	3,089.35	92.34	13.94	7.55	-332.35	1,886.96	4,004.43	3,971.54	32.89	121.766	
9,900.00	6,989.39	3,147.00	3,089.35	95.29	13.94	7.55	-332.35	1,886.96	4,023.85	3,990.16	33.69	119.452	
10,000.00	6,989.48	3,147.00	3,089.35	98.25	13.94	7.55	-332.35	1,886.96	4,045.65	4,011.17	34.49	117.316	
10,100.00	6,989.58	3,147.00	3,089.35	101.22	13.94	7.55	-332.35	1,886.96	4,069.79	4,034.51	35.28	115.353	
10,200.00	6,989.67	3,147.00	3,089.35	104.19	13.94	7.55	-332.35	1,886.96	4,096.23	4,060.16	36.07	113.558	
10,300.00	6,989.77	3,147.00	3,089.35	107.17	13.94	7.55	-332.35	1,886.96	4,124.93	4,088.07	36.86	111.922	
10,400.00	6,989.86	3,147.00	3,089.35	110.16	13.94	7.55	-332.35	1,886.96	4,155.83	4,118.20	37.63	110.442	
10,500.00	6,989.96	3,147.00	3,089.35	113.15	13.94	7.55	-332.35	1,886.96	4,188.90	4,150.51	38.39	109.109	
10,600.00	6,990.05	3,147.00	3,089.35	116.14	13.94	7.55	-332.35	1,886.96	4,224.07	4,184.93	39.14	107.918	
10,700.00	6,990.15	3,147.00	3,089.35	119.14	13.94	7.55	-332.35	1,886.96	4,261.30	4,221.43	39.88	106.862	
10,800.00	6,990.24	3,147.00	3,089.35	122.14	13.94	7.55	-332.35	1,886.96	4,300.54	4,259.94	40.60	105.935	
10,900.00	6,990.34	3,147.00	3,089.35	125.15	13.94	7.55	-332.35	1,886.96	4,341.72	4,300.42	41.30	105.131	
11,000.00	6,990.43	3,147.00	3,089.35	128.16	13.94	7.55	-332.35	1,886.96	4,384.80	4,342.82	41.98	104.443	
11,100.00	6,990.52	3,147.00	3,089.35	131.17	13.94	7.55	-332.35	1,886.96	4,429.71	4,387.07	42.65	103.866	
11,200.00	6,990.62	3,147.00	3,089.35	134.18	13.94	7.55	-332.35	1,886.96	4,476.41	4,433.12	43.29	103.394	
11,300.00	6,990.71	3,147.00	3,089.35	137.20	13.94	7.55	-332.35	1,886.96	4,524.84	4,480.92	43.92	103.021	
11,400.00	6,990.81	3,147.00	3,089.35	140.22	13.94	7.55	-332.35	1,886.96	4,574.94	4,530.42	44.53	102.742	
11,500.00	6,990.90	3,147.00	3,089.35	143.24	13.94	7.55	-332.35	1,886.96	4,626.67	4,581.55	45.12	102.552	
11,600.00	6,991.00	3,147.00	3,089.35	146.27	13.94	7.55	-332.35	1,886.96	4,679.95	4,634.27	45.68	102.446	
11,700.00	6,991.09	3,147.00	3,089.35	149.29	13.94	7.55	-332.35	1,886.96	4,734.75	4,688.52	46.23	102.420	
11,800.00	6,991.19	3,147.00	3,089.35	152.32	13.94	7.55	-332.35	1,886.96	4,791.01	4,744.26	46.76	102.469	
11,900.00	6,991.28	3,147.00	3,089.35	155.35	13.94	7.55	-332.35	1,886.96	4,848.68	4,801.42	47.26	102.588	
12,000.00	6,991.38	3,147.00	3,089.35	158.38	13.94	7.55	-332.35	1,886.96	4,907.71	4,859.96	47.75	102.775	
12,100.00	6,991.47	3,147.00	3,089.35	161.41	13.94	7.55	-332.35	1,886.96	4,968.05	4,919.83	48.22	103.024	
12,200.00	6,991.56	3,147.00	3,089.35	164.45	13.94	7.55	-332.35	1,886.96	5,029.66	4,980.98	48.67	103.334	
12,300.00	6,991.66	3,147.00	3,089.35	167.49	13.94	7.55	-332.35	1,886.96	5,092.48	5,043.37	49.11	103.699	
12,400.00	6,991.75	3,147.00	3,089.35	170.52	13.94	7.55	-332.35	1,886.96	5,156.48	5,106.95	49.53	104.118	
12,500.00	6,991.85	3,147.00	3,089.35	173.56	13.94	7.55	-332.35	1,886.96	5,221.61	5,171.68	49.93	104.588	
12,600.00	6,991.94	3,147.00	3,089.35	176.60	13.94	7.55	-332.35	1,886.96	5,287.83	5,237.52	50.31	105.105	
12,700.00	6,992.04	3,147.00	3,089.35	179.64	13.94	7.55	-332.35	1,886.96	5,355.09	5,304.42	50.68	105.667	
12,800.00	6,992.13	3,147.00	3,089.35	182.68	13.94	7.55	-332.35	1,886.96	5,423.37	5,372.34	51.03	106.272	
12,900.00	6,992.23	3,147.00	3,089.35	185.73	13.94	7.55	-332.35	1,886.96	5,492.62	5,441.25	51.37	106.917	
13,000.00	6,992.32	3,147.00	3,089.35	188.77	13.94	7.55	-332.35	1,886.96	5,562.80	5,511.10	51.70	107.600	
13,100.00	6,992.42	3,147.00	3,089.35	191.82	13.94	7.55	-332.35	1,886.96	5,633.89	5,581.88	52.01	108.319	
13,200.00	6,992.51	3,147.00	3,089.35	194.86	13.94	7.55	-332.35	1,886.96	5,705.84	5,653.53	52.31	109.072	
13,300.00	6,992.60	3,147.00	3,089.35	197.91	13.94	7.55	-332.35	1,886.96	5,778.63	5,726.03	52.60	109.858	
13,400.00	6,992.70	3,147.00	3,089.35	200.96	13.94	7.55	-332.35	1,886.96	5,852.22	5,799.34	52.88	110.674	
13,500.00	6,992.79	3,147.00	3,089.35	204.01	13.94	7.55	-332.35	1,886.96	5,926.58	5,873.44	53.14	111.519	
13,600.00	6,992.89	3,147.00	3,089.35	207.05	13.94	7.55	-332.35	1,886.96	6,001.69	5,948.29	53.40	112.392	
13,700.00	6,992.98	3,147.00	3,089.35	210.10	13.94	7.55	-332.35	1,886.96	6,077.52	6,023.87	53.65	113.291	
13,800.00	6,993.08	3,147.00	3,089.35	213.16	13.94	7.55	-332.35	1,886.96	6,154.03	6,100.15	53.88	114.215	
13,900.00	6,993.17	3,147.00	3,089.35	216.21	13.94	7.55	-332.35	1,886.96	6,231.21	6,177.11	54.11	115.162	

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

Lonestar Consulting

Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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

Offset Design: Sec 30 T31N R5W Offsets - Rosa Unit #233A - OH - OH

Offset Site Error: 0.00 ft

Survey Program: 349-MWD

Rule Assigned:

