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.: NMSF078768

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.: NMNM078407E/ROSA UNIT

8. Lease Name and Well No.: ROSA UNIT 840H

2. Name of Operator: LOGOS OPERATING LLC

9. API Well No.: 30-039-31498

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

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

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

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

At surface: NESE / 2233 FSL / 437 FEL / LAT 36.855022 / LONG -107.324074

At proposed prod. zone: NESE / 2033 FSL / 200 FEL / LAT 36.8545 / LONG -107.287947

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 35/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): 200 feet

16. No of acres in lease:

17. Spacing Unit dedicated to this well: 627.53

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 25 feet

19. Proposed Depth: 7293 feet / 17802 feet

20. BLM/BIA Bond No. in file: FED: NMB001820

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 6718 feet

22. Approximate date work will start*: 06/02/2025

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: (Electronic Submission)

Name *(Printed/Typed)*: ETTA TRUJILLO / Ph: (505) 324-4145

Date: 04/24/2025

Title: Regulatory Specialist

Approved by *(Signature)*: (Electronic Submission)

Name *(Printed/Typed)*: DAVE J MANKIEWICZ / Ph: (505) 564-7761

Date: 06/20/2025

Title: AFM-Minerals

Office: 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

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 06/20/2025

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: 06/20/2025

Additional Operator Remarks

Location of Well

0. SHL: NESE / 2233 FSL / 437 FEL / TWSP: 31N / RANGE: 5W / SECTION: 35 / LAT: 36.855022 / LONG: -107.324074 (TVD: 0 feet, MD: 0 feet)

PPP: LOT 3 / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 4W / SECTION: 31 / LAT: 36.855152 / LONG: -107.322561 (TVD: 0 feet, MD: 0 feet)

PPP: NESW / 0 FSL / 0 FWL / TWSP: 31N / RANGE: 4W / SECTION: 31 / LAT: 36.855152 / LONG: -107.322561 (TVD: 0 feet, MD: 0 feet)

PPP: NWSW / 2280 FSL / 5 FWL / TWSP: 31N / RANGE: 5W / SECTION: 36 / LAT: 36.855152 / LONG: -107.322561 (TVD: 7295 feet, MD: 7663 feet)

BHL: NESE / 2033 FSL / 200 FEL / TWSP: 31N / RANGE: 4W / SECTION: 31 / LAT: 36.8545 / LONG: -107.287947 (TVD: 7293 feet, MD: 17802 feet)

BLM Point of Contact

Name: CHRISTOPHER P WENMAN
Title: Natural Resource Specialist
Phone: (505) 564-7727
Email: cwenman@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

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

#840H ROSA UNIT

Lease: NMSF078768 Agreement: NMNM78407E

SH: NE¼SE¼ Section 35, T. 31N., R. 5W.
Rio Arriba County, New Mexico
BH: NE¼SE¼ Section 31, T. 31N., R. 4W.
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 all casing strings below the conductor 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. If pressure declines more than 10 percent in 30 minutes, corrective action shall be taken.

D. ☐ Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the Bureau of Land Management, New Mexico State Office, Reservoir Management Group, 301 Dinosaur Trail, Santa Fe, New Mexico 87508.
The effective date of the agreement must be **prior** to any sales.

E. ☐ 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 and regulations, 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 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. BOP equipment (except the annular preventer) shall be tested utilizing a test plug to full working pressure for 10 minutes. No bleed-off of pressure is acceptable. (See 43 CFR 3172.6(b)(9)(ii)).

G. The operator shall have sufficient weighting materials and lost circulation materials on location in the event of a pressure kick or in the event of lost circulation. (See 43 CFR 3172.8(a)).

H. The flare line(s) discharge shall be located not less than 100 feet from the well head, having straight lines unless turns are targeted with running tees, and shall be positioned downwind of the prevailing wind direction and shall be anchored. The flare system shall have an effective method for ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and to maintain a continuous flare. (See 43 CFR 3172.8(b)(7)).

I. 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 sundry within three business days. **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 Virgil Lucero at 505-793-1836.**

J. 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.

K. Unless drilling operations are commenced within three years according to 43 CFR 3171.14, approval of the Application for Permit to Drill will expire. No extensions will be granted.

L. 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 times, unless the well is secured with blowout preventers or cement plugs.

M. 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.

N. **Commingling**: No production (oil, gas, and water) from the subject well should start until Sundry Notices (if necessary) granting variances from applicable regulations as related to commingling and off-lease measurement are approved by this office. (See 43 CFR 3173.14)

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 online through AFMSS 2 within 30 days after the work is completed.

1. Provide 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 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 way 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 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.

C. Production Startup Notification is required no later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site or resumes production in the case of a well which has been off production for more than 90 days. The operator shall notify the Authorized Officer by letter or Sundry Notice, Form 3160-5, or orally to be followed by a letter or Sundry Notice, of the date on which such production has begun or resumed. CFR 43 3162.4-1(c).

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, 20 MMCF following its (completion)(recompletion), or flowback has been routed to the production separator, whichever first occurs, without the prior, written approval of the authorized officer in accordance with 43 CFR 3179.81. 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 beginning of flowback following completion or recompletion.

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 to mitigate unanticipated conditions encountered during drilling operations, will require approval as set forth in Section 1.I.

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.I. 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
Kenneth Rennick (505) 564-7742
Matthew Kade (505) 564-7736

C-102 Submit Electronically Via OCD Permitting	State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION	Revised July 9, 2024 Submittal Type: ☒ Initial Submittal ☐ Amended Report ☐ As Drilled

WELL LOCATION INFORMATION

API Number	Pool Code	Pool Name
30-039-31498	97232	BASIN MANCOS

Property Code	Property Name	Well Number
320608	ROSA UNIT	840H

OGRID No.	Operator Name	Ground Level Elevation
289408	LOGOS OPERATING, LLC	6718'

Surface Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal

Mineral Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal

Surface Location

UL	Section	Township	Range	Lot	Feet from N/S Line	Feet from E/W Line	Latitude	Longitude	County
I	35	31N	5W		2233' SOUTH	437' EAST	36.855022 °N	-107.324074 °W	RIO ARRIBA

Bottom Hole Location

UL	Section	Township	Range	Lot	Feet from N/S Line	Feet from E/W Line	Latitude	Longitude	County
I	31	31N	4W		2033' SOUTH	200' EAST	36.854500 °N	-107.287947 °W	RIO ARRIBA

Penetrated Spacing Unit:

Dedicated Acres		Infill or Defining Well	Defining Well API	Overlapping Spacing Unit	Consolidation Code
627.53	S/2 - Section 36, T31N, R5W Lots 3-4, E/2 SW/4, SE/4 - Section 31, T31N, R4W	INFILL		☐ Yes ☒ No	UNITIZATION

Order Numbers: R-13457

Well setbacks are under Common Ownership: ☐ Yes ☒ No

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet from N/S Line	Feet from E/W Line	Latitude	Longitude	County
I	35	31N	5W		2379' SOUTH	624' EAST	36.855423 °N	-107.324710 °W	RIO ARRIBA

First Take Point (FTP)

UL	Section	Township	Range	Lot	Feet from N/S Line	Feet from E/W Line	Latitude	Longitude	County
L	36	31N	5W		2280' SOUTH	5' WEST	36.855152 °N	-107.322561 °W	RIO ARRIBA

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet from N/S Line	Feet from E/W Line	Latitude	Longitude	County
I	31	31N	4W		2034' SOUTH	335' EAST	36.854503 °N	-107.288408 °W	RIO ARRIBA

Unitized Area or Area of Uniform Interest	Spacing Unit Type	Ground Floor Elevation
ROSA UNIT	☒ Horizontal ☐ Vertical ☐ Directional	6688'

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, 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 a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division.

Etta Trujillo
Signature

4/28/2025
Date

Etta Trujillo
Printed Name

etrujillo@logosresources.com
E-mail Address

SURVEYOR CERTIFICATION

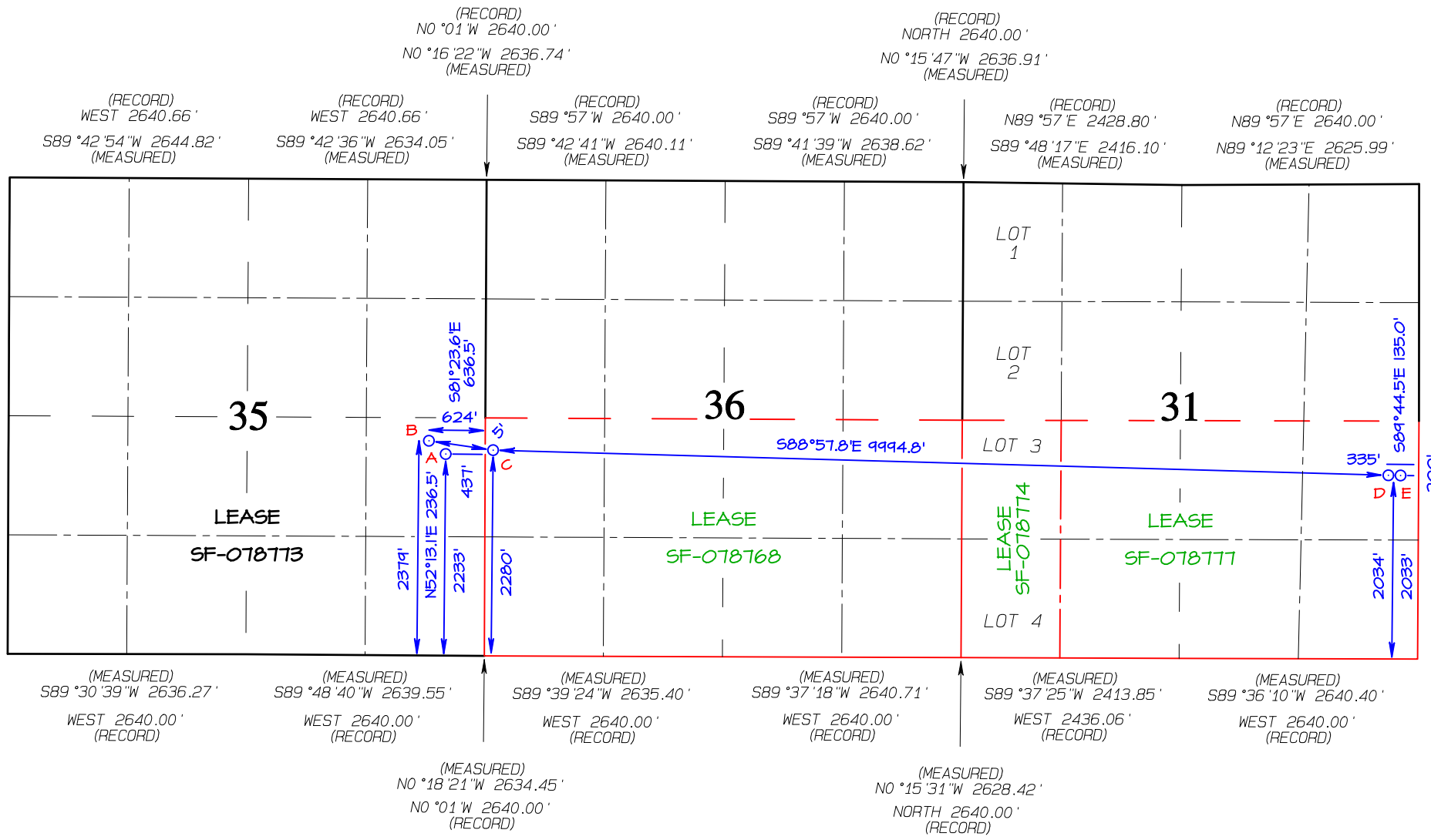
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

JASON C. EDWARDS
NEW MEXICO
15269
4/28/2025
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Signature and Seal of Professional Surveyor

Certificate Number	Date of Survey
15269	NOVEMBER 13, 2024

Note: No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



SURFACE LOCATION (A)
2233' FSL 437' FEL
SECTION 35, T31N, R5W
LAT 36.855016 °N
LONG -107.323473 °W
DATUM: NAD1927

LAT 36.855022 °N
LONG -107.324074 °W
DATUM: NAD1983

KICK OFF POINT (B)
2379' FSL 624' FEL
SECTION 35, T31N, R5W
LAT 36.855416 °N
LONG -107.324109 °W
DATUM: NAD1927

LAT 36.855423 °N
LONG -107.324710 °W
DATUM: NAD1983

FIRST TAKE POINT (C)
2280' FSL 5' FWL
SECTION 36, T31N, R5W
LAT 36.855146 °N
LONG -107.321960 °W
DATUM: NAD1927

LAT 36.855152 °N
LONG -107.322561 °W
DATUM: NAD1983

LAST TAKE POINT (D)
2034' FSL 335' FEL
SECTION 31, T31N, R4W
LAT 36.854497 °N
LONG -107.287808 °W
DATUM: NAD1927

LAT 36.854503 °N
LONG -107.288408 °W
DATUM: NAD1983

BOTTOM HOLE LOCATION (E)
2033' FSL 200' FEL
SECTION 31, T31N, R4W
LAT 36.854493 °N
LONG -107.287347 °W
DATUM: NAD1927

LAT 36.854500 °N
LONG -107.287947 °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:** 4/23/2025

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 840H	30-039-pending	I-35-T31N-R5W	2233FSL, 437FEL	N/A	13,840	522
Rosa Unit 842H	30-039-pending	I-35-T31N-R5W	2239FSL, 462FEL	N/A	13,840	522

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

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

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Rosa Unit 840H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 842H	30-039-pending	Pending	Pending	Pending	Pending	Pending

VI. Separation Equipment: ☒ Attach a complete description of how the 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 2 – Enhanced Plan

EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

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 wll 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 II
E-mail Address:	etrujillo@logosresourcesllc.com
Date:	4/23/2025
Phone:	505-324-4154

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

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

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 Oil 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 or combusted, with an appropriately sized and located flare stack, if technically and safely feasible.
    b. New Drill HZ Gas Wells: The operator drills wells in the area by balancing the mud weight to safely drill the wellbore with as minimal flaring as possible. When gas kicks enter the wellbore, sometimes it is necessary to circulate it out of the wellbore to an appropriately sized and located flare stack. The operator will estimate the volume flared and appropriately report.
C. Venting and flaring during completion or recompletion operations:
    a. New Drill HZ Oil 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. During the separation flowback period natural gas will be routed to a properly sized and located flare until the natural gas is of pipeline quality (less than 60 days). The natural gas will also be utilized on site as needed for fuel gas or injection gas.

    b. 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 Oil 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. This facility will operate under a notice of intent (NOI) from the New Mexico Environment Department (NMED).

   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 requires liquids 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 with minor exceptions.
   (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 utilize a LACT system when available to minimize gas vented during oil tank loading.
   (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) Storage tanks and other low-pressure vessel normal operational venting will be minimized during the early life of the well with the installation of a vapor recovery unit to limit the flash and working and breathing emissions to atmosphere.
   (h) No dehydration or amine units are anticipated to be set on location.
   (i) Compressors, compressor engines, turbines, flanges, connectors, valves, and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operation.
   (j) 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.
   (k) When natural gas does not meet gathering pipeline specifications, for example high nitrogen content after a nearby frac, 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.
   (l) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.

b. 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, or instrument air, 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:	March 20, 2025	Pool:	Basin Mancos
Well Name:	**Rosa Unit 840H**	GL Elevation:	6,718’
Surface Location:	Sec 35, T31N, R5W 2233’ FSL, 437’ FEL (36.855022º N, -107.324074º W – NAD83)	KB:	30’
Bottom Hole Location:	Sec 31, T31N, R4W 2033’ FSL, 200’ FEL (36.854500º N, -107.287947º W – NAD83)	Measured Depth:	17,802’ (KB)
Lease Serial CA Serial	**# NMSF078768 # NMNM78407E**	County:	Rio Arriba

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,874'	2,872'	*POINT LOOKOUT	6,016'	6,012'
KIRTLAND	3,116'	3,114'	*MANCOS	6,516'	6,512'
*FRUITLAND	3,366'	3,364'	KICKOFF POINT	6,641'	6,637'
*PICTURED CLIFFS	3,750'	3,748'	LANDING POINT	7,663'	7,295'
LEWIS	3,881'	3,878'	TD	17,802'	7,293'
CHACRA	4,941'	4,938'			
*CLIFF HOUSE	5,769'	5,765'			
MENEFEE	5,803'	5,799'			

* 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 26”/24” conductor hole. LSND (WBM) will be used to drill the 17-1/2” surface hole and 12-1/4” intermediate hole. A LSND (WBM) or (OBM) will be used to drill the 8-1/2” curve and lateral portion of the wellbore. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses.

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

B. **BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **3000 psi (High) for 10 minutes.** Pressure test surface casing to **1500 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:** 7295' TVD x 0.43 = 3137 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
CONDUCTOR	26" or 24"	320' or greater (GL)	20"	94 LBS	J-55 or equiv	LTC/BTC
SURFACE	17.5"	3,800'	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,591'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	17,802'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

NOTE: All casing depths are approximate, based on KB 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. CONDUCTOR CASING: 20" cement nose guide shoe. Place float collar 1 joint above shoe. Run (1) standard centralizer on each of the bottom (3) joints of casing.
2. SURFACE CASING: 13-3/8" cement nose guide shoe with 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., 2,000ft., 1,500 ft., 1,000 ft, and 500ft.
   - Casing will be kept fluid filled during drilling
3. INTERMEDIATE CASING: 9-5/8" cement float shoe. 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. Optional use of an ICP may be used in conjunction with DV Tools.
4. PRODUCTION CASING: Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2" full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) one Toe Sleeve (Sliding Sleeve) positioned inside the applicable production area. Centralizer program will be determined by wellbore conditions. Production casing to be pressure tested

during completion operations with frac stack installed.

C. CEMENTING:

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

1. CONDUCTOR: Casing shall be set at ~ 320'(GL) and cemented to surface. TOC at Surface.

Conductor - 20"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Type G	-	320	0.9599	1.3	449	80	1.10	408	15.8
Type III		320	0.9599	1.3	449	80	1.39	323	14.6
			24" hole						
Set Depth (GL)	320								

2. SURFACE: Casing shall be kept fluid-filled while running into the hole to meet BLM minimum collapse requirements. The surface casing will be cemented in 1 stage. If cement does not circulate to the surface, a CBL will be run to determine TOC.

Surface - 13-3/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	3,200	600	0.6947	1.3	575	102	1.15	501	15.8
Stage 1 Lead - OH	320	2,880	0.6947	1.3	2,601	463	2.66	978	11.8
Stage 2 Lead - Cased	-	320	1.019	1	326	58	2.66	123	11.8
					3,503	**624**		**1601**	
Set Depth	3800								

3. 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 and optional ICP's 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

Intermediate - 9-5/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	6,091	500	0.3132	1.3	220	39	1.15	192	15.8
Stage 1 Lead	5,016	1,075	0.3132	1.3	438	78	2.66	165	11.8
					658	**117**		**356**	
Stage 2 Tail	4,416	600	0.3132	1.3	244	44	1.76	139	13.5
Stage 2 Lead	3,700	716	0.3132	1.3	291	52	2.66	110	11.8
Stage 2 Lead - Cased	3,600	100	0.3627	1	36	6	2.66	14	11.8
Stage 2 Totals					**572**	**102**		**262**	
Int 2 Totals					**1,230**	**219**		**618**	
Contingency									
Stage 3 Tail	3,800	75	0.3132	1.3	31	5	1.76	17	13.5
Stage 3 Tail - Cased	3,300	500	0.3490	1	175	31	1.76	99	13.5
Stage 3 Lead - Cased	-	3,300	0.3490	1	1,152	205	2.66	433	11.8
Contingency Stage 3 Totals					**1,357**	**242**		**550**	
Set Depth	6591								

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

4. 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.

Production - 5-1/2"	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	6,491	100	0.2531	1	25	5	2.03	12	13.2
Open Hole Lead	6,591	11,211	0.2291	1.15	2,959	527	2.03	1,457	13.2
					2,984	532		1,469	
Set depth	17802								

Calculations based on 15% excess for open hole and 100' overlap into intermediate casing. Actual volumes will vary.

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

IV. COMPLETION

A. CBL

CBLs and/or Temperature Surveys will be performed as needed or required to determine cement top if cement is not circulated.

B. PRESSURE TEST

C. Pressure test 5-1/2" casing to 0.22 psi/ft * 7295' TVD = 1605 psi for 30 minutes. Increase pressure to Open RSI sleeves.

D. STIMULATION

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

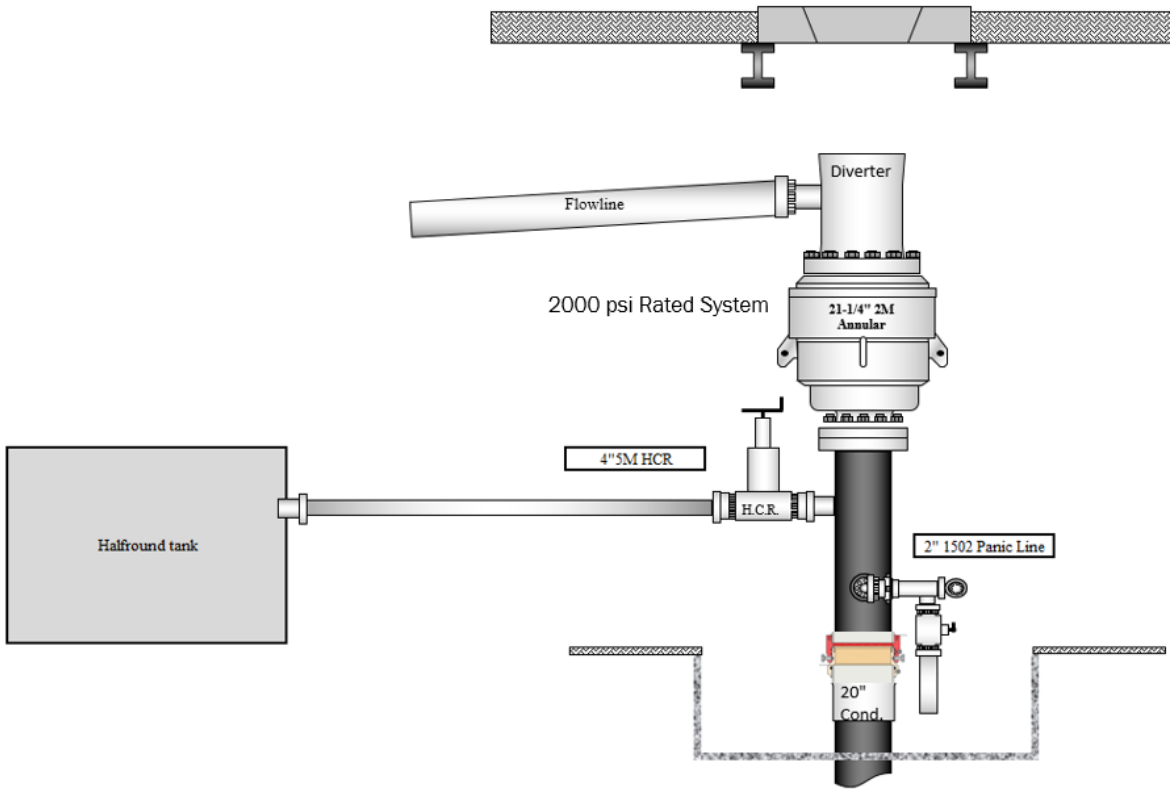
E. PRODUCTION TUBING

2-7/8", 6.5#, J-55 or L-80, EUE tubing will be run once volumes and pressures dictate. Due to the extremely high initial flow rates and pressures seen in offset wells, tubing will be installed once it is safe to do so, typically 12-36 months after completion.

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

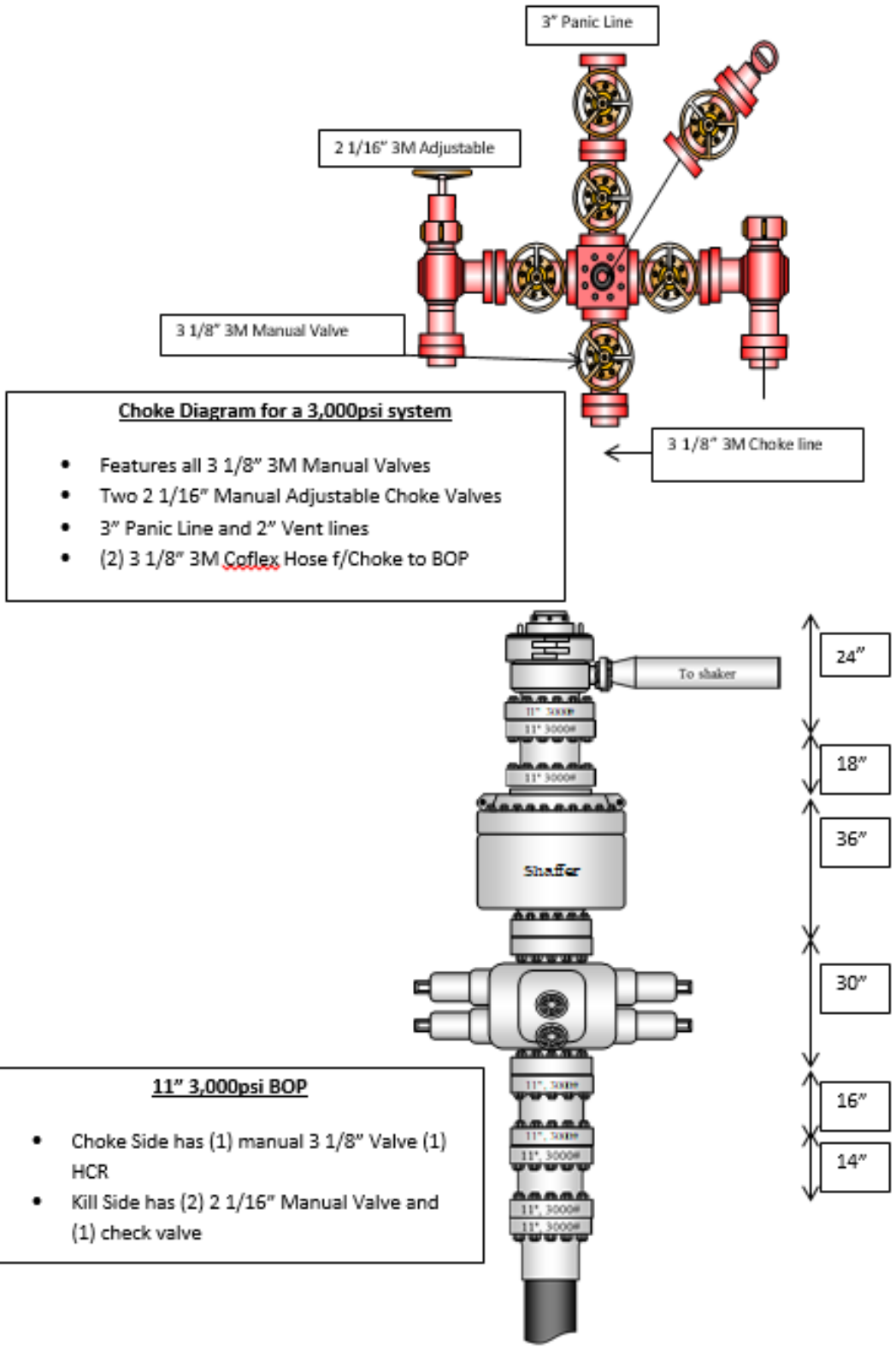
BOP Equipment

Surface Hole Diverter:



BOP:

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

Logos Operating LLC

Rio Arriba, NM (NAD83)
Rosa Unit 43
Rosa Unit 840H

OH
Prelim 3

Anticollision Report

07 March, 2025

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Reference	Prelim 3		
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:	Max. CC of 100,000.00usft or Max. SF of 4 or Max. ES of 1,000.0	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 3/6/2025

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,802.15	Prelim 3 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Rosa Unit 43						
(O) RU #271A - OH - OH-SVY	0.00	0.00	565.39			
(O) RU #271A - OH - OH-SVY	1,460.97	1,430.76	517.85	508.49	55.320	CC
(O) RU #271A - OH - OH-SVY	1,500.00	1,468.39	518.00	508.38	53.881	ES
(O) RU #362 - OH - OH-SVY	0.00	44.40	2,184.17			
(O) RU #362 - OH - OH-SVY	500.00	548.27	2,186.05	2,182.62	637.676	ES
(O) RU #362 - OH - OH-SVY	3,900.00	3,560.00	2,344.96	2,319.21	91.057	SF
(O) RU #372 - OH - OH	14,166.92	3,321.00	3,860.41	3,790.48	55.208	CC
(O) RU #372 - OH - OH	14,200.00	3,321.00	3,860.55	3,790.34	54.989	ES
(O) RU #372 - OH - OH	16,500.00	3,321.00	4,510.65	4,401.06	41.156	SF
(O) RU #399A - OH - OH-SVY	16,644.00	4,366.03	3,747.71	3,661.20	43.322	CC, ES
(O) RU #399A - OH - OH-SVY	17,500.00	4,201.00	3,834.72	3,742.69	41.668	SF
(O) RU #54H-OH - OH - OH-INC	9,250.38	7,388.03	542.68	125.04	1.299	Level 3, CC, ES, SF
(O) RU #54H-OH - ST01 - ST01	9,280.92	7,200.00	663.87	503.10	4.129	CC, ES
(O) RU #54H-OH - ST01 - ST01	9,400.00	7,221.84	673.90	510.44	4.123	SF
(O) RU 754H - OH - OH	7,500.00	21,591.00	549.70	317.72	2.370	ES, SF
(O) RU 754H - OH - OH	7,522.00	21,591.00	549.09	318.37	2.380	CC
(O) RU 756H - OH - OH	7,600.00	21,532.00	1,638.12	1,378.56	6.311	SF
(O) RU 756H - OH - OH	7,629.01	21,532.00	1,637.87	1,378.48	6.314	CC, ES
Rosa Unit 842H - OH - Prelim 7	704.82	704.39	21.08	16.30	4.407	CC, ES
Rosa Unit 842H - OH - Prelim 7	17,802.15	17,841.72	1,363.63	1,019.48	3.962	SF

Offset Design: Rosa Unit 43 - (O) RU #271A - OH - OH-SVY — **Offset Site Error:** 0.00 usft

Survey Program: 330-MWD-SDI — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-69.57	196.67	-527.99	565.39				
100.00	100.00	53.00	53.00	0.25	0.15	-69.57	196.67	-527.99	563.43	563.03	0.40	1,397.446	
200.00	200.00	153.00	153.00	0.61	0.44	-69.57	196.67	-527.99	563.43	562.38	1.05	537.147	
300.00	300.00	253.00	253.00	0.97	0.73	-69.57	196.67	-527.99	563.43	561.73	1.69	332.471	
306.71	306.71	259.71	259.71	0.99	0.75	-69.57	196.67	-527.99	563.43	561.69	1.74	324.182	
400.00	400.00	346.92	346.92	1.33	1.00	-69.57	196.66	-528.09	563.55	561.23	2.33	242.360	
500.00	500.00	443.15	443.09	1.68	1.29	-69.81	195.18	-530.82	565.65	562.68	2.97	190.294	
600.00	599.98	547.56	547.23	2.04	1.60	-18.73	188.84	-534.71	565.45	561.81	3.64	155.310	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #271A - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 330-MWD-SDI

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
611.38	611.35	560.29	559.91	2.08	1.64	-18.87	187.78	-535.20	565.16	561.44	3.72	151.908	
700.00	699.90	656.96	656.00	2.40	1.93	-20.06	177.83	-538.67	562.00	557.67	4.32	129.969	
800.00	799.83	772.41	770.18	2.75	2.28	-21.95	161.18	-541.67	556.59	551.57	5.03	110.760	
900.00	899.75	881.74	877.45	3.11	2.60	-24.27	140.16	-542.93	549.05	543.34	5.71	96.200	
1,000.00	999.68	987.94	980.10	3.47	2.92	-27.26	113.03	-543.80	540.70	534.32	6.38	84.744	
1,100.00	1,099.60	1,089.95	1,077.15	3.83	3.23	-30.79	81.60	-544.02	532.38	525.34	7.04	75.596	
1,200.00	1,199.53	1,186.96	1,168.81	4.19	3.52	-34.42	49.85	-543.47	525.15	517.46	7.69	68.274	
1,300.00	1,299.45	1,277.24	1,254.00	4.55	3.80	-37.91	19.98	-542.91	520.15	511.83	8.32	62.498	
1,400.00	1,399.38	1,372.35	1,343.72	4.91	4.08	-41.65	-11.61	-543.00	518.24	509.27	8.97	57.793	
1,460.97	1,460.30	1,430.76	1,398.81	5.13	4.26	-43.95	-31.00	-542.64	517.85	508.49	9.36	55.320	CC
1,500.00	1,499.30	1,468.39	1,434.31	5.27	4.37	-45.43	-43.48	-542.32	518.00	508.38	9.61	53.881	ES
1,600.00	1,599.22	1,562.53	1,522.77	5.63	4.65	-49.24	-75.64	-541.09	519.86	509.60	10.25	50.703	
1,700.00	1,699.15	1,656.30	1,610.80	5.99	4.93	-53.01	-107.93	-539.83	524.31	513.42	10.89	48.152	
1,800.00	1,799.07	1,747.19	1,696.19	6.35	5.21	-56.60	-139.03	-538.43	531.06	519.55	11.51	46.137	
1,900.00	1,899.00	1,839.73	1,782.87	6.71	5.49	-60.21	-171.42	-537.33	540.83	528.70	12.13	44.569	
2,000.00	1,998.92	1,934.51	1,872.02	7.07	5.77	-63.68	-203.61	-536.24	552.54	539.77	12.77	43.283	
2,100.00	2,098.85	2,030.40	1,962.44	7.43	6.06	-66.99	-235.48	-535.26	566.08	552.68	13.40	42.247	
2,200.00	2,198.77	2,123.95	2,050.72	7.79	6.34	-70.07	-266.44	-534.13	581.28	567.26	14.02	41.458	
2,300.00	2,298.70	2,215.85	2,137.48	8.15	6.61	-72.92	-296.71	-533.26	598.33	583.70	14.63	40.891	
2,400.00	2,398.62	2,304.02	2,220.75	8.51	6.88	-75.49	-325.69	-532.91	617.30	602.07	15.22	40.553	
2,500.00	2,498.54	2,397.36	2,308.83	8.87	7.16	-78.02	-356.59	-533.44	638.46	622.63	15.84	40.316	
2,600.00	2,598.47	2,488.37	2,394.78	9.23	7.43	-80.31	-386.50	-534.27	660.92	644.48	16.44	40.208	
2,700.00	2,698.39	2,591.71	2,492.71	9.60	7.74	-82.67	-419.47	-535.43	683.90	666.79	17.11	39.975	
2,800.00	2,798.32	2,687.41	2,583.66	9.96	8.03	-84.66	-449.21	-536.48	707.16	689.42	17.74	39.870	
2,900.00	2,898.24	2,787.34	2,678.77	10.32	8.33	-86.63	-479.86	-536.93	730.49	712.10	18.39	39.724	
3,000.00	2,998.17	2,917.34	2,803.60	10.68	8.72	-88.77	-516.06	-538.60	753.15	733.94	19.21	39.206	
3,100.00	3,098.09	3,064.03	2,946.87	11.04	9.16	-90.79	-547.35	-536.75	769.18	749.08	20.10	38.269	
3,200.00	3,198.02	3,187.91	3,069.28	11.40	9.53	-92.01	-566.30	-536.25	781.44	760.58	20.87	37.451	
3,300.00	3,297.94	3,346.13	3,226.95	11.76	10.00	-93.02	-578.84	-535.88	787.70	765.95	21.75	36.215	
3,400.00	3,397.86	3,456.64	3,337.42	12.12	10.33	-93.41	-581.52	-536.38	790.16	767.71	22.45	35.202	
3,500.00	3,497.79	3,527.00	3,407.78	12.48	10.54	-93.60	-582.19	-536.98	792.34	769.34	23.00	34.444	
3,600.00	3,597.71	3,527.00	3,407.78	12.85	10.54	-93.60	-582.19	-536.98	804.24	781.04	23.20	34.661	
3,700.00	3,697.64	3,527.00	3,407.78	13.21	10.54	-93.60	-582.19	-536.98	828.13	804.89	23.24	35.629	
3,800.00	3,797.56	3,527.00	3,407.78	13.57	10.54	-93.60	-582.19	-536.98	863.01	839.86	23.15	37.278	
3,900.00	3,897.49	3,527.00	3,407.78	13.93	10.54	-93.60	-582.19	-536.98	907.63	884.66	22.96	39.523	
4,000.00	3,997.41	3,527.00	3,407.78	14.29	10.54	-93.60	-582.19	-536.98	960.62	937.90	22.72	42.277	
4,100.00	4,097.34	3,527.00	3,407.78	14.65	10.54	-93.60	-582.19	-536.98	1,020.68	998.22	22.45	45.457	
4,200.00	4,197.26	3,527.00	3,407.78	15.01	10.54	-93.60	-582.19	-536.98	1,086.64	1,064.45	22.18	48.985	
4,300.00	4,297.18	3,527.00	3,407.78	15.37	10.54	-93.60	-582.19	-536.98	1,157.49	1,135.56	21.93	52.790	
4,400.00	4,397.11	3,527.00	3,407.78	15.74	10.54	-93.60	-582.19	-536.98	1,232.38	1,210.69	21.69	56.813	
4,500.00	4,497.03	3,527.00	3,407.78	16.10	10.54	-93.60	-582.19	-536.98	1,310.64	1,289.15	21.48	61.002	
4,600.00	4,596.96	3,527.00	3,407.78	16.46	10.54	-93.60	-582.19	-536.98	1,391.68	1,370.37	21.31	65.313	
4,700.00	4,696.88	3,527.00	3,407.78	16.82	10.54	-93.60	-582.19	-536.98	1,475.05	1,453.88	21.16	69.709	
4,800.00	4,796.81	3,527.00	3,407.78	17.18	10.54	-93.60	-582.19	-536.98	1,560.37	1,539.33	21.04	74.158	
4,900.00	4,896.73	3,527.00	3,407.78	17.54	10.54	-93.60	-582.19	-536.98	1,647.35	1,626.40	20.95	78.636	
5,000.00	4,996.66	3,527.00	3,407.78	17.90	10.54	-93.60	-582.19	-536.98	1,735.73	1,714.84	20.88	83.120	
5,100.00	5,096.58	3,527.00	3,407.78	18.26	10.54	-93.60	-582.19	-536.98	1,825.31	1,804.47	20.84	87.593	
5,200.00	5,196.50	3,527.00	3,407.78	18.63	10.54	-93.60	-582.19	-536.98	1,915.92	1,895.10	20.82	92.040	
5,300.00	5,296.43	3,527.00	3,407.78	18.99	10.54	-93.60	-582.19	-536.98	2,007.42	1,986.61	20.81	96.448	
5,400.00	5,396.35	3,527.00	3,407.78	19.35	10.54	-93.60	-582.19	-536.98	2,099.70	2,078.87	20.83	100.809	
5,500.00	5,496.28	3,527.00	3,407.78	19.71	10.54	-93.60	-582.19	-536.98	2,192.65	2,171.79	20.86	105.112	
5,600.00	5,596.20	3,527.00	3,407.78	20.07	10.54	-93.60	-582.19	-536.98	2,286.20	2,265.30	20.91	109.353	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #271A - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 330-MWD-SDI

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,700.00	5,696.13	3,527.00	3,407.78	20.43	10.54	-93.60	-582.19	-536.98	2,380.28	2,359.31	20.97	113.525	
5,800.00	5,796.05	3,527.00	3,407.78	20.79	10.54	-93.60	-582.19	-536.98	2,474.82	2,453.78	21.04	117.624	
5,900.00	5,895.98	3,527.00	3,407.78	21.16	10.54	-93.60	-582.19	-536.98	2,569.77	2,548.64	21.12	121.646	
6,000.00	5,995.90	3,527.00	3,407.78	21.52	10.54	-93.60	-582.19	-536.98	2,665.09	2,643.87	21.22	125.589	
6,100.00	6,095.82	3,527.00	3,407.78	21.88	10.54	-93.60	-582.19	-536.98	2,760.74	2,739.42	21.33	129.451	
6,200.00	6,195.75	3,527.00	3,407.78	22.24	10.54	-93.60	-582.19	-536.98	2,856.69	2,835.25	21.44	133.230	
6,300.00	6,295.67	3,527.00	3,407.78	22.60	10.54	-93.60	-582.19	-536.98	2,952.91	2,931.35	21.57	136.925	
6,400.00	6,395.60	3,527.00	3,407.78	22.96	10.54	-93.60	-582.19	-536.98	3,049.38	3,027.68	21.70	140.536	
6,500.00	6,495.52	3,527.00	3,407.78	23.32	10.54	-93.60	-582.19	-536.98	3,146.06	3,124.22	21.84	144.061	
6,600.00	6,595.45	3,527.00	3,407.78	23.68	10.54	-93.60	-582.19	-536.98	3,242.94	3,220.96	21.99	147.501	
6,641.25	6,636.67	3,527.00	3,407.78	23.83	10.54	-93.60	-582.19	-536.98	3,282.97	3,260.92	22.05	148.896	
6,650.00	6,645.41	3,527.00	3,407.78	23.87	10.54	-110.17	-582.19	-536.98	3,291.46	3,269.40	22.06	149.188	
6,700.00	6,695.38	3,527.00	3,407.78	24.03	10.54	110.01	-582.19	-536.98	3,340.20	3,318.06	22.14	150.855	
6,750.00	6,745.12	3,527.00	3,407.78	24.19	10.54	80.15	-582.19	-536.98	3,389.01	3,366.79	22.22	152.505	
6,800.00	6,794.33	3,527.00	3,407.78	24.34	10.54	60.79	-582.19	-536.98	3,437.59	3,415.29	22.30	154.137	
6,850.00	6,842.70	3,527.00	3,407.78	24.49	10.54	47.48	-582.19	-536.98	3,485.66	3,463.28	22.38	155.741	
6,900.00	6,889.94	3,527.00	3,407.78	24.63	10.54	38.36	-582.19	-536.98	3,532.96	3,510.50	22.46	157.305	
6,950.00	6,935.75	3,527.00	3,407.78	24.76	10.54	31.98	-582.19	-536.98	3,579.22	3,556.68	22.54	158.819	
7,000.00	6,979.84	3,527.00	3,407.78	24.89	10.54	27.38	-582.19	-536.98	3,624.21	3,601.60	22.61	160.271	
7,050.00	7,021.96	3,527.00	3,407.78	25.02	10.54	23.94	-582.19	-536.98	3,667.70	3,645.01	22.69	161.648	
7,100.00	7,061.84	3,527.00	3,407.78	25.16	10.54	21.32	-582.19	-536.98	3,709.47	3,686.71	22.77	162.934	
7,150.00	7,099.23	3,527.00	3,407.78	25.29	10.54	19.27	-582.19	-536.98	3,749.34	3,726.50	22.85	164.114	
7,200.00	7,133.90	3,527.00	3,407.78	25.42	10.54	17.64	-582.19	-536.98	3,787.12	3,764.20	22.93	165.170	
7,250.00	7,165.64	3,527.00	3,407.78	25.56	10.54	16.33	-582.19	-536.98	3,822.65	3,799.63	23.02	166.084	
7,300.00	7,194.26	3,527.00	3,407.78	25.71	10.54	15.26	-582.19	-536.98	3,855.76	3,832.65	23.11	166.836	
7,350.00	7,219.57	3,527.00	3,407.78	25.86	10.54	14.39	-582.19	-536.98	3,886.33	3,863.12	23.21	167.408	
7,400.00	7,241.42	3,527.00	3,407.78	26.03	10.54	13.67	-582.19	-536.98	3,914.22	3,890.89	23.33	167.782	
7,450.00	7,259.68	3,527.00	3,407.78	26.20	10.54	13.08	-582.19	-536.98	3,939.32	3,915.86	23.46	167.943	
7,500.00	7,274.23	3,527.00	3,407.78	26.38	10.54	12.60	-582.19	-536.98	3,961.53	3,937.93	23.60	167.878	
7,550.00	7,284.99	3,527.00	3,407.78	26.58	10.54	12.21	-582.19	-536.98	3,980.76	3,957.00	23.75	167.578	
7,600.00	7,291.88	3,527.00	3,407.78	26.78	10.54	11.91	-582.19	-536.98	3,996.93	3,973.01	23.93	167.038	
7,650.00	7,294.87	3,527.00	3,407.78	27.00	10.54	11.68	-582.19	-536.98	4,010.00	3,985.88	24.12	166.260	
7,663.21	7,295.00	3,527.00	3,407.78	27.06	10.54	11.63	-582.19	-536.98	4,012.92	3,988.75	24.17	166.032	
7,700.00	7,294.99	3,527.00	3,407.78	27.23	10.54	11.63	-582.19	-536.98	4,020.92	3,996.59	24.33	165.290	
7,800.00	7,294.97	3,527.00	3,407.78	27.74	10.54	11.63	-582.19	-536.98	4,044.26	4,019.48	24.79	163.163	
7,900.00	7,294.95	3,527.00	3,407.78	28.34	10.54	11.63	-582.19	-536.98	4,069.94	4,044.65	25.29	160.953	
8,000.00	7,294.93	3,527.00	3,407.78	29.02	10.54	11.63	-582.19	-536.98	4,097.89	4,072.07	25.82	158.719	
8,100.00	7,294.91	3,527.00	3,407.78	29.77	10.54	11.63	-582.19	-536.98	4,128.07	4,101.70	26.38	156.508	
8,200.00	7,294.89	3,527.00	3,407.78	30.58	10.54	11.63	-582.19	-536.98	4,160.44	4,133.49	26.95	154.359	
8,253.21	7,294.88	3,527.00	3,407.78	31.04	10.54	11.63	-582.19	-536.98	4,178.54	4,151.27	27.27	153.251	
8,300.00	7,294.87	3,527.00	3,407.78	31.46	10.54	11.28	-582.19	-536.98	4,195.02	4,167.48	27.54	152.301	
8,400.00	7,294.86	3,527.00	3,407.78	32.39	10.54	10.49	-582.19	-536.98	4,232.22	4,204.07	28.15	150.363	
8,500.00	7,294.84	3,527.00	3,407.78	33.38	10.54	9.64	-582.19	-536.98	4,272.01	4,243.26	28.76	148.565	
8,600.00	7,294.82	3,527.00	3,407.78	34.41	10.54	8.72	-582.19	-536.98	4,314.28	4,284.92	29.36	146.921	
8,700.00	7,294.80	3,527.00	3,407.78	35.48	10.54	7.73	-582.19	-536.98	4,358.91	4,328.94	29.97	145.437	
8,724.88	7,294.79	3,527.00	3,407.78	35.76	10.54	7.47	-582.19	-536.98	4,370.37	4,340.25	30.12	145.092	
8,800.00	7,294.78	3,527.00	3,407.78	36.59	10.54	7.47	-582.19	-536.98	4,405.66	4,375.09	30.57	144.111	
8,900.00	7,294.76	3,527.00	3,407.78	37.74	10.54	7.47	-582.19	-536.98	4,454.18	4,423.02	31.16	142.930	
9,000.00	7,294.74	3,527.00	3,407.78	38.91	10.54	7.47	-582.19	-536.98	4,504.40	4,472.65	31.75	141.888	
9,100.00	7,294.72	3,527.00	3,407.78	40.12	10.54	7.47	-582.19	-536.98	4,556.26	4,523.94	32.32	140.981	
9,200.00	7,294.70	3,527.00	3,407.78	41.35	10.54	7.47	-582.19	-536.98	4,609.70	4,576.82	32.88	140.202	
9,300.00	7,294.68	3,527.00	3,407.78	42.61	10.54	7.47	-582.19	-536.98	4,664.68	4,631.25	33.43	139.546	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #271A - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 330-MWD-SDI

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Rule Assigned: Minimum Separation (usft)	Separation Factor	Warning
9,400.00	7,294.66	3,527.00	3,407.78	43.89	10.54	7.47	-582.19	-536.98	4,721.13	4,687.17	33.96	139.007	
9,500.00	7,294.64	3,527.00	3,407.78	45.20	10.54	7.47	-582.19	-536.98	4,779.01	4,744.53	34.49	138.579	
9,600.00	7,294.62	3,527.00	3,407.78	46.52	10.54	7.47	-582.19	-536.98	4,838.27	4,803.27	35.00	138.255	
9,700.00	7,294.60	3,527.00	3,407.78	47.85	10.54	7.47	-582.19	-536.98	4,898.85	4,863.36	35.49	138.030	
9,800.00	7,294.58	3,527.00	3,407.78	49.21	10.54	7.47	-582.19	-536.98	4,960.70	4,924.73	35.97	137.899	
9,900.00	7,294.56	3,527.00	3,407.78	50.58	10.54	7.47	-582.19	-536.98	5,023.79	4,987.35	36.44	137.856	
10,000.00	7,294.54	3,527.00	3,407.78	51.96	10.54	7.47	-582.19	-536.98	5,088.06	5,051.16	36.90	137.897	
10,100.00	7,294.52	3,527.00	3,407.78	53.35	10.54	7.47	-582.19	-536.98	5,153.46	5,116.12	37.34	138.015	
10,200.00	7,294.50	3,527.00	3,407.78	54.76	10.54	7.47	-582.19	-536.98	5,219.97	5,182.20	37.77	138.207	
10,300.00	7,294.48	3,527.00	3,407.78	56.18	10.54	7.47	-582.19	-536.98	5,287.53	5,249.34	38.19	138.469	
10,400.00	7,294.46	3,527.00	3,407.78	57.60	10.54	7.47	-582.19	-536.98	5,356.10	5,317.51	38.59	138.796	
10,500.00	7,294.44	3,527.00	3,407.78	59.04	10.54	7.47	-582.19	-536.98	5,425.65	5,386.67	38.98	139.184	
10,600.00	7,294.42	3,527.00	3,407.78	60.48	10.54	7.47	-582.19	-536.98	5,496.14	5,456.78	39.36	139.631	
10,700.00	7,294.40	3,527.00	3,407.78	61.93	10.54	7.47	-582.19	-536.98	5,567.53	5,527.80	39.73	140.132	
10,800.00	7,294.38	3,527.00	3,407.78	63.39	10.54	7.47	-582.19	-536.98	5,639.79	5,599.71	40.09	140.685	
10,900.00	7,294.36	3,527.00	3,407.78	64.86	10.54	7.47	-582.19	-536.98	5,712.89	5,672.46	40.43	141.286	
11,000.00	7,294.34	3,527.00	3,407.78	66.33	10.54	7.47	-582.19	-536.98	5,786.80	5,746.03	40.77	141.933	
11,100.00	7,294.32	3,527.00	3,407.78	67.81	10.54	7.47	-582.19	-536.98	5,861.48	5,820.38	41.10	142.623	
11,200.00	7,294.30	3,527.00	3,407.78	69.30	10.54	7.47	-582.19	-536.98	5,936.90	5,895.48	41.41	143.354	
11,300.00	7,294.28	3,527.00	3,407.78	70.79	10.54	7.47	-582.19	-536.98	6,013.04	5,971.32	41.72	144.124	
11,400.00	7,294.26	3,527.00	3,407.78	72.28	10.54	7.47	-582.19	-536.98	6,089.87	6,047.85	42.02	144.929	
11,500.00	7,294.24	3,527.00	3,407.78	73.78	10.54	7.47	-582.19	-536.98	6,167.36	6,125.05	42.31	145.769	
11,600.00	7,294.22	3,527.00	3,407.78	75.28	10.54	7.47	-582.19	-536.98	6,245.50	6,202.91	42.59	146.641	
11,700.00	7,294.20	3,527.00	3,407.78	76.79	10.54	7.47	-582.19	-536.98	6,324.25	6,281.38	42.86	147.544	
11,800.00	7,294.18	3,527.00	3,407.78	78.30	10.54	7.47	-582.19	-536.98	6,403.59	6,360.46	43.13	148.476	
11,900.00	7,294.16	3,527.00	3,407.78	79.82	10.54	7.47	-582.19	-536.98	6,483.51	6,440.12	43.39	149.435	
12,000.00	7,294.14	3,527.00	3,407.78	81.33	10.54	7.47	-582.19	-536.98	6,563.97	6,520.33	43.64	150.420	
12,100.00	7,294.12	3,527.00	3,407.78	82.86	10.54	7.47	-582.19	-536.98	6,644.97	6,601.09	43.88	151.429	
12,200.00	7,294.10	3,527.00	3,407.78	84.38	10.54	7.47	-582.19	-536.98	6,726.47	6,682.36	44.12	152.461	
12,300.00	7,294.09	3,527.00	3,407.78	85.91	10.54	7.47	-582.19	-536.98	6,808.47	6,764.12	44.35	153.515	
12,400.00	7,294.07	3,527.00	3,407.78	87.44	10.54	7.47	-582.19	-536.98	6,890.95	6,846.37	44.58	154.589	
12,500.00	7,294.05	3,527.00	3,407.78	88.97	10.54	7.47	-582.19	-536.98	6,973.88	6,929.09	44.80	155.683	
12,600.00	7,294.03	3,527.00	3,407.78	90.51	10.54	7.47	-582.19	-536.98	7,057.26	7,012.25	45.01	156.796	
12,700.00	7,294.01	3,527.00	3,407.78	92.04	10.54	7.47	-582.19	-536.98	7,141.07	7,095.85	45.22	157.926	
12,800.00	7,293.99	3,527.00	3,407.78	93.58	10.54	7.47	-582.19	-536.98	7,225.28	7,179.86	45.42	159.072	
12,900.00	7,293.97	3,527.00	3,407.78	95.13	10.54	7.47	-582.19	-536.98	7,309.89	7,264.27	45.62	160.234	
13,000.00	7,293.95	3,527.00	3,407.78	96.67	10.54	7.47	-582.19	-536.98	7,394.89	7,349.08	45.81	161.411	
13,100.00	7,293.93	3,527.00	3,407.78	98.22	10.54	7.47	-582.19	-536.98	7,480.26	7,434.26	46.00	162.601	
13,200.00	7,293.91	3,527.00	3,407.78	99.76	10.54	7.47	-582.19	-536.98	7,565.99	7,519.80	46.19	163.805	
13,300.00	7,293.89	3,527.00	3,407.78	101.31	10.54	7.47	-582.19	-536.98	7,652.06	7,605.69	46.37	165.021	
13,400.00	7,293.87	3,527.00	3,407.78	102.87	10.54	7.47	-582.19	-536.98	7,738.47	7,691.92	46.55	166.249	
13,500.00	7,293.85	3,527.00	3,407.78	104.42	10.54	7.47	-582.19	-536.98	7,825.20	7,778.48	46.72	167.488	
13,600.00	7,293.83	3,527.00	3,407.78	105.97	10.54	7.47	-582.19	-536.98	7,912.25	7,865.36	46.89	168.737	
13,700.00	7,293.81	3,527.00	3,407.78	107.53	10.54	7.47	-582.19	-536.98	7,999.59	7,952.54	47.06	169.996	
13,800.00	7,293.79	3,527.00	3,407.78	109.09	10.54	7.47	-582.19	-536.98	8,087.24	8,040.01	47.22	171.264	
13,900.00	7,293.77	3,527.00	3,407.78	110.65	10.54	7.47	-582.19	-536.98	8,175.16	8,127.78	47.38	172.541	
14,000.00	7,293.75	3,527.00	3,407.78	112.21	10.54	7.47	-582.19	-536.98	8,263.36	8,215.82	47.54	173.826	
14,100.00	7,293.73	3,527.00	3,407.78	113.77	10.54	7.47	-582.19	-536.98	8,351.83	8,304.13	47.69	175.119	
14,200.00	7,293.71	3,527.00	3,407.78	115.33	10.54	7.47	-582.19	-536.98	8,440.55	8,392.70	47.84	176.420	
14,300.00	7,293.69	3,527.00	3,407.78	116.89	10.54	7.47	-582.19	-536.98	8,529.52	8,481.53	47.99	177.726	
14,400.00	7,293.67	3,527.00	3,407.78	118.46	10.54	7.47	-582.19	-536.98	8,618.74	8,570.60	48.14	179.040	
14,500.00	7,293.65	3,527.00	3,407.78	120.02	10.54	7.47	-582.19	-536.98	8,708.18	8,659.90	48.28	180.359	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #271A - OH - OH-SVY — **Offset Site Error:** 0.00 usft

Survey Program: 330-MWD-SDI — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,600.00	7,293.63	3,527.00	3,407.78	121.59	10.54	7.47	-582.19	-536.98	8,797.86	8,749.44	48.42	181.684	
14,700.00	7,293.61	3,527.00	3,407.78	123.16	10.54	7.47	-582.19	-536.98	8,887.76	8,839.19	48.56	183.013	
14,800.00	7,293.59	3,527.00	3,407.78	124.73	10.54	7.47	-582.19	-536.98	8,977.87	8,929.17	48.70	184.348	
14,900.00	7,293.57	3,527.00	3,407.78	126.30	10.54	7.47	-582.19	-536.98	9,068.18	9,019.35	48.84	185.687	
15,000.00	7,293.55	3,527.00	3,407.78	127.87	10.54	7.47	-582.19	-536.98	9,158.70	9,109.73	48.97	187.030	
15,100.00	7,293.53	3,527.00	3,407.78	129.44	10.54	7.47	-582.19	-536.98	9,249.42	9,200.32	49.10	188.377	
15,200.00	7,293.51	3,527.00	3,407.78	131.01	10.54	7.47	-582.19	-536.98	9,340.32	9,291.09	49.23	189.728	
15,300.00	7,293.49	3,527.00	3,407.78	132.58	10.54	7.47	-582.19	-536.98	9,431.41	9,382.05	49.36	191.082	
15,400.00	7,293.47	3,527.00	3,407.78	134.16	10.54	7.47	-582.19	-536.98	9,522.67	9,473.19	49.48	192.438	
15,500.00	7,293.45	3,527.00	3,407.78	135.73	10.54	7.47	-582.19	-536.98	9,614.11	9,564.50	49.61	193.798	
15,600.00	7,293.43	3,527.00	3,407.78	137.31	10.54	7.47	-582.19	-536.98	9,705.72	9,655.99	49.73	195.159	
15,700.00	7,293.41	3,527.00	3,407.78	138.88	10.54	7.47	-582.19	-536.98	9,797.50	9,747.64	49.85	196.523	
15,800.00	7,293.39	3,527.00	3,407.78	140.46	10.54	7.47	-582.19	-536.98	9,889.43	9,839.45	49.97	197.889	
15,900.00	7,293.37	3,527.00	3,407.78	142.03	10.54	7.47	-582.19	-536.98	9,981.52	9,931.42	50.09	199.256	
16,000.00	7,293.35	3,527.00	3,407.78	143.61	10.54	7.47	-582.19	-536.98	10,073.75	10,023.54	50.21	200.625	
16,100.00	7,293.34	3,527.00	3,407.78	145.19	10.54	7.47	-582.19	-536.98	10,166.14	10,115.81	50.33	201.995	
16,200.00	7,293.32	3,527.00	3,407.78	146.77	10.54	7.47	-582.19	-536.98	10,258.67	10,208.22	50.44	203.366	
16,300.00	7,293.30	3,527.00	3,407.78	148.35	10.54	7.47	-582.19	-536.98	10,351.33	10,300.78	50.56	204.738	
16,400.00	7,293.28	3,527.00	3,407.78	149.93	10.54	7.47	-582.19	-536.98	10,444.14	10,393.46	50.67	206.111	
16,500.00	7,293.26	3,527.00	3,407.78	151.51	10.54	7.47	-582.19	-536.98	10,537.07	10,486.29	50.79	207.484	
16,600.00	7,293.24	3,527.00	3,407.78	153.09	10.54	7.47	-582.19	-536.98	10,630.13	10,579.24	50.90	208.857	
16,700.00	7,293.22	3,527.00	3,407.78	154.67	10.54	7.47	-582.19	-536.98	10,723.32	10,672.31	51.01	210.230	
16,800.00	7,293.20	3,527.00	3,407.78	156.25	10.54	7.47	-582.19	-536.98	10,816.63	10,765.51	51.12	211.603	
16,900.00	7,293.18	3,527.00	3,407.78	157.83	10.54	7.47	-582.19	-536.98	10,910.06	10,858.83	51.23	212.977	
17,000.00	7,293.16	3,527.00	3,407.78	159.42	10.54	7.47	-582.19	-536.98	11,003.60	10,952.27	51.33	214.349	
17,100.00	7,293.14	3,527.00	3,407.78	161.00	10.54	7.47	-582.19	-536.98	11,097.26	11,045.81	51.44	215.721	
17,200.00	7,293.12	3,527.00	3,407.78	162.58	10.54	7.47	-582.19	-536.98	11,191.02	11,139.47	51.55	217.093	
17,300.00	7,293.10	3,527.00	3,407.78	164.17	10.54	7.47	-582.19	-536.98	11,284.89	11,233.24	51.66	218.464	
17,400.00	7,293.08	3,527.00	3,407.78	165.75	10.54	7.47	-582.19	-536.98	11,378.87	11,327.11	51.76	219.834	
17,500.00	7,293.06	3,527.00	3,407.78	167.34	10.54	7.47	-582.19	-536.98	11,472.95	11,421.08	51.87	221.202	
17,600.00	7,293.04	3,527.00	3,407.78	168.92	10.54	7.47	-582.19	-536.98	11,567.13	11,515.16	51.97	222.570	
17,667.15	7,293.03	3,527.00	3,407.78	169.99	10.54	7.47	-582.19	-536.98	11,630.43	11,578.39	52.04	223.487	
17,700.00	7,293.02	3,527.00	3,407.78	170.51	10.54	7.47	-582.19	-536.98	11,661.40	11,609.33	52.07	223.936	
17,802.15	7,293.00	3,527.00	3,407.78	172.13	10.54	7.47	-582.19	-536.98	11,757.81	11,705.62	52.18	225.330	

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #362 - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 100-A020Ga_GYRO-NS