Offset Well Error: 0.00 ft

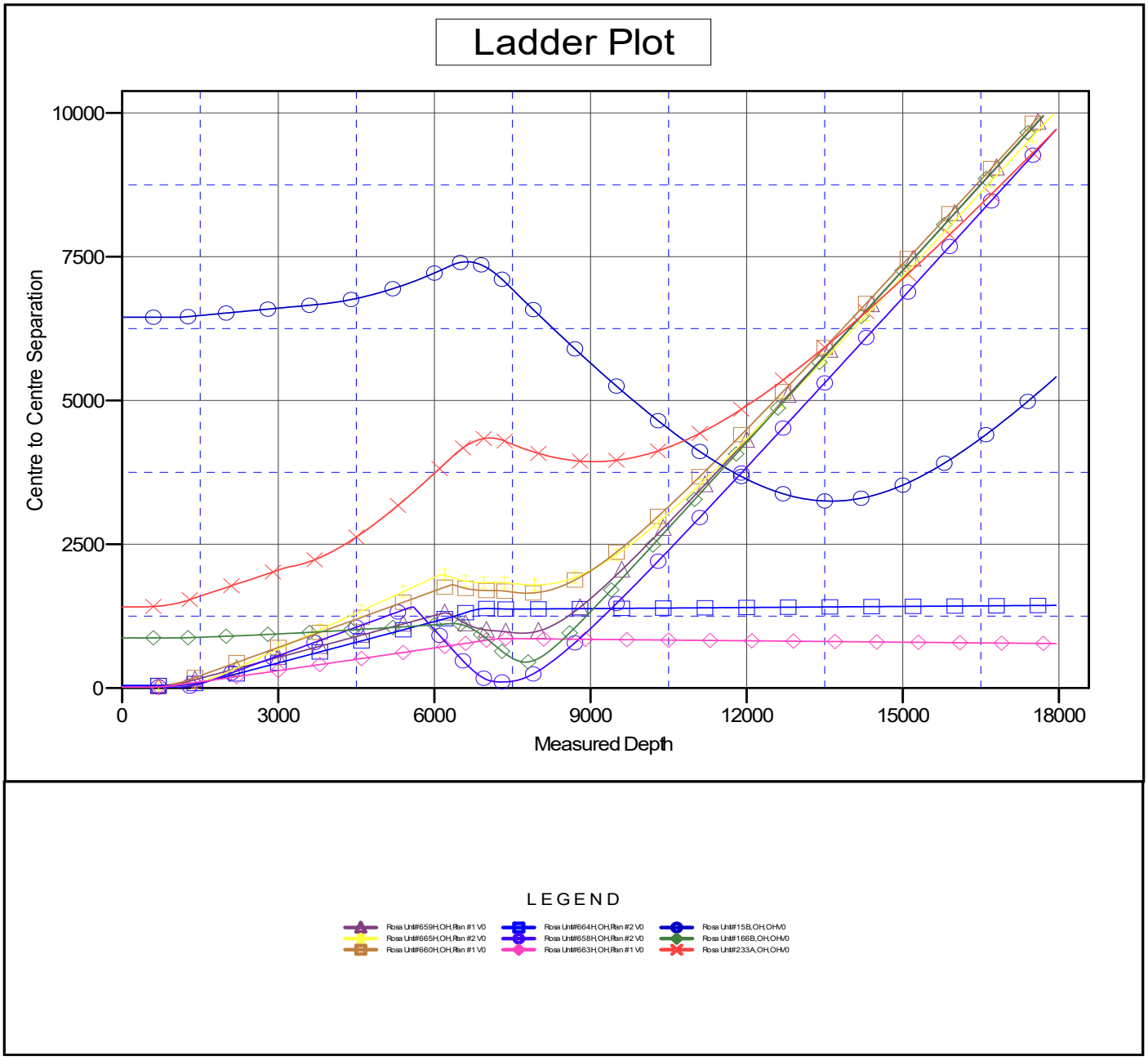
Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,000.00	6,993.27	3,147.00	3,089.35	219.26	13.94	7.55	-332.35	1,886.96	6,309.04	6,254.71	54.33	116.132	
14,100.00	6,993.36	3,147.00	3,089.35	222.31	13.94	7.55	-332.35	1,886.96	6,387.48	6,332.94	54.54	117.122	
14,200.00	6,993.46	3,147.00	3,089.35	225.36	13.94	7.55	-332.35	1,886.96	6,466.51	6,411.77	54.74	118.133	
14,300.00	6,993.55	3,147.00	3,089.35	228.42	13.94	7.55	-332.35	1,886.96	6,546.12	6,491.19	54.93	119.163	
14,400.00	6,993.64	3,147.00	3,089.35	231.47	13.94	7.55	-332.35	1,886.96	6,626.28	6,571.16	55.12	120.211	
14,500.00	6,993.74	3,147.00	3,089.35	234.53	13.94	7.55	-332.35	1,886.96	6,706.98	6,651.67	55.30	121.276	
14,600.00	6,993.83	3,147.00	3,089.35	237.58	13.94	7.55	-332.35	1,886.96	6,788.18	6,732.71	55.48	122.358	
14,700.00	6,993.93	3,147.00	3,089.35	240.64	13.94	7.55	-332.35	1,886.96	6,869.89	6,814.24	55.65	123.455	
14,800.00	6,994.02	3,147.00	3,089.35	243.69	13.94	7.55	-332.35	1,886.96	6,952.07	6,896.26	55.81	124.566	
14,900.00	6,994.12	3,147.00	3,089.35	246.75	13.94	7.55	-332.35	1,886.96	7,034.71	6,978.75	55.97	125.692	
15,000.00	6,994.21	3,147.00	3,089.35	249.81	13.94	7.55	-332.35	1,886.96	7,117.80	7,061.68	56.12	126.830	
15,100.00	6,994.31	3,147.00	3,089.35	252.86	13.94	7.55	-332.35	1,886.96	7,201.32	7,145.05	56.27	127.982	
15,200.00	6,994.40	3,147.00	3,089.35	255.92	13.94	7.55	-332.35	1,886.96	7,285.26	7,228.84	56.41	129.145	
15,300.00	6,994.50	3,147.00	3,089.35	258.98	13.94	7.55	-332.35	1,886.96	7,369.59	7,313.04	56.55	130.320	
15,400.00	6,994.59	3,147.00	3,089.35	262.04	13.94	7.55	-332.35	1,886.96	7,454.31	7,397.63	56.68	131.505	
15,500.00	6,994.68	3,147.00	3,089.35	265.10	13.94	7.55	-332.35	1,886.96	7,539.41	7,482.59	56.82	132.701	
15,600.00	6,994.78	3,147.00	3,089.35	268.16	13.94	7.55	-332.35	1,886.96	7,624.87	7,567.93	56.94	133.906	
15,700.00	6,994.87	3,147.00	3,089.35	271.22	13.94	7.55	-332.35	1,886.96	7,710.68	7,653.61	57.07	135.120	
15,800.00	6,994.97	3,147.00	3,089.35	274.28	13.94	7.55	-332.35	1,886.96	7,796.82	7,739.64	57.19	136.343	
15,900.00	6,995.06	3,147.00	3,089.35	277.34	13.94	7.55	-332.35	1,886.96	7,883.30	7,825.99	57.30	137.574	
16,000.00	6,995.16	3,147.00	3,089.35	280.40	13.94	7.55	-332.35	1,886.96	7,970.09	7,912.67	57.42	138.813	
16,100.00	6,995.25	3,147.00	3,089.35	283.46	13.94	7.55	-332.35	1,886.96	8,057.18	7,999.66	57.53	140.059	
16,200.00	6,995.35	3,147.00	3,089.35	286.52	13.94	7.55	-332.35	1,886.96	8,144.58	8,086.94	57.64	141.312	
16,300.00	6,995.44	3,147.00	3,089.35	289.58	13.94	7.55	-332.35	1,886.96	8,232.26	8,174.51	57.74	142.572	
16,400.00	6,995.54	3,147.00	3,089.35	292.64	13.94	7.55	-332.35	1,886.96	8,320.21	8,262.37	57.84	143.838	
16,500.00	6,995.63	3,147.00	3,089.35	295.70	13.94	7.55	-332.35	1,886.96	8,408.44	8,350.49	57.95	145.110	
16,600.00	6,995.72	3,147.00	3,089.35	298.76	13.94	7.55	-332.35	1,886.96	8,496.93	8,438.88	58.04	146.387	
16,700.00	6,995.82	3,147.00	3,089.35	301.83	13.94	7.55	-332.35	1,886.96	8,585.67	8,527.53	58.14	147.669	
16,800.00	6,995.91	3,147.00	3,089.35	304.89	13.94	7.55	-332.35	1,886.96	8,674.65	8,616.42	58.24	148.956	
16,900.00	6,996.01	3,147.00	3,089.35	307.95	13.94	7.55	-332.35	1,886.96	8,763.88	8,705.55	58.33	150.248	
17,000.00	6,996.10	3,147.00	3,089.35	311.01	13.94	7.55	-332.35	1,886.96	8,853.33	8,794.91	58.42	151.544	
17,100.00	6,996.20	3,147.00	3,089.35	314.08	13.94	7.55	-332.35	1,886.96	8,943.01	8,884.50	58.51	152.844	
17,200.00	6,996.29	3,147.00	3,089.35	317.14	13.94	7.55	-332.35	1,886.96	9,032.90	8,974.30	58.60	154.147	
17,300.00	6,996.39	3,147.00	3,089.35	320.20	13.94	7.55	-332.35	1,886.96	9,123.00	9,064.32	58.69	155.454	
17,400.00	6,996.48	3,147.00	3,089.35	323.27	13.94	7.55	-332.35	1,886.96	9,213.31	9,154.54	58.77	156.765	
17,500.00	6,996.58	3,147.00	3,089.35	326.33	13.94	7.55	-332.35	1,886.96	9,303.82	9,244.96	58.86	158.078	
17,600.00	6,996.67	3,147.00	3,089.35	329.40	13.94	7.55	-332.35	1,886.96	9,394.52	9,335.58	58.94	159.393	
17,700.00	6,996.76	3,147.00	3,089.35	332.46	13.94	7.55	-332.35	1,886.96	9,485.40	9,426.38	59.02	160.712	
17,800.00	6,996.86	3,147.00	3,089.35	335.52	13.94	7.55	-332.35	1,886.96	9,576.47	9,517.37	59.10	162.032	
17,900.00	6,996.95	3,147.00	3,089.35	338.59	13.94	7.55	-332.35	1,886.96	9,667.71	9,608.53	59.18	163.355	
17,948.87	6,997.00	3,147.00	3,089.35	340.09	13.94	7.55	-332.35	1,886.96	9,712.36	9,653.14	59.22	164.002	

Lonestar Consulting
Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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 6394' @ 6394.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #662H - Slot B2 (662H)
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.26°