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	44.40	44.40	0.00	0.08	105.49	-583.16	2,104.87	2,184.17				
100.00	100.00	135.68	135.68	0.25	0.30	105.48	-583.15	2,105.48	2,184.80	2,184.25	0.55	3,956.766	
200.00	200.00	242.09	242.09	0.61	0.67	105.48	-583.31	2,106.16	2,185.46	2,184.18	1.28	1,703.698	
300.00	300.00	348.34	348.34	0.97	1.05	105.49	-583.68	2,106.31	2,185.69	2,183.68	2.01	1,085.997	
400.00	400.00	447.98	447.98	1.33	1.39	105.50	-584.05	2,106.40	2,185.88	2,183.16	2.72	803.863	
500.00	500.00	548.27	548.26	1.68	1.75	105.50	-584.37	2,106.49	2,186.05	2,182.62	3.43	637.676 ES	
600.00	599.98	647.82	647.81	2.04	2.09	157.39	-584.69	2,106.59	2,187.84	2,183.71	4.13	529.521	
611.38	611.35	659.09	659.08	2.08	2.13	157.40	-584.74	2,106.60	2,188.25	2,184.04	4.21	519.429	
700.00	699.90	748.23	748.23	2.40	2.45	157.44	-585.14	2,106.67	2,191.60	2,186.77	4.84	453.093	
800.00	799.83	845.98	845.97	2.75	2.79	157.49	-585.58	2,106.71	2,195.36	2,189.83	5.53	396.786	
900.00	899.75	941.57	941.56	3.11	3.12	157.53	-585.92	2,107.01	2,199.35	2,193.12	6.22	353.440	
1,000.00	999.68	1,039.27	1,039.26	3.47	3.47	157.58	-586.33	2,107.41	2,203.44	2,196.52	6.92	318.375	
1,100.00	1,099.60	1,135.35	1,135.34	3.83	3.80	157.63	-586.90	2,107.89	2,207.68	2,200.07	7.61	289.952	
1,200.00	1,199.53	1,232.55	1,232.53	4.19	4.14	157.67	-587.51	2,108.55	2,212.10	2,203.79	8.31	266.153	
1,300.00	1,299.45	1,332.48	1,332.46	4.55	4.49	157.72	-588.13	2,109.25	2,216.54	2,207.52	9.02	245.769	
1,400.00	1,399.38	1,433.95	1,433.92	4.91	4.85	157.77	-588.86	2,109.96	2,221.01	2,211.27	9.73	228.220	
1,500.00	1,499.30	1,540.83	1,540.80	5.27	5.22	157.83	-589.48	2,110.47	2,225.22	2,214.76	10.46	212.650	
1,600.00	1,599.22	1,648.79	1,648.75	5.63	5.60	157.87	-589.86	2,110.72	2,229.14	2,217.94	11.20	199.039	
1,700.00	1,699.15	1,753.86	1,753.83	5.99	5.97	157.92	-589.96	2,110.62	2,232.68	2,220.75	11.92	187.256	
1,800.00	1,799.07	1,850.93	1,850.90	6.35	6.31	157.96	-590.19	2,110.47	2,236.20	2,223.58	12.62	177.210	
1,900.00	1,899.00	1,942.89	1,942.86	6.71	6.63	158.01	-590.73	2,110.45	2,239.95	2,226.65	13.30	168.447	
2,000.00	1,998.92	2,033.69	2,033.65	7.07	6.95	158.06	-591.68	2,110.74	2,244.15	2,230.18	13.97	160.608	
2,100.00	2,098.85	2,129.19	2,129.15	7.43	7.28	158.12	-592.68	2,111.33	2,248.64	2,233.98	14.67	153.332	
2,200.00	2,198.77	2,233.55	2,233.50	7.79	7.65	158.17	-593.49	2,112.14	2,253.21	2,237.82	15.39	146.412	
2,300.00	2,298.70	2,349.31	2,349.26	8.15	8.05	158.22	-593.96	2,112.46	2,257.19	2,241.04	16.15	139.731	
2,400.00	2,398.62	2,453.66	2,453.60	8.51	8.42	158.27	-594.11	2,112.30	2,260.70	2,243.82	16.88	133.960	
2,500.00	2,498.54	2,552.56	2,552.50	8.87	8.76	158.31	-594.21	2,112.16	2,264.21	2,246.63	17.58	128.806	
2,600.00	2,598.47	2,647.74	2,647.68	9.23	9.09	158.35	-594.47	2,112.06	2,267.79	2,249.52	18.27	124.137	
2,700.00	2,698.39	2,742.58	2,742.52	9.60	9.43	158.39	-594.98	2,112.19	2,271.68	2,252.73	18.96	119.828	
2,800.00	2,798.32	2,845.31	2,845.25	9.96	9.79	158.44	-595.63	2,112.34	2,275.62	2,255.95	19.68	115.655	
2,900.00	2,898.24	2,953.41	2,953.35	10.32	10.16	158.50	-596.29	2,112.20	2,279.29	2,258.88	20.41	111.660	
3,000.00	2,998.17	3,061.73	3,061.67	10.68	10.54	158.56	-596.87	2,111.66	2,282.58	2,261.43	21.15	107.926	
3,100.00	3,098.09	3,165.70	3,165.63	11.04	10.90	158.60	-596.94	2,110.97	2,285.58	2,263.71	21.87	104.507	
3,200.00	3,198.02	3,264.90	3,264.83	11.40	11.25	158.64	-596.96	2,110.25	2,288.52	2,265.94	22.57	101.379	
3,300.00	3,297.94	3,362.93	3,362.86	11.76	11.59	158.69	-597.15	2,109.58	2,291.54	2,268.26	23.27	98.459	
3,400.00	3,397.86	3,459.27	3,459.20	12.12	11.93	158.73	-597.50	2,108.96	2,294.66	2,270.69	23.97	95.737	
3,500.00	3,497.79	3,559.11	3,559.03	12.48	12.28	158.79	-598.26	2,108.33	2,297.89	2,273.22	24.68	93.125	
3,600.00	3,597.71	3,560.00	3,559.92	12.85	12.28	158.79	-598.27	2,108.32	2,303.25	2,278.24	25.01	92.099	
3,700.00	3,697.64	3,560.00	3,559.92	13.21	12.28	158.79	-598.27	2,108.32	2,312.91	2,287.62	25.30	91.428	
3,800.00	3,797.56	3,560.00	3,559.92	13.57	12.28	158.79	-598.27	2,108.32	2,326.84	2,301.30	25.55	91.086	
3,900.00	3,897.49	3,560.00	3,559.92	13.93	12.28	158.79	-598.27	2,108.32	2,344.96	2,319.21	25.75	91.057 SF	
4,000.00	3,997.41	3,560.00	3,559.92	14.29	12.28	158.79	-598.27	2,108.32	2,367.16	2,341.24	25.92	91.324	
4,100.00	4,097.34	3,560.00	3,559.92	14.65	12.28	158.79	-598.27	2,108.32	2,393.34	2,367.29	26.05	91.873	
4,200.00	4,197.26	3,560.00	3,559.92	15.01	12.28	158.79	-598.27	2,108.32	2,423.37	2,397.22	26.15	92.689	
4,300.00	4,297.18	3,560.00	3,559.92	15.37	12.28	158.79	-598.27	2,108.32	2,457.10	2,430.90	26.21	93.757	
4,400.00	4,397.11	3,560.00	3,559.92	15.74	12.28	158.79	-598.27	2,108.32	2,494.39	2,468.15	26.24	95.064	
4,500.00	4,497.03	3,560.00	3,559.92	16.10	12.28	158.79	-598.27	2,108.32	2,535.08	2,508.83	26.24	96.594	
4,600.00	4,596.96	3,560.00	3,559.92	16.46	12.28	158.79	-598.27	2,108.32	2,579.00	2,552.77	26.23	98.335	
4,700.00	4,696.88	3,560.00	3,559.92	16.82	12.28	158.79	-598.27	2,108.32	2,626.00	2,599.81	26.19	100.273	
4,800.00	4,796.81	3,560.00	3,559.92	17.18	12.28	158.79	-598.27	2,108.32	2,675.91	2,649.78	26.13	102.394	
4,900.00	4,896.73	3,560.00	3,559.92	17.54	12.28	158.79	-598.27	2,108.32	2,728.58	2,702.51	26.06	104.687	
5,000.00	4,996.66	3,560.00	3,559.92	17.90	12.28	158.79	-598.27	2,108.32	2,783.84	2,757.86	25.98	107.138	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #362 - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 100-A020Ga_GYRO-NS

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,096.58	3,560.00	3,559.92	18.26	12.28	158.79	-598.27	2,108.32	2,841.55	2,815.65	25.89	109.736	
5,200.00	5,196.50	3,560.00	3,559.92	18.63	12.28	158.79	-598.27	2,108.32	2,901.55	2,875.76	25.80	112.468	
5,300.00	5,296.43	3,560.00	3,559.92	18.99	12.28	158.79	-598.27	2,108.32	2,963.72	2,938.02	25.70	115.322	
5,400.00	5,396.35	3,560.00	3,559.92	19.35	12.28	158.79	-598.27	2,108.32	3,027.92	3,002.32	25.60	118.288	
5,500.00	5,496.28	3,560.00	3,559.92	19.71	12.28	158.79	-598.27	2,108.32	3,094.01	3,068.52	25.50	121.354	
5,600.00	5,596.20	3,560.00	3,559.92	20.07	12.28	158.79	-598.27	2,108.32	3,161.89	3,136.49	25.39	124.509	
5,700.00	5,696.13	3,560.00	3,559.92	20.43	12.28	158.79	-598.27	2,108.32	3,231.43	3,206.14	25.30	127.743	
5,800.00	5,796.05	3,560.00	3,559.92	20.79	12.28	158.79	-598.27	2,108.32	3,302.54	3,277.34	25.20	131.046	
5,900.00	5,895.98	3,560.00	3,559.92	21.16	12.28	158.79	-598.27	2,108.32	3,375.12	3,350.01	25.11	134.407	
6,000.00	5,995.90	3,560.00	3,559.92	21.52	12.28	158.79	-598.27	2,108.32	3,449.07	3,424.04	25.03	137.818	
6,100.00	6,095.82	3,560.00	3,559.92	21.88	12.28	158.79	-598.27	2,108.32	3,524.30	3,499.35	24.95	141.269	
6,200.00	6,195.75	3,560.00	3,559.92	22.24	12.28	158.79	-598.27	2,108.32	3,600.74	3,575.86	24.88	144.751	
6,300.00	6,295.67	3,560.00	3,559.92	22.60	12.28	158.79	-598.27	2,108.32	3,678.31	3,653.50	24.81	148.256	
6,400.00	6,395.60	3,560.00	3,559.92	22.96	12.28	158.79	-598.27	2,108.32	3,756.94	3,732.18	24.75	151.776	
6,500.00	6,495.52	3,560.00	3,559.92	23.32	12.28	158.79	-598.27	2,108.32	3,836.56	3,811.86	24.70	155.303	
6,600.00	6,595.45	3,560.00	3,559.92	23.68	12.28	158.79	-598.27	2,108.32	3,917.12	3,892.46	24.66	158.830	
6,641.25	6,636.67	3,560.00	3,559.92	23.83	12.28	158.79	-598.27	2,108.32	3,950.61	3,925.96	24.65	160.283	
6,650.00	6,645.41	3,560.00	3,559.92	23.87	12.28	145.05	-598.27	2,108.32	3,957.70	3,933.05	24.64	160.597	
6,700.00	6,695.38	3,560.00	3,559.92	24.03	12.28	23.71	-598.27	2,108.32	3,996.95	3,972.34	24.61	162.411	
6,750.00	6,745.12	3,560.00	3,559.92	24.19	12.28	13.32	-598.27	2,108.32	4,033.93	4,009.37	24.56	164.255	
6,800.00	6,794.33	3,560.00	3,559.92	24.34	12.28	10.15	-598.27	2,108.32	4,068.49	4,044.00	24.50	166.077	
6,850.00	6,842.70	3,560.00	3,559.92	24.49	12.28	8.53	-598.27	2,108.32	4,100.48	4,076.05	24.43	167.871	
6,900.00	6,889.94	3,560.00	3,559.92	24.63	12.28	7.52	-598.27	2,108.32	4,129.76	4,105.41	24.34	169.635	
6,950.00	6,935.75	3,560.00	3,559.92	24.76	12.28	6.83	-598.27	2,108.32	4,156.20	4,131.95	24.25	171.365	
7,000.00	6,979.84	3,560.00	3,559.92	24.89	12.28	6.31	-598.27	2,108.32	4,179.71	4,155.56	24.15	173.057	
7,050.00	7,021.96	3,560.00	3,559.92	25.02	12.28	5.93	-598.27	2,108.32	4,200.19	4,176.15	24.04	174.705	
7,100.00	7,061.84	3,560.00	3,559.92	25.16	12.28	5.63	-598.27	2,108.32	4,217.55	4,193.63	23.92	176.300	
7,150.00	7,099.23	3,560.00	3,559.92	25.29	12.28	5.40	-598.27	2,108.32	4,231.73	4,207.93	23.80	177.834	
7,200.00	7,133.90	3,560.00	3,559.92	25.42	12.28	5.22	-598.27	2,108.32	4,242.67	4,219.00	23.66	179.296	
7,250.00	7,165.64	3,560.00	3,559.92	25.56	12.28	5.08	-598.27	2,108.32	4,250.33	4,226.80	23.52	180.675	
7,300.00	7,194.26	3,560.00	3,559.92	25.71	12.28	4.99	-598.27	2,108.32	4,254.68	4,231.29	23.38	181.956	
7,350.00	7,219.57	3,560.00	3,559.92	25.86	12.28	4.93	-598.27	2,108.32	4,255.70	4,232.46	23.24	183.128	
7,400.00	7,241.42	3,560.00	3,559.92	26.03	12.28	4.90	-598.27	2,108.32	4,253.40	4,230.30	23.09	184.176	
7,450.00	7,259.68	3,560.00	3,559.92	26.20	12.28	4.89	-598.27	2,108.32	4,247.77	4,224.82	22.95	185.086	
7,500.00	7,274.23	3,560.00	3,559.92	26.38	12.28	4.92	-598.27	2,108.32	4,238.85	4,216.04	22.81	185.848	
7,550.00	7,284.99	3,560.00	3,559.92	26.58	12.28	4.98	-598.27	2,108.32	4,226.66	4,203.99	22.67	186.448	
7,600.00	7,291.88	3,560.00	3,559.92	26.78	12.28	5.07	-598.27	2,108.32	4,211.25	4,188.71	22.53	186.879	
7,650.00	7,294.87	3,560.00	3,559.92	27.00	12.28	5.19	-598.27	2,108.32	4,192.68	4,170.27	22.40	187.133	
7,663.21	7,295.00	3,560.00	3,559.92	27.06	12.28	5.23	-598.27	2,108.32	4,187.26	4,164.88	22.38	187.139	
7,700.00	7,294.99	3,560.00	3,559.92	27.23	12.28	5.23	-598.27	2,108.32	4,171.99	4,149.71	22.28	187.258	
7,800.00	7,294.97	3,560.00	3,559.92	27.74	12.28	5.23	-598.27	2,108.32	4,131.85	4,109.80	22.05	187.403	
7,900.00	7,294.95	3,560.00	3,559.92	28.34	12.28	5.23	-598.27	2,108.32	4,093.77	4,071.90	21.87	187.206	
8,000.00	7,294.93	3,560.00	3,559.92	29.02	12.28	5.23	-598.27	2,108.32	4,057.79	4,036.05	21.74	186.629	
8,100.00	7,294.91	3,560.00	3,559.92	29.77	12.28	5.23	-598.27	2,108.32	4,023.97	4,002.30	21.68	185.642	
8,200.00	7,294.89	3,560.00	3,559.92	30.58	12.28	5.23	-598.27	2,108.32	3,992.38	3,970.71	21.67	184.229	
8,253.21	7,294.88	3,560.00	3,559.92	31.04	12.28	5.23	-598.27	2,108.32	3,976.49	3,954.80	21.69	183.303	
8,300.00	7,294.87	3,560.00	3,559.92	31.46	12.28	5.51	-598.27	2,108.32	3,963.09	3,941.36	21.73	182.385	
8,400.00	7,294.86	3,560.00	3,559.92	32.39	12.28	6.06	-598.27	2,108.32	3,936.41	3,914.55	21.86	180.091	
8,500.00	7,294.84	3,560.00	3,559.92	33.38	12.28	6.55	-598.27	2,108.32	3,912.46	3,890.40	22.06	177.368	
8,600.00	7,294.82	3,560.00	3,559.92	34.41	12.28	6.98	-598.27	2,108.32	3,891.32	3,868.99	22.33	174.254	
8,700.00	7,294.80	3,560.00	3,559.92	35.48	12.28	7.35	-598.27	2,108.32	3,873.06	3,850.39	22.68	170.804	
8,724.88	7,294.79	3,560.00	3,559.92	35.76	12.28	7.43	-598.27	2,108.32	3,868.98	3,846.21	22.77	169.901	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #362 - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 100-A020Ga_GYRO-NS

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,800.00	7,294.78	3,560.00	3,559.92	36.59	12.28	7.43	-598.27	2,108.32	3,857.63	3,834.55	23.09	167.092	
8,900.00	7,294.76	3,560.00	3,559.92	37.74	12.28	7.43	-598.27	2,108.32	3,844.75	3,821.20	23.56	163.216	
9,000.00	7,294.74	3,560.00	3,559.92	38.91	12.28	7.43	-598.27	2,108.32	3,834.44	3,810.36	24.08	159.242	
9,100.00	7,294.72	3,560.00	3,559.92	40.12	12.28	7.43	-598.27	2,108.32	3,826.71	3,802.06	24.65	155.226	
9,200.00	7,294.70	3,560.00	3,559.92	41.35	12.28	7.43	-598.27	2,108.32	3,821.59	3,796.32	25.27	151.223	
9,300.00	7,294.68	3,560.00	3,559.92	42.61	12.28	7.43	-598.27	2,108.32	3,819.08	3,793.15	25.93	147.278	
9,345.97	7,294.67	3,560.00	3,559.92	43.20	12.28	7.43	-598.27	2,108.32	3,818.80	3,792.55	26.25	145.488	
9,400.00	7,294.66	3,560.00	3,559.92	43.89	12.28	7.43	-598.27	2,108.32	3,819.18	3,792.56	26.63	143.428	
9,500.00	7,294.64	3,560.00	3,559.92	45.20	12.28	7.43	-598.27	2,108.32	3,821.91	3,794.55	27.36	139.707	
9,600.00	7,294.62	3,560.00	3,559.92	46.52	12.28	7.43	-598.27	2,108.32	3,827.24	3,799.13	28.11	136.137	
9,700.00	7,294.60	3,560.00	3,559.92	47.85	12.28	7.43	-598.27	2,108.32	3,835.18	3,806.28	28.89	132.740	
9,800.00	7,294.58	3,560.00	3,559.92	49.21	12.28	7.43	-598.27	2,108.32	3,845.70	3,816.01	29.69	129.527	
9,900.00	7,294.56	3,560.00	3,559.92	50.58	12.28	7.43	-598.27	2,108.32	3,858.78	3,828.28	30.50	126.509	
10,000.00	7,294.54	3,560.00	3,559.92	51.96	12.28	7.43	-598.27	2,108.32	3,874.40	3,843.08	31.32	123.690	
10,100.00	7,294.52	3,560.00	3,559.92	53.35	12.28	7.43	-598.27	2,108.32	3,892.53	3,860.38	32.15	121.072	
10,200.00	7,294.50	3,560.00	3,559.92	54.76	12.28	7.43	-598.27	2,108.32	3,913.13	3,880.15	32.98	118.654	
10,300.00	7,294.48	3,560.00	3,559.92	56.18	12.28	7.43	-598.27	2,108.32	3,936.17	3,902.36	33.81	116.432	
10,400.00	7,294.46	3,560.00	3,559.92	57.60	12.28	7.43	-598.27	2,108.32	3,961.59	3,926.97	34.63	114.403	
10,500.00	7,294.44	3,560.00	3,559.92	59.04	12.28	7.43	-598.27	2,108.32	3,989.36	3,953.92	35.44	112.560	
10,600.00	7,294.42	3,560.00	3,559.92	60.48	12.28	7.43	-598.27	2,108.32	4,019.43	3,983.19	36.25	110.895	
10,700.00	7,294.40	3,560.00	3,559.92	61.93	12.28	7.43	-598.27	2,108.32	4,051.75	4,014.71	37.04	109.402	
10,800.00	7,294.38	3,560.00	3,559.92	63.39	12.28	7.43	-598.27	2,108.32	4,086.25	4,048.44	37.81	108.072	
10,900.00	7,294.36	3,560.00	3,559.92	64.86	12.28	7.43	-598.27	2,108.32	4,122.89	4,084.33	38.57	106.897	
11,000.00	7,294.34	3,560.00	3,559.92	66.33	12.28	7.43	-598.27	2,108.32	4,161.62	4,122.31	39.31	105.869	
11,100.00	7,294.32	3,560.00	3,559.92	67.81	12.28	7.43	-598.27	2,108.32	4,202.36	4,162.33	40.03	104.981	
11,200.00	7,294.30	3,560.00	3,559.92	69.30	12.28	7.43	-598.27	2,108.32	4,245.08	4,204.35	40.73	104.223	
11,300.00	7,294.28	3,560.00	3,559.92	70.79	12.28	7.43	-598.27	2,108.32	4,289.69	4,248.28	41.41	103.590	
11,400.00	7,294.26	3,560.00	3,559.92	72.28	12.28	7.43	-598.27	2,108.32	4,336.16	4,294.09	42.07	103.073	
11,500.00	7,294.24	3,560.00	3,559.92	73.78	12.28	7.43	-598.27	2,108.32	4,384.41	4,341.71	42.71	102.666	
11,600.00	7,294.22	3,560.00	3,559.92	75.28	12.28	7.43	-598.27	2,108.32	4,434.40	4,391.08	43.32	102.362	
11,700.00	7,294.20	3,560.00	3,559.92	76.79	12.28	7.43	-598.27	2,108.32	4,486.06	4,442.14	43.91	102.154	
11,800.00	7,294.18	3,560.00	3,559.92	78.30	12.28	7.43	-598.27	2,108.32	4,539.33	4,494.84	44.49	102.039	
11,900.00	7,294.16	3,560.00	3,559.92	79.82	12.28	7.43	-598.27	2,108.32	4,594.16	4,549.12	45.04	102.008	
12,000.00	7,294.14	3,560.00	3,559.92	81.33	12.28	7.43	-598.27	2,108.32	4,650.50	4,604.93	45.57	102.059	
12,100.00	7,294.12	3,560.00	3,559.92	82.86	12.28	7.43	-598.27	2,108.32	4,708.28	4,662.21	46.08	102.185	
12,200.00	7,294.10	3,560.00	3,559.92	84.38	12.28	7.43	-598.27	2,108.32	4,767.47	4,720.90	46.57	102.382	
12,300.00	7,294.09	3,560.00	3,559.92	85.91	12.28	7.43	-598.27	2,108.32	4,828.00	4,780.96	47.04	102.647	
12,400.00	7,294.07	3,560.00	3,559.92	87.44	12.28	7.43	-598.27	2,108.32	4,889.82	4,842.34	47.49	102.974	
12,500.00	7,294.05	3,560.00	3,559.92	88.97	12.28	7.43	-598.27	2,108.32	4,952.89	4,904.98	47.92	103.361	
12,600.00	7,294.03	3,560.00	3,559.92	90.51	12.28	7.43	-598.27	2,108.32	5,017.17	4,968.83	48.33	103.804	
12,700.00	7,294.01	3,560.00	3,559.92	92.04	12.28	7.43	-598.27	2,108.32	5,082.59	5,033.86	48.73	104.299	
12,800.00	7,293.99	3,560.00	3,559.92	93.58	12.28	7.43	-598.27	2,108.32	5,149.13	5,100.02	49.11	104.844	
12,900.00	7,293.97	3,560.00	3,559.92	95.13	12.28	7.43	-598.27	2,108.32	5,216.74	5,167.26	49.48	105.435	
13,000.00	7,293.95	3,560.00	3,559.92	96.67	12.28	7.43	-598.27	2,108.32	5,285.38	5,235.55	49.83	106.071	
13,100.00	7,293.93	3,560.00	3,559.92	98.22	12.28	7.43	-598.27	2,108.32	5,355.00	5,304.83	50.16	106.748	
13,200.00	7,293.91	3,560.00	3,559.92	99.76	12.28	7.43	-598.27	2,108.32	5,425.57	5,375.08	50.49	107.464	
13,300.00	7,293.89	3,560.00	3,559.92	101.31	12.28	7.43	-598.27	2,108.32	5,497.05	5,446.26	50.80	108.218	
13,400.00	7,293.87	3,560.00	3,559.92	102.87	12.28	7.43	-598.27	2,108.32	5,569.42	5,518.33	51.09	109.006	
13,500.00	7,293.85	3,560.00	3,559.92	104.42	12.28	7.43	-598.27	2,108.32	5,642.63	5,591.25	51.38	109.827	
13,600.00	7,293.83	3,560.00	3,559.92	105.97	12.28	7.43	-598.27	2,108.32	5,716.64	5,664.99	51.65	110.680	
13,700.00	7,293.81	3,560.00	3,559.92	107.53	12.28	7.43	-598.27	2,108.32	5,791.44	5,739.53	51.91	111.562	
13,800.00	7,293.79	3,560.00	3,559.92	109.09	12.28	7.43	-598.27	2,108.32	5,867.00	5,814.83	52.16	112.472	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #362 - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 100-A020Ga_GYRO-NS

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,293.77	3,560.00	3,559.92	110.65	12.28	7.43	-598.27	2,108.32	5,943.27	5,890.86	52.41	113.409	
14,000.00	7,293.75	3,560.00	3,559.92	112.21	12.28	7.43	-598.27	2,108.32	6,020.24	5,967.60	52.64	114.370	
14,100.00	7,293.73	3,560.00	3,559.92	113.77	12.28	7.43	-598.27	2,108.32	6,097.87	6,045.01	52.86	115.355	
14,200.00	7,293.71	3,560.00	3,559.92	115.33	12.28	7.43	-598.27	2,108.32	6,176.15	6,123.08	53.08	116.363	
14,300.00	7,293.69	3,560.00	3,559.92	116.89	12.28	7.43	-598.27	2,108.32	6,255.05	6,201.77	53.28	117.392	
14,400.00	7,293.67	3,560.00	3,559.92	118.46	12.28	7.43	-598.27	2,108.32	6,334.55	6,281.06	53.48	118.440	
14,500.00	7,293.65	3,560.00	3,559.92	120.02	12.28	7.43	-598.27	2,108.32	6,414.61	6,360.94	53.68	119.508	
14,600.00	7,293.63	3,560.00	3,559.92	121.59	12.28	7.43	-598.27	2,108.32	6,495.24	6,441.38	53.86	120.593	
14,700.00	7,293.61	3,560.00	3,559.92	123.16	12.28	7.43	-598.27	2,108.32	6,576.39	6,522.35	54.04	121.696	
14,800.00	7,293.59	3,560.00	3,559.92	124.73	12.28	7.43	-598.27	2,108.32	6,658.06	6,603.84	54.21	122.815	
14,900.00	7,293.57	3,560.00	3,559.92	126.30	12.28	7.43	-598.27	2,108.32	6,740.22	6,685.84	54.38	123.949	
15,000.00	7,293.55	3,560.00	3,559.92	127.87	12.28	7.43	-598.27	2,108.32	6,822.85	6,768.31	54.54	125.097	
15,100.00	7,293.53	3,560.00	3,559.92	129.44	12.28	7.43	-598.27	2,108.32	6,905.95	6,851.25	54.70	126.259	
15,200.00	7,293.51	3,560.00	3,559.92	131.01	12.28	7.43	-598.27	2,108.32	6,989.49	6,934.64	54.85	127.434	
15,300.00	7,293.49	3,560.00	3,559.92	132.58	12.28	7.43	-598.27	2,108.32	7,073.45	7,018.46	54.99	128.621	
15,400.00	7,293.47	3,560.00	3,559.92	134.16	12.28	7.43	-598.27	2,108.32	7,157.83	7,102.69	55.14	129.820	
15,500.00	7,293.45	3,560.00	3,559.92	135.73	12.28	7.43	-598.27	2,108.32	7,242.61	7,187.33	55.27	131.029	
15,600.00	7,293.43	3,560.00	3,559.92	137.31	12.28	7.43	-598.27	2,108.32	7,327.77	7,272.36	55.41	132.249	
15,700.00	7,293.41	3,560.00	3,559.92	138.88	12.28	7.43	-598.27	2,108.32	7,413.30	7,357.76	55.54	133.479	
15,800.00	7,293.39	3,560.00	3,559.92	140.46	12.28	7.43	-598.27	2,108.32	7,499.18	7,443.52	55.67	134.718	
15,900.00	7,293.37	3,560.00	3,559.92	142.03	12.28	7.43	-598.27	2,108.32	7,585.42	7,529.63	55.79	135.965	
16,000.00	7,293.35	3,560.00	3,559.92	143.61	12.28	7.43	-598.27	2,108.32	7,671.99	7,616.08	55.91	137.221	
16,100.00	7,293.34	3,560.00	3,559.92	145.19	12.28	7.43	-598.27	2,108.32	7,758.88	7,702.85	56.03	138.484	
16,200.00	7,293.32	3,560.00	3,559.92	146.77	12.28	7.43	-598.27	2,108.32	7,846.08	7,789.94	56.14	139.755	
16,300.00	7,293.30	3,560.00	3,559.92	148.35	12.28	7.43	-598.27	2,108.32	7,933.59	7,877.33	56.25	141.033	
16,400.00	7,293.28	3,560.00	3,559.92	149.93	12.28	7.43	-598.27	2,108.32	8,021.38	7,965.02	56.36	142.317	
16,500.00	7,293.26	3,560.00	3,559.92	151.51	12.28	7.43	-598.27	2,108.32	8,109.46	8,052.99	56.47	143.606	
16,600.00	7,293.24	3,560.00	3,559.92	153.09	12.28	7.43	-598.27	2,108.32	8,197.82	8,141.24	56.57	144.902	
16,700.00	7,293.22	3,560.00	3,559.92	154.67	12.28	7.43	-598.27	2,108.32	8,286.44	8,229.76	56.68	146.203	
16,800.00	7,293.20	3,560.00	3,559.92	156.25	12.28	7.43	-598.27	2,108.32	8,375.31	8,318.53	56.78	147.509	
16,900.00	7,293.18	3,560.00	3,559.92	157.83	12.28	7.43	-598.27	2,108.32	8,464.43	8,407.56	56.88	148.819	
17,000.00	7,293.16	3,560.00	3,559.92	159.42	12.28	7.43	-598.27	2,108.32	8,553.80	8,496.82	56.97	150.134	
17,100.00	7,293.14	3,560.00	3,559.92	161.00	12.28	7.43	-598.27	2,108.32	8,643.39	8,586.32	57.07	151.452	
17,200.00	7,293.12	3,560.00	3,559.92	162.58	12.28	7.43	-598.27	2,108.32	8,733.22	8,676.05	57.16	152.775	
17,300.00	7,293.10	3,560.00	3,559.92	164.17	12.28	7.43	-598.27	2,108.32	8,823.26	8,766.00	57.26	154.100	
17,400.00	7,293.08	3,560.00	3,559.92	165.75	12.28	7.43	-598.27	2,108.32	8,913.51	8,856.16	57.35	155.429	
17,500.00	7,293.06	3,560.00	3,559.92	167.34	12.28	7.43	-598.27	2,108.32	9,003.97	8,946.53	57.44	156.761	
17,600.00	7,293.04	3,560.00	3,559.92	168.92	12.28	7.43	-598.27	2,108.32	9,094.63	9,037.10	57.53	158.095	
17,667.15	7,293.03	3,560.00	3,559.92	169.99	12.28	7.43	-598.27	2,108.32	9,155.62	9,098.03	57.59	158.992	
17,700.00	7,293.02	3,560.00	3,559.92	170.51	12.28	7.43	-598.27	2,108.32	9,185.48	9,127.87	57.61	159.432	
17,802.15	7,293.00	3,560.00	3,559.92	172.13	12.28	7.43	-598.27	2,108.32	9,278.49	9,220.78	57.70	160.799	

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #372 - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 170-INC-ONLY OWSG Rev5

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	88.28	207.94	6,937.47	6,941.80				
100.00	100.00	0.00	0.00	0.25	0.00	88.28	207.94	6,937.47	6,940.65	6,940.40	0.25	N/A	
147.62	147.62	17.62	17.62	0.42	0.39	88.28	207.94	6,937.47	6,940.59	6,939.77	0.81	8,538.780	
200.00	200.00	70.00	70.00	0.61	1.55	88.28	207.94	6,937.47	6,940.59	6,938.42	2.16	3,208.732	
300.00	300.00	170.00	170.00	0.97	3.77	88.28	207.94	6,937.47	6,940.59	6,935.85	4.74	1,464.018	
400.00	400.00	270.35	270.34	1.33	5.68	88.28	208.19	6,937.47	6,940.59	6,933.59	7.00	990.852	
500.00	500.00	370.01	370.00	1.68	7.77	88.28	207.94	6,937.47	6,940.59	6,931.13	9.46	733.951	
600.00	599.98	469.99	469.98	2.04	10.17	140.15	207.94	6,937.47	6,941.93	6,929.71	12.21	568.443	
611.38	611.35	481.36	481.35	2.08	10.44	140.15	207.94	6,937.47	6,942.25	6,929.72	12.53	554.214	
700.00	699.90	569.92	569.90	2.40	12.57	140.17	207.94	6,937.47	6,944.89	6,929.93	14.97	464.068	
800.00	799.83	670.18	670.17	2.75	14.98	140.19	208.40	6,937.47	6,947.89	6,930.17	17.73	391.939	
900.00	899.75	770.46	770.44	3.11	17.39	140.21	208.14	6,937.47	6,950.87	6,930.38	20.49	339.229	
1,000.00	999.68	869.72	869.68	3.47	19.84	140.23	207.94	6,937.47	6,953.86	6,930.56	23.30	298.477	
1,100.00	1,099.60	969.65	969.60	3.83	22.38	140.25	207.94	6,937.47	6,956.84	6,930.65	26.20	265.564	
1,200.00	1,199.53	1,069.57	1,069.53	4.19	24.92	140.27	207.94	6,937.47	6,959.83	6,930.74	29.10	239.206	
1,300.00	1,299.45	1,169.96	1,169.91	4.55	27.47	140.29	208.66	6,937.47	6,962.84	6,930.84	32.01	217.542	
1,400.00	1,399.38	1,270.38	1,270.32	4.91	30.03	140.31	208.29	6,937.47	6,965.83	6,930.91	34.92	199.485	
1,500.00	1,499.30	1,369.39	1,369.30	5.27	32.57	140.33	207.94	6,937.47	6,968.81	6,930.99	37.82	184.249	
1,600.00	1,599.22	1,469.31	1,469.22	5.63	35.18	140.35	207.94	6,937.47	6,971.80	6,931.01	40.79	170.912	
1,700.00	1,699.15	1,569.24	1,569.15	5.99	37.79	140.37	207.94	6,937.47	6,974.80	6,931.04	43.76	159.385	
1,800.00	1,799.07	1,669.49	1,669.40	6.35	40.41	140.39	208.74	6,937.47	6,977.81	6,931.07	46.74	149.295	
1,900.00	1,899.00	1,769.86	1,769.76	6.71	43.04	140.41	208.43	6,937.47	6,980.80	6,931.08	49.72	140.404	
2,000.00	1,998.92	1,869.17	1,868.92	7.07	45.60	140.43	207.94	6,937.47	6,983.78	6,931.15	52.64	132.672	
2,100.00	2,098.85	1,969.10	1,968.85	7.43	47.85	140.45	207.94	6,937.47	6,986.78	6,931.53	55.25	126.462	
2,200.00	2,198.77	2,070.94	2,070.66	7.79	50.14	140.47	208.61	6,937.47	6,989.80	6,931.90	57.90	120.723	
2,300.00	2,298.70	2,169.04	2,168.70	8.15	52.61	140.50	207.94	6,937.47	6,992.78	6,932.05	60.73	115.150	
2,400.00	2,398.62	2,268.96	2,268.62	8.51	55.37	140.52	207.94	6,937.47	6,995.78	6,931.93	63.85	109.571	
2,500.00	2,498.54	2,368.89	2,368.54	8.87	58.13	140.54	207.94	6,937.47	6,998.78	6,931.82	66.97	104.511	
2,600.00	2,598.47	2,469.37	2,469.01	9.23	60.91	140.55	208.87	6,937.47	7,001.81	6,931.70	70.10	99.881	
2,700.00	2,698.39	2,569.85	2,569.49	9.60	63.68	140.57	208.35	6,937.47	7,004.80	6,931.56	73.24	95.646	
2,800.00	2,798.32	2,668.99	2,668.32	9.96	66.36	140.60	207.94	6,937.47	7,007.79	6,931.52	76.27	91.878	
2,900.00	2,898.24	2,770.26	2,769.54	10.32	69.02	140.61	209.24	6,937.47	7,010.82	6,931.53	79.29	88.416	
3,000.00	2,998.17	2,868.98	2,868.17	10.68	71.44	140.64	207.94	6,937.47	7,013.80	6,931.72	82.08	85.454	
3,100.00	3,098.09	2,968.90	2,968.09	11.04	73.36	140.66	207.94	6,937.47	7,016.81	6,932.46	84.35	83.185	
3,200.00	3,198.02	3,068.82	3,068.02	11.40	75.28	140.68	207.94	6,937.47	7,019.82	6,933.19	86.63	81.035	
3,300.00	3,297.94	3,168.75	3,167.94	11.76	77.19	140.70	207.94	6,937.47	7,022.82	6,933.92	88.90	78.995	
3,400.00	3,397.86	3,268.67	3,267.86	12.12	79.11	140.72	207.94	6,937.47	7,025.83	6,934.66	91.18	77.057	
3,500.00	3,497.79	3,321.00	3,320.15	12.48	80.11	140.73	207.94	6,937.47	7,029.00	6,936.47	92.54	75.960	
3,600.00	3,597.71	3,321.00	3,320.15	12.85	80.11	140.73	207.94	6,937.47	7,033.40	6,940.53	92.87	75.731	
3,700.00	3,697.64	3,321.00	3,320.15	13.21	80.11	140.73	207.94	6,937.47	7,039.22	6,946.02	93.19	75.534	
3,800.00	3,797.56	3,321.00	3,320.15	13.57	80.11	140.73	207.94	6,937.47	7,046.45	6,952.95	93.49	75.369	
3,900.00	3,897.49	3,321.00	3,320.15	13.93	80.11	140.73	207.94	6,937.47	7,055.09	6,961.31	93.78	75.234	
4,000.00	3,997.41	3,321.00	3,320.15	14.29	80.11	140.73	207.94	6,937.47	7,065.13	6,971.09	94.04	75.130	
4,100.00	4,097.34	3,321.00	3,320.15	14.65	80.11	140.73	207.94	6,937.47	7,076.58	6,982.29	94.28	75.056	
4,200.00	4,197.26	3,321.00	3,320.15	15.01	80.11	140.73	207.94	6,937.47	7,089.41	6,994.90	94.51	75.012	
4,300.00	4,297.18	3,321.00	3,320.15	15.37	80.11	140.73	207.94	6,937.47	7,103.63	7,008.91	94.72	74.997	
4,400.00	4,397.11	3,321.00	3,320.15	15.74	80.11	140.73	207.94	6,937.47	7,119.23	7,024.32	94.91	75.011	
4,500.00	4,497.03	3,321.00	3,320.15	16.10	80.11	140.73	207.94	6,937.47	7,136.19	7,041.11	95.08	75.053	
4,600.00	4,596.96	3,321.00	3,320.15	16.46	80.11	140.73	207.94	6,937.47	7,154.52	7,059.28	95.24	75.124	
4,700.00	4,696.88	3,321.00	3,320.15	16.82	80.11	140.73	207.94	6,937.47	7,174.19	7,078.81	95.37	75.222	
4,800.00	4,796.81	3,321.00	3,320.15	17.18	80.11	140.73	207.94	6,937.47	7,195.19	7,099.70	95.49	75.348	
4,900.00	4,896.73	3,321.00	3,320.15	17.54	80.11	140.73	207.94	6,937.47	7,217.52	7,121.93	95.60	75.500	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #372 - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 170-INC-ONLY OWSG Rev5

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	4,996.66	3,321.00	3,320.15	17.90	80.11	140.73	207.94	6,937.47	7,241.16	7,145.48	95.68	75.679	
5,100.00	5,096.58	3,321.00	3,320.15	18.26	80.11	140.73	207.94	6,937.47	7,266.11	7,170.35	95.75	75.884	
5,200.00	5,196.50	3,321.00	3,320.15	18.63	80.11	140.73	207.94	6,937.47	7,292.33	7,196.53	95.81	76.115	
5,300.00	5,296.43	3,321.00	3,320.15	18.99	80.11	140.73	207.94	6,937.47	7,319.84	7,223.99	95.85	76.371	
5,400.00	5,396.35	3,321.00	3,320.15	19.35	80.11	140.73	207.94	6,937.47	7,348.59	7,252.72	95.87	76.653	
5,500.00	5,496.28	3,321.00	3,320.15	19.71	80.11	140.73	207.94	6,937.47	7,378.59	7,282.72	95.88	76.958	
5,600.00	5,596.20	3,321.00	3,320.15	20.07	80.11	140.73	207.94	6,937.47	7,409.82	7,313.95	95.87	77.288	
5,700.00	5,696.13	3,321.00	3,320.15	20.43	80.11	140.73	207.94	6,937.47	7,442.27	7,346.41	95.85	77.642	
5,800.00	5,796.05	3,321.00	3,320.15	20.79	80.11	140.73	207.94	6,937.47	7,475.91	7,380.09	95.82	78.020	
5,900.00	5,895.98	3,321.00	3,320.15	21.16	80.11	140.73	207.94	6,937.47	7,510.73	7,414.95	95.78	78.420	
6,000.00	5,995.90	3,321.00	3,320.15	21.52	80.11	140.73	207.94	6,937.47	7,546.71	7,450.99	95.72	78.843	
6,100.00	6,095.82	3,321.00	3,320.15	21.88	80.11	140.73	207.94	6,937.47	7,583.84	7,488.20	95.65	79.288	
6,200.00	6,195.75	3,321.00	3,320.15	22.24	80.11	140.73	207.94	6,937.47	7,622.11	7,526.54	95.57	79.756	
6,300.00	6,295.67	3,321.00	3,320.15	22.60	80.11	140.73	207.94	6,937.47	7,661.49	7,566.01	95.48	80.244	
6,400.00	6,395.60	3,321.00	3,320.15	22.96	80.11	140.73	207.94	6,937.47	7,701.96	7,606.59	95.38	80.754	
6,500.00	6,495.52	3,321.00	3,320.15	23.32	80.11	140.73	207.94	6,937.47	7,743.52	7,648.25	95.26	81.285	
6,600.00	6,595.45	3,321.00	3,320.15	23.68	80.11	140.73	207.94	6,937.47	7,786.13	7,690.99	95.14	81.836	
6,641.25	6,636.67	3,321.00	3,320.15	23.83	80.11	140.73	207.94	6,937.47	7,804.02	7,708.93	95.09	82.069	
6,650.00	6,645.41	3,321.00	3,320.15	23.87	80.11	127.19	207.94	6,937.47	7,807.78	7,712.70	95.08	82.119	
6,700.00	6,695.38	3,321.00	3,320.15	24.03	80.11	6.86	207.94	6,937.47	7,827.38	7,732.38	95.00	82.395	
6,750.00	6,745.12	3,321.00	3,320.15	24.19	80.11	-2.74	207.94	6,937.47	7,843.65	7,748.75	94.90	82.652	
6,800.00	6,794.33	3,321.00	3,320.15	24.34	80.11	-5.29	207.94	6,937.47	7,856.52	7,761.73	94.79	82.882	
6,850.00	6,842.70	3,321.00	3,320.15	24.49	80.11	-6.42	207.94	6,937.47	7,865.92	7,771.25	94.67	83.085	
6,900.00	6,889.94	3,321.00	3,320.15	24.63	80.11	-7.07	207.94	6,937.47	7,871.82	7,777.28	94.55	83.260	
6,950.00	6,935.75	3,321.00	3,320.15	24.76	80.11	-7.51	207.94	6,937.47	7,874.18	7,779.77	94.41	83.406	
7,000.00	6,979.84	3,321.00	3,320.15	24.89	80.11	-7.86	207.94	6,937.47	7,872.99	7,778.73	94.26	83.523	
7,050.00	7,021.96	3,321.00	3,320.15	25.02	80.11	-8.17	207.94	6,937.47	7,868.26	7,774.15	94.11	83.611	
7,100.00	7,061.84	3,321.00	3,320.15	25.16	80.11	-8.49	207.94	6,937.47	7,860.00	7,766.06	93.94	83.668	
7,150.00	7,099.23	3,321.00	3,320.15	25.29	80.11	-8.82	207.94	6,937.47	7,848.27	7,754.49	93.77	83.694	
7,200.00	7,133.90	3,321.00	3,320.15	25.42	80.11	-9.19	207.94	6,937.47	7,833.11	7,739.51	93.60	83.688	
7,250.00	7,165.64	3,321.00	3,320.15	25.56	80.11	-9.61	207.94	6,937.47	7,814.60	7,721.18	93.42	83.650	
7,300.00	7,194.26	3,321.00	3,320.15	25.71	80.11	-10.10	207.94	6,937.47	7,792.83	7,699.59	93.24	83.579	
7,350.00	7,219.57	3,321.00	3,320.15	25.86	80.11	-10.68	207.94	6,937.47	7,767.91	7,674.85	93.06	83.474	
7,400.00	7,241.42	3,321.00	3,320.15	26.03	80.11	-11.37	207.94	6,937.47	7,739.96	7,647.09	92.88	83.336	
7,450.00	7,259.68	3,321.00	3,320.15	26.20	80.11	-12.19	207.94	6,937.47	7,709.13	7,616.43	92.70	83.164	
7,500.00	7,274.23	3,321.00	3,320.15	26.38	80.11	-13.19	207.94	6,937.47	7,675.56	7,583.04	92.52	82.958	
7,550.00	7,284.99	3,321.00	3,320.15	26.58	80.11	-14.42	207.94	6,937.47	7,639.44	7,547.08	92.35	82.719	
7,600.00	7,291.88	3,321.00	3,320.15	26.78	80.11	-15.95	207.94	6,937.47	7,600.94	7,508.75	92.19	82.446	
7,650.00	7,294.87	3,321.00	3,320.15	27.00	80.11	-17.89	207.94	6,937.47	7,560.28	7,468.24	92.04	82.139	
7,663.21	7,295.00	3,321.00	3,320.15	27.06	80.11	-18.50	207.94	6,937.47	7,549.20	7,457.20	92.01	82.050	
7,700.00	7,294.99	3,321.00	3,320.15	27.23	80.11	-18.50	207.94	6,937.47	7,518.19	7,426.29	91.90	81.811	
7,800.00	7,294.97	3,321.00	3,320.15	27.74	80.11	-18.50	207.94	6,937.47	7,434.16	7,342.56	91.60	81.161	
7,900.00	7,294.95	3,321.00	3,320.15	28.34	80.11	-18.50	207.94	6,937.47	7,350.53	7,259.23	91.30	80.508	
8,000.00	7,294.93	3,321.00	3,320.15	29.02	80.11	-18.50	207.94	6,937.47	7,267.31	7,176.30	91.01	79.852	
8,100.00	7,294.91	3,321.00	3,320.15	29.77	80.11	-18.50	207.94	6,937.47	7,184.52	7,093.80	90.72	79.193	
8,200.00	7,294.89	3,321.00	3,320.15	30.58	80.11	-18.50	207.94	6,937.47	7,102.18	7,011.74	90.44	78.531	
8,253.21	7,294.88	3,321.00	3,320.15	31.04	80.11	-18.50	207.94	6,937.47	7,058.55	6,968.27	90.29	78.178	
8,300.00	7,294.87	3,321.00	3,320.15	31.46	80.11	-17.23	207.94	6,937.47	7,020.23	6,930.07	90.16	77.866	
8,400.00	7,294.86	3,321.00	3,320.15	32.39	80.11	-14.47	207.94	6,937.47	6,938.24	6,848.36	89.88	77.198	
8,500.00	7,294.84	3,321.00	3,320.15	33.38	80.11	-11.68	207.94	6,937.47	6,856.23	6,766.64	89.59	76.530	
8,600.00	7,294.82	3,321.00	3,320.15	34.41	80.11	-8.87	207.94	6,937.47	6,774.29	6,684.99	89.29	75.864	
8,700.00	7,294.80	3,321.00	3,320.15	35.48	80.11	-6.05	207.94	6,937.47	6,692.52	6,603.53	88.99	75.204	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #372 - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 170-INC-ONLY OWSG Rev5 **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,724.88	7,294.79	3,321.00	3,320.15	35.76	80.11	-5.35	207.94	6,937.47	6,672.22	6,583.31	88.91	75.041	
8,800.00	7,294.78	3,321.00	3,320.15	36.59	80.11	-5.35	207.94	6,937.47	6,611.09	6,522.41	88.68	74.549	
8,900.00	7,294.76	3,321.00	3,320.15	37.74	80.11	-5.35	207.94	6,937.47	6,530.17	6,441.80	88.37	73.895	
9,000.00	7,294.74	3,321.00	3,320.15	38.91	80.11	-5.35	207.94	6,937.47	6,449.79	6,361.73	88.06	73.242	
9,100.00	7,294.72	3,321.00	3,320.15	40.12	80.11	-5.35	207.94	6,937.47	6,369.96	6,282.21	87.75	72.591	
9,200.00	7,294.70	3,321.00	3,320.15	41.35	80.11	-5.35	207.94	6,937.47	6,290.71	6,203.27	87.44	71.941	
9,300.00	7,294.68	3,321.00	3,320.15	42.61	80.11	-5.35	207.94	6,937.47	6,212.06	6,124.92	87.13	71.292	
9,400.00	7,294.66	3,321.00	3,320.15	43.89	80.11	-5.35	207.94	6,937.47	6,134.02	6,047.20	86.83	70.646	
9,500.00	7,294.64	3,321.00	3,320.15	45.20	80.11	-5.35	207.94	6,937.47	6,056.64	5,970.12	86.52	70.002	
9,600.00	7,294.62	3,321.00	3,320.15	46.52	80.11	-5.35	207.94	6,937.47	5,979.92	5,893.71	86.22	69.360	
9,700.00	7,294.60	3,321.00	3,320.15	47.85	80.11	-5.35	207.94	6,937.47	5,903.91	5,818.00	85.91	68.722	
9,800.00	7,294.58	3,321.00	3,320.15	49.21	80.11	-5.35	207.94	6,937.47	5,828.61	5,743.01	85.61	68.087	
9,900.00	7,294.56	3,321.00	3,320.15	50.58	80.11	-5.35	207.94	6,937.47	5,754.07	5,668.77	85.30	67.455	
10,000.00	7,294.54	3,321.00	3,320.15	51.96	80.11	-5.35	207.94	6,937.47	5,680.31	5,595.31	85.00	66.829	
10,100.00	7,294.52	3,321.00	3,320.15	53.35	80.11	-5.35	207.94	6,937.47	5,607.37	5,522.67	84.69	66.207	
10,200.00	7,294.50	3,321.00	3,320.15	54.76	80.11	-5.35	207.94	6,937.47	5,535.27	5,450.88	84.39	65.591	
10,300.00	7,294.48	3,321.00	3,320.15	56.18	80.11	-5.35	207.94	6,937.47	5,464.05	5,379.96	84.09	64.982	
10,400.00	7,294.46	3,321.00	3,320.15	57.60	80.11	-5.35	207.94	6,937.47	5,393.74	5,309.96	83.78	64.380	
10,500.00	7,294.44	3,321.00	3,320.15	59.04	80.11	-5.35	207.94	6,937.47	5,324.38	5,240.91	83.47	63.786	
10,600.00	7,294.42	3,321.00	3,320.15	60.48	80.11	-5.35	207.94	6,937.47	5,256.01	5,172.85	83.16	63.202	
10,700.00	7,294.40	3,321.00	3,320.15	61.93	80.11	-5.35	207.94	6,937.47	5,188.67	5,105.82	82.85	62.628	
10,800.00	7,294.38	3,321.00	3,320.15	63.39	80.11	-5.35	207.94	6,937.47	5,122.39	5,039.86	82.53	62.065	
10,900.00	7,294.36	3,321.00	3,320.15	64.86	80.11	-5.35	207.94	6,937.47	5,057.22	4,975.01	82.21	61.515	
11,000.00	7,294.34	3,321.00	3,320.15	66.33	80.11	-5.35	207.94	6,937.47	4,993.21	4,911.32	81.88	60.979	
11,100.00	7,294.32	3,321.00	3,320.15	67.81	80.11	-5.35	207.94	6,937.47	4,930.39	4,848.84	81.55	60.458	
11,200.00	7,294.30	3,321.00	3,320.15	69.30	80.11	-5.35	207.94	6,937.47	4,868.81	4,787.60	81.21	59.953	
11,300.00	7,294.28	3,321.00	3,320.15	70.79	80.11	-5.35	207.94	6,937.47	4,808.53	4,727.67	80.86	59.467	
11,400.00	7,294.26	3,321.00	3,320.15	72.28	80.11	-5.35	207.94	6,937.47	4,749.59	4,669.09	80.50	58.999	
11,500.00	7,294.24	3,321.00	3,320.15	73.78	80.11	-5.35	207.94	6,937.47	4,692.04	4,611.90	80.13	58.553	
11,600.00	7,294.22	3,321.00	3,320.15	75.28	80.11	-5.35	207.94	6,937.47	4,635.93	4,556.18	79.75	58.130	
11,700.00	7,294.20	3,321.00	3,320.15	76.79	80.11	-5.35	207.94	6,937.47	4,581.31	4,501.96	79.36	57.731	
11,800.00	7,294.18	3,321.00	3,320.15	78.30	80.11	-5.35	207.94	6,937.47	4,528.25	4,449.30	78.95	57.357	
11,900.00	7,294.16	3,321.00	3,320.15	79.82	80.11	-5.35	207.94	6,937.47	4,476.79	4,398.27	78.52	57.011	
12,000.00	7,294.14	3,321.00	3,320.15	81.33	80.11	-5.35	207.94	6,937.47	4,426.99	4,348.91	78.08	56.695	
12,100.00	7,294.12	3,321.00	3,320.15	82.86	80.11	-5.35	207.94	6,937.47	4,378.91	4,301.29	77.63	56.409	
12,200.00	7,294.10	3,321.00	3,320.15	84.38	80.11	-5.35	207.94	6,937.47	4,332.61	4,255.46	77.15	56.156	
12,300.00	7,294.09	3,321.00	3,320.15	85.91	80.11	-5.35	207.94	6,937.47	4,288.14	4,211.48	76.66	55.937	
12,400.00	7,294.07	3,321.00	3,320.15	87.44	80.11	-5.35	207.94	6,937.47	4,245.56	4,169.41	76.15	55.754	
12,500.00	7,294.05	3,321.00	3,320.15	88.97	80.11	-5.35	207.94	6,937.47	4,204.92	4,129.30	75.62	55.607	
12,600.00	7,294.03	3,321.00	3,320.15	90.51	80.11	-5.35	207.94	6,937.47	4,166.29	4,091.22	75.07	55.499	
12,700.00	7,294.01	3,321.00	3,320.15	92.04	80.11	-5.35	207.94	6,937.47	4,129.72	4,055.22	74.50	55.429	
12,800.00	7,293.99	3,321.00	3,320.15	93.58	80.11	-5.35	207.94	6,937.47	4,095.27	4,021.34	73.92	55.398	
12,900.00	7,293.97	3,321.00	3,320.15	95.13	80.11	-5.35	207.94	6,937.47	4,062.98	3,989.65	73.33	55.406	
13,000.00	7,293.95	3,321.00	3,320.15	96.67	80.11	-5.35	207.94	6,937.47	4,032.92	3,960.19	72.73	55.450	
13,100.00	7,293.93	3,321.00	3,320.15	98.22	80.11	-5.35	207.94	6,937.47	4,005.13	3,933.00	72.13	55.530	
13,200.00	7,293.91	3,321.00	3,320.15	99.76	80.11	-5.35	207.94	6,937.47	3,979.66	3,908.13	71.53	55.640	
13,300.00	7,293.89	3,321.00	3,320.15	101.31	80.11	-5.35	207.94	6,937.47	3,956.55	3,885.61	70.94	55.774	
13,400.00	7,293.87	3,321.00	3,320.15	102.87	80.11	-5.35	207.94	6,937.47	3,935.85	3,865.47	70.38	55.923	
13,500.00	7,293.85	3,321.00	3,320.15	104.42	80.11	-5.35	207.94	6,937.47	3,917.59	3,847.73	69.86	56.074	
13,600.00	7,293.83	3,321.00	3,320.15	105.97	80.11	-5.35	207.94	6,937.47	3,901.81	3,832.39	69.42	56.208	
13,700.00	7,293.81	3,321.00	3,320.15	107.53	80.11	-5.35	207.94	6,937.47	3,888.54	3,819.47	69.07	56.301	
13,800.00	7,293.79	3,321.00	3,320.15	109.09	80.11	-5.35	207.94	6,937.47	3,877.80	3,808.95	68.85	56.321	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #372 - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 170-INC-ONLY OWSG Rev5

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,293.77	3,321.00	3,320.15	110.65	80.11	-5.35	207.94	6,937.47	3,869.62	3,800.81	68.81	56.233	
14,000.00	7,293.75	3,321.00	3,320.15	112.21	80.11	-5.35	207.94	6,937.47	3,864.01	3,795.01	69.00	55.999	
14,100.00	7,293.73	3,321.00	3,320.15	113.77	80.11	-5.35	207.94	6,937.47	3,860.99	3,791.53	69.46	55.589	
14,166.92	7,293.72	3,321.00	3,320.15	114.81	80.11	-5.35	207.94	6,937.47	3,860.41	3,790.48	69.92	55.208	CC
14,200.00	7,293.71	3,321.00	3,320.15	115.33	80.11	-5.35	207.94	6,937.47	3,860.55	3,790.34	70.21	54.989	ES
14,300.00	7,293.69	3,321.00	3,320.15	116.89	80.11	-5.35	207.94	6,937.47	3,862.70	3,791.45	71.25	54.213	
14,400.00	7,293.67	3,321.00	3,320.15	118.46	80.11	-5.35	207.94	6,937.47	3,867.44	3,794.87	72.57	53.293	
14,500.00	7,293.65	3,321.00	3,320.15	120.02	80.11	-5.35	207.94	6,937.47	3,874.75	3,800.63	74.12	52.278	
14,600.00	7,293.63	3,321.00	3,320.15	121.59	80.11	-5.35	207.94	6,937.47	3,884.62	3,808.77	75.85	51.216	
14,700.00	7,293.61	3,321.00	3,320.15	123.16	80.11	-5.35	207.94	6,937.47	3,897.04	3,819.33	77.71	50.148	
14,800.00	7,293.59	3,321.00	3,320.15	124.73	80.11	-5.35	207.94	6,937.47	3,911.97	3,832.31	79.66	49.107	
14,900.00	7,293.57	3,321.00	3,320.15	126.30	80.11	-5.35	207.94	6,937.47	3,929.39	3,847.73	81.67	48.114	
15,000.00	7,293.55	3,321.00	3,320.15	127.87	80.11	-5.35	207.94	6,937.47	3,949.27	3,865.57	83.70	47.184	
15,100.00	7,293.53	3,321.00	3,320.15	129.44	80.11	-5.35	207.94	6,937.47	3,971.57	3,885.84	85.73	46.324	
15,200.00	7,293.51	3,321.00	3,320.15	131.01	80.11	-5.35	207.94	6,937.47	3,996.25	3,908.49	87.76	45.538	
15,300.00	7,293.49	3,321.00	3,320.15	132.58	80.11	-5.35	207.94	6,937.47	4,023.26	3,933.51	89.75	44.826	
15,400.00	7,293.47	3,321.00	3,320.15	134.16	80.11	-5.35	207.94	6,937.47	4,052.56	3,960.85	91.71	44.188	
15,500.00	7,293.45	3,321.00	3,320.15	135.73	80.11	-5.35	207.94	6,937.47	4,084.10	3,990.47	93.63	43.621	
15,600.00	7,293.43	3,321.00	3,320.15	137.31	80.11	-5.35	207.94	6,937.47	4,117.82	4,022.33	95.49	43.122	
15,700.00	7,293.41	3,321.00	3,320.15	138.88	80.11	-5.35	207.94	6,937.47	4,153.68	4,056.38	97.30	42.689	
15,800.00	7,293.39	3,321.00	3,320.15	140.46	80.11	-5.35	207.94	6,937.47	4,191.62	4,092.57	99.05	42.317	
15,900.00	7,293.37	3,321.00	3,320.15	142.03	80.11	-5.35	207.94	6,937.47	4,231.58	4,130.84	100.75	42.003	
16,000.00	7,293.35	3,321.00	3,320.15	143.61	80.11	-5.35	207.94	6,937.47	4,273.51	4,171.14	102.38	41.743	
16,100.00	7,293.34	3,321.00	3,320.15	145.19	80.11	-5.35	207.94	6,937.47	4,317.35	4,213.41	103.94	41.535	
16,200.00	7,293.32	3,321.00	3,320.15	146.77	80.11	-5.35	207.94	6,937.47	4,363.04	4,257.59	105.45	41.375	
16,300.00	7,293.30	3,321.00	3,320.15	148.35	80.11	-5.35	207.94	6,937.47	4,410.53	4,303.64	106.89	41.261	
16,400.00	7,293.28	3,321.00	3,320.15	149.93	80.11	-5.35	207.94	6,937.47	4,459.75	4,351.48	108.28	41.189	
16,500.00	7,293.26	3,321.00	3,320.15	151.51	80.11	-5.35	207.94	6,937.47	4,510.65	4,401.06	109.60	41.156	SF
16,600.00	7,293.24	3,321.00	3,320.15	153.09	80.11	-5.35	207.94	6,937.47	4,563.18	4,452.32	110.86	41.161	
16,700.00	7,293.22	3,321.00	3,320.15	154.67	80.11	-5.35	207.94	6,937.47	4,617.28	4,505.21	112.07	41.201	
16,800.00	7,293.20	3,321.00	3,320.15	156.25	80.11	-5.35	207.94	6,937.47	4,672.88	4,559.67	113.22	41.274	
16,900.00	7,293.18	3,321.00	3,320.15	157.83	80.11	-5.35	207.94	6,937.47	4,729.95	4,615.64	114.31	41.378	
17,000.00	7,293.16	3,321.00	3,320.15	159.42	80.11	-5.35	207.94	6,937.47	4,788.43	4,673.08	115.35	41.511	
17,100.00	7,293.14	3,321.00	3,320.15	161.00	80.11	-5.35	207.94	6,937.47	4,848.27	4,731.92	116.34	41.672	
17,200.00	7,293.12	3,321.00	3,320.15	162.58	80.11	-5.35	207.94	6,937.47	4,909.41	4,792.12	117.29	41.858	
17,300.00	7,293.10	3,321.00	3,320.15	164.17	80.11	-5.35	207.94	6,937.47	4,971.81	4,853.63	118.18	42.069	
17,400.00	7,293.08	3,321.00	3,320.15	165.75	80.11	-5.35	207.94	6,937.47	5,035.43	4,916.40	119.03	42.303	
17,500.00	7,293.06	3,321.00	3,320.15	167.34	80.11	-5.35	207.94	6,937.47	5,100.21	4,980.37	119.84	42.558	
17,600.00	7,293.04	3,321.00	3,320.15	168.92	80.11	-5.35	207.94	6,937.47	5,166.12	5,045.51	120.61	42.833	
17,667.15	7,293.03	3,321.00	3,320.15	169.99	80.11	-5.35	207.94	6,937.47	5,210.99	5,089.88	121.10	43.029	
17,700.00	7,293.02	3,321.00	3,320.15	170.51	80.11	-5.35	207.94	6,937.47	5,233.11	5,111.77	121.34	43.128	
17,802.15	7,293.00	3,321.00	3,320.15	172.13	80.11	-5.35	207.94	6,937.47	5,302.61	5,180.57	122.04	43.448	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #399A - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 200-A020Ga_GYRO-NS, 3081-MWD OWSG Rev5