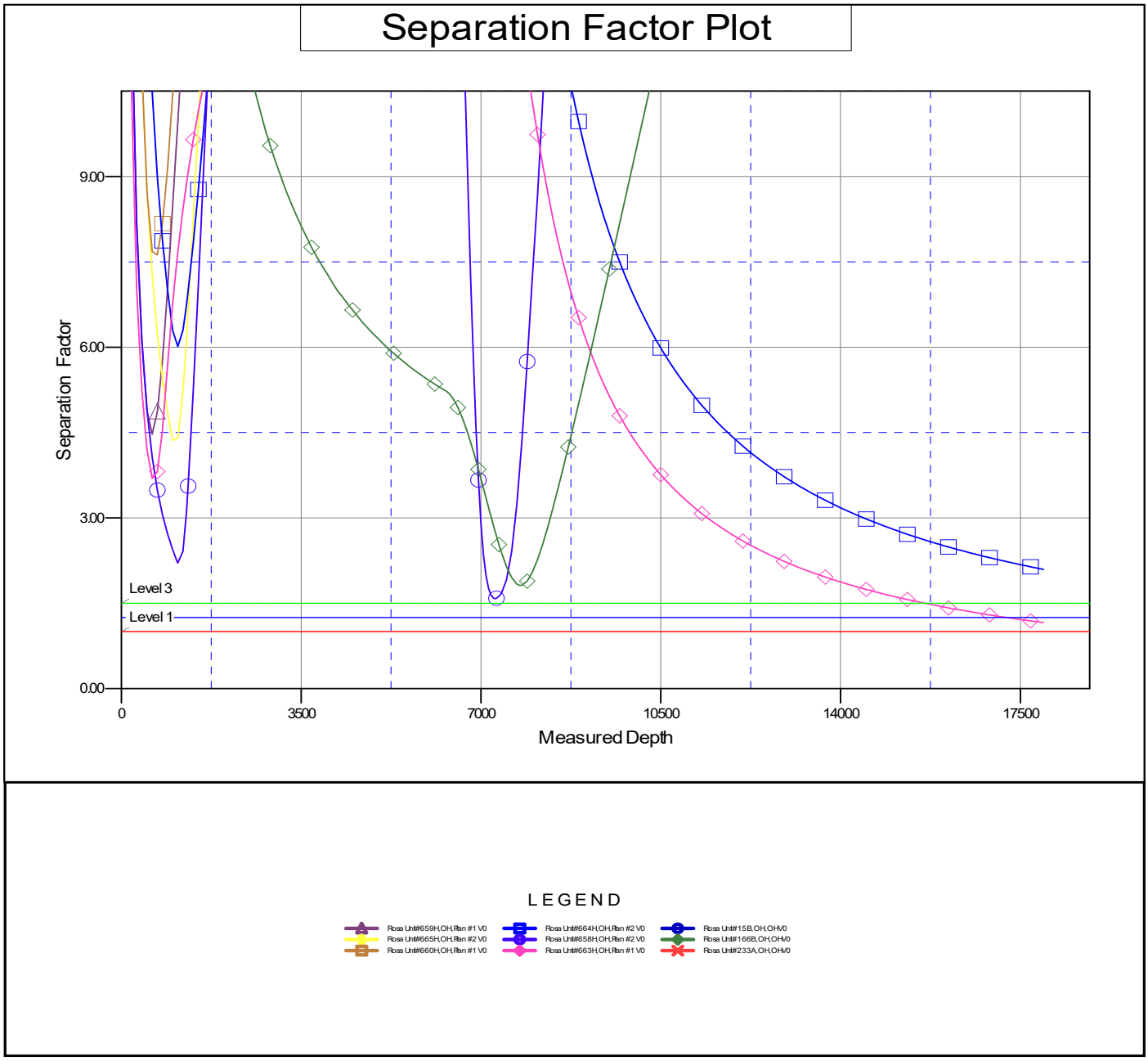


Lonestar Consulting
Anticollision Report

Company:	Logos Opersting LLC	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	**TVD Reference:**	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	**MD Reference:**	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	**North Reference:**	True
Reference Well:	Rosa Unit #662H	**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 6394' @ 6394.00ft
Offset Depths are relative to Offset Datum
Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #662H - Slot B2 (662H)
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.26°



LOGOS RESOURCES II, LLC

Company: Logos Opersting LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 30
Well: Rosa Unit #662H
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

LONESTAR CONSULTING

WELL DETAILS: Rosa Unit #662H

GL 6394' @ 6394.00ft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	2136165.14	2848512.74	36.8696679	-107.4045529	B2 (662H)

Plan: Plan #2 (Rosa Unit #662H/OH)

Created By: Janie Collins Date: 9:33, July 05 2021

Azimuths to True North
Magnetic North: 10.83°
Magnetic Field
Strength: 51652.0nT
Dip Angle: 63.23°
Date: 12/31/2021
Model: IGRF2020

DESIGN TARGET DETAILS

me	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
62H POE	6987.00	207.70	192.37	2136373.70	2848704.18	36.8702384	-107.4038952
2H BHL	6997.00	66.84	10767.82	2136280.32	2859280.13	36.8698458	-107.3677413

SECTION DETAILS

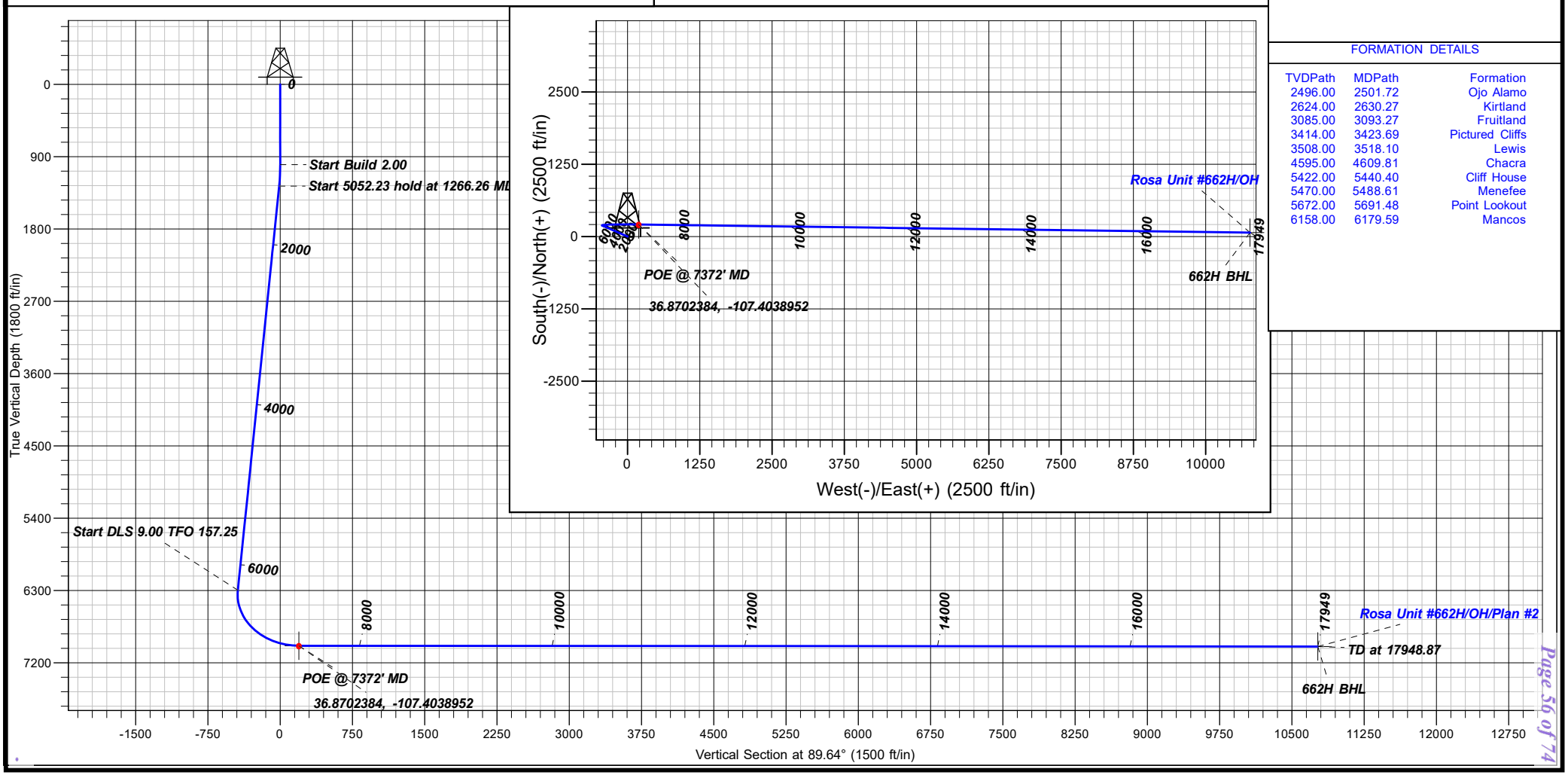
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00
1266.26	5.33	293.43	1265.88	4.92	-11.35	2.00	293.43	-11.31
6318.49	5.33	293.43	6296.30	191.36	-441.58	0.00	0.00	-440.38
7372.48	89.95	90.76	6987.00	207.70	192.37	9.00	157.25	193.66
17948.87	89.95	90.76	6997.00	66.84	10767.82	0.00	0.00	10768.02