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	6,200.00	3,477.33	0.00	57.01	80.45	1,474.55	8,764.82	9,570.11				
100.00	100.00	6,200.00	3,477.33	0.25	57.01	80.45	1,474.55	8,764.82	9,533.49	9,479.63	53.85	177.026	
200.00	200.00	6,200.00	3,477.33	0.61	57.01	80.45	1,474.55	8,764.82	9,497.77	9,443.63	54.14	175.429	
300.00	300.00	6,200.00	3,477.33	0.97	57.01	80.45	1,474.55	8,764.82	9,462.98	9,408.47	54.51	173.601	
400.00	400.00	6,200.00	3,477.33	1.33	57.01	80.45	1,474.55	8,764.82	9,429.12	9,374.20	54.93	171.667	
500.00	500.00	6,200.00	3,477.33	1.68	57.01	80.45	1,474.55	8,764.82	9,396.21	9,340.84	55.37	169.700	
600.00	599.98	6,200.00	3,477.33	2.04	57.01	132.81	1,474.55	8,764.82	9,365.36	9,309.55	55.81	167.793	
611.38	611.35	6,200.00	3,477.33	2.08	57.01	132.86	1,474.55	8,764.82	9,362.06	9,306.20	55.86	167.605	
700.00	699.90	6,200.00	3,477.33	2.40	57.01	132.86	1,474.55	8,764.82	9,336.87	9,280.60	56.27	165.934	
800.00	799.83	6,200.00	3,477.33	2.75	57.01	132.86	1,474.55	8,764.82	9,309.37	9,252.63	56.74	164.078	
900.00	899.75	6,200.00	3,477.33	3.11	57.01	132.86	1,474.55	8,764.82	9,282.87	9,225.66	57.21	162.263	
1,000.00	999.68	6,200.00	3,477.33	3.47	57.01	132.86	1,474.55	8,764.82	9,257.38	9,199.70	57.68	160.491	
1,100.00	1,099.60	6,200.00	3,477.33	3.83	57.01	132.86	1,474.55	8,764.82	9,232.89	9,174.74	58.15	158.766	
1,200.00	1,199.53	6,200.00	3,477.33	4.19	57.01	132.86	1,474.55	8,764.82	9,209.43	9,150.81	58.63	157.089	
1,300.00	1,299.45	6,200.00	3,477.33	4.55	57.01	132.86	1,474.55	8,764.82	9,187.00	9,127.90	59.10	155.460	
1,400.00	1,399.38	6,200.00	3,477.33	4.91	57.01	132.86	1,474.55	8,764.82	9,165.60	9,106.04	59.56	153.880	
1,500.00	1,499.30	6,200.00	3,477.33	5.27	57.01	132.86	1,474.55	8,764.82	9,145.25	9,085.22	60.03	152.348	
1,600.00	1,599.22	6,200.00	3,477.33	5.63	57.01	132.86	1,474.55	8,764.82	9,125.95	9,065.46	60.49	150.865	
1,700.00	1,699.15	6,200.00	3,477.33	5.99	57.01	132.86	1,474.55	8,764.82	9,107.70	9,046.75	60.95	149.430	
1,800.00	1,799.07	6,200.00	3,477.33	6.35	57.01	132.86	1,474.55	8,764.82	9,090.52	9,029.11	61.40	148.042	
1,900.00	1,899.00	6,200.00	3,477.33	6.71	57.01	132.86	1,474.55	8,764.82	9,074.41	9,012.55	61.86	146.701	
2,000.00	1,998.92	6,200.00	3,477.33	7.07	57.01	132.86	1,474.55	8,764.82	9,059.37	8,997.07	62.30	145.407	
2,100.00	2,098.85	6,200.00	3,477.33	7.43	57.01	132.86	1,474.55	8,764.82	9,045.41	8,982.67	62.75	144.159	
2,200.00	2,198.77	6,200.00	3,477.33	7.79	57.01	132.86	1,474.55	8,764.82	9,032.54	8,969.36	63.18	142.956	
2,300.00	2,298.70	6,200.00	3,477.33	8.15	57.01	132.86	1,474.55	8,764.82	9,020.76	8,957.14	63.62	141.798	
2,400.00	2,398.62	6,200.00	3,477.33	8.51	57.01	132.86	1,474.55	8,764.82	9,010.07	8,946.03	64.04	140.684	
2,500.00	2,498.54	6,200.00	3,477.33	8.87	57.01	132.86	1,474.55	8,764.82	9,000.49	8,936.02	64.47	139.613	
2,600.00	2,598.47	6,200.00	3,477.33	9.23	57.01	132.86	1,474.55	8,764.82	8,992.00	8,927.12	64.88	138.586	
2,700.00	2,698.39	6,200.00	3,477.33	9.60	57.01	132.86	1,474.55	8,764.82	8,984.62	8,919.32	65.30	137.600	
2,800.00	2,798.32	6,200.00	3,477.33	9.96	57.01	132.86	1,474.55	8,764.82	8,978.35	8,912.65	65.70	136.656	
2,900.00	2,898.24	6,200.00	3,477.33	10.32	57.01	132.86	1,474.55	8,764.82	8,973.18	8,907.08	66.10	135.754	
3,000.00	2,998.17	6,200.00	3,477.33	10.68	57.01	132.86	1,474.55	8,764.82	8,969.13	8,902.64	66.49	134.891	
3,100.00	3,098.09	6,200.00	3,477.33	11.04	57.01	132.86	1,474.55	8,764.82	8,966.19	8,899.32	66.88	134.068	
3,200.00	3,198.02	6,200.00	3,477.33	11.40	57.01	132.86	1,474.55	8,764.82	8,964.37	8,897.11	67.26	133.285	
3,300.00	3,297.94	6,200.00	3,477.33	11.76	57.01	132.86	1,474.55	8,764.82	8,963.66	8,896.03	67.63	132.540	
3,313.40	3,311.33	6,200.00	3,477.33	11.81	57.01	132.86	1,474.55	8,764.82	8,963.65	8,895.97	67.68	132.443	
3,400.00	3,397.86	6,200.00	3,477.33	12.12	57.01	132.86	1,474.55	8,764.82	8,964.07	8,896.08	68.00	131.833	
3,500.00	3,497.79	6,200.00	3,477.33	12.48	57.01	132.86	1,474.55	8,764.82	8,965.60	8,897.24	68.35	131.163	
3,600.00	3,597.71	6,200.00	3,477.33	12.85	57.01	132.86	1,474.55	8,764.82	8,968.23	8,899.53	68.71	130.530	
3,700.00	3,697.64	6,200.00	3,477.33	13.21	57.01	132.86	1,474.55	8,764.82	8,971.99	8,902.94	69.05	129.933	
3,800.00	3,797.56	6,200.00	3,477.33	13.57	57.01	132.86	1,474.55	8,764.82	8,976.85	8,907.46	69.39	129.372	
3,900.00	3,897.49	6,200.00	3,477.33	13.93	57.01	132.86	1,474.55	8,764.82	8,982.83	8,913.11	69.72	128.846	
4,000.00	3,997.41	6,200.00	3,477.33	14.29	57.01	132.86	1,474.55	8,764.82	8,989.91	8,919.87	70.04	128.354	
4,100.00	4,097.34	6,200.00	3,477.33	14.65	57.01	132.86	1,474.55	8,764.82	8,998.10	8,927.74	70.35	127.896	
4,200.00	4,197.26	6,200.00	3,477.33	15.01	57.01	132.86	1,474.55	8,764.82	9,007.39	8,936.73	70.66	127.471	
4,300.00	4,297.18	6,200.00	3,477.33	15.37	57.01	132.86	1,474.55	8,764.82	9,017.78	8,946.82	70.96	127.080	
4,400.00	4,397.11	6,200.00	3,477.33	15.74	57.01	132.86	1,474.55	8,764.82	9,029.27	8,958.02	71.25	126.720	
4,500.00	4,497.03	6,200.00	3,477.33	16.10	57.01	132.86	1,474.55	8,764.82	9,041.85	8,970.31	71.54	126.392	
4,600.00	4,596.96	6,200.00	3,477.33	16.46	57.01	132.86	1,474.55	8,764.82	9,055.52	8,983.70	71.81	126.096	
4,700.00	4,696.88	6,200.00	3,477.33	16.82	57.01	132.86	1,474.55	8,764.82	9,070.26	8,998.18	72.08	125.829	
4,800.00	4,796.81	6,200.00	3,477.33	17.18	57.01	132.86	1,474.55	8,764.82	9,086.09	9,013.74	72.35	125.593	
4,900.00	4,896.73	6,200.00	3,477.33	17.54	57.01	132.86	1,474.55	8,764.82	9,102.98	9,030.38	72.60	125.387	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #399A - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 200-A020Ga_GYRO-NS, 3081-MWD OWSG Rev5

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	4,996.66	6,200.00	3,477.33	17.90	57.01	132.86	1,474.55	8,764.82	9,120.94	9,048.10	72.85	125.210	
5,100.00	5,096.58	6,200.00	3,477.33	18.26	57.01	132.86	1,474.55	8,764.82	9,139.96	9,066.88	73.08	125.061	
5,200.00	5,196.50	6,200.00	3,477.33	18.63	57.01	132.86	1,474.55	8,764.82	9,160.04	9,086.72	73.32	124.940	
5,300.00	5,296.43	6,200.00	3,477.33	18.99	57.01	132.86	1,474.55	8,764.82	9,181.15	9,107.61	73.54	124.847	
5,400.00	5,396.35	6,200.00	3,477.33	19.35	57.01	132.86	1,474.55	8,764.82	9,203.31	9,129.55	73.76	124.780	
5,500.00	5,496.28	6,200.00	3,477.33	19.71	57.01	132.86	1,474.55	8,764.82	9,226.49	9,152.53	73.97	124.740	
5,600.00	5,596.20	6,200.00	3,477.33	20.07	57.01	132.86	1,474.55	8,764.82	9,250.70	9,176.54	74.17	124.727	
5,700.00	5,696.13	6,200.00	3,477.33	20.43	57.01	132.86	1,474.55	8,764.82	9,275.93	9,201.56	74.36	124.738	
5,800.00	5,796.05	6,200.00	3,477.33	20.79	57.01	132.86	1,474.55	8,764.82	9,302.16	9,227.61	74.55	124.775	
5,900.00	5,895.98	6,200.00	3,477.33	21.16	57.01	132.86	1,474.55	8,764.82	9,329.39	9,254.65	74.73	124.836	
6,000.00	5,995.90	6,200.00	3,477.33	21.52	57.01	132.86	1,474.55	8,764.82	9,357.61	9,282.70	74.91	124.922	
6,100.00	6,095.82	6,200.00	3,477.33	21.88	57.01	132.86	1,474.55	8,764.82	9,386.80	9,311.73	75.08	125.031	
6,200.00	6,195.75	6,200.00	3,477.33	22.24	57.01	132.86	1,474.55	8,764.82	9,416.97	9,341.74	75.24	125.163	
6,300.00	6,295.67	6,200.00	3,477.33	22.60	57.01	132.86	1,474.55	8,764.82	9,448.11	9,372.71	75.39	125.317	
6,400.00	6,395.60	6,200.00	3,477.33	22.96	57.01	132.86	1,474.55	8,764.82	9,480.19	9,404.65	75.54	125.494	
6,500.00	6,495.52	6,200.00	3,477.33	23.32	57.01	132.86	1,474.55	8,764.82	9,513.22	9,437.53	75.69	125.692	
6,600.00	6,595.45	6,200.00	3,477.33	23.68	57.01	132.86	1,474.55	8,764.82	9,547.18	9,471.36	75.82	125.912	
6,641.25	6,636.67	6,200.00	3,477.33	23.83	57.01	132.86	1,474.55	8,764.82	9,561.46	9,485.58	75.88	126.009	
6,650.00	6,645.41	6,200.00	3,477.33	23.87	57.01	119.34	1,474.55	8,764.82	9,564.46	9,488.56	75.89	126.030	
6,700.00	6,695.38	6,200.00	3,477.33	24.03	57.01	-0.90	1,474.55	8,764.82	9,579.64	9,503.69	75.95	126.138	
6,750.00	6,745.12	6,200.00	3,477.33	24.19	57.01	-10.43	1,474.55	8,764.82	9,591.48	9,515.49	75.99	126.222	
6,800.00	6,794.33	6,200.00	3,477.33	24.34	57.01	-12.96	1,474.55	8,764.82	9,599.92	9,523.89	76.03	126.267	
6,850.00	6,842.70	6,200.00	3,477.33	24.49	57.01	-14.10	1,474.55	8,764.82	9,604.91	9,528.85	76.06	126.275	
6,900.00	6,889.94	6,200.00	3,477.33	24.63	57.01	-14.80	1,474.55	8,764.82	9,606.43	9,530.34	76.09	126.246	
6,950.00	6,935.75	6,200.00	3,477.33	24.76	57.01	-15.33	1,474.55	8,764.82	9,604.48	9,528.36	76.12	126.181	
7,000.00	6,979.84	6,200.00	3,477.33	24.89	57.01	-15.81	1,474.55	8,764.82	9,599.05	9,522.91	76.14	126.079	
7,050.00	7,021.96	6,200.00	3,477.33	25.02	57.01	-16.30	1,474.55	8,764.82	9,590.18	9,514.03	76.15	125.942	
7,100.00	7,061.84	6,200.00	3,477.33	25.16	57.01	-16.84	1,474.55	8,764.82	9,577.91	9,501.75	76.15	125.769	
7,150.00	7,099.23	6,200.00	3,477.33	25.29	57.01	-17.46	1,474.55	8,764.82	9,562.31	9,486.15	76.16	125.561	
7,200.00	7,133.90	6,200.00	3,477.33	25.42	57.01	-18.18	1,474.55	8,764.82	9,543.45	9,467.30	76.15	125.318	
7,250.00	7,165.64	6,200.00	3,477.33	25.56	57.01	-19.02	1,474.55	8,764.82	9,521.44	9,445.29	76.15	125.039	
7,300.00	7,194.26	6,200.00	3,477.33	25.71	57.01	-20.01	1,474.55	8,764.82	9,496.38	9,420.25	76.14	124.727	
7,350.00	7,219.57	6,200.00	3,477.33	25.86	57.01	-21.20	1,474.55	8,764.82	9,468.42	9,392.29	76.13	124.380	
7,400.00	7,241.42	6,200.00	3,477.33	26.03	57.01	-22.62	1,474.55	8,764.82	9,437.69	9,361.58	76.11	123.999	
7,450.00	7,259.68	6,200.00	3,477.33	26.20	57.01	-24.33	1,474.55	8,764.82	9,404.36	9,328.26	76.10	123.586	
7,500.00	7,274.23	6,200.00	3,477.33	26.38	57.01	-26.41	1,474.55	8,764.82	9,368.60	9,292.52	76.08	123.141	
7,550.00	7,284.99	6,200.00	3,477.33	26.58	57.01	-28.96	1,474.55	8,764.82	9,330.62	9,254.56	76.07	122.665	
7,600.00	7,291.88	6,200.00	3,477.33	26.78	57.01	-32.12	1,474.55	8,764.82	9,290.62	9,214.57	76.05	122.160	
7,650.00	7,294.87	6,200.00	3,477.33	27.00	57.01	-36.07	1,474.55	8,764.82	9,248.83	9,172.78	76.04	121.627	
7,663.21	7,295.00	6,200.00	3,477.33	27.06	57.01	-37.28	1,474.55	8,764.82	9,237.52	9,161.47	76.04	121.477	
7,700.00	7,294.99	6,200.00	3,477.33	27.23	57.01	-37.28	1,474.55	8,764.82	9,205.88	9,129.84	76.03	121.075	
7,800.00	7,294.97	6,200.00	3,477.33	27.74	57.01	-37.28	1,474.55	8,764.82	9,120.08	9,044.06	76.02	119.968	
7,900.00	7,294.95	6,200.00	3,477.33	28.34	57.01	-37.28	1,474.55	8,764.82	9,034.57	8,958.55	76.02	118.840	
8,000.00	7,294.93	6,200.00	3,477.33	29.02	57.01	-37.28	1,474.55	8,764.82	8,949.36	8,873.32	76.04	117.690	
8,100.00	7,294.91	6,200.00	3,477.33	29.77	57.01	-37.28	1,474.55	8,764.82	8,864.46	8,788.39	76.08	116.518	
8,200.00	7,294.89	6,200.00	3,477.33	30.58	57.01	-37.28	1,474.55	8,764.82	8,779.88	8,703.75	76.13	115.324	
8,253.21	7,294.88	6,200.00	3,477.33	31.04	57.01	-37.28	1,474.55	8,764.82	8,735.02	8,658.85	76.17	114.680	
8,300.00	7,294.87	6,200.00	3,477.33	31.46	57.01	-36.09	1,474.55	8,764.82	8,695.51	8,619.30	76.20	114.108	
8,400.00	7,294.86	6,200.00	3,477.33	32.39	57.01	-33.45	1,474.55	8,764.82	8,610.52	8,534.24	76.28	112.878	
8,500.00	7,294.84	6,200.00	3,477.33	33.38	57.01	-30.63	1,474.55	8,764.82	8,524.86	8,448.50	76.36	111.641	
8,600.00	7,294.82	6,200.00	3,477.33	34.41	57.01	-27.65	1,474.55	8,764.82	8,438.58	8,362.15	76.43	110.404	
8,700.00	7,294.80	6,200.00	3,477.33	35.48	57.01	-24.51	1,474.55	8,764.82	8,351.80	8,275.30	76.50	109.172	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #399A - OH - OH-SVY

Offset Site Error: 0.00 usft

Survey Program: 200-A020Ga_GYRO-NS, 3081-MWD OWSG Rev5

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,724.88	7,294.79	6,200.00	3,477.33	35.76	57.01	-23.71	1,474.55	8,764.82	8,330.14	8,253.62	76.52	108.866	
8,800.00	7,294.78	6,200.00	3,477.33	36.59	57.01	-23.71	1,474.55	8,764.82	8,264.78	8,188.21	76.57	107.944	
8,900.00	7,294.76	6,200.00	3,477.33	37.74	57.01	-23.71	1,474.55	8,764.82	8,178.03	8,101.39	76.64	106.708	
9,000.00	7,294.74	6,200.00	3,477.33	38.91	57.01	-23.71	1,474.55	8,764.82	8,091.60	8,014.87	76.73	105.462	
9,100.00	7,294.72	6,200.00	3,477.33	40.12	57.01	-23.71	1,474.55	8,764.82	8,005.47	7,928.65	76.82	104.206	
9,200.00	7,294.70	6,200.00	3,477.33	41.35	57.01	-23.71	1,474.55	8,764.82	7,919.68	7,842.74	76.93	102.941	
9,300.00	7,294.68	6,200.00	3,477.33	42.61	57.01	-23.71	1,474.55	8,764.82	7,834.22	7,757.16	77.06	101.667	
9,400.00	7,294.66	6,200.00	3,477.33	43.89	57.01	-23.71	1,474.55	8,764.82	7,749.10	7,671.91	77.19	100.384	
9,500.00	7,294.64	6,200.00	3,477.33	45.20	57.01	-23.71	1,474.55	8,764.82	7,664.35	7,587.01	77.35	99.092	
9,600.00	7,294.62	6,200.00	3,477.33	46.52	57.01	-23.71	1,474.55	8,764.82	7,579.97	7,502.46	77.51	97.793	
9,700.00	7,294.60	6,200.00	3,477.33	47.85	57.01	-23.71	1,474.55	8,764.82	7,495.97	7,418.28	77.69	96.486	
9,800.00	7,294.58	6,200.00	3,477.33	49.21	57.01	-23.71	1,474.55	8,764.82	7,412.37	7,334.49	77.88	95.172	
9,900.00	7,294.56	6,200.00	3,477.33	50.58	57.01	-23.71	1,474.55	8,764.82	7,329.19	7,251.09	78.09	93.852	
10,000.00	7,294.54	6,200.00	3,477.33	51.96	57.01	-23.71	1,474.55	8,764.82	7,246.42	7,168.11	78.32	92.527	
10,100.00	7,294.52	6,200.00	3,477.33	53.35	57.01	-23.71	1,474.55	8,764.82	7,164.10	7,085.54	78.56	91.196	
10,200.00	7,294.50	6,200.00	3,477.33	54.76	57.01	-23.71	1,474.55	8,764.82	7,082.23	7,003.42	78.81	89.862	
10,300.00	7,294.48	6,200.00	3,477.33	56.18	57.01	-23.71	1,474.55	8,764.82	7,000.83	6,921.75	79.08	88.524	
10,400.00	7,294.46	6,200.00	3,477.33	57.60	57.01	-23.71	1,474.55	8,764.82	6,919.92	6,840.55	79.37	87.184	
10,500.00	7,294.44	6,200.00	3,477.33	59.04	57.01	-23.71	1,474.55	8,764.82	6,839.52	6,759.84	79.68	85.842	
10,600.00	7,294.42	6,200.00	3,477.33	60.48	57.01	-23.71	1,474.55	8,764.82	6,759.64	6,679.64	80.00	84.499	
10,700.00	7,294.40	6,200.00	3,477.33	61.93	57.01	-23.71	1,474.55	8,764.82	6,680.30	6,599.96	80.33	83.157	
10,800.00	7,294.38	6,200.00	3,477.33	63.39	57.01	-23.71	1,474.55	8,764.82	6,601.52	6,520.83	80.69	81.816	
10,900.00	7,294.36	6,200.00	3,477.33	64.86	57.01	-23.71	1,474.55	8,764.82	6,523.32	6,442.26	81.06	80.477	
11,000.00	7,294.34	6,200.00	3,477.33	66.33	57.01	-23.71	1,474.55	8,764.82	6,445.72	6,364.28	81.45	79.141	
11,100.00	7,294.32	6,200.00	3,477.33	67.81	57.01	-23.71	1,474.55	8,764.82	6,368.75	6,286.90	81.85	77.809	
11,200.00	7,294.30	6,200.00	3,477.33	69.30	57.01	-23.71	1,474.55	8,764.82	6,292.43	6,210.16	82.27	76.483	
11,300.00	7,294.28	6,200.00	3,477.33	70.79	57.01	-23.71	1,474.55	8,764.82	6,216.78	6,134.07	82.71	75.163	
11,400.00	7,294.26	6,200.00	3,477.33	72.28	57.01	-23.71	1,474.55	8,764.82	6,141.83	6,058.66	83.17	73.850	
11,500.00	7,294.24	6,200.00	3,477.33	73.78	57.01	-23.71	1,474.55	8,764.82	6,067.60	5,983.96	83.64	72.547	
11,600.00	7,294.22	6,200.00	3,477.33	75.28	57.01	-23.71	1,474.55	8,764.82	5,994.11	5,909.99	84.13	71.252	
11,700.00	7,294.20	6,200.00	3,477.33	76.79	57.01	-23.71	1,474.55	8,764.82	5,921.41	5,836.78	84.63	69.968	
11,800.00	7,294.18	6,200.00	3,477.33	78.30	57.01	-23.71	1,474.55	8,764.82	5,849.51	5,764.36	85.15	68.696	
11,900.00	7,294.16	6,186.91	3,477.00	79.82	56.76	-23.55	1,462.25	8,769.29	5,778.43	5,693.04	85.39	67.670	
12,000.00	7,294.14	6,151.83	3,476.11	81.33	56.10	-23.12	1,429.29	8,781.28	5,708.04	5,622.90	85.14	67.039	
12,100.00	7,294.12	6,108.00	3,475.05	82.86	55.27	-22.58	1,388.11	8,796.23	5,638.29	5,553.58	84.71	66.562	
12,200.00	7,294.10	6,089.11	3,474.57	84.38	54.91	-22.35	1,370.35	8,802.65	5,569.27	5,484.42	84.84	65.641	
12,300.00	7,294.09	6,073.60	3,474.07	85.91	54.61	-22.16	1,355.77	8,807.92	5,501.10	5,416.03	85.07	64.667	
12,400.00	7,294.07	6,035.44	3,472.59	87.44	53.89	-21.68	1,319.90	8,820.86	5,433.85	5,349.07	84.78	64.095	
12,500.00	7,294.05	5,840.02	3,469.56	88.97	50.21	-19.20	1,135.75	8,886.10	5,366.31	5,285.42	80.89	66.342	
12,600.00	7,294.03	5,812.10	3,469.63	90.51	49.68	-18.85	1,109.43	8,895.44	5,299.53	5,218.68	80.85	65.550	
12,700.00	7,294.01	5,782.88	3,469.79	92.04	49.13	-18.47	1,081.94	8,905.36	5,233.63	5,152.84	80.79	64.783	
12,800.00	7,293.99	5,750.67	3,469.98	93.58	48.52	-18.06	1,051.66	8,916.32	5,168.61	5,087.94	80.67	64.073	
12,900.00	7,293.97	5,724.00	3,470.10	95.13	48.02	-17.71	1,026.58	8,925.38	5,104.51	5,023.82	80.69	63.264	
13,000.00	7,293.95	5,697.09	3,470.18	96.67	47.51	-17.36	1,001.28	8,934.54	5,041.38	4,960.68	80.71	62.466	
13,100.00	7,293.93	5,673.83	3,470.21	98.22	47.08	-17.06	979.42	8,942.50	4,979.31	4,898.49	80.82	61.608	
13,200.00	7,293.91	5,629.54	3,470.33	99.76	46.24	-16.48	937.86	8,957.81	4,918.29	4,837.83	80.46	61.125	
13,300.00	7,293.89	5,580.39	3,471.06	101.31	45.31	-15.84	891.88	8,975.16	4,858.12	4,778.12	80.01	60.722	
13,400.00	7,293.87	5,553.45	3,471.35	102.87	44.80	-15.48	866.64	8,984.57	4,799.05	4,718.98	80.07	59.935	
13,500.00	7,293.85	5,522.19	3,471.44	104.42	44.21	-15.07	837.27	8,995.28	4,741.14	4,661.09	80.05	59.229	
13,600.00	7,293.83	5,469.00	3,471.58	105.97	43.22	-14.36	787.23	9,013.31	4,684.32	4,604.77	79.54	58.889	
13,700.00	7,293.81	5,447.45	3,471.67	107.53	42.81	-14.07	766.96	9,020.64	4,628.68	4,548.91	79.77	58.028	
13,800.00	7,293.79	5,425.73	3,471.77	109.09	42.40	-13.77	746.59	9,028.15	4,574.39	4,494.39	80.00	57.182	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #399A - OH - OH-SVY — **Offset Site Error:** 0.00 usft

Survey Program: 200-A020Ga_GYRO-NS, 3081-MWD OWSG Rev5 — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,293.77	5,405.00	3,471.87	110.65	42.01	-13.50	727.17	9,035.43	4,521.48	4,441.22	80.26	56.335	
14,000.00	7,293.75	5,381.45	3,471.96	112.21	41.57	-13.18	705.15	9,043.77	4,470.01	4,389.54	80.47	55.549	
14,100.00	7,293.73	5,359.39	3,471.97	113.77	41.15	-12.88	684.53	9,051.61	4,420.01	4,339.29	80.72	54.755	
14,200.00	7,293.71	5,341.00	3,471.92	115.33	40.80	-12.63	667.35	9,058.16	4,371.56	4,290.49	81.07	53.925	
14,300.00	7,293.69	5,312.37	3,471.90	116.89	40.26	-12.25	640.69	9,068.60	4,324.66	4,243.46	81.20	53.261	
14,400.00	7,293.67	5,277.00	3,472.12	118.46	39.58	-11.77	608.01	9,082.13	4,279.37	4,198.17	81.20	52.700	
14,500.00	7,293.65	5,254.84	3,472.33	120.02	39.16	-11.47	587.64	9,090.84	4,235.67	4,154.17	81.50	51.970	
14,600.00	7,293.63	5,222.28	3,472.59	121.59	38.54	-11.04	557.71	9,103.65	4,193.61	4,112.01	81.60	51.392	
14,700.00	7,293.61	5,191.01	3,472.78	123.16	37.95	-10.62	528.95	9,115.96	4,153.21	4,071.47	81.74	50.810	
14,800.00	7,293.59	5,160.78	3,472.82	124.73	37.38	-10.21	501.12	9,127.74	4,114.55	4,032.63	81.92	50.228	
14,900.00	7,293.57	5,087.55	3,472.91	126.30	36.00	-9.21	433.52	9,155.91	4,077.54	3,996.27	81.28	50.168	
15,000.00	7,293.55	5,024.00	3,473.55	127.87	34.81	-8.34	374.81	9,180.21	4,041.87	3,960.99	80.88	49.972	
15,100.00	7,293.53	4,992.17	3,473.88	129.44	34.21	-7.90	345.33	9,192.24	4,007.95	3,926.83	81.12	49.410	
15,200.00	7,293.51	4,960.00	3,473.94	131.01	33.61	-7.45	315.42	9,204.06	3,976.02	3,894.65	81.36	48.867	
15,300.00	7,293.49	4,934.99	3,473.90	132.58	33.15	-7.10	292.12	9,213.16	3,946.09	3,864.33	81.76	48.267	
15,400.00	7,293.47	4,898.00	3,473.85	134.16	32.47	-6.58	257.71	9,226.72	3,918.15	3,836.19	81.97	47.803	
15,500.00	7,293.45	4,878.92	3,473.79	135.73	32.12	-6.32	239.96	9,233.73	3,892.31	3,809.82	82.49	47.185	
15,600.00	7,293.43	4,859.81	3,473.61	137.31	31.77	-6.05	222.17	9,240.70	3,868.70	3,785.67	83.03	46.597	
15,700.00	7,293.41	4,835.00	3,473.23	138.88	31.31	-5.70	199.05	9,249.68	3,847.37	3,763.88	83.48	46.086	
15,800.00	7,293.39	4,808.86	3,472.74	140.46	30.83	-5.33	174.69	9,259.15	3,828.28	3,744.35	83.93	45.611	
15,900.00	7,293.37	4,664.29	3,472.24	142.03	28.21	-3.29	39.88	9,311.35	3,810.73	3,727.90	82.83	46.009	
16,000.00	7,293.35	4,632.25	3,472.50	143.61	27.64	-2.84	9.90	9,322.66	3,794.99	3,711.68	83.31	45.550	
16,100.00	7,293.34	4,605.70	3,472.66	145.19	27.16	-2.46	-14.94	9,332.03	3,781.56	3,697.68	83.89	45.080	
16,200.00	7,293.32	4,577.74	3,472.75	146.77	26.67	-2.06	-41.09	9,341.89	3,770.48	3,686.03	84.46	44.644	
16,300.00	7,293.30	4,501.30	3,473.20	148.35	25.32	-0.97	-112.74	9,368.53	3,761.64	3,677.06	84.58	44.474	
16,400.00	7,293.28	4,455.00	3,473.77	149.93	24.51	-0.31	-156.24	9,384.39	3,754.81	3,669.76	85.05	44.146	
16,500.00	7,293.26	4,424.81	3,474.27	151.51	23.99	0.12	-184.62	9,394.67	3,750.15	3,664.47	85.69	43.766	
16,600.00	7,293.24	4,381.95	3,474.80	153.09	23.25	0.73	-224.77	9,409.66	3,747.99	3,661.75	86.24	43.460	
16,644.00	7,293.23	4,366.03	3,475.05	153.78	22.98	0.96	-239.66	9,415.27	3,747.71	3,661.20	86.51	43.322 CC, ES	
16,700.00	7,293.22	4,328.00	3,475.66	154.67	22.34	1.50	-275.24	9,428.68	3,748.04	3,661.29	86.75	43.206	
16,800.00	7,293.20	4,303.42	3,476.17	156.25	21.92	1.85	-298.25	9,437.34	3,750.21	3,662.77	87.44	42.888	
16,900.00	7,293.18	4,284.62	3,476.46	157.83	21.60	2.12	-315.85	9,443.94	3,754.87	3,666.72	88.15	42.594	
17,000.00	7,293.16	4,265.00	3,476.67	159.42	21.27	2.40	-334.21	9,450.83	3,762.01	3,673.16	88.84	42.344	
17,100.00	7,293.14	4,265.00	3,476.67	161.00	21.27	2.40	-334.21	9,450.83	3,771.68	3,682.09	89.59	42.098	
17,200.00	7,293.12	4,237.09	3,476.77	162.58	20.81	2.80	-360.39	9,460.51	3,783.72	3,693.51	90.20	41.946	
17,300.00	7,293.10	4,223.30	3,476.71	164.17	20.59	3.00	-373.36	9,465.20	3,798.28	3,707.44	90.84	41.812	
17,400.00	7,293.08	4,201.00	3,476.47	165.75	20.22	3.32	-394.37	9,472.67	3,815.32	3,723.90	91.42	41.733	
17,500.00	7,293.06	4,201.00	3,476.47	167.34	20.22	3.32	-394.37	9,472.67	3,834.72	3,742.69	92.03	41.668 SF	
17,600.00	7,293.04	4,175.42	3,476.02	168.92	19.81	3.68	-418.49	9,481.19	3,856.46	3,763.91	92.55	41.670	
17,667.15	7,293.03	4,162.33	3,475.73	169.99	19.60	3.87	-430.82	9,485.58	3,872.36	3,779.47	92.89	41.689	
17,700.00	7,293.02	4,155.88	3,475.57	170.51	19.49	3.96	-436.88	9,487.74	3,880.50	3,787.46	93.05	41.705	
17,802.15	7,293.00	4,134.13	3,474.96	172.13	19.15	4.27	-457.34	9,495.10	3,907.37	3,813.85	93.52	41.782	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - OH - OH-INC