CASING DETAILS

No casing data is available

FORMATION DETAILS

TVDPath	MDPath	Formation
2496.00	2501.72	Ojo Alamo
2624.00	2630.27	Kirtland
3085.00	3093.27	Fruitland
3414.00	3423.69	Pictured Cliffs
3508.00	3518.10	Lewis
4595.00	4609.81	Chacra
5422.00	5440.40	Cliff House
5470.00	5488.61	Menefee
5672.00	5691.48	Point Lookout
6158.00	6179.59	Mancos



Logos Opersting LLC

Rio Arriba, NM NAD83
Rosa Unit 30
Rosa Unit #662H - Slot B2 (662H)

OH

Plan: Plan #2

Standard Planning Report

05 July, 2021

LOGOS RESOURCES II, LLC

Lonestar Consulting

Planning Report

LONESTAR CONSULTING

Database:	EDM _16.0	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Opersting LLC	**TVD Reference:**	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	**MD Reference:**	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	**North Reference:**	True
Well:	Rosa Unit #662H	**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 30

Site Position:		**Northing:**	2,136,112.13 usft	**Latitude:**	36.8695220
From:	Lat/Long	**Easting:**	2,848,540.75 usft	**Longitude:**	-107.4044580
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in		

Well Rosa Unit #662H - Slot B2 (662H)

Well Position	**+N/-S**	0.00 ft	**Northing:**	2,136,165.13 usft	**Latitude:**	36.8696679
	+E/-W	0.00 ft	**Easting:**	2,848,512.75 usft	**Longitude:**	-107.4045529
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	6,394.00 ft
Grid Convergence:		0.26 °				

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2000	12/31/2004	10.80	63.86	51,652.04753061

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	89.64

Plan Survey Tool Program **Date** 7/5/2021

	Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,948.87	Plan #2 (OH)	MWD	
				MWD - Standard	

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	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,266.26	5.33	293.43	1,265.88	4.92	-11.35	2.00	2.00	0.00	293.43	
6,318.49	5.33	293.43	6,296.30	191.36	-441.58	0.00	0.00	0.00	0.00	
7,372.48	89.95	90.76	6,987.00	207.70	192.37	9.00	8.03	14.93	157.25	662H POE
17,948.87	89.95	90.76	6,997.00	66.84	10,767.82	0.00	0.00	0.00	0.00	662H BHL

LOGOS RESOURCES II, LLC

Lonestar Consulting

Planning Report

LONESTAR CONSULTING

Database:	EDM _16.0	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Opersting LLC	**TVD Reference:**	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	**MD Reference:**	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	**North Reference:**	True
Well:	Rosa Unit #662H	**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	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	2.00	293.43	1,099.98	0.69	-1.60	-1.60	2.00	2.00	0.00
1,200.00	4.00	293.43	1,199.84	2.77	-6.40	-6.39	2.00	2.00	0.00
1,266.26	5.33	293.43	1,265.88	4.92	-11.35	-11.31	2.00	2.00	0.00
1,300.00	5.33	293.43	1,299.47	6.16	-14.22	-14.18	0.00	0.00	0.00
1,400.00	5.33	293.43	1,399.04	9.85	-22.73	-22.67	0.00	0.00	0.00
1,500.00	5.33	293.43	1,498.61	13.54	-31.25	-31.17	0.00	0.00	0.00
1,600.00	5.33	293.43	1,598.18	17.23	-39.77	-39.66	0.00	0.00	0.00
1,700.00	5.33	293.43	1,697.74	20.92	-48.28	-48.15	0.00	0.00	0.00
1,800.00	5.33	293.43	1,797.31	24.61	-56.80	-56.64	0.00	0.00	0.00
1,900.00	5.33	293.43	1,896.88	28.30	-65.31	-65.14	0.00	0.00	0.00
2,000.00	5.33	293.43	1,996.45	31.99	-73.83	-73.63	0.00	0.00	0.00
2,100.00	5.33	293.43	2,096.02	35.68	-82.34	-82.12	0.00	0.00	0.00
2,200.00	5.33	293.43	2,195.59	39.37	-90.86	-90.61	0.00	0.00	0.00
2,300.00	5.33	293.43	2,295.16	43.06	-99.38	-99.11	0.00	0.00	0.00
2,400.00	5.33	293.43	2,394.72	46.75	-107.89	-107.60	0.00	0.00	0.00
2,500.00	5.33	293.43	2,494.29	50.44	-116.41	-116.09	0.00	0.00	0.00
2,600.00	5.33	293.43	2,593.86	54.13	-124.92	-124.58	0.00	0.00	0.00
2,700.00	5.33	293.43	2,693.43	57.82	-133.44	-133.08	0.00	0.00	0.00
2,800.00	5.33	293.43	2,793.00	61.51	-141.95	-141.57	0.00	0.00	0.00
2,900.00	5.33	293.43	2,892.57	65.20	-150.47	-150.06	0.00	0.00	0.00
3,000.00	5.33	293.43	2,992.13	68.90	-158.99	-158.56	0.00	0.00	0.00
3,100.00	5.33	293.43	3,091.70	72.59	-167.50	-167.05	0.00	0.00	0.00
3,200.00	5.33	293.43	3,191.27	76.28	-176.02	-175.54	0.00	0.00	0.00
3,300.00	5.33	293.43	3,290.84	79.97	-184.53	-184.03	0.00	0.00	0.00
3,400.00	5.33	293.43	3,390.41	83.66	-193.05	-192.53	0.00	0.00	0.00
3,500.00	5.33	293.43	3,489.98	87.35	-201.56	-201.02	0.00	0.00	0.00
3,600.00	5.33	293.43	3,589.54	91.04	-210.08	-209.51	0.00	0.00	0.00
3,700.00	5.33	293.43	3,689.11	94.73	-218.60	-218.00	0.00	0.00	0.00
3,800.00	5.33	293.43	3,788.68	98.42	-227.11	-226.50	0.00	0.00	0.00
3,900.00	5.33	293.43	3,888.25	102.11	-235.63	-234.99	0.00	0.00	0.00
4,000.00	5.33	293.43	3,987.82	105.80	-244.14	-243.48	0.00	0.00	0.00
4,100.00	5.33	293.43	4,087.39	109.49	-252.66	-251.97	0.00	0.00	0.00
4,200.00	5.33	293.43	4,186.95	113.18	-261.17	-260.47	0.00	0.00	0.00
4,300.00	5.33	293.43	4,286.52	116.87	-269.69	-268.96	0.00	0.00	0.00
4,400.00	5.33	293.43	4,386.09	120.56	-278.21	-277.45	0.00	0.00	0.00
4,500.00	5.33	293.43	4,485.66	124.25	-286.72	-285.95	0.00	0.00	0.00
4,600.00	5.33	293.43	4,585.23	127.94	-295.24	-294.44	0.00	0.00	0.00
4,700.00	5.33	293.43	4,684.80	131.63	-303.75	-302.93	0.00	0.00	0.00
4,800.00	5.33	293.43	4,784.36	135.32	-312.27	-311.42	0.00	0.00	0.00
4,900.00	5.33	293.43	4,883.93	139.01	-320.79	-319.92	0.00	0.00	0.00
5,000.00	5.33	293.43	4,983.50	142.70	-329.30	-328.41	0.00	0.00	0.00
5,100.00	5.33	293.43	5,083.07	146.39	-337.82	-336.90	0.00	0.00	0.00
5,200.00	5.33	293.43	5,182.64	150.08	-346.33	-345.39	0.00	0.00	0.00

LOGOS RESOURCES II, LLC

Lonestar Consulting

Planning Report

LONESTAR CONSULTING

Database:	EDM _16.0	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Opersting LLC	**TVD Reference:**	GL 6394' @ 6394.00ft
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Site:	Rosa Unit 30	**North Reference:**	True
Well:	Rosa Unit #662H	**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	5.33	293.43	5,282.21	153.77	-354.85	-353.89	0.00	0.00	0.00
5,400.00	5.33	293.43	5,381.78	157.46	-363.36	-362.38	0.00	0.00	0.00
5,500.00	5.33	293.43	5,481.34	161.15	-371.88	-370.87	0.00	0.00	0.00
5,600.00	5.33	293.43	5,580.91	164.84	-380.40	-379.36	0.00	0.00	0.00
5,700.00	5.33	293.43	5,680.48	168.53	-388.91	-387.86	0.00	0.00	0.00
5,800.00	5.33	293.43	5,780.05	172.22	-397.43	-396.35	0.00	0.00	0.00
5,900.00	5.33	293.43	5,879.62	175.91	-405.94	-404.84	0.00	0.00	0.00
6,000.00	5.33	293.43	5,979.19	179.60	-414.46	-413.34	0.00	0.00	0.00
6,100.00	5.33	293.43	6,078.75	183.29	-422.97	-421.83	0.00	0.00	0.00
6,200.00	5.33	293.43	6,178.32	186.98	-431.49	-430.32	0.00	0.00	0.00
6,300.00	5.33	293.43	6,277.89	190.67	-440.01	-438.81	0.00	0.00	0.00
6,318.49	5.33	293.43	6,296.30	191.36	-441.58	-440.38	0.00	0.00	0.00
6,400.00	3.18	50.45	6,377.68	194.30	-443.31	-442.10	9.00	-2.63	143.58
6,500.00	11.60	80.69	6,476.79	197.70	-431.22	-429.99	9.00	8.43	30.24
6,600.00	20.52	85.26	6,572.79	200.78	-403.77	-402.52	9.00	8.92	4.57
6,700.00	29.49	87.12	6,663.33	203.47	-361.64	-360.37	9.00	8.97	1.86
6,800.00	38.47	88.17	6,746.17	205.70	-305.85	-304.57	9.00	8.98	1.05
6,900.00	47.46	88.88	6,819.27	207.42	-237.79	-236.50	9.00	8.99	0.70
7,000.00	56.45	89.40	6,880.84	208.58	-159.14	-157.84	9.00	8.99	0.52
7,100.00	65.44	89.82	6,929.36	209.16	-71.81	-70.51	9.00	8.99	0.42
7,200.00	74.43	90.19	6,963.63	209.13	22.02	23.32	9.00	8.99	0.37
7,300.00	83.43	90.53	6,982.81	208.51	120.06	121.35	9.00	8.99	0.34
7,372.48	89.95	90.76	6,987.00	207.70	192.37	193.66	9.00	8.99	0.32
7,400.00	89.95	90.76	6,987.03	207.33	219.89	221.17	0.00	0.00	0.00
7,500.00	89.95	90.76	6,987.12	206.00	319.88	321.15	0.00	0.00	0.00
7,600.00	89.95	90.76	6,987.22	204.67	419.87	421.14	0.00	0.00	0.00
7,700.00	89.95	90.76	6,987.31	203.34	519.86	521.12	0.00	0.00	0.00
7,800.00	89.95	90.76	6,987.40	202.01	619.86	621.10	0.00	0.00	0.00
7,900.00	89.95	90.76	6,987.50	200.67	719.85	721.08	0.00	0.00	0.00
8,000.00	89.95	90.76	6,987.59	199.34	819.84	821.06	0.00	0.00	0.00
8,100.00	89.95	90.76	6,987.69	198.01	919.83	921.04	0.00	0.00	0.00
8,200.00	89.95	90.76	6,987.78	196.68	1,019.82	1,021.02	0.00	0.00	0.00
8,300.00	89.95	90.76	6,987.88	195.35	1,119.81	1,121.00	0.00	0.00	0.00
8,400.00	89.95	90.76	6,987.97	194.01	1,219.80	1,220.98	0.00	0.00	0.00
8,500.00	89.95	90.76	6,988.07	192.68	1,319.79	1,320.96	0.00	0.00	0.00
8,600.00	89.95	90.76	6,988.16	191.35	1,419.78	1,420.94	0.00	0.00	0.00
8,700.00	89.95	90.76	6,988.26	190.02	1,519.77	1,520.93	0.00	0.00	0.00
8,800.00	89.95	90.76	6,988.35	188.69	1,619.77	1,620.91	0.00	0.00	0.00
8,900.00	89.95	90.76	6,988.44	187.35	1,719.76	1,720.89	0.00	0.00	0.00
9,000.00	89.95	90.76	6,988.54	186.02	1,819.75	1,820.87	0.00	0.00	0.00
9,100.00	89.95	90.76	6,988.63	184.69	1,919.74	1,920.85	0.00	0.00	0.00
9,200.00	89.95	90.76	6,988.73	183.36	2,019.73	2,020.83	0.00	0.00	0.00
9,300.00	89.95	90.76	6,988.82	182.03	2,119.72	2,120.81	0.00	0.00	0.00
9,400.00	89.95	90.76	6,988.92	180.70	2,219.71	2,220.79	0.00	0.00	0.00
9,500.00	89.95	90.76	6,989.01	179.36	2,319.70	2,320.77	0.00	0.00	0.00
9,600.00	89.95	90.76	6,989.11	178.03	2,419.69	2,420.75	0.00	0.00	0.00
9,700.00	89.95	90.76	6,989.20	176.70	2,519.69	2,520.73	0.00	0.00	0.00
9,800.00	89.95	90.76	6,989.30	175.37	2,619.68	2,620.71	0.00	0.00	0.00
9,900.00	89.95	90.76	6,989.39	174.04	2,719.67	2,720.70	0.00	0.00	0.00
10,000.00	89.95	90.76	6,989.48	172.70	2,819.66	2,820.68	0.00	0.00	0.00
10,100.00	89.95	90.76	6,989.58	171.37	2,919.65	2,920.66	0.00	0.00	0.00
10,200.00	89.95	90.76	6,989.67	170.04	3,019.64	3,020.64	0.00	0.00	0.00
10,300.00	89.95	90.76	6,989.77	168.71	3,119.63	3,120.62	0.00	0.00	0.00
10,400.00	89.95	90.76	6,989.86	167.38	3,219.62	3,220.60	0.00	0.00	0.00

LOGOS RESOURCES II, LLC

Lonestar Consulting

Planning Report

LONESTAR CONSULTING

Database:	EDM _16.0	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Opersting LLC	**TVD Reference:**	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	**MD Reference:**	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	**North Reference:**	True
Well:	Rosa Unit #662H	**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	89.95	90.76	6,989.96	166.04	3,319.61	3,320.58	0.00	0.00	0.00
10,600.00	89.95	90.76	6,990.05	164.71	3,419.61	3,420.56	0.00	0.00	0.00
10,700.00	89.95	90.76	6,990.15	163.38	3,519.60	3,520.54	0.00	0.00	0.00
10,800.00	89.95	90.76	6,990.24	162.05	3,619.59	3,620.52	0.00	0.00	0.00
10,900.00	89.95	90.76	6,990.34	160.72	3,719.58	3,720.50	0.00	0.00	0.00
11,000.00	89.95	90.76	6,990.43	159.39	3,819.57	3,820.49	0.00	0.00	0.00
11,100.00	89.95	90.76	6,990.52	158.05	3,919.56	3,920.47	0.00	0.00	0.00
11,200.00	89.95	90.76	6,990.62	156.72	4,019.55	4,020.45	0.00	0.00	0.00
11,300.00	89.95	90.76	6,990.71	155.39	4,119.54	4,120.43	0.00	0.00	0.00
11,400.00	89.95	90.76	6,990.81	154.06	4,219.53	4,220.41	0.00	0.00	0.00
11,500.00	89.95	90.76	6,990.90	152.73	4,319.53	4,320.39	0.00	0.00	0.00
11,600.00	89.95	90.76	6,991.00	151.39	4,419.52	4,420.37	0.00	0.00	0.00
11,700.00	89.95	90.76	6,991.09	150.06	4,519.51	4,520.35	0.00	0.00	0.00
11,800.00	89.95	90.76	6,991.19	148.73	4,619.50	4,620.33	0.00	0.00	0.00
11,900.00	89.95	90.76	6,991.28	147.40	4,719.49	4,720.31	0.00	0.00	0.00
12,000.00	89.95	90.76	6,991.38	146.07	4,819.48	4,820.29	0.00	0.00	0.00
12,100.00	89.95	90.76	6,991.47	144.73	4,919.47	4,920.28	0.00	0.00	0.00
12,200.00	89.95	90.76	6,991.56	143.40	5,019.46	5,020.26	0.00	0.00	0.00
12,300.00	89.95	90.76	6,991.66	142.07	5,119.45	5,120.24	0.00	0.00	0.00
12,400.00	89.95	90.76	6,991.75	140.74	5,219.45	5,220.22	0.00	0.00	0.00
12,500.00	89.95	90.76	6,991.85	139.41	5,319.44	5,320.20	0.00	0.00	0.00
12,600.00	89.95	90.76	6,991.94	138.08	5,419.43	5,420.18	0.00	0.00	0.00
12,700.00	89.95	90.76	6,992.04	136.74	5,519.42	5,520.16	0.00	0.00	0.00
12,800.00	89.95	90.76	6,992.13	135.41	5,619.41	5,620.14	0.00	0.00	0.00
12,900.00	89.95	90.76	6,992.23	134.08	5,719.40	5,720.12	0.00	0.00	0.00
13,000.00	89.95	90.76	6,992.32	132.75	5,819.39	5,820.10	0.00	0.00	0.00
13,100.00	89.95	90.76	6,992.42	131.42	5,919.38	5,920.08	0.00	0.00	0.00
13,200.00	89.95	90.76	6,992.51	130.08	6,019.37	6,020.07	0.00	0.00	0.00
13,300.00	89.95	90.76	6,992.60	128.75	6,119.36	6,120.05	0.00	0.00	0.00
13,400.00	89.95	90.76	6,992.70	127.42	6,219.36	6,220.03	0.00	0.00	0.00
13,500.00	89.95	90.76	6,992.79	126.09	6,319.35	6,320.01	0.00	0.00	0.00
13,600.00	89.95	90.76	6,992.89	124.76	6,419.34	6,419.99	0.00	0.00	0.00
13,700.00	89.95	90.76	6,992.98	123.42	6,519.33	6,519.97	0.00	0.00	0.00
13,800.00	89.95	90.76	6,993.08	122.09	6,619.32	6,619.95	0.00	0.00	0.00
13,900.00	89.95	90.76	6,993.17	120.76	6,719.31	6,719.93	0.00	0.00	0.00
14,000.00	89.95	90.76	6,993.27	119.43	6,819.30	6,819.91	0.00	0.00	0.00
14,100.00	89.95	90.76	6,993.36	118.10	6,919.29	6,919.89	0.00	0.00	0.00
14,200.00	89.95	90.76	6,993.46	116.77	7,019.28	7,019.87	0.00	0.00	0.00
14,300.00	89.95	90.76	6,993.55	115.43	7,119.28	7,119.86	0.00	0.00	0.00
14,400.00	89.95	90.76	6,993.64	114.10	7,219.27	7,219.84	0.00	0.00	0.00
14,500.00	89.95	90.76	6,993.74	112.77	7,319.26	7,319.82	0.00	0.00	0.00
14,600.00	89.95	90.76	6,993.83	111.44	7,419.25	7,419.80	0.00	0.00	0.00
14,700.00	89.95	90.76	6,993.93	110.11	7,519.24	7,519.78	0.00	0.00	0.00
14,800.00	89.95	90.76	6,994.02	108.77	7,619.23	7,619.76	0.00	0.00	0.00
14,900.00	89.95	90.76	6,994.12	107.44	7,719.22	7,719.74	0.00	0.00	0.00
15,000.00	89.95	90.76	6,994.21	106.11	7,819.21	7,819.72	0.00	0.00	0.00
15,100.00	89.95	90.76	6,994.31	104.78	7,919.20	7,919.70	0.00	0.00	0.00
15,200.00	89.95	90.76	6,994.40	103.45	8,019.20	8,019.68	0.00	0.00	0.00
15,300.00	89.95	90.76	6,994.50	102.11	8,119.19	8,119.66	0.00	0.00	0.00
15,400.00	89.95	90.76	6,994.59	100.78	8,219.18	8,219.64	0.00	0.00	0.00
15,500.00	89.95	90.76	6,994.68	99.45	8,319.17	8,319.63	0.00	0.00	0.00
15,600.00	89.95	90.76	6,994.78	98.12	8,419.16	8,419.61	0.00	0.00	0.00
15,700.00	89.95	90.76	6,994.87	96.79	8,519.15	8,519.59	0.00	0.00	0.00
15,800.00	89.95	90.76	6,994.97	95.46	8,619.14	8,619.57	0.00	0.00	0.00