Offset Site Error: 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5 **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	65.00	65.00	0.00	1.60	107.80	-646.27	2,013.00	2,114.20				
100.00	100.00	165.00	165.00	0.25	4.07	107.80	-646.27	2,013.00	2,114.20	2,109.88	4.32	489.294	
200.00	200.00	265.00	265.00	0.61	6.54	107.80	-646.27	2,013.00	2,114.20	2,107.06	7.15	295.856	
300.00	300.00	365.00	365.00	0.97	9.77	107.80	-646.27	2,013.00	2,114.20	2,103.47	10.73	196.965	
400.00	400.00	465.00	465.00	1.33	13.64	107.80	-646.27	2,013.00	2,114.20	2,099.23	14.97	141.218	
500.00	500.00	565.00	565.00	1.68	17.52	107.80	-646.27	2,013.00	2,114.20	2,094.99	19.21	110.066	
600.00	599.98	664.98	664.98	2.04	21.40	159.68	-646.27	2,013.00	2,115.84	2,092.40	23.44	90.258	
611.38	611.35	676.35	676.35	2.08	21.84	159.68	-646.27	2,013.00	2,116.23	2,092.31	23.92	88.454	
700.00	699.90	764.91	764.90	2.40	25.28	159.72	-646.27	2,013.00	2,119.46	2,091.79	27.67	76.591	
800.00	799.83	864.54	864.53	2.75	29.14	159.72	-645.19	2,013.00	2,122.78	2,090.89	31.89	66.563	
900.00	899.75	963.90	963.89	3.11	33.00	159.76	-645.28	2,013.00	2,126.45	2,090.35	36.10	58.904	
1,000.00	999.68	1,063.26	1,063.25	3.47	36.85	159.80	-645.46	2,013.00	2,130.15	2,089.84	40.31	52.843	
1,100.00	1,099.60	1,162.61	1,162.60	3.83	40.70	159.85	-645.72	2,013.00	2,133.88	2,089.36	44.52	47.930	
1,200.00	1,199.53	1,261.96	1,261.95	4.19	44.56	159.89	-646.06	2,013.00	2,137.64	2,088.91	48.73	43.865	
1,300.00	1,299.45	1,364.52	1,364.45	4.55	48.43	159.93	-646.27	2,013.00	2,141.35	2,088.39	52.96	40.431	
1,400.00	1,399.38	1,464.44	1,464.38	4.91	52.10	159.97	-646.27	2,013.00	2,145.01	2,088.01	56.99	37.636	
1,500.00	1,499.30	1,564.36	1,564.30	5.27	55.78	160.00	-646.27	2,013.00	2,148.66	2,087.63	61.02	35.210	
1,600.00	1,599.22	1,664.29	1,664.22	5.63	59.45	160.04	-646.27	2,013.00	2,152.31	2,087.26	65.06	33.084	
1,700.00	1,699.15	1,764.21	1,764.15	5.99	63.12	160.07	-646.27	2,013.00	2,155.97	2,086.88	69.09	31.206	
1,800.00	1,799.07	1,863.58	1,863.50	6.35	66.78	160.07	-644.70	2,013.00	2,159.13	2,086.03	73.10	29.538	
1,900.00	1,899.00	1,962.61	1,962.53	6.71	70.42	160.11	-644.85	2,013.00	2,162.83	2,085.74	77.10	28.054	
2,000.00	1,998.92	2,061.64	2,061.56	7.07	74.06	160.15	-645.13	2,013.00	2,166.58	2,085.48	81.10	26.716	
2,100.00	2,098.85	2,160.66	2,160.58	7.43	77.70	160.19	-645.54	2,013.00	2,170.36	2,085.27	85.09	25.506	
2,200.00	2,198.77	2,259.68	2,259.59	7.79	81.34	160.24	-646.09	2,013.00	2,174.19	2,085.10	89.09	24.404	
2,300.00	2,298.70	2,363.82	2,363.70	8.15	84.34	160.28	-646.27	2,013.00	2,177.91	2,085.46	92.45	23.558	
2,400.00	2,398.62	2,463.74	2,463.62	8.51	86.90	160.32	-646.27	2,013.00	2,181.57	2,086.19	95.38	22.873	
2,500.00	2,498.54	2,563.67	2,563.54	8.87	89.47	160.35	-646.27	2,013.00	2,185.23	2,086.93	98.30	22.230	
2,600.00	2,598.47	2,663.59	2,663.47	9.23	92.04	160.39	-646.27	2,013.00	2,188.89	2,087.66	101.23	21.624	
2,700.00	2,698.39	2,763.39	2,763.26	9.60	94.60	160.39	-645.28	2,013.00	2,192.24	2,088.09	104.15	21.049	
2,800.00	2,798.32	2,862.65	2,862.53	9.96	97.15	160.43	-645.35	2,013.00	2,195.92	2,088.86	107.06	20.512	
2,900.00	2,898.24	2,961.91	2,961.78	10.32	99.70	160.47	-645.51	2,013.00	2,199.63	2,089.67	109.96	20.003	
3,000.00	2,998.17	3,061.17	3,061.04	10.68	102.25	160.51	-645.76	2,013.00	2,203.38	2,090.51	112.87	19.521	
3,100.00	3,098.09	3,160.42	3,160.29	11.04	104.80	160.55	-646.11	2,013.00	2,207.16	2,091.37	115.78	19.063	
3,200.00	3,198.02	3,263.17	3,263.02	11.40	107.25	160.59	-646.27	2,013.00	2,210.87	2,092.28	118.60	18.642	
3,300.00	3,297.94	3,363.10	3,362.94	11.76	109.53	160.62	-646.27	2,013.00	2,214.54	2,093.31	121.23	18.267	
3,400.00	3,397.86	3,463.02	3,462.86	12.12	111.80	160.66	-646.27	2,013.00	2,218.21	2,094.34	123.86	17.908	
3,500.00	3,497.79	3,562.94	3,562.78	12.48	114.08	160.67	-645.48	2,013.00	2,221.62	2,095.12	126.50	17.563	
3,600.00	3,597.71	3,662.01	3,661.84	12.85	116.33	160.70	-645.54	2,013.00	2,225.31	2,096.20	129.11	17.235	
3,700.00	3,697.64	3,761.07	3,760.91	13.21	118.59	160.74	-645.72	2,013.00	2,229.04	2,097.31	131.73	16.922	
3,800.00	3,797.56	3,860.13	3,859.97	13.57	120.84	160.78	-646.02	2,013.00	2,232.80	2,098.46	134.34	16.620	
3,900.00	3,897.49	3,963.04	3,962.49	13.93	123.08	160.82	-646.27	2,013.00	2,236.55	2,099.62	136.94	16.333	
4,000.00	3,997.41	4,048.46	4,047.86	14.29	124.79	160.84	-645.89	2,013.00	2,240.15	2,101.15	139.00	16.116	
4,100.00	4,097.34	4,162.07	4,161.33	14.65	126.99	160.88	-645.98	2,013.00	2,243.80	2,102.24	141.56	15.851	
4,200.00	4,197.26	4,263.04	4,262.26	15.01	129.09	160.92	-646.27	2,013.00	2,247.57	2,103.55	144.02	15.605	
4,300.00	4,297.18	4,361.89	4,360.95	15.37	131.22	160.95	-646.12	2,013.00	2,251.20	2,104.68	146.52	15.365	
4,400.00	4,397.11	4,462.26	4,461.22	15.74	133.76	160.97	-645.90	2,013.00	2,254.80	2,105.38	149.41	15.091	
4,500.00	4,497.03	4,563.46	4,562.03	16.10	137.33	161.01	-646.27	2,013.00	2,258.60	2,105.26	153.33	14.730	
4,600.00	4,596.96	4,661.34	4,659.29	16.46	141.99	161.03	-645.78	2,013.00	2,262.11	2,103.76	158.35	14.286	
4,700.00	4,696.88	4,764.76	4,761.88	16.82	147.50	161.08	-646.27	2,013.00	2,265.95	2,101.72	164.22	13.798	
4,800.00	4,796.81	4,865.10	4,861.81	17.18	153.39	161.11	-646.27	2,013.00	2,269.63	2,099.15	170.47	13.314	
4,900.00	4,896.73	4,966.19	4,961.73	17.54	159.49	161.14	-646.27	2,013.00	2,273.30	2,096.37	176.93	12.849	
5,000.00	4,996.66	5,060.51	5,055.85	17.90	165.63	161.10	-643.43	2,013.00	2,276.05	2,092.62	183.43	12.408	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - OH - OH-INC

Offset Site Error: 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5 **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,096.58	5,167.63	5,161.58	18.26	172.84	161.20	-646.27	2,013.00	2,280.66	2,089.66	191.00	11.940	
5,200.00	5,196.50	5,256.41	5,250.10	18.63	179.56	161.16	-643.35	2,013.00	2,283.40	2,085.33	198.07	11.528	
5,300.00	5,296.43	5,369.32	5,361.43	18.99	188.58	161.27	-646.27	2,013.00	2,288.02	2,080.57	207.46	11.029	
5,400.00	5,396.35	5,455.77	5,447.52	19.35	196.16	161.21	-642.74	2,013.00	2,290.57	2,075.18	215.39	10.635	
5,500.00	5,496.28	5,572.09	5,561.28	19.71	206.49	161.33	-646.27	2,013.00	2,295.39	2,069.30	226.08	10.153	
5,600.00	5,596.20	5,673.14	5,661.20	20.07	215.21	161.36	-646.27	2,013.00	2,299.07	2,063.91	235.16	9.776	
5,700.00	5,696.13	5,773.56	5,761.13	20.43	222.80	161.39	-646.27	2,013.00	2,302.75	2,059.64	243.11	9.472	
5,800.00	5,796.05	5,874.21	5,861.05	20.79	230.69	161.42	-646.27	2,013.00	2,306.44	2,055.08	251.36	9.176	
5,900.00	5,895.98	5,956.59	5,943.16	21.16	237.35	161.39	-643.60	2,013.00	2,309.30	2,050.93	258.37	8.938	
6,000.00	5,995.90	6,066.27	6,051.32	21.52	246.49	161.45	-645.00	2,013.00	2,313.40	2,045.52	267.88	8.636	
6,100.00	6,095.82	6,177.15	6,160.82	21.88	256.26	161.51	-646.27	2,013.00	2,317.50	2,039.48	278.01	8.336	
6,200.00	6,195.75	6,253.87	6,237.33	22.24	262.94	161.50	-644.62	2,013.00	2,320.74	2,035.71	285.03	8.142	
6,300.00	6,295.67	6,378.11	6,360.67	22.60	273.74	161.58	-646.27	2,013.00	2,324.87	2,028.66	296.21	7.849	
6,400.00	6,395.60	6,450.11	6,432.27	22.96	279.99	161.54	-643.77	2,013.00	2,327.88	2,025.09	302.79	7.688	
6,500.00	6,495.52	6,571.08	6,551.54	23.32	291.03	161.59	-644.28	2,013.00	2,331.59	2,017.38	314.21	7.421	
6,600.00	6,595.45	6,681.13	6,660.45	23.68	301.83	161.67	-646.27	2,013.00	2,335.94	2,010.56	325.37	7.179	
6,641.25	6,636.67	6,713.77	6,692.80	23.83	305.15	161.60	-643.22	2,013.00	2,336.44	2,007.61	328.84	7.105	
6,650.00	6,645.41	6,718.74	6,697.75	23.87	305.65	148.00	-643.29	2,013.00	2,336.75	2,007.38	329.37	7.095	
6,700.00	6,695.38	6,747.22	6,726.12	24.03	308.55	27.34	-644.13	2,013.00	2,336.48	2,004.08	332.40	7.029	
6,750.00	6,745.12	6,832.79	6,810.12	24.19	317.29	17.64	-646.27	2,013.00	2,332.33	1,990.98	341.35	6.833	
6,800.00	6,794.33	6,872.77	6,849.82	24.34	321.39	14.99	-643.33	2,013.00	2,322.89	1,977.29	345.60	6.721	
6,850.00	6,842.70	6,899.98	6,876.92	24.49	324.18	13.96	-644.02	2,013.00	2,311.07	1,962.56	348.51	6.631	
6,900.00	6,889.94	6,979.53	6,954.94	24.63	332.37	13.71	-646.27	2,013.00	2,295.71	1,938.82	356.88	6.433	
6,950.00	6,935.75	7,021.46	6,996.62	24.76	336.70	13.63	-643.29	2,013.00	2,275.15	1,913.80	361.35	6.296	
7,000.00	6,979.84	7,046.27	7,021.34	24.89	339.26	13.85	-643.72	2,013.00	2,252.42	1,888.39	364.03	6.188	
7,050.00	7,021.96	7,113.46	7,086.96	25.02	346.22	14.52	-646.27	2,013.00	2,226.85	1,855.72	371.13	6.000	
7,100.00	7,061.84	7,153.34	7,126.84	25.16	350.36	15.28	-646.27	2,013.00	2,197.36	1,821.98	375.39	5.854	
7,150.00	7,099.23	7,181.13	7,154.37	25.29	353.26	16.16	-643.45	2,013.00	2,163.92	1,785.55	378.37	5.719	
7,200.00	7,133.90	7,200.62	7,173.78	25.42	355.28	17.38	-643.89	2,013.00	2,128.97	1,748.50	380.47	5.596	
7,250.00	7,165.64	7,258.99	7,230.64	25.56	361.44	19.45	-646.27	2,013.00	2,091.90	1,705.16	386.74	5.409	
7,300.00	7,194.26	7,287.60	7,259.26	25.71	364.61	21.76	-646.27	2,013.00	2,051.83	1,661.84	389.98	5.261	
7,350.00	7,219.57	7,312.91	7,284.57	25.86	367.41	24.80	-646.27	2,013.00	2,009.70	1,616.85	392.85	5.116	
7,400.00	7,241.42	7,334.76	7,306.42	26.03	369.82	28.87	-646.27	2,013.00	1,965.79	1,570.47	395.32	4.973	
7,450.00	7,259.68	7,353.02	7,324.68	26.20	371.84	34.43	-646.27	2,013.00	1,920.37	1,522.99	397.39	4.832	
7,500.00	7,274.23	7,367.57	7,339.23	26.38	373.45	42.16	-646.27	2,013.00	1,873.74	1,474.70	399.04	4.696	
7,550.00	7,284.99	7,378.33	7,349.99	26.58	374.64	52.95	-646.27	2,013.00	1,826.18	1,425.92	400.27	4.562	
7,600.00	7,291.88	7,385.22	7,356.88	26.78	375.40	67.53	-646.27	2,013.00	1,778.00	1,376.94	401.07	4.433	
7,650.00	7,294.87	7,388.21	7,359.87	27.00	375.73	85.20	-646.27	2,013.00	1,729.50	1,328.08	401.43	4.308	
7,663.21	7,295.00	7,388.34	7,360.00	27.06	375.75	90.05	-646.27	2,013.00	1,716.68	1,315.23	401.45	4.276	
7,700.00	7,294.99	7,388.34	7,359.99	27.23	375.75	90.04	-646.27	2,013.00	1,680.98	1,279.50	401.48	4.187	
7,800.00	7,294.97	7,388.32	7,359.97	27.74	375.74	90.04	-646.27	2,013.00	1,584.19	1,182.63	401.56	3.945	
7,900.00	7,294.95	7,388.30	7,359.95	28.34	375.74	90.04	-646.27	2,013.00	1,487.83	1,086.17	401.66	3.704	
8,000.00	7,294.93	7,388.28	7,359.93	29.02	375.74	90.04	-646.27	2,013.00	1,391.99	990.19	401.79	3.464	
8,100.00	7,294.91	7,388.26	7,359.91	29.77	375.74	90.03	-646.27	2,013.00	1,296.77	894.80	401.97	3.226	
8,200.00	7,294.89	7,388.24	7,359.89	30.58	375.73	90.03	-646.27	2,013.00	1,202.33	800.13	402.20	2.989	
8,253.21	7,294.88	7,388.23	7,359.88	31.04	375.73	90.03	-646.27	2,013.00	1,152.46	750.12	402.34	2.864	
8,300.00	7,294.87	7,388.22	7,359.87	31.46	375.73	90.03	-646.27	2,013.00	1,109.00	706.51	402.50	2.755	
8,400.00	7,294.86	7,388.20	7,359.86	32.39	375.73	90.02	-646.27	2,013.00	1,018.22	615.29	402.93	2.527	
8,500.00	7,294.84	7,388.18	7,359.84	33.38	375.73	90.02	-646.27	2,013.00	931.06	527.51	403.55	2.307	
8,600.00	7,294.82	7,388.16	7,359.82	34.41	375.73	90.01	-646.27	2,013.00	848.77	444.32	404.45	2.099	
8,700.00	7,294.80	7,388.14	7,359.80	35.48	375.72	90.01	-646.27	2,013.00	773.00	367.30	405.70	1.905	
8,724.88	7,294.79	7,388.13	7,359.79	35.76	375.72	90.01	-646.27	2,013.00	755.42	349.34	406.08	1.860	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - OH - OH-INC — **Offset Site Error:** 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5 — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,800.00	7,294.78	7,388.12	7,359.78	36.59	375.72	90.01	-646.27	2,013.00	705.23	297.84	407.38	1.731	
8,900.00	7,294.76	7,388.10	7,359.76	37.74	375.72	90.01	-646.27	2,013.00	645.96	236.48	409.49	1.577	
9,000.00	7,294.74	7,388.08	7,359.74	38.91	375.72	90.01	-646.27	2,013.00	597.65	185.72	411.93	1.451	Level 3
9,100.00	7,294.72	7,388.06	7,359.72	40.12	375.72	90.00	-646.27	2,013.00	563.13	148.65	414.48	1.359	Level 3
9,200.00	7,294.70	7,388.04	7,359.70	41.35	375.71	90.00	-646.27	2,013.00	545.01	128.27	416.74	1.308	Level 3
9,250.38	7,294.69	7,388.03	7,359.69	41.99	375.71	90.00	-646.27	2,013.00	542.68	125.04	417.64	1.299	Level 3, CC, ES, SF
9,300.00	7,294.68	7,388.02	7,359.68	42.61	375.71	90.00	-646.27	2,013.00	544.94	126.63	418.31	1.303	Level 3
9,400.00	7,294.66	7,388.00	7,359.66	43.89	375.71	90.00	-646.27	2,013.00	562.93	143.93	418.99	1.344	Level 3
9,500.00	7,294.64	7,387.98	7,359.64	45.20	375.71	89.99	-646.27	2,013.00	597.34	178.49	418.84	1.426	Level 3
9,600.00	7,294.62	7,387.96	7,359.62	46.52	375.70	89.99	-646.27	2,013.00	645.55	227.42	418.13	1.544	
9,700.00	7,294.60	7,387.94	7,359.60	47.85	375.70	89.99	-646.27	2,013.00	704.74	287.62	417.12	1.690	
9,800.00	7,294.58	7,387.92	7,359.58	49.21	375.70	89.99	-646.27	2,013.00	772.39	356.37	416.02	1.857	
9,900.00	7,294.56	7,387.90	7,359.56	50.58	375.70	89.99	-646.27	2,013.00	846.47	431.52	414.95	2.040	
10,000.00	7,294.54	7,387.88	7,359.54	51.96	375.70	89.98	-646.27	2,013.00	925.43	511.48	413.96	2.236	
10,100.00	7,294.52	7,387.86	7,359.52	53.35	375.69	89.98	-646.27	2,013.00	1,008.14	595.07	413.07	2.441	
10,200.00	7,294.50	7,387.84	7,359.50	54.76	375.69	89.98	-646.27	2,013.00	1,093.74	681.45	412.29	2.653	
10,300.00	7,294.48	7,387.82	7,359.48	56.18	375.69	89.98	-646.27	2,013.00	1,181.61	770.00	411.61	2.871	
10,400.00	7,294.46	7,387.80	7,359.46	57.60	375.69	89.98	-646.27	2,013.00	1,271.27	860.26	411.01	3.093	
10,500.00	7,294.44	7,387.78	7,359.44	59.04	375.68	89.97	-646.27	2,013.00	1,362.37	951.87	410.50	3.319	
10,600.00	7,294.42	7,387.76	7,359.42	60.48	375.68	89.97	-646.27	2,013.00	1,454.64	1,044.60	410.04	3.548	
10,700.00	7,294.40	7,387.74	7,359.40	61.93	375.68	89.97	-646.27	2,013.00	1,547.87	1,138.22	409.65	3.779	
10,800.00	7,294.38	7,387.72	7,359.38	63.39	375.68	89.97	-646.27	2,013.00	1,641.90	1,232.59	409.30	4.011	
10,900.00	7,294.36	7,387.70	7,359.36	64.86	375.68	89.97	-646.27	2,013.00	1,736.59	1,327.59	409.00	4.246	
11,000.00	7,294.34	7,387.69	7,359.34	66.33	375.67	89.96	-646.27	2,013.00	1,831.85	1,423.12	408.73	4.482	
11,100.00	7,294.32	7,387.67	7,359.32	67.81	375.67	89.96	-646.27	2,013.00	1,927.59	1,519.10	408.49	4.719	
11,200.00	7,294.30	7,387.65	7,359.30	69.30	375.67	89.96	-646.27	2,013.00	2,023.74	1,615.46	408.28	4.957	
11,300.00	7,294.28	7,387.63	7,359.28	70.79	375.67	89.96	-646.27	2,013.00	2,120.25	1,712.15	408.09	5.196	
11,400.00	7,294.26	7,387.61	7,359.26	72.28	375.67	89.96	-646.27	2,013.00	2,217.06	1,809.14	407.93	5.435	
11,500.00	7,294.24	7,387.59	7,359.24	73.78	375.66	89.95	-646.27	2,013.00	2,314.15	1,906.37	407.78	5.675	
11,600.00	7,294.22	7,387.57	7,359.22	75.28	375.66	89.95	-646.27	2,013.00	2,411.47	2,003.83	407.65	5.916	
11,700.00	7,294.20	7,387.55	7,359.20	76.79	375.66	89.95	-646.27	2,013.00	2,509.01	2,101.48	407.53	6.157	
11,800.00	7,294.18	7,387.53	7,359.18	78.30	375.66	89.95	-646.27	2,013.00	2,606.73	2,199.31	407.43	6.398	
11,900.00	7,294.16	7,387.51	7,359.16	79.82	375.65	89.94	-646.27	2,013.00	2,704.62	2,297.29	407.34	6.640	
12,000.00	7,294.14	7,387.49	7,359.14	81.33	375.65	89.94	-646.27	2,013.00	2,802.66	2,395.41	407.26	6.882	
12,100.00	7,294.12	7,387.47	7,359.12	82.86	375.65	89.94	-646.27	2,013.00	2,900.83	2,493.65	407.18	7.124	
12,200.00	7,294.10	7,387.45	7,359.10	84.38	375.65	89.94	-646.27	2,013.00	2,999.13	2,592.01	407.12	7.367	
12,300.00	7,294.09	7,387.43	7,359.09	85.91	375.65	89.94	-646.27	2,013.00	3,097.53	2,690.46	407.06	7.609	
12,400.00	7,294.07	7,387.41	7,359.07	87.44	375.64	89.93	-646.27	2,013.00	3,196.03	2,789.01	407.02	7.852	
12,500.00	7,294.05	7,387.39	7,359.05	88.97	375.64	89.93	-646.27	2,013.00	3,294.62	2,887.65	406.97	8.095	
12,600.00	7,294.03	7,387.37	7,359.03	90.51	375.64	89.93	-646.27	2,013.00	3,393.29	2,986.36	406.94	8.339	
12,700.00	7,294.01	7,387.35	7,359.01	92.04	375.64	89.93	-646.27	2,013.00	3,492.04	3,085.14	406.91	8.582	
12,800.00	7,293.99	7,387.33	7,358.99	93.58	375.63	89.93	-646.27	2,013.00	3,590.86	3,183.98	406.88	8.825	
12,900.00	7,293.97	7,387.31	7,358.97	95.13	375.63	89.92	-646.27	2,013.00	3,689.75	3,282.88	406.86	9.069	
13,000.00	7,293.95	7,387.29	7,358.95	96.67	375.63	89.92	-646.27	2,013.00	3,788.69	3,381.84	406.85	9.312	
13,100.00	7,293.93	7,387.27	7,358.93	98.22	375.63	89.92	-646.27	2,013.00	3,887.68	3,480.84	406.84	9.556	
13,200.00	7,293.91	7,387.25	7,358.91	99.76	375.63	89.92	-646.27	2,013.00	3,986.73	3,579.90	406.83	9.799	
13,300.00	7,293.89	7,387.23	7,358.89	101.31	375.62	89.92	-646.27	2,013.00	4,085.82	3,678.99	406.83	10.043	
13,400.00	7,293.87	7,387.21	7,358.87	102.87	375.62	89.91	-646.27	2,013.00	4,184.95	3,778.13	406.83	10.287	
13,500.00	7,293.85	7,387.19	7,358.85	104.42	375.62	89.91	-646.27	2,013.00	4,284.13	3,877.30	406.83	10.531	
13,600.00	7,293.83	7,387.17	7,358.83	105.97	375.62	89.91	-646.27	2,013.00	4,383.34	3,976.51	406.84	10.774	
13,700.00	7,293.81	7,387.15	7,358.81	107.53	375.61	89.91	-646.27	2,013.00	4,482.59	4,075.75	406.84	11.018	
13,800.00	7,293.79	7,387.13	7,358.79	109.09	375.61	89.91	-646.27	2,013.00	4,581.87	4,175.01	406.86	11.262	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - OH - OH-INC

Offset Site Error: 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5

Offset Well Error: 0.00 usft

Rule Assigned:

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,293.77	7,387.11	7,358.77	110.65	375.61	89.90	-646.27	2,013.00	4,681.18	4,274.31	406.87	11.505	
14,000.00	7,293.75	7,387.09	7,358.75	112.21	375.61	89.90	-646.27	2,013.00	4,780.52	4,373.63	406.89	11.749	
14,100.00	7,293.73	7,387.07	7,358.73	113.77	375.61	89.90	-646.27	2,013.00	4,879.89	4,472.98	406.91	11.993	
14,200.00	7,293.71	7,387.05	7,358.71	115.33	375.60	89.90	-646.27	2,013.00	4,979.28	4,572.35	406.93	12.236	
14,300.00	7,293.69	7,387.03	7,358.69	116.89	375.60	89.89	-646.27	2,013.00	5,078.70	4,671.74	406.95	12.480	
14,400.00	7,293.67	7,387.01	7,358.67	118.46	375.60	89.89	-646.27	2,013.00	5,178.13	4,771.16	406.98	12.723	
14,500.00	7,293.65	7,386.99	7,358.65	120.02	375.60	89.89	-646.27	2,013.00	5,277.59	4,870.59	407.01	12.967	
14,600.00	7,293.63	7,386.97	7,358.63	121.59	375.60	89.89	-646.27	2,013.00	5,377.07	4,970.04	407.03	13.210	
14,700.00	7,293.61	7,386.95	7,358.61	123.16	375.59	89.89	-646.27	2,013.00	5,476.57	5,069.51	407.07	13.454	
14,800.00	7,293.59	7,386.94	7,358.59	124.73	375.59	89.88	-646.27	2,013.00	5,576.09	5,168.99	407.10	13.697	
14,900.00	7,293.57	7,386.92	7,358.57	126.30	375.59	89.88	-646.27	2,013.00	5,675.62	5,268.49	407.13	13.940	
15,000.00	7,293.55	7,386.90	7,358.55	127.87	375.59	89.88	-646.27	2,013.00	5,775.17	5,368.00	407.17	14.184	
15,100.00	7,293.53	7,386.88	7,358.53	129.44	375.58	89.88	-646.27	2,013.00	5,874.74	5,467.53	407.21	14.427	
15,200.00	7,293.51	7,386.86	7,358.51	131.01	375.58	89.88	-646.27	2,013.00	5,974.32	5,567.07	407.25	14.670	
15,300.00	7,293.49	7,386.84	7,358.49	132.58	375.58	89.87	-646.27	2,013.00	6,073.91	5,666.62	407.29	14.913	
15,400.00	7,293.47	7,386.82	7,358.47	134.16	375.58	89.87	-646.27	2,013.00	6,173.52	5,766.18	407.33	15.156	
15,500.00	7,293.45	7,386.80	7,358.45	135.73	375.58	89.87	-646.27	2,013.00	6,273.14	5,865.76	407.38	15.399	
15,600.00	7,293.43	7,386.78	7,358.43	137.31	375.57	89.87	-646.27	2,013.00	6,372.77	5,965.35	407.42	15.642	
15,700.00	7,293.41	7,386.76	7,358.41	138.88	375.57	89.87	-646.27	2,013.00	6,472.41	6,064.94	407.47	15.884	
15,800.00	7,293.39	7,386.74	7,358.39	140.46	375.57	89.86	-646.27	2,013.00	6,572.06	6,164.55	407.52	16.127	
15,900.00	7,293.37	7,386.72	7,358.37	142.03	375.57	89.86	-646.27	2,013.00	6,671.73	6,264.16	407.57	16.370	
16,000.00	7,293.35	7,386.70	7,358.35	143.61	375.56	89.86	-646.27	2,013.00	6,771.40	6,363.78	407.62	16.612	
16,100.00	7,293.34	7,386.68	7,358.34	145.19	375.56	89.86	-646.27	2,013.00	6,871.08	6,463.41	407.67	16.855	
16,200.00	7,293.32	7,386.66	7,358.32	146.77	375.56	89.86	-646.27	2,013.00	6,970.78	6,563.05	407.72	17.097	
16,300.00	7,293.30	7,386.64	7,358.30	148.35	375.56	89.85	-646.27	2,013.00	7,070.48	6,662.70	407.78	17.339	
16,400.00	7,293.28	7,386.62	7,358.28	149.93	375.56	89.85	-646.27	2,013.00	7,170.19	6,762.35	407.83	17.581	
16,500.00	7,293.26	7,386.60	7,358.26	151.51	375.55	89.85	-646.27	2,013.00	7,269.90	6,862.02	407.89	17.823	
16,600.00	7,293.24	7,386.58	7,358.24	153.09	375.55	89.85	-646.27	2,013.00	7,369.63	6,961.68	407.94	18.065	
16,700.00	7,293.22	7,386.56	7,358.22	154.67	375.55	89.84	-646.27	2,013.00	7,469.36	7,061.36	408.00	18.307	
16,800.00	7,293.20	7,386.54	7,358.20	156.25	375.55	89.84	-646.27	2,013.00	7,569.10	7,161.04	408.06	18.549	
16,900.00	7,293.18	7,386.52	7,358.18	157.83	375.55	89.84	-646.27	2,013.00	7,668.84	7,260.72	408.12	18.791	
17,000.00	7,293.16	7,386.50	7,358.16	159.42	375.54	89.84	-646.27	2,013.00	7,768.60	7,360.41	408.18	19.032	
17,100.00	7,293.14	7,386.48	7,358.14	161.00	375.54	89.84	-646.27	2,013.00	7,868.36	7,460.11	408.25	19.274	
17,200.00	7,293.12	7,386.46	7,358.12	162.58	375.54	89.83	-646.27	2,013.00	7,968.12	7,559.81	408.31	19.515	
17,300.00	7,293.10	7,386.44	7,358.10	164.17	375.54	89.83	-646.27	2,013.00	8,067.89	7,659.52	408.37	19.756	
17,400.00	7,293.08	7,386.42	7,358.08	165.75	375.53	89.83	-646.27	2,013.00	8,167.67	7,759.23	408.44	19.997	
17,500.00	7,293.06	7,386.40	7,358.06	167.34	375.53	89.83	-646.27	2,013.00	8,267.45	7,858.95	408.50	20.238	
17,600.00	7,293.04	7,386.38	7,358.04	168.92	375.53	89.83	-646.27	2,013.00	8,367.24	7,958.67	408.57	20.479	
17,667.15	7,293.03	7,386.37	7,358.03	169.99	375.53	89.82	-646.27	2,013.00	8,434.25	8,025.63	408.62	20.641	
17,700.00	7,293.02	7,386.36	7,358.02	170.51	375.53	89.82	-646.27	2,013.00	8,467.03	8,058.39	408.64	20.720	
17,802.15	7,293.00	7,386.34	7,358.00	172.13	375.53	89.82	-646.27	2,013.00	8,568.97	8,160.27	408.71	20.966	