LOGOS RESOURCES II, LLC

Lonestar Consulting

Planning Report

LONESTAR CONSULTING

Database:	EDM _16.0	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Opersting LLC	**TVD Reference:**	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	**MD Reference:**	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	**North Reference:**	True
Well:	Rosa Unit #662H	**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	89.95	90.76	6,995.06	94.12	8,719.13	8,719.55	0.00	0.00	0.00
16,000.00	89.95	90.76	6,995.16	92.79	8,819.12	8,819.53	0.00	0.00	0.00
16,100.00	89.95	90.76	6,995.25	91.46	8,919.12	8,919.51	0.00	0.00	0.00
16,200.00	89.95	90.76	6,995.35	90.13	9,019.11	9,019.49	0.00	0.00	0.00
16,300.00	89.95	90.76	6,995.44	88.80	9,119.10	9,119.47	0.00	0.00	0.00
16,400.00	89.95	90.76	6,995.54	87.46	9,219.09	9,219.45	0.00	0.00	0.00
16,500.00	89.95	90.76	6,995.63	86.13	9,319.08	9,319.43	0.00	0.00	0.00
16,600.00	89.95	90.76	6,995.72	84.80	9,419.07	9,419.42	0.00	0.00	0.00
16,700.00	89.95	90.76	6,995.82	83.47	9,519.06	9,519.40	0.00	0.00	0.00
16,800.00	89.95	90.76	6,995.91	82.14	9,619.05	9,619.38	0.00	0.00	0.00
16,900.00	89.95	90.76	6,996.01	80.80	9,719.04	9,719.36	0.00	0.00	0.00
17,000.00	89.95	90.76	6,996.10	79.47	9,819.04	9,819.34	0.00	0.00	0.00
17,100.00	89.95	90.76	6,996.20	78.14	9,919.03	9,919.32	0.00	0.00	0.00
17,200.00	89.95	90.76	6,996.29	76.81	10,019.02	10,019.30	0.00	0.00	0.00
17,300.00	89.95	90.76	6,996.39	75.48	10,119.01	10,119.28	0.00	0.00	0.00
17,400.00	89.95	90.76	6,996.48	74.15	10,219.00	10,219.26	0.00	0.00	0.00
17,500.00	89.95	90.76	6,996.58	72.81	10,318.99	10,319.24	0.00	0.00	0.00
17,600.00	89.95	90.76	6,996.67	71.48	10,418.98	10,419.22	0.00	0.00	0.00
17,700.00	89.95	90.76	6,996.76	70.15	10,518.97	10,519.21	0.00	0.00	0.00
17,800.00	89.95	90.76	6,996.86	68.82	10,618.96	10,619.19	0.00	0.00	0.00
17,900.00	89.95	90.76	6,996.95	67.49	10,718.95	10,719.17	0.00	0.00	0.00
17,948.87	89.95	90.76	6,997.00	66.84	10,767.82	10,768.02	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
662H POE - plan hits target center - Point	0.00	0.00	6,987.00	207.70	192.37	2,136,373.69	2,848,704.19	36.8702384	-107.4038953
662H BHL - plan hits target center - Point	0.00	0.00	6,997.00	66.84	10,767.82	2,136,280.32	2,859,280.13	36.8698458	-107.3677413

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,501.72	2,496.00	Ojo Alamo		0.00	0.00
2,630.27	2,624.00	Kirtland		0.00	0.00
3,093.27	3,085.00	Fruitland		0.00	0.00
3,423.69	3,414.00	Pictured Cliffs		0.00	0.00
3,518.10	3,508.00	Lewis		0.00	0.00
4,609.81	4,595.00	Chacra		0.00	0.00
5,440.40	5,422.00	Cliff House		0.00	0.00
5,488.61	5,470.00	Menefee		0.00	0.00
5,691.48	5,672.00	Point Lookout		0.00	0.00
6,179.59	6,158.00	Mancos		0.00	0.00

Lonestar Consulting

Planning Report

Database:	EDM _16.0	**Local Co-ordinate Reference:**	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Opersting LLC	**TVD Reference:**	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	**MD Reference:**	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	**North Reference:**	True
Well:	Rosa Unit #662H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
1,000.00	1,000.00	0.00	0.00	Start Build 2.00
1,266.26	1,265.88	4.92	-11.35	Start 5052.23 hold at 1266.26 MD
6,318.49	6,296.30	191.36	-441.58	Start DLS 9.00 TFO 157.25
7,372.48	6,987.00	207.70	192.37	POE @ 7372' MD
7,372.48	6,987.00	207.70	192.37	36.8702384, -107.4038952
17,948.87	6,997.00	66.84	10,767.82	TD at 17948.87

Logos Operating, LLC. Rosa Unit #662H and 664H

DOI-BLM-NM-F010-2022-0001-DNA

Conditions of Approval (COA)

– Design Features –

Logos Operating, LLC would adhere to the following Conditions of Approval (COAs) and follow the general design features and best management practices (BMPs).

Control of Waste

• Drilling of the horizontal lateral will be accomplished with water-based mud and/or oil-based mud. All cuttings will be placed in roll-off bins and hauled to Section 25 cuttings disposal. No blow pit will be used.

• If oil-based mud drilling is used, a closed-loop system will be used to minimize potential impacts to surface and groundwater quality. A 30-mil reinforced liner will be placed under the drill rig mats and all drilling machinery. This area will be enclosed by a containment berm and ditches, which will drain to sump areas for spill prevention and control. The containment berm will be ramped to allow access to the solids control area.

• Storage tanks will be sized to ensure confinement of all fluids and will provide sufficient freeboard to prevent uncontrolled releases.

• Drilling fluids will be stored on-site in aboveground storage tanks. Upon termination of drilling operations, the drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical. All residual fluids will be hauled to a commercial disposal facility.

• Green completion technology will be used.

• Any spills of non-freshwater fluids will be immediately cleaned up and removed to an approved disposal site.

• Portable toilets will be provided and maintained during construction, as needed.

• Garbage, trash, and other waste materials will be collected in a portable, self-contained, and fully enclosed trash container during drilling and completion operations. The accumulated trash will be removed, as needed, and will be disposed of at an authorized sanitary landfill. No trash will be buried or burned on location.

• Immediately after removal of the drilling and completion rigs, all debris and other waste materials not contained in the trash container will be cleaned up and removed from the well location.

• No chemicals subject to reporting under the Superfund Amendments and Reauthorization Act Title III in an amount equal to or greater than 10,000 pounds will be used, produced, stored, transported, or disposed annually in association with the drilling, testing, or completing of these wells.

• No extremely hazardous substances (as defined in 40 CFR 355) in threshold planning quantities will be used, produced, stored, transported, or disposed in association with the drilling, testing, or completing of these wells.

• Berms will be constructed around all storage facilities sufficient in size to contain the storage capacity of tanks. Berm walls will be compacted with appropriate equipment to assure containment.

Protection of Paleontological Resources

• If a paleontological site is discovered, the BLM would be notified and the site would be avoided by personnel, personal vehicles, and company equipment. Workers would be informed that it is illegal to collect, damage, or disturb some such resources, and that such activities are punishable by criminal and/or administrative penalties.

• Any paleontological resource discovery by the Holder, or any person working on their behalf on public or Federal land, shall be immediately reported to the Authorized Officer. The Holder shall suspend all operations in the immediate area of such discovery until given written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant scientific values. The Holder will be responsible for the cost of the evaluation. The results of further investigation will dictate site specific stipulations for avoidance or salvage of any potentially significant paleontological resources. Any decision as to proper mitigation measures will be made by the Authorized Officer, after consultation with the Holder.

Protection of Cultural Resources

• All BLM/FFO cultural resources stipulations will be followed as indicated in the Cultural Resource Records of Review. These stipulations may include, but are not limited to, temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, reduction and/or specific construction avoidance zones, and employee education. All employees, contractors, and sub-contractors of the project will be informed by the project proponent that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment. All employees, contractors, and sub-contractors of the project will also be informed that it is illegal to collect, damage, or disturb cultural resources and that such activities are punishable by criminal and/or administrative penalties under the provisions of the Archaeological Resources Protection Act. In the event of a discovery during construction, the project proponent will immediately stop all construction activities in the immediate vicinity of the discovery and then immediately notify the archaeological monitor, if present, or the BLM. The BLM will then evaluate or cause the site to be evaluated. Should a discovery be evaluated as significant (e.g., National Register, Native American Graves Protection and Repatriation Act, Archaeological Resources Protection Act), it will be protected in place until mitigating measures can be developed and implemented according to guidelines set by the BLM.

Protection of Flora and Fauna, including Special Status Species (SSS) and Livestock

• Horizontal drilling of multiple wells from one well pad will minimize the amount of surface disturbance, fugitive dust, and emissions.

• Temporary surface water lines will be implemented to minimize truck traffic from hauling of water. The surface waterlines would consist of a maximum of two 10-inch to 12-inch diameter heavy duty lay flat lines and/or poly surface pipelines permitted for temporary use.

• Surface water lines will be temporarily placed in or adjacent to existing roads, existing pipeline corridors and along the proposed pipeline corridor. 24-inch culverts will be installed and utilized to cross any roads.

• In areas where the surface lines traverse a side slope or steep slope, t-posts will be used to secure them. The 12-inch lay flat lines will have a joint every 660 feet and a 6-foot by 10-foot containment will be placed under each connection.

• All surface lines in service will be inspected daily.

• The drilling rig will use natural gas-powered engines and is self-moving between well bores (i.e., does not require multiple trucks or other vehicles to move between well bores drilled on the same pad). Use of natural gas-powered engines will result in less air and noise emissions.

• Once drilling is complete, LOGOS would reuse produced water in its own operations or dispose of the produced water from wells.

• Produced water would be piped through the existing water gathering system in the Rosa Mesa area where possible and would be hauled by truck if necessary.

• Vegetation removed during construction, including trees that measure less than 3 inches in diameter

(at ground level) and slash/brush, will be chipped or mulched and incorporated into the topsoil as additional organic matter. All trees 3 inches in diameter or greater (at ground level) will be cut to ground level and delimbed. Tree trunks (left whole) and cut limbs will be stacked on existing well pad. The subsurface portion of trees (tree stumps) will be hauled to an approved disposal facility.

• The construction and drilling activities will not be allowed during the Rosa Mesa Wildlife Area SDA seasonal restriction, between December 1 and March 31, to protect the integrity of the habitat for wintering deer and elk. This stipulation does not apply to operation and maintenance of production facilities.

• A migratory bird nest survey will be conducted for any ground-disturbing activities occurring between May 15 and July 31. The survey must be conducted by a BLM biologist using a survey protocol developed and provided by the BLM/FFO. If active nests are located within the proposed permitted area, project activities will not be permitted without written approval by a BLM/FFO biologist.

• Should any active raptor nests be observed within one-third mile of the proposed project area or should any SSS (listed by the USFWS or BLM) be observed within the proposed project area prior to or during project implementation, construction would cease and the BLM-FFO would be immediately contacted. The BLM-FFO would then ensure evaluation of the resource. Should a discovery be evaluated as significant (protected under the ESA, etc.), it would be protected in place until mitigation could be developed and implemented according to guidelines set by the BLM.

• Any open water containing fluids (i.e. produced water) that could harm birds and other wildlife will be netted in accordance to BLM/FFO migratory bird policy.

• Wildlife hazards associated with the proposed project would be fenced, covered, and/or contained in storage tanks, as necessary.

• Grazing permittees will be notified when construction is scheduled to begin. All hazards to livestock will be fenced or contained.

• All existing improvements (such as fences, gates, and bar ditches) will be repaired to previous or better than pre-construction conditions. Cut fences will be tied to H-braces prior to cutting and openings will be protected as necessary during construction to prevent the escape of livestock. A temporary closure will be installed the same day the fence is cut. Following reclamation, the fence will be reconstructed to BLM specifications.

• Backfilling operations will be performed within a reasonable amount of time to ensure that the trenches are not left open for more than 24 hours. If a trench is left open overnight, it will be temporarily fenced or a night watchman will be utilized. The excavated soils will be returned to the trenches, atop the pipe, and compacted to prevent subsidence. The trenches will be compacted after approximately 2 feet of fill is placed over the pipe and after the ground surface has been leveled.

• Escape ramps/crossovers will be constructed every 1,320 feet. The ends of the open trench will be sloped each night with a 4:1 slope.

• Established livestock and wildlife trails will be left in place as crossovers. In areas where active grazing is taking place, escape ramps/crossovers will be placed every 500 feet. Crossovers will be a minimum of 10 feet wide and not fenced.

• The end of the pipe will be plugged to prevent animals from crawling in.

• Before the trench is closed, it will be inspected for animals. Any trapped wildlife or livestock will be promptly removed and released at least 150 yards from the trench.

• Production equipment will be placed on location in such a manner to minimize long-term disturbance and maximize interim reclamation. As practical, access will be provided by a teardrop-shaped road through the production area so that the center may be revegetated.

Protection of Topsoil

• The upper 6 inches of topsoil (if available) will be stripped following vegetation and site clearing. Topsoil will not be mixed with the underlying subsoil horizons and will be stockpiled as a berm along the perimeter of the well pad within the construction zone, separate from subsoil or other excavated material.

• Topsoil and sub-surface soils will be replaced in the proper order, prior to final seedbed preparation. Spreading shall not be done when the ground or topsoil is wet. Vehicle/equipment traffic will not be allowed to cross topsoil stockpiles. If topsoil is stored for a length of time such that nutrients are depleted from the topsoil, amendments will be added to the topsoil as advised by the Logos environmental scientist or appropriate agent/contractor.

Protection of the Public

• The hauling of equipment and materials on public roads would comply with Department of Transportation regulations. No toxic substances would be stored or used within the proposed project area. Logos would have inspectors present during construction. Any accidents involving persons or property would immediately be reported to the BLM-FFO. Logos would notify the public of potential hazards by posting signage, as necessary.

Prevention and Control of Weeds

• Prior to construction equipment entering the proposed project area, construction equipment would be inspected for noxious weeds and cleaned.

• It will be the operator's responsibility to monitor, control, and eradicate all noxious weed species within the permitted area throughout the life of the proposed project. The operator will contact the BLM/FFO regarding acceptable weed-control methods. If the operator does not hold a current Pesticide Use Proposal, a Pesticide Use Proposal will be submitted prior to pesticide application. Only pesticides authorized for use on BLM lands will be used. The use of pesticides will comply with federal and state laws. Pesticides will be used only in accordance with their registered use and limitations. The operator will contact the BLM/FFO prior to using these chemicals.

Protection of Air Resources

• The BLM's regulatory jurisdiction over field production operations has resulted in the development of BMPs designed to reduce impacts to air quality by reducing all emissions from field production and operations. Typical measures could include flaring hydrocarbons and gases at high temperatures in order to reduce emissions of incomplete combustion, requiring that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored, ensuring that compressor engines 300 horsepower or less have nitrogen oxide (NOx) emissions limited to 2 grams per horsepower hour, revegetating areas not required for production facilities to reduce the amount of dust, and watering dirt roads during periods of high use in order to reduce fugitive dust emissions.

• BMPs for dust abatement and erosion control will be utilized to reduce fugitive dust for the life of the project, as necessary. Water application, using a rear-spraying truck or other suitable means, will be the primary method of dust suppression along the road. Magnesium chloride, organic-based compounds, or polymer compounds could also be applied to roads or other surfaces to reduce fugitive dust. Neither petroleum-based products nor produced water would be used.

Noise

• Engines would be equipped with mufflers and barriers or other sound-proofing measures would be implemented, if needed, to meet the requirements of BLM Notice to Lessees and Operators on Onshore Oil and Gas Leases within the jurisdiction of the FFO NTL 04-2 FFO.

Additional Design Features and BMPs

• Diversions and other water control features will be installed as needed during construction and interim reclamation.

• The access road will be designed and constructed as a Resource Road in accordance with the BLM Gold Book Standards (BLM and USFS 2007), BLM 9113-1 (Roads Design Handbook), and BLM 9113-2 (Roads National Inventory and Condition Assessment Guidance and Instructions Handbook). Construction will include ditching, draining, installing culverts, crowning and capping or sloping and dipping the roadbed, as necessary, to provide a well-constructed and safe road.

• Production facilities would be painted ***Juniper Green*** *to blend with the natural color of the landscape and would be located to reasonably minimize visual impact, to the extent practical. Equipment subject to safety considerations would not be painted.*

• Vehicles would be restricted to proposed disturbance areas and existing areas of surface disturbance, such as existing roads and well pads.

• No construction or routine maintenance activities would be performed during periods when the soil is too wet to adequately support construction equipment. If equipment would create ruts deeper than six inches, the soil would be deemed too wet for construction or maintenance.

• Worker safety incidents would be reported to the BLM-FFO as required under Notice to Lessees (NTL) -3A (USGS 1979). Logos would adhere to company safety policies, Occupational Safety and Health Administration regulations, and Department of Transportation regulations.

Approval Date: 03/18/2022

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Farmington District Office
6251 College Blvd, Suite A
Farmington, New Mexico 87402

In Reply Refer To:
3162.3-1(NMF0110)

* LOGOS OPERATING LLC

#662H ROSA UNIT

Lease: NMSF078764
SH: NE¼SW¼ Section 30, T.31 N., R.5W.
Rio Arriba County, New Mexico
BH: NE¼SW¼ Section 28, T.31 N., R5 W.
Rio Arriba County, New Mexico
***Above Data Required on Well Sign**

GENERAL REQUIREMENTS FOR OIL AND GAS OPERATIONS ON FEDERAL AND INDIAN LEASES

The following special requirements apply and are effective when **checked**:

A. ☒ Note all surface/drilling conditions of approval attached.

B. ☒ The required wait on cement (WOC) time will be a minimum of 500 psi compressive strength at 60 degrees. Blowout preventor (BOP) nipple-up operations may then be initiated

C. ☐ Test the surface casing to a minimum of _____ psi for 30 minutes.

D. ☐ Test all casing strings below the surface casing to .22 psi/ft. of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the minimum internal yield burst) for a minimum of 30 minutes.

E. ☐ Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the Bureau of Land Management, Farmington District Office, Branch of Reservoir Management, 6251 College Blvd. Suite A, Farmington, New Mexico 87402. The effective date of the agreement must be **prior** to any sales.

F. ☒ The use of co-flex hose is authorized contingent upon the following:
1. From the BOP to the choke manifold: the co-flex hose must be hobbled on both ends and saddle to prevent whip.
2. From the choke manifold to the discharge tank: the co-flex hoses must be as straight as practical, hobbled on both ends and anchored to prevent whip.
3. The co-flex hose pressure rating must be at least commensurate with approved BOPE.

I. GENERAL

A. Full compliance with all applicable laws, regulations, and Onshore Orders, with the approved Permit to drill, and with the approved Surface Use and Operations Plan is required. Lessees and/or operators are fully accountable for the actions of their contractors and subcontractors. Failure to comply with these requirements and the filing of required reports will result in strict enforcement pursuant to 43 CFR 3163.1 or 3163.2.

B. Each well shall have a well sign in legible condition from spud date to final abandonment. The sign should show the operator's name, lease serial number, or unit name, well number, location of the well, and whether lease is Tribal or Allotted, (See 43 CFR 3162.6(b)).

C. A complete copy of the approved Application for Permit to Drill, along with any conditions of approval, shall be available to authorized personnel at the drill site whenever active drilling operations are under way.

D. For Wildcat wells only, a drilling operations progress report is to be submitted, to the BLM-Field Office, weekly from the spud date until the well is completed and the Well Completion Report (Form 3160-4) is filed. The report should be on 8-1/2 x 11 inch paper, and each page should identify the well by; operator's name, well number, location and lease number.

E. As soon as practical, notice is required of all blowouts, fires and accidents involving life-threatening injuries or loss of life. (See NTL-3A).

F. Prior approval by the BLM-Authorized Office (Drilling and Production Section) is required for variance from the approved drilling program and before commencing plugging operations, plug back work casing repair work, corrective cementing operations, or suspending drilling operations indefinitely. Emergency approval may be obtained orally, but such approval is contingent upon filing of a notice of intent (on a Sundry Notice, Form 3160-5) within three business days (original and three copies of Federal leases and an original and four copies on Indian leases). **Any changes to the approved plan or any questions regarding drilling operations should be directed to BLM during regular business hours at 505-564-7600. Emergency program changes after hours should be directed to at Virgil Lucero at 505-793-1836.**

G. The Inspection and Enforcement Section (I&E), phone number (505-564-7750) is to be notified at least 24 hours in advance of BOP test, spudding, cementing, or plugging operations so that a BLM representative may witness the operations.

H. Unless drilling operations are commenced within two years, approval of the Application for Permit to Drill will expire. A written request for a two years extension may be granted if submitted prior to expiration.

I. From the time drilling operations are initiated and until drilling operations are completed, a member of the drilling crew or the tool pusher shall maintain rig surveillance at all time, unless the well is secured with blowout preventers or cement plugs.

J. If for any reason, drilling operations are suspended for more than 90 days, a written notice must be provided to this office outlining your plans for this well.

II. REPORTING REQUIREMENTS

A. For reporting purposes, all well Sundry notices, well completion and other well actions shall be referenced by the appropriate lease, communitization agreement and/or unit agreement numbers.

B. The following reports shall be filed with the BLM-Authorized Officer within 30 days after the work is completed.

1 .Original and three copies on Federal and an Original and five copies on Indian leases of Sundry Notice (Form 3150-5), giving complete information concerning.

a. Setting of each string of casing. Show size and depth of hole, grade and weight of casing, depth set, depth of any and all cementing tools that are used, amount (in cubic feet) and types of cement used, whether cement circulated to surface and all cement tops in the casing annulus, casing test method and results, and the date work was done. Show spud date on first report submitted.

b. Intervals tested, perforated (include; size, number and location of perforations), acidized, or fractured; and results obtained. Provide date work was done on well completion report and completion sundry notice.

c. Subsequent Report of Abandonment, show the manner in which the well was plugged, including depths where casing was cut and pulled, intervals (by depths) where cement plugs were replaced, and dates of the operations.

2. Well Completion Report (Form 3160-4) will be submitted with 30 days after well has been completed.

a. Initial Bottom Hole Pressure (BHP) for the producing formations. Show the BHP on the completion report. The pressure may be: 1) measured with a bottom hole bomb, or; 2) calculated based on shut in surface pressures (minimum seven day buildup) and fluid level shot.

3. Submit a cement evaluation log, if cement is not circulated to surface.

III. DRILLER'S LOG

The following shall be entered in the daily driller's log: 1) Blowout preventer pressures tests, including test pressures and results. 2) Blowout preventer tests for proper functioning, 3) Blowout prevention drills conducted, 4) Casing run, including size, grade, weight, and depth set, 5) How pipe was cemented, including amount of cement, type, whether cement circulated to surface, location of cementing tools, etc., 6) Waiting on cement time for each casing string, 7) Casing pressure tests after cementing, including test pressure and results and 8) Estimated amounts of oil and gas recovered and/or produced during drill stem test.

IV. GAS FLARING

Gas produced from this well may not be vented or flared beyond an initial, authorized test period of * Days or 50 MMCF following its (completion)(recompletion), whichever first occurs, without the prior, written approval of the authorized officer. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted. You shall be required to compensate the lessor for the portion of the gas vented or flared without approval which is determined to have been avoidably lost.

*30 days, unless a longer test period is specifically approved by the authorized officer. The 30-day period will commence upon the first gas to surface.

V. SAFETY

A. All rig heating stoves are to be of the explosion-proof type.

B. Rig safety lines are to be installed.

C. Hard hats and other Personal Protective Equipment (PPE) must be utilized.

VI. CHANGE OF PLANS OR ABANDONMENT

A. Any changes of plans required in order to mitigate unanticipated conditions encountered during drilling operations, will require approval as set forth in Section 1.F.

B. If the well is dry, it is to be plugged in accordance with 43 CFR 3162.3-4, approval of the proposed plugging program is required as set forth in Section 1.F. The report should show the total depth reached, the reason for plugging, and the proposed intervals, by depths, where cement plugs are to be placed, type of plugging mud, etc. A Subsequent Report of Abandonment is required as set forth in Section II.B.1c.

C. Unless a well has been properly cased and cemented, or properly plugged, the drilling rig must not be moved from the drill site without prior approval from the BLM-Authorized Officer.

VII. PHONE NUMBERS

A. For BOPE tests, cementing, and plugging operations the phone number is 505-564-7750 and must be called 24 hours in advance in order that a BLM representative may witness the operations.

B. Emergency program changes after hours contact:

Virgil Lucero (505) 793-1836
Joe Killins (505) 564-7736

Approval Date: 03/18/2022

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 92376

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 92376
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Notify OCD 24 hours prior to casing & cement	3/23/2022
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104	3/23/2022
kpickford	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	3/23/2022
kpickford	Cement is required to circulate on both surface and intermediate1 strings of casing	3/23/2022
kpickford	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	3/23/2022