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - ST01 - ST01

Offset Site Error: 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5, 4000-MWD OWSG Rev5

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	65.00	65.00	0.00	1.60	107.80	-646.27	2,013.00	2,114.20				
100.00	100.00	165.00	165.00	0.25	4.07	107.80	-646.27	2,013.00	2,114.20	2,109.88	4.32	489.294	
200.00	200.00	265.00	265.00	0.61	6.54	107.80	-646.27	2,013.00	2,114.20	2,107.06	7.15	295.856	
300.00	300.00	365.00	365.00	0.97	9.77	107.80	-646.27	2,013.00	2,114.20	2,103.47	10.73	196.965	
400.00	400.00	465.00	465.00	1.33	13.64	107.80	-646.27	2,013.00	2,114.20	2,099.23	14.97	141.218	
500.00	500.00	565.00	565.00	1.68	17.52	107.80	-646.27	2,013.00	2,114.20	2,094.99	19.21	110.066	
600.00	599.98	664.98	664.98	2.04	21.40	159.68	-646.27	2,013.00	2,115.84	2,092.40	23.44	90.258	
611.38	611.35	676.35	676.35	2.08	21.84	159.68	-646.27	2,013.00	2,116.23	2,092.31	23.92	88.454	
700.00	699.90	764.91	764.90	2.40	25.28	159.72	-646.27	2,013.00	2,119.46	2,091.79	27.67	76.591	
800.00	799.83	864.54	864.53	2.75	29.14	159.72	-645.19	2,013.00	2,122.78	2,090.89	31.89	66.563	
900.00	899.75	963.90	963.89	3.11	33.00	159.76	-645.28	2,013.00	2,126.45	2,090.35	36.10	58.904	
1,000.00	999.68	1,063.26	1,063.25	3.47	36.85	159.80	-645.46	2,013.00	2,130.15	2,089.84	40.31	52.843	
1,100.00	1,099.60	1,162.61	1,162.60	3.83	40.70	159.85	-645.72	2,013.00	2,133.88	2,089.36	44.52	47.930	
1,200.00	1,199.53	1,261.96	1,261.95	4.19	44.56	159.89	-646.06	2,013.00	2,137.64	2,088.91	48.73	43.865	
1,300.00	1,299.45	1,364.52	1,364.45	4.55	48.43	159.93	-646.27	2,013.00	2,141.35	2,088.39	52.96	40.431	
1,400.00	1,399.38	1,464.44	1,464.38	4.91	52.10	159.97	-646.27	2,013.00	2,145.01	2,088.01	56.99	37.636	
1,500.00	1,499.30	1,564.36	1,564.30	5.27	55.78	160.00	-646.27	2,013.00	2,148.66	2,087.63	61.02	35.210	
1,600.00	1,599.22	1,664.29	1,664.22	5.63	59.45	160.04	-646.27	2,013.00	2,152.31	2,087.26	65.06	33.084	
1,700.00	1,699.15	1,764.21	1,764.15	5.99	63.12	160.07	-646.27	2,013.00	2,155.97	2,086.88	69.09	31.206	
1,800.00	1,799.07	1,863.58	1,863.50	6.35	66.78	160.07	-644.70	2,013.00	2,159.13	2,086.03	73.10	29.538	
1,900.00	1,899.00	1,962.61	1,962.53	6.71	70.42	160.11	-644.85	2,013.00	2,162.83	2,085.74	77.10	28.054	
2,000.00	1,998.92	2,061.64	2,061.56	7.07	74.06	160.15	-645.13	2,013.00	2,166.58	2,085.48	81.10	26.716	
2,100.00	2,098.85	2,160.66	2,160.58	7.43	77.70	160.19	-645.54	2,013.00	2,170.36	2,085.27	85.09	25.506	
2,200.00	2,198.77	2,259.68	2,259.59	7.79	81.34	160.24	-646.09	2,013.00	2,174.19	2,085.10	89.09	24.404	
2,300.00	2,298.70	2,363.82	2,363.70	8.15	84.34	160.28	-646.27	2,013.00	2,177.91	2,085.46	92.45	23.558	
2,400.00	2,398.62	2,463.74	2,463.62	8.51	86.90	160.32	-646.27	2,013.00	2,181.57	2,086.19	95.38	22.873	
2,500.00	2,498.54	2,563.67	2,563.54	8.87	89.47	160.35	-646.27	2,013.00	2,185.23	2,086.93	98.30	22.230	
2,600.00	2,598.47	2,663.59	2,663.47	9.23	92.04	160.39	-646.27	2,013.00	2,188.89	2,087.66	101.23	21.624	
2,700.00	2,698.39	2,763.39	2,763.26	9.60	94.60	160.39	-645.28	2,013.00	2,192.24	2,088.09	104.15	21.049	
2,800.00	2,798.32	2,862.65	2,862.53	9.96	97.15	160.43	-645.35	2,013.00	2,195.92	2,088.86	107.06	20.512	
2,900.00	2,898.24	2,961.91	2,961.78	10.32	99.70	160.47	-645.51	2,013.00	2,199.63	2,089.67	109.96	20.003	
3,000.00	2,998.17	3,061.17	3,061.04	10.68	102.25	160.51	-645.76	2,013.00	2,203.38	2,090.51	112.87	19.521	
3,100.00	3,098.09	3,160.42	3,160.29	11.04	104.80	160.55	-646.11	2,013.00	2,207.16	2,091.37	115.78	19.063	
3,200.00	3,198.02	3,263.17	3,263.02	11.40	107.25	160.59	-646.27	2,013.00	2,210.87	2,092.28	118.60	18.642	
3,300.00	3,297.94	3,363.10	3,362.94	11.76	109.53	160.62	-646.27	2,013.00	2,214.54	2,093.31	121.23	18.267	
3,400.00	3,397.86	3,463.02	3,462.86	12.12	111.80	160.66	-646.27	2,013.00	2,218.21	2,094.34	123.86	17.908	
3,500.00	3,497.79	3,563.16	3,562.96	12.48	114.08	160.78	-650.22	2,013.00	2,223.15	2,096.65	126.50	17.574	
3,600.00	3,597.71	3,667.53	3,667.33	12.85	116.46	160.81	-649.88	2,013.00	2,226.72	2,097.48	129.24	17.229	
3,700.00	3,697.64	3,771.85	3,771.67	13.21	118.83	160.82	-648.89	2,013.00	2,230.08	2,098.11	131.97	16.898	
3,800.00	3,797.56	3,876.12	3,875.95	13.57	121.21	160.82	-647.24	2,013.00	2,233.24	2,098.53	134.71	16.579	
3,900.00	3,897.49	3,949.49	3,948.93	13.93	122.58	160.80	-645.71	2,013.16	2,236.56	2,100.14	136.43	16.394	
4,000.00	3,997.41	4,004.62	4,004.03	14.29	123.13	160.79	-645.07	2,014.61	2,242.11	2,104.82	137.29	16.331	
4,100.00	4,097.34	4,122.23	4,121.54	14.65	123.15	160.72	-641.94	2,018.36	2,247.93	2,110.24	137.69	16.326	
4,200.00	4,197.26	4,228.45	4,227.70	15.01	123.16	160.68	-639.64	2,021.03	2,253.28	2,115.22	138.06	16.320	
4,300.00	4,297.18	4,340.17	4,339.38	15.37	123.16	160.65	-637.82	2,023.22	2,258.28	2,119.84	138.44	16.312	
4,400.00	4,397.11	4,445.71	4,444.90	15.74	123.17	160.64	-636.37	2,024.53	2,262.67	2,123.86	138.81	16.300	
4,500.00	4,497.03	4,547.47	4,546.65	16.10	123.18	160.64	-635.24	2,025.83	2,267.20	2,128.02	139.18	16.290	
4,600.00	4,596.96	4,662.06	4,661.23	16.46	123.18	160.64	-633.85	2,026.71	2,271.20	2,131.64	139.55	16.275	
4,700.00	4,696.88	4,777.36	4,776.52	16.82	123.19	160.64	-632.60	2,026.78	2,274.58	2,134.66	139.92	16.257	
4,800.00	4,796.81	4,890.63	4,889.78	17.18	123.20	160.70	-633.19	2,025.45	2,277.29	2,137.02	140.28	16.234	
4,900.00	4,896.73	4,986.76	4,985.88	17.54	123.20	160.79	-634.92	2,023.66	2,279.79	2,139.15	140.64	16.210	
5,000.00	4,996.66	5,072.76	5,071.83	17.90	123.21	160.89	-637.19	2,022.17	2,282.68	2,141.67	141.01	16.188	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - ST01 - ST01 — **Offset Site Error:** 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5, 4000-MWD OWSG Rev5 — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,096.58	5,172.92	5,171.94	18.26	123.21	161.00	-640.14	2,020.79	2,286.02	2,144.64	141.37	16.170	
5,200.00	5,196.50	5,269.69	5,268.67	18.63	123.22	161.11	-642.89	2,019.38	2,289.25	2,147.51	141.74	16.151	
5,300.00	5,296.43	5,365.75	5,364.67	18.99	123.22	161.22	-645.88	2,018.12	2,292.72	2,150.62	142.10	16.134	
5,400.00	5,396.35	5,461.88	5,460.74	19.35	123.23	161.34	-649.23	2,016.87	2,296.34	2,153.87	142.47	16.118	
5,500.00	5,496.28	5,563.02	5,561.79	19.71	123.24	161.47	-653.08	2,015.56	2,300.07	2,157.24	142.83	16.103	
5,600.00	5,596.20	5,668.75	5,667.43	20.07	123.24	161.61	-657.10	2,013.96	2,303.62	2,160.42	143.20	16.087	
5,700.00	5,696.13	5,768.33	5,766.94	20.43	123.25	161.73	-660.60	2,012.38	2,307.01	2,163.44	143.56	16.070	
5,800.00	5,796.05	5,855.25	5,853.80	20.79	123.25	161.84	-663.71	2,011.21	2,310.66	2,166.74	143.92	16.055	
5,900.00	5,895.98	5,947.58	5,946.05	21.16	123.26	161.96	-667.24	2,010.52	2,314.96	2,170.67	144.29	16.044	
6,000.00	5,995.90	6,048.52	6,046.90	21.52	123.27	162.10	-671.56	2,009.56	2,319.24	2,174.59	144.65	16.033	
6,100.00	6,095.82	6,143.15	6,141.40	21.88	123.28	162.24	-676.25	2,008.52	2,323.63	2,178.61	145.01	16.023	
6,200.00	6,195.75	6,240.55	6,238.69	22.24	123.29	162.39	-680.99	2,007.76	2,328.30	2,182.92	145.38	16.016	
6,300.00	6,295.67	6,353.47	6,351.49	22.60	123.30	162.55	-686.10	2,006.73	2,332.75	2,187.00	145.75	16.005	
6,400.00	6,395.60	6,451.35	6,449.29	22.96	123.31	162.67	-689.79	2,005.59	2,336.71	2,190.59	146.12	15.992	
6,500.00	6,495.52	6,549.68	6,547.54	23.32	123.33	162.79	-693.64	2,004.86	2,341.12	2,194.64	146.48	15.982	
6,600.00	6,595.45	6,676.11	6,673.83	23.68	123.35	162.97	-699.12	2,002.82	2,344.89	2,198.04	146.86	15.967	
6,641.25	6,636.67	6,720.42	6,718.04	23.83	123.36	163.05	-701.75	2,001.46	2,346.13	2,199.12	147.01	15.959	
6,650.00	6,645.41	6,728.15	6,725.75	23.87	123.36	149.46	-702.25	2,001.21	2,346.34	2,199.29	147.04	15.957	
6,700.00	6,695.38	6,772.27	6,769.74	24.03	123.37	28.88	-705.27	1,999.78	2,345.33	2,198.11	147.22	15.931	
6,750.00	6,745.12	6,800.00	6,797.38	24.19	123.37	19.16	-707.34	1,998.88	2,340.68	2,193.31	147.37	15.883	
6,800.00	6,794.33	6,840.55	6,837.80	24.34	123.38	16.68	-710.36	1,997.84	2,332.50	2,184.97	147.53	15.810	
6,850.00	6,842.70	6,869.78	6,866.96	24.49	123.39	15.72	-712.41	1,997.45	2,321.01	2,173.34	147.67	15.718	
6,900.00	6,889.94	6,900.00	6,897.12	24.63	123.39	15.40	-714.42	1,997.36	2,306.22	2,158.43	147.79	15.605	
6,950.00	6,935.75	6,900.00	6,897.12	24.76	123.39	15.30	-714.42	1,997.36	2,288.45	2,140.64	147.82	15.482	
7,000.00	6,979.84	6,933.97	6,931.00	24.89	123.41	15.60	-716.61	1,997.87	2,267.42	2,119.50	147.92	15.328	
7,050.00	7,021.96	6,950.73	6,947.72	25.02	123.42	16.04	-717.70	1,998.44	2,243.69	2,095.74	147.95	15.165	
7,100.00	7,061.84	6,966.95	6,963.89	25.16	123.43	16.67	-718.75	1,999.19	2,217.19	2,069.24	147.95	14.986	
7,150.00	7,099.23	7,000.00	6,996.80	25.29	123.44	17.65	-720.90	2,001.34	2,188.21	2,040.17	148.04	14.782	
7,200.00	7,133.90	7,000.00	6,996.80	25.42	123.44	18.60	-720.90	2,001.34	2,156.33	2,008.41	147.92	14.578	
7,250.00	7,165.64	7,000.00	6,996.80	25.56	123.44	19.80	-720.90	2,001.34	2,122.29	1,974.53	147.76	14.363	
7,300.00	7,194.26	7,000.00	6,996.80	25.71	123.44	21.28	-720.90	2,001.34	2,086.20	1,938.62	147.57	14.137	
7,350.00	7,219.57	7,000.00	6,996.80	25.86	123.44	23.11	-720.90	2,001.34	2,048.17	1,900.81	147.36	13.899	
7,400.00	7,241.42	7,000.00	6,996.80	26.03	123.44	25.39	-720.90	2,001.34	2,008.33	1,861.20	147.13	13.650	
7,450.00	7,259.68	7,037.72	7,034.23	26.20	123.49	29.25	-723.53	2,005.22	1,965.52	1,818.14	147.39	13.336	
7,500.00	7,274.23	7,043.60	7,040.04	26.38	123.49	33.38	-723.97	2,006.00	1,922.08	1,774.80	147.27	13.051	
7,550.00	7,284.99	7,048.67	7,045.04	26.58	123.50	38.76	-724.36	2,006.71	1,877.31	1,730.13	147.17	12.756	
7,600.00	7,291.88	7,052.85	7,049.17	26.78	123.50	45.81	-724.68	2,007.32	1,831.42	1,684.33	147.09	12.451	
7,650.00	7,294.87	7,056.08	7,052.35	27.00	123.51	55.05	-724.94	2,007.81	1,784.66	1,637.63	147.03	12.138	
7,663.21	7,295.00	7,056.77	7,053.03	27.06	123.51	57.90	-724.99	2,007.92	1,772.20	1,625.18	147.02	12.054	
7,700.00	7,294.99	7,058.60	7,054.83	27.23	123.51	58.06	-725.14	2,008.20	1,737.45	1,590.46	146.99	11.820	
7,800.00	7,294.97	7,063.88	7,060.03	27.74	123.51	58.51	-725.56	2,009.05	1,643.41	1,496.50	146.91	11.186	
7,900.00	7,294.95	7,100.00	7,095.36	28.34	123.55	61.71	-728.65	2,015.82	1,550.97	1,403.58	147.39	10.523	
8,000.00	7,294.93	7,100.00	7,095.36	29.02	123.55	61.71	-728.65	2,015.82	1,458.10	1,310.83	147.28	9.900	
8,100.00	7,294.91	7,100.00	7,095.36	29.77	123.55	61.71	-728.65	2,015.82	1,366.24	1,219.09	147.15	9.285	
8,200.00	7,294.89	7,100.00	7,095.36	30.58	123.55	61.71	-728.65	2,015.82	1,275.61	1,128.58	147.02	8.676	
8,253.21	7,294.88	7,100.00	7,095.36	31.04	123.55	61.71	-728.65	2,015.82	1,227.97	1,081.02	146.95	8.356	
8,300.00	7,294.87	7,100.00	7,095.36	31.46	123.55	62.54	-728.65	2,015.82	1,186.64	1,039.74	146.89	8.078	
8,400.00	7,294.86	7,100.00	7,095.36	32.39	123.55	64.03	-728.65	2,015.82	1,100.96	954.16	146.80	7.500	
8,500.00	7,294.84	7,100.00	7,095.36	33.38	123.55	65.23	-728.65	2,015.82	1,019.75	872.97	146.79	6.947	
8,600.00	7,294.82	7,100.00	7,095.36	34.41	123.55	66.18	-728.65	2,015.82	944.29	797.39	146.90	6.428	
8,700.00	7,294.80	7,100.00	7,095.36	35.48	123.55	66.92	-728.65	2,015.82	876.15	728.94	147.22	5.951	
8,724.88	7,294.79	7,132.88	7,127.13	35.76	123.62	69.70	-732.49	2,023.40	858.84	709.82	149.02	5.763	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - ST01 - ST01 — **Offset Site Error:** 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5, 4000-MWD OWSG Rev5 — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,800.00	7,294.78	7,139.96	7,133.89	36.59	123.64	70.28	-733.54	2,025.19	813.92	663.91	150.01	5.426	
8,900.00	7,294.76	7,150.10	7,143.54	37.74	123.67	71.10	-735.19	2,027.85	761.25	609.58	151.67	5.019	
9,000.00	7,294.74	7,161.17	7,153.99	38.91	123.71	72.01	-737.19	2,030.87	718.32	564.58	153.74	4.672	
9,100.00	7,294.72	7,200.00	7,190.02	40.12	123.91	75.19	-745.72	2,042.53	688.09	530.37	157.71	4.363	
9,200.00	7,294.70	7,200.00	7,190.02	41.35	123.91	75.19	-745.72	2,042.53	668.79	509.30	159.49	4.193	
9,280.92	7,294.68	7,200.00	7,190.02	42.37	123.91	75.19	-745.72	2,042.53	663.87	503.10	160.78	4.129	CC, ES
9,300.00	7,294.68	7,200.00	7,190.02	42.61	123.91	75.19	-745.72	2,042.53	664.15	503.10	161.05	4.124	
9,400.00	7,294.66	7,221.84	7,209.80	43.89	124.00	76.97	-751.42	2,049.83	673.90	510.44	163.47	4.123	SF
9,500.00	7,294.64	7,245.68	7,230.97	45.20	124.11	78.87	-758.17	2,058.47	696.89	531.58	165.32	4.216	
9,600.00	7,294.62	7,273.81	7,255.34	46.52	124.24	81.05	-766.82	2,069.54	731.57	564.95	166.62	4.391	
9,700.00	7,294.60	7,300.00	7,277.38	47.85	124.37	83.01	-775.53	2,080.69	776.05	608.82	167.23	4.641	
9,800.00	7,294.58	7,300.00	7,277.38	49.21	124.37	83.01	-775.53	2,080.69	829.68	662.98	166.70	4.977	
9,900.00	7,294.56	7,338.47	7,309.63	50.58	124.46	85.82	-789.41	2,096.37	889.24	722.24	167.00	5.325	
10,000.00	7,294.54	7,352.34	7,321.43	51.96	124.49	86.83	-794.72	2,101.39	955.61	789.11	166.50	5.739	
10,100.00	7,294.52	7,364.52	7,331.84	53.35	124.51	87.71	-799.50	2,105.51	1,026.99	861.07	165.91	6.190	
10,200.00	7,294.50	7,399.00	7,361.55	54.76	124.59	90.15	-813.68	2,115.73	1,103.27	937.60	165.67	6.659	
10,300.00	7,294.48	7,399.00	7,361.55	56.18	124.59	90.15	-813.68	2,115.73	1,181.63	1,016.72	164.91	7.165	
10,400.00	7,294.46	7,399.00	7,361.55	57.60	124.59	90.15	-813.68	2,115.73	1,263.05	1,098.85	164.21	7.692	
10,500.00	7,294.44	7,399.00	7,361.55	59.04	124.59	90.15	-813.68	2,115.73	1,346.98	1,183.42	163.56	8.236	
10,600.00	7,294.42	7,399.00	7,361.55	60.48	124.59	90.15	-813.68	2,115.73	1,432.97	1,270.00	162.96	8.793	
10,700.00	7,294.40	7,399.00	7,361.55	61.93	124.59	90.15	-813.68	2,115.73	1,520.67	1,358.24	162.43	9.362	
10,800.00	7,294.38	7,399.00	7,361.55	63.39	124.59	90.15	-813.68	2,115.73	1,609.81	1,447.87	161.94	9.941	
10,900.00	7,294.36	7,399.00	7,361.55	64.86	124.59	90.15	-813.68	2,115.73	1,700.16	1,538.65	161.50	10.527	
11,000.00	7,294.34	7,399.00	7,361.55	66.33	124.59	90.15	-813.68	2,115.73	1,791.53	1,630.42	161.11	11.120	
11,100.00	7,294.32	7,399.00	7,361.55	67.81	124.59	90.15	-813.68	2,115.73	1,883.78	1,723.03	160.75	11.719	
11,200.00	7,294.30	7,399.00	7,361.55	69.30	124.59	90.15	-813.68	2,115.73	1,976.79	1,816.36	160.43	12.322	
11,300.00	7,294.28	7,399.00	7,361.55	70.79	124.59	90.15	-813.68	2,115.73	2,070.44	1,910.30	160.14	12.929	
11,400.00	7,294.26	7,399.00	7,361.55	72.28	124.59	90.15	-813.68	2,115.73	2,164.67	2,004.79	159.88	13.540	
11,500.00	7,294.24	7,399.00	7,361.55	73.78	124.59	90.15	-813.68	2,115.73	2,259.39	2,099.75	159.64	14.153	
11,600.00	7,294.22	7,399.00	7,361.55	75.28	124.59	90.15	-813.68	2,115.73	2,354.54	2,195.12	159.42	14.769	
11,700.00	7,294.20	7,399.00	7,361.55	76.79	124.59	90.15	-813.68	2,115.73	2,450.09	2,290.86	159.22	15.388	
11,800.00	7,294.18	7,399.00	7,361.55	78.30	124.59	90.15	-813.68	2,115.73	2,545.97	2,386.92	159.05	16.008	
11,900.00	7,294.16	7,399.00	7,361.55	79.82	124.59	90.15	-813.68	2,115.73	2,642.16	2,483.28	158.89	16.629	
12,000.00	7,294.14	7,399.00	7,361.55	81.33	124.59	90.15	-813.68	2,115.73	2,738.62	2,579.89	158.74	17.252	
12,100.00	7,294.12	7,399.00	7,361.55	82.86	124.59	90.15	-813.68	2,115.73	2,835.33	2,676.73	158.61	17.877	
12,200.00	7,294.10	7,399.00	7,361.55	84.38	124.59	90.15	-813.68	2,115.73	2,932.26	2,773.78	158.49	18.502	
12,300.00	7,294.09	7,399.00	7,361.55	85.91	124.59	90.15	-813.68	2,115.73	3,029.39	2,871.01	158.38	19.128	
12,400.00	7,294.07	7,399.00	7,361.55	87.44	124.59	90.15	-813.68	2,115.73	3,126.70	2,968.42	158.28	19.755	
12,500.00	7,294.05	7,399.00	7,361.55	88.97	124.59	90.15	-813.68	2,115.73	3,224.18	3,065.99	158.19	20.382	
12,600.00	7,294.03	7,399.00	7,361.55	90.51	124.59	90.15	-813.68	2,115.73	3,321.80	3,163.69	158.11	21.010	
12,700.00	7,294.01	7,399.00	7,361.55	92.04	124.59	90.15	-813.68	2,115.73	3,419.56	3,261.53	158.04	21.638	
12,800.00	7,293.99	7,399.00	7,361.55	93.58	124.59	90.15	-813.68	2,115.73	3,517.45	3,359.48	157.97	22.267	
12,900.00	7,293.97	7,399.00	7,361.55	95.13	124.59	90.15	-813.68	2,115.73	3,615.45	3,457.54	157.91	22.895	
13,000.00	7,293.95	7,399.00	7,361.55	96.67	124.59	90.15	-813.68	2,115.73	3,713.56	3,555.70	157.86	23.524	
13,100.00	7,293.93	7,399.00	7,361.55	98.22	124.59	90.15	-813.68	2,115.73	3,811.77	3,653.96	157.82	24.153	
13,200.00	7,293.91	7,399.00	7,361.55	99.76	124.59	90.15	-813.68	2,115.73	3,910.07	3,752.29	157.78	24.783	
13,300.00	7,293.89	7,399.00	7,361.55	101.31	124.59	90.15	-813.68	2,115.73	4,008.45	3,850.71	157.74	25.412	
13,400.00	7,293.87	7,399.00	7,361.55	102.87	124.59	90.15	-813.68	2,115.73	4,106.91	3,949.20	157.71	26.041	
13,500.00	7,293.85	7,399.00	7,361.55	104.42	124.59	90.15	-813.68	2,115.73	4,205.45	4,047.76	157.69	26.670	
13,600.00	7,293.83	7,399.00	7,361.55	105.97	124.59	90.15	-813.68	2,115.73	4,304.05	4,146.38	157.67	27.299	
13,700.00	7,293.81	7,399.00	7,361.55	107.53	124.59	90.15	-813.68	2,115.73	4,402.71	4,245.06	157.65	27.927	
13,800.00	7,293.79	7,399.00	7,361.55	109.09	124.59	90.15	-813.68	2,115.73	4,501.44	4,343.80	157.64	28.556	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU #54H-OH - ST01 - ST01

Offset Site Error: 0.00 usft

Survey Program: 311-INC-ONLY OWSG Rev5, 4000-MWD OWSG Rev5

Rule Assigned:

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,293.77	7,399.00	7,361.55	110.65	124.59	90.15	-813.68	2,115.73	4,600.21	4,442.59	157.63	29.184	
14,000.00	7,293.75	7,399.00	7,361.55	112.21	124.59	90.15	-813.68	2,115.73	4,699.05	4,541.42	157.62	29.812	
14,100.00	7,293.73	7,399.00	7,361.55	113.77	124.59	90.15	-813.68	2,115.73	4,797.92	4,640.31	157.62	30.440	
14,200.00	7,293.71	7,399.00	7,361.55	115.33	124.59	90.15	-813.68	2,115.73	4,896.85	4,739.23	157.62	31.068	
14,300.00	7,293.69	7,399.00	7,361.55	116.89	124.59	90.15	-813.68	2,115.73	4,995.82	4,838.19	157.62	31.695	
14,400.00	7,293.67	7,399.00	7,361.55	118.46	124.59	90.15	-813.68	2,115.73	5,094.82	4,937.19	157.63	32.321	
14,500.00	7,293.65	7,399.00	7,361.55	120.02	124.59	90.15	-813.68	2,115.73	5,193.87	5,036.23	157.64	32.948	
14,600.00	7,293.63	7,399.00	7,361.55	121.59	124.59	90.15	-813.68	2,115.73	5,292.95	5,135.30	157.65	33.574	
14,700.00	7,293.61	7,399.00	7,361.55	123.16	124.59	90.15	-813.68	2,115.73	5,392.06	5,234.40	157.67	34.199	
14,800.00	7,293.59	7,399.00	7,361.55	124.73	124.59	90.15	-813.68	2,115.73	5,491.21	5,333.53	157.68	34.824	
14,900.00	7,293.57	7,399.00	7,361.55	126.30	124.59	90.15	-813.68	2,115.73	5,590.39	5,432.69	157.70	35.449	
15,000.00	7,293.55	7,399.00	7,361.55	127.87	124.59	90.15	-813.68	2,115.73	5,689.60	5,531.87	157.72	36.073	
15,100.00	7,293.53	7,399.00	7,361.55	129.44	124.59	90.15	-813.68	2,115.73	5,788.83	5,631.08	157.75	36.697	
15,200.00	7,293.51	7,399.00	7,361.55	131.01	124.59	90.15	-813.68	2,115.73	5,888.09	5,730.32	157.77	37.320	
15,300.00	7,293.49	7,399.00	7,361.55	132.58	124.59	90.15	-813.68	2,115.73	5,987.37	5,829.57	157.80	37.943	
15,400.00	7,293.47	7,399.00	7,361.55	134.16	124.59	90.15	-813.68	2,115.73	6,086.68	5,928.85	157.83	38.565	
15,500.00	7,293.45	7,399.00	7,361.55	135.73	124.59	90.15	-813.68	2,115.73	6,186.01	6,028.15	157.86	39.187	
15,600.00	7,293.43	7,399.00	7,361.55	137.31	124.59	90.15	-813.68	2,115.73	6,285.36	6,127.47	157.89	39.808	
15,700.00	7,293.41	7,399.00	7,361.55	138.88	124.59	90.15	-813.68	2,115.73	6,384.74	6,226.81	157.93	40.428	
15,800.00	7,293.39	7,399.00	7,361.55	140.46	124.59	90.15	-813.68	2,115.73	6,484.13	6,326.16	157.96	41.048	
15,900.00	7,293.37	7,399.00	7,361.55	142.03	124.59	90.15	-813.68	2,115.73	6,583.54	6,425.53	158.00	41.667	
16,000.00	7,293.35	7,399.00	7,361.55	143.61	124.59	90.15	-813.68	2,115.73	6,682.96	6,524.92	158.04	42.286	
16,100.00	7,293.34	7,399.00	7,361.55	145.19	124.59	90.15	-813.68	2,115.73	6,782.41	6,624.32	158.08	42.904	
16,200.00	7,293.32	7,399.00	7,361.55	146.77	124.59	90.15	-813.68	2,115.73	6,881.87	6,723.74	158.12	43.522	
16,300.00	7,293.30	7,399.00	7,361.55	148.35	124.59	90.15	-813.68	2,115.73	6,981.34	6,823.17	158.17	44.139	
16,400.00	7,293.28	7,399.00	7,361.55	149.93	124.59	90.15	-813.68	2,115.73	7,080.83	6,922.62	158.21	44.755	
16,500.00	7,293.26	7,399.00	7,361.55	151.51	124.59	90.15	-813.68	2,115.73	7,180.34	7,022.08	158.26	45.370	
16,600.00	7,293.24	7,399.00	7,361.55	153.09	124.59	90.15	-813.68	2,115.73	7,279.85	7,121.55	158.31	45.985	
16,700.00	7,293.22	7,399.00	7,361.55	154.67	124.59	90.15	-813.68	2,115.73	7,379.38	7,221.03	158.36	46.599	
16,800.00	7,293.20	7,399.00	7,361.55	156.25	124.59	90.15	-813.68	2,115.73	7,478.93	7,320.52	158.41	47.213	
16,900.00	7,293.18	7,399.00	7,361.55	157.83	124.59	90.15	-813.68	2,115.73	7,578.48	7,420.02	158.46	47.826	
17,000.00	7,293.16	7,399.00	7,361.55	159.42	124.59	90.15	-813.68	2,115.73	7,678.05	7,519.54	158.51	48.438	
17,100.00	7,293.14	7,399.00	7,361.55	161.00	124.59	90.15	-813.68	2,115.73	7,777.63	7,619.06	158.57	49.050	
17,200.00	7,293.12	7,399.00	7,361.55	162.58	124.59	90.15	-813.68	2,115.73	7,877.22	7,718.60	158.62	49.660	
17,300.00	7,293.10	7,399.00	7,361.55	164.17	124.59	90.15	-813.68	2,115.73	7,976.82	7,818.14	158.68	50.270	
17,400.00	7,293.08	7,399.00	7,361.55	165.75	124.59	90.15	-813.68	2,115.73	8,076.43	7,917.69	158.74	50.880	
17,500.00	7,293.06	7,399.00	7,361.55	167.34	124.59	90.15	-813.68	2,115.73	8,176.04	8,017.25	158.79	51.488	
17,600.00	7,293.04	7,399.00	7,361.55	168.92	124.59	90.15	-813.68	2,115.73	8,275.67	8,116.82	158.85	52.096	
17,667.15	7,293.03	7,399.00	7,361.55	169.99	124.59	90.15	-813.68	2,115.73	8,342.58	8,183.69	158.89	52.504	
17,700.00	7,293.02	7,399.00	7,361.55	170.51	124.59	90.15	-813.68	2,115.73	8,375.31	8,216.40	158.91	52.703	
17,802.15	7,293.00	7,399.00	7,361.55	172.13	124.59	90.15	-813.68	2,115.73	8,477.10	8,318.12	158.98	53.323	

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 754H - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 28-Standard Keeper 105, 446-MWD+HRGM+MS, 5851-Standard Keeper 105, 6495-MWD+HRGM+MS, 21591-A026Ua_| **Rule Assigned:**

Offset Well Error: 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	21,411.00	7,369.03	0.00	229.19	-177.56	-386.39	-16.48	7,562.93				
100.00	100.00	21,411.00	7,369.03	0.25	229.19	-177.56	-386.39	-16.48	7,463.06	7,348.36	114.70	65.064	
200.00	200.00	21,411.00	7,369.03	0.61	229.19	-177.56	-386.39	-16.48	7,363.20	7,248.47	114.73	64.180	
300.00	300.00	21,411.00	7,369.03	0.97	229.19	-177.56	-386.39	-16.48	7,263.34	7,148.58	114.76	63.294	
400.00	400.00	21,411.00	7,369.03	1.33	229.19	-177.56	-386.39	-16.48	7,163.48	7,048.69	114.79	62.405	
500.00	500.00	21,411.00	7,369.03	1.68	229.19	-177.56	-386.39	-16.48	7,063.63	6,948.80	114.83	61.514	
600.00	599.98	21,411.00	7,369.03	2.04	229.19	-146.23	-386.39	-16.48	6,963.86	6,848.98	114.88	60.619	
611.38	611.35	21,411.00	7,369.03	2.08	229.19	-147.72	-386.39	-16.48	6,952.52	6,837.64	114.88	60.518	
700.00	699.90	21,411.00	7,369.03	2.40	229.19	-147.72	-386.39	-16.48	6,864.22	6,749.28	114.94	59.722	
800.00	799.83	21,390.72	7,368.91	2.75	228.87	-145.84	-386.63	-36.76	6,764.54	6,649.70	114.85	58.900	
900.00	899.75	21,389.21	7,368.90	3.11	228.85	-145.69	-386.65	-38.26	6,664.92	6,550.01	114.91	58.002	
1,000.00	999.68	21,387.69	7,368.90	3.47	228.82	-145.55	-386.67	-39.79	6,565.31	6,450.33	114.98	57.101	
1,100.00	1,099.60	21,386.15	7,368.89	3.83	228.80	-145.40	-386.69	-41.33	6,465.70	6,350.65	115.05	56.199	
1,200.00	1,199.53	21,384.59	7,368.88	4.19	228.77	-145.26	-386.71	-42.89	6,366.11	6,250.98	115.13	55.294	
1,300.00	1,299.45	21,383.01	7,368.88	4.55	228.75	-145.11	-386.73	-44.46	6,266.54	6,151.32	115.22	54.388	
1,400.00	1,399.38	21,381.42	7,368.87	4.91	228.72	-144.96	-386.75	-46.05	6,166.97	6,051.66	115.31	53.481	
1,500.00	1,499.30	21,379.81	7,368.86	5.27	228.70	-144.80	-386.78	-47.66	6,067.42	5,952.01	115.41	52.573	
1,600.00	1,599.22	21,378.18	7,368.86	5.63	228.67	-144.65	-386.80	-49.29	5,967.88	5,852.37	115.51	51.664	
1,700.00	1,699.15	21,376.54	7,368.85	5.99	228.65	-144.49	-386.83	-50.93	5,868.36	5,752.74	115.62	50.754	
1,800.00	1,799.07	21,374.87	7,368.84	6.35	228.62	-144.33	-386.85	-52.60	5,768.86	5,653.12	115.74	49.843	
1,900.00	1,899.00	21,373.19	7,368.84	6.71	228.59	-144.17	-386.88	-54.28	5,669.37	5,553.50	115.86	48.931	
2,000.00	1,998.92	21,371.49	7,368.83	7.07	228.57	-144.01	-386.90	-55.98	5,569.90	5,453.90	115.99	48.019	
2,100.00	2,098.85	21,369.77	7,368.83	7.43	228.54	-143.84	-386.93	-57.71	5,470.44	5,354.31	116.13	47.107	
2,200.00	2,198.77	21,368.02	7,368.82	7.79	228.51	-143.67	-386.96	-59.45	5,371.01	5,254.74	116.27	46.194	
2,300.00	2,298.70	21,366.26	7,368.81	8.15	228.48	-143.50	-386.99	-61.21	5,271.60	5,155.18	116.42	45.281	
2,400.00	2,398.62	21,364.48	7,368.81	8.51	228.45	-143.33	-387.02	-62.99	5,172.21	5,055.63	116.58	44.368	
2,500.00	2,498.54	21,362.68	7,368.81	8.87	228.43	-143.16	-387.05	-64.80	5,072.84	4,956.10	116.74	43.455	
2,600.00	2,598.47	21,360.85	7,368.80	9.23	228.40	-142.98	-387.08	-66.62	4,973.49	4,856.58	116.91	42.541	
2,700.00	2,698.39	21,359.00	7,368.80	9.60	228.37	-142.80	-387.11	-68.47	4,874.17	4,757.09	117.09	41.628	
2,800.00	2,798.32	21,357.13	7,368.79	9.96	228.34	-142.62	-387.14	-70.33	4,774.88	4,657.61	117.27	40.715	
2,900.00	2,898.24	21,355.24	7,368.79	10.32	228.31	-142.44	-387.17	-72.23	4,675.62	4,558.15	117.47	39.803	
3,000.00	2,998.17	21,353.33	7,368.79	10.68	228.28	-142.25	-387.21	-74.14	4,576.39	4,458.72	117.67	38.890	
3,100.00	3,098.09	21,351.39	7,368.78	11.04	228.25	-142.06	-387.24	-76.08	4,477.19	4,359.30	117.89	37.978	
3,200.00	3,198.02	21,349.43	7,368.78	11.40	228.22	-141.87	-387.28	-78.04	4,378.03	4,259.92	118.11	37.066	
3,300.00	3,297.94	21,347.45	7,368.78	11.76	228.18	-141.68	-387.32	-80.02	4,278.90	4,160.55	118.35	36.155	
3,400.00	3,397.86	21,345.44	7,368.78	12.12	228.15	-141.48	-387.35	-82.03	4,179.82	4,061.22	118.60	35.244	
3,500.00	3,497.79	21,343.40	7,368.77	12.48	228.12	-141.28	-387.39	-84.07	4,080.78	3,961.92	118.86	34.333	
3,600.00	3,597.71	21,341.34	7,368.77	12.85	228.09	-141.08	-387.43	-86.13	3,981.78	3,862.65	119.13	33.423	
3,700.00	3,697.64	21,339.25	7,368.77	13.21	228.05	-140.87	-387.47	-88.21	3,882.84	3,763.41	119.42	32.513	
3,800.00	3,797.56	21,337.14	7,368.77	13.57	228.02	-140.66	-387.52	-90.33	3,783.95	3,664.22	119.73	31.604	
3,900.00	3,897.49	21,335.00	7,368.77	13.93	227.99	-140.45	-387.56	-92.47	3,685.11	3,565.06	120.05	30.696	
4,000.00	3,997.41	21,332.83	7,368.77	14.29	227.95	-140.24	-387.60	-94.63	3,586.34	3,465.94	120.40	29.788	
4,100.00	4,097.34	21,330.64	7,368.77	14.65	227.92	-140.02	-387.65	-96.83	3,487.64	3,366.88	120.76	28.880	
4,200.00	4,197.26	21,317.00	7,368.79	15.01	227.70	-138.66	-387.95	-110.46	3,389.04	3,267.97	121.07	27.993	
4,300.00	4,297.18	21,317.00	7,368.79	15.37	227.70	-138.66	-387.95	-110.46	3,290.48	3,168.98	121.50	27.083	
4,400.00	4,397.11	21,317.00	7,368.79	15.74	227.70	-138.66	-387.95	-110.46	3,192.01	3,070.05	121.96	26.173	
4,500.00	4,497.03	21,317.00	7,368.79	16.10	227.70	-138.66	-387.95	-110.46	3,093.64	2,971.19	122.45	25.264	
4,600.00	4,596.96	21,317.00	7,368.79	16.46	227.70	-138.66	-387.95	-110.46	2,995.38	2,872.40	122.98	24.356	
4,700.00	4,696.88	21,317.00	7,368.79	16.82	227.70	-138.66	-387.95	-110.46	2,897.24	2,773.69	123.56	23.449	
4,800.00	4,796.81	21,317.00	7,368.79	17.18	227.70	-138.66	-387.95	-110.46	2,799.23	2,675.06	124.17	22.543	
4,900.00	4,896.73	21,317.00	7,368.79	17.54	227.70	-138.66	-387.95	-110.46	2,701.37	2,576.53	124.84	21.638	
5,000.00	4,996.66	21,308.52	7,368.81	17.90	227.56	-137.81	-388.14	-118.94	2,603.65	2,478.14	125.51	20.745	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 754H - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 28-Standard Keeper 105, 446-MWD+HRGM+MS, 5851-Standard Keeper 105, 6495-MWD+HRGM+MS, 21591-A026Ua_| **Rule Assigned:** — **Offset Well Error:** 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,096.58	21,305.69	7,368.81	18.26	227.52	-137.53	-388.20	-121.77	2,506.12	2,379.83	126.29	19.845	
5,200.00	5,196.50	21,302.83	7,368.82	18.63	227.47	-137.24	-388.27	-124.63	2,408.78	2,281.64	127.14	18.946	
5,300.00	5,296.43	21,299.94	7,368.83	18.99	227.43	-136.95	-388.33	-127.52	2,311.67	2,183.58	128.09	18.048	
5,400.00	5,396.35	21,297.02	7,368.84	19.35	227.38	-136.65	-388.40	-130.44	2,214.81	2,085.68	129.13	17.151	
5,500.00	5,496.28	21,294.06	7,368.84	19.71	227.33	-136.35	-388.46	-133.39	2,118.24	1,987.94	130.30	16.256	
5,600.00	5,596.20	21,291.07	7,368.85	20.07	227.29	-136.05	-388.53	-136.38	2,022.00	1,890.38	131.61	15.363	
5,700.00	5,696.13	21,288.05	7,368.87	20.43	227.24	-135.75	-388.59	-139.40	1,926.13	1,793.04	133.09	14.472	
5,800.00	5,796.05	21,284.99	7,368.88	20.79	227.19	-135.44	-388.66	-142.46	1,830.70	1,695.94	134.77	13.584	
5,900.00	5,895.98	21,281.90	7,368.89	21.16	227.14	-135.12	-388.73	-145.56	1,735.78	1,599.11	136.67	12.700	
6,000.00	5,995.90	21,278.77	7,368.90	21.52	227.09	-134.80	-388.80	-148.68	1,641.46	1,502.59	138.86	11.821	
6,100.00	6,095.82	21,275.60	7,368.91	21.88	227.04	-134.48	-388.87	-151.85	1,547.84	1,406.45	141.39	10.948	
6,200.00	6,195.75	21,272.40	7,368.93	22.24	226.99	-134.15	-388.94	-155.05	1,455.06	1,310.75	144.32	10.082	
6,300.00	6,295.67	21,269.16	7,368.94	22.60	226.94	-133.82	-389.01	-158.29	1,363.30	1,215.56	147.74	9.228	
6,400.00	6,395.60	21,265.88	7,368.96	22.96	226.89	-133.49	-389.08	-161.57	1,272.77	1,121.02	151.76	8.387	
6,500.00	6,495.52	21,262.56	7,368.98	23.32	226.83	-133.15	-389.15	-164.89	1,183.76	1,027.26	156.50	7.564	
6,600.00	6,595.45	21,259.20	7,368.99	23.68	226.78	-132.81	-389.22	-168.24	1,096.63	934.52	162.11	6.765	
6,641.25	6,636.67	21,257.80	7,369.00	23.83	226.76	-132.66	-389.25	-169.64	1,061.35	896.62	164.73	6.443	
6,650.00	6,645.41	21,257.56	7,369.00	23.87	226.75	-145.01	-389.26	-169.88	1,053.91	888.61	165.30	6.376	
6,700.00	6,695.38	21,258.35	7,369.00	24.03	226.77	101.26	-389.24	-169.09	1,011.57	842.82	168.75	5.995	
6,750.00	6,745.12	21,262.85	7,368.97	24.19	226.84	97.79	-389.14	-164.60	969.71	797.28	172.44	5.624	
6,800.00	6,794.33	21,271.06	7,368.93	24.34	226.97	100.69	-388.97	-156.39	928.61	752.25	176.36	5.266	
6,850.00	6,842.70	21,282.96	7,368.88	24.49	227.16	104.23	-388.71	-144.50	888.54	708.04	180.49	4.923	
6,900.00	6,889.94	21,298.50	7,368.83	24.63	227.40	107.49	-388.36	-128.96	849.74	664.92	184.82	4.598	
6,950.00	6,935.75	21,317.00	7,368.79	24.76	227.70	110.31	-387.95	-110.46	812.47	623.16	189.31	4.292	
7,000.00	6,979.84	21,338.21	7,368.77	24.89	228.04	112.64	-387.49	-89.25	776.93	583.03	193.90	4.007	
7,050.00	7,021.96	21,361.99	7,368.80	25.02	228.42	114.51	-387.06	-65.48	743.35	544.79	198.56	3.744	
7,100.00	7,061.84	21,388.80	7,368.90	25.16	228.84	115.93	-386.65	-38.68	711.89	508.68	203.21	3.503	
7,150.00	7,099.23	21,419.33	7,369.09	25.29	229.33	116.93	-386.30	-8.15	682.68	474.88	207.80	3.285	
7,200.00	7,133.90	21,455.32	7,369.40	25.42	229.90	117.50	-385.87	27.84	655.66	443.42	212.24	3.089	
7,250.00	7,165.64	21,493.96	7,369.80	25.56	230.52	117.88	-385.32	66.48	630.79	414.34	216.45	2.914	
7,300.00	7,194.26	21,546.11	7,370.44	25.71	233.66	117.74	-383.75	118.59	607.55	385.35	222.19	2.734	
7,350.00	7,219.57	21,588.64	7,370.96	25.86	238.61	118.09	-382.08	161.08	586.04	356.81	229.23	2.557	
7,400.00	7,241.42	21,591.00	7,370.98	26.03	238.88	119.51	-381.99	163.45	568.02	335.79	232.23	2.446	
7,450.00	7,259.68	21,591.00	7,370.98	26.20	238.88	120.48	-381.99	163.45	555.75	322.56	233.20	2.383	
7,500.00	7,274.23	21,591.00	7,370.98	26.38	238.88	120.93	-381.99	163.45	549.70	317.72	231.98	2.370 ES, SF	
7,522.00	7,279.43	21,591.00	7,370.98	26.47	238.88	120.97	-381.99	163.45	549.09	318.37	230.72	2.380 CC	
7,550.00	7,284.99	21,591.00	7,370.98	26.58	238.88	120.88	-381.99	163.45	550.12	321.65	228.47	2.408	
7,600.00	7,291.88	21,591.00	7,370.98	26.78	238.88	120.32	-381.99	163.45	556.98	334.16	222.82	2.500	
7,650.00	7,294.87	21,591.00	7,370.98	27.00	238.88	119.25	-381.99	163.45	570.01	354.61	215.41	2.646	
7,663.21	7,295.00	21,591.00	7,370.98	27.06	238.88	118.88	-381.99	163.45	574.43	361.21	213.22	2.694	
7,700.00	7,294.99	21,591.00	7,370.98	27.23	238.88	118.88	-381.99	163.45	588.28	381.43	206.85	2.844	
7,800.00	7,294.97	21,591.00	7,370.98	27.74	238.88	118.88	-381.99	163.45	635.25	446.50	188.74	3.366	
7,900.00	7,294.95	21,591.00	7,370.98	28.34	238.88	118.88	-381.99	163.45	693.54	522.56	170.98	4.056	
8,000.00	7,294.93	21,591.00	7,370.98	29.02	238.88	118.88	-381.99	163.45	760.57	605.84	154.73	4.916	
8,100.00	7,294.91	21,591.00	7,370.98	29.77	238.88	118.88	-381.99	163.45	834.22	693.78	140.44	5.940	
8,200.00	7,294.89	21,591.00	7,370.98	30.58	238.88	118.88	-381.99	163.45	912.90	784.74	128.16	7.123	
8,253.21	7,294.88	21,591.00	7,370.98	31.04	238.88	118.88	-381.99	163.45	956.39	834.00	122.39	7.814	
8,300.00	7,294.87	21,591.00	7,370.98	31.46	238.88	119.58	-381.99	163.45	995.59	877.81	117.79	8.453	
8,400.00	7,294.86	21,591.00	7,370.98	32.39	238.88	121.36	-381.99	163.45	1,082.47	972.99	109.48	9.887	
8,500.00	7,294.84	21,591.00	7,370.98	33.38	238.88	123.62	-381.99	163.45	1,172.72	1,069.73	102.99	11.387	
8,600.00	7,294.82	21,591.00	7,370.98	34.41	238.88	126.48	-381.99	163.45	1,265.51	1,167.54	97.97	12.917	
8,700.00	7,294.80	21,591.00	7,370.98	35.48	238.88	130.15	-381.99	163.45	1,360.22	1,266.09	94.14	14.449	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 754H - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 28-Standard Keeper 105, 446-MWD+HRGM+MS, 5851-Standard Keeper 105, 6495-MWD+HRGM+MS, 21591-A026Ua_| **Rule Assigned:**

Offset Well Error: 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,724.88	7,294.79	21,591.00	7,370.98	35.76	238.88	131.22	-381.99	163.45	1,384.03	1,290.69	93.34	14.828	
8,800.00	7,294.78	21,591.00	7,370.98	36.59	238.88	131.22	-381.99	163.45	1,456.19	1,365.04	91.15	15.976	
8,900.00	7,294.76	21,591.00	7,370.98	37.74	238.88	131.22	-381.99	163.45	1,552.69	1,464.11	88.58	17.528	
9,000.00	7,294.74	21,591.00	7,370.98	38.91	238.88	131.22	-381.99	163.45	1,649.60	1,563.24	86.36	19.101	
9,100.00	7,294.72	21,591.00	7,370.98	40.12	238.88	131.22	-381.99	163.45	1,746.87	1,662.44	84.42	20.691	
9,200.00	7,294.70	21,591.00	7,370.98	41.35	238.88	131.22	-381.99	163.45	1,844.42	1,761.69	82.73	22.295	
9,300.00	7,294.68	21,591.00	7,370.98	42.61	238.88	131.22	-381.99	163.45	1,942.23	1,860.99	81.24	23.908	
9,400.00	7,294.66	21,591.00	7,370.98	43.89	238.88	131.22	-381.99	163.45	2,040.24	1,960.33	79.92	25.529	
9,500.00	7,294.64	21,591.00	7,370.98	45.20	238.88	131.22	-381.99	163.45	2,138.44	2,059.70	78.75	27.156	
9,600.00	7,294.62	21,591.00	7,370.98	46.52	238.88	131.22	-381.99	163.45	2,236.80	2,159.10	77.71	28.785	
9,700.00	7,294.60	21,591.00	7,370.98	47.85	238.88	131.22	-381.99	163.45	2,335.30	2,258.53	76.78	30.417	
9,800.00	7,294.58	21,591.00	7,370.98	49.21	238.88	131.22	-381.99	163.45	2,433.93	2,357.98	75.94	32.050	
9,900.00	7,294.56	21,591.00	7,370.98	50.58	238.88	131.22	-381.99	163.45	2,532.66	2,457.46	75.19	33.682	
10,000.00	7,294.54	21,591.00	7,370.98	51.96	238.88	131.22	-381.99	163.45	2,631.48	2,556.96	74.52	35.313	
10,100.00	7,294.52	21,591.00	7,370.98	53.35	238.88	131.22	-381.99	163.45	2,730.39	2,656.48	73.91	36.943	
10,200.00	7,294.50	21,591.00	7,370.98	54.76	238.88	131.22	-381.99	163.45	2,829.38	2,756.02	73.36	38.570	
10,300.00	7,294.48	21,591.00	7,370.98	56.18	238.88	131.22	-381.99	163.45	2,928.44	2,855.58	72.86	40.195	
10,400.00	7,294.46	21,591.00	7,370.98	57.60	238.88	131.22	-381.99	163.45	3,027.56	2,955.15	72.40	41.816	
10,500.00	7,294.44	21,591.00	7,370.98	59.04	238.88	131.22	-381.99	163.45	3,126.73	3,054.74	71.99	43.434	
10,600.00	7,294.42	21,591.00	7,370.98	60.48	238.88	131.22	-381.99	163.45	3,225.96	3,154.35	71.61	45.049	
10,700.00	7,294.40	21,591.00	7,370.98	61.93	238.88	131.22	-381.99	163.45	3,325.23	3,253.96	71.27	46.659	
10,800.00	7,294.38	21,591.00	7,370.98	63.39	238.88	131.22	-381.99	163.45	3,424.54	3,353.59	70.95	48.266	
10,900.00	7,294.36	21,591.00	7,370.98	64.86	238.88	131.22	-381.99	163.45	3,523.90	3,453.23	70.66	49.868	
11,000.00	7,294.34	21,591.00	7,370.98	66.33	238.88	131.22	-381.99	163.45	3,623.29	3,552.88	70.40	51.466	
11,100.00	7,294.32	21,591.00	7,370.98	67.81	238.88	131.22	-381.99	163.45	3,722.71	3,652.55	70.16	53.060	
11,200.00	7,294.30	21,591.00	7,370.98	69.30	238.88	131.22	-381.99	163.45	3,822.16	3,752.22	69.94	54.649	
11,300.00	7,294.28	21,591.00	7,370.98	70.79	238.88	131.22	-381.99	163.45	3,921.64	3,851.90	69.74	56.234	
11,400.00	7,294.26	21,591.00	7,370.98	72.28	238.88	131.22	-381.99	163.45	4,021.14	3,951.59	69.55	57.815	
11,500.00	7,294.24	21,591.00	7,370.98	73.78	238.88	131.22	-381.99	163.45	4,120.67	4,051.29	69.38	59.391	
11,600.00	7,294.22	21,591.00	7,370.98	75.28	238.88	131.22	-381.99	163.45	4,220.22	4,151.00	69.23	60.962	
11,700.00	7,294.20	21,591.00	7,370.98	76.79	238.88	131.22	-381.99	163.45	4,319.80	4,250.71	69.08	62.529	
11,800.00	7,294.18	21,591.00	7,370.98	78.30	238.88	131.22	-381.99	163.45	4,419.39	4,350.43	68.95	64.092	
11,900.00	7,294.16	21,591.00	7,370.98	79.82	238.88	131.22	-381.99	163.45	4,519.00	4,450.16	68.83	65.650	
12,000.00	7,294.14	21,591.00	7,370.98	81.33	238.88	131.22	-381.99	163.45	4,618.63	4,549.90	68.73	67.203	
12,100.00	7,294.12	21,591.00	7,370.98	82.86	238.88	131.22	-381.99	163.45	4,718.27	4,649.64	68.63	68.752	
12,200.00	7,294.10	21,591.00	7,370.98	84.38	238.88	131.22	-381.99	163.45	4,817.92	4,749.39	68.54	70.296	
12,300.00	7,294.09	21,591.00	7,370.98	85.91	238.88	131.22	-381.99	163.45	4,917.60	4,849.14	68.46	71.836	
12,400.00	7,294.07	21,591.00	7,370.98	87.44	238.88	131.22	-381.99	163.45	5,017.28	4,948.90	68.38	73.371	
12,500.00	7,294.05	21,591.00	7,370.98	88.97	238.88	131.22	-381.99	163.45	5,116.98	5,048.66	68.32	74.902	
12,600.00	7,294.03	21,591.00	7,370.98	90.51	238.88	131.22	-381.99	163.45	5,216.68	5,148.43	68.26	76.428	
12,700.00	7,294.01	21,591.00	7,370.98	92.04	238.88	131.22	-381.99	163.45	5,316.40	5,248.20	68.20	77.949	
12,800.00	7,293.99	21,591.00	7,370.98	93.58	238.88	131.22	-381.99	163.45	5,416.13	5,347.98	68.16	79.466	
12,900.00	7,293.97	21,591.00	7,370.98	95.13	238.88	131.22	-381.99	163.45	5,515.87	5,447.76	68.12	80.979	
13,000.00	7,293.95	21,591.00	7,370.98	96.67	238.88	131.22	-381.99	163.45	5,615.62	5,547.54	68.08	82.487	
13,100.00	7,293.93	21,591.00	7,370.98	98.22	238.88	131.22	-381.99	163.45	5,715.38	5,647.33	68.05	83.990	
13,200.00	7,293.91	21,591.00	7,370.98	99.76	238.88	131.22	-381.99	163.45	5,815.14	5,747.12	68.02	85.489	
13,300.00	7,293.89	21,591.00	7,370.98	101.31	238.88	131.22	-381.99	163.45	5,914.92	5,846.92	68.00	86.983	
13,400.00	7,293.87	21,591.00	7,370.98	102.87	238.88	131.22	-381.99	163.45	6,014.70	5,946.72	67.98	88.473	
13,500.00	7,293.85	21,591.00	7,370.98	104.42	238.88	131.22	-381.99	163.45	6,114.49	6,046.52	67.97	89.958	
13,600.00	7,293.83	21,591.00	7,370.98	105.97	238.88	131.22	-381.99	163.45	6,214.28	6,146.32	67.96	91.439	
13,700.00	7,293.81	21,591.00	7,370.98	107.53	238.88	131.22	-381.99	163.45	6,314.08	6,246.13	67.96	92.915	
13,800.00	7,293.79	21,591.00	7,370.98	109.09	238.88	131.22	-381.99	163.45	6,413.89	6,345.94	67.95	94.386	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 754H - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 28-Standard Keeper 105, 446-MWD+HRGM+MS, 5851-Standard Keeper 105, 6495-MWD+HRGM+MS, 21591-A026Ua_| **Rule Assigned:**

Offset Well Error: 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,293.77	21,591.00	7,370.98	110.65	238.88	131.22	-381.99	163.45	6,513.70	6,445.75	67.95	95.853	
14,000.00	7,293.75	21,591.00	7,370.98	112.21	238.88	131.22	-381.99	163.45	6,613.52	6,545.56	67.96	97.316	
14,100.00	7,293.73	21,591.00	7,370.98	113.77	238.88	131.22	-381.99	163.45	6,713.35	6,645.38	67.97	98.774	
14,200.00	7,293.71	21,591.00	7,370.98	115.33	238.88	131.22	-381.99	163.45	6,813.18	6,745.20	67.98	100.227	
14,300.00	7,293.69	21,591.00	7,370.98	116.89	238.88	131.22	-381.99	163.45	6,913.01	6,845.02	67.99	101.676	
14,400.00	7,293.67	21,591.00	7,370.98	118.46	238.88	131.22	-381.99	163.45	7,012.85	6,944.85	68.01	103.120	
14,500.00	7,293.65	21,591.00	7,370.98	120.02	238.88	131.22	-381.99	163.45	7,112.70	7,044.67	68.03	104.560	
14,600.00	7,293.63	21,591.00	7,370.98	121.59	238.88	131.22	-381.99	163.45	7,212.54	7,144.50	68.05	105.995	
14,700.00	7,293.61	21,591.00	7,370.98	123.16	238.88	131.22	-381.99	163.45	7,312.40	7,244.33	68.07	107.425	
14,800.00	7,293.59	21,591.00	7,370.98	124.73	238.88	131.22	-381.99	163.45	7,412.25	7,344.16	68.10	108.851	
14,900.00	7,293.57	21,591.00	7,370.98	126.30	238.88	131.22	-381.99	163.45	7,512.11	7,443.99	68.12	110.273	
15,000.00	7,293.55	21,591.00	7,370.98	127.87	238.88	131.22	-381.99	163.45	7,611.98	7,543.82	68.15	111.689	
15,100.00	7,293.53	21,591.00	7,370.98	129.44	238.88	131.22	-381.99	163.45	7,711.84	7,643.66	68.19	113.101	
15,200.00	7,293.51	21,591.00	7,370.98	131.01	238.88	131.22	-381.99	163.45	7,811.72	7,743.50	68.22	114.509	
15,300.00	7,293.49	21,591.00	7,370.98	132.58	238.88	131.22	-381.99	163.45	7,911.59	7,843.33	68.26	115.912	
15,400.00	7,293.47	21,591.00	7,370.98	134.16	238.88	131.22	-381.99	163.45	8,011.47	7,943.17	68.29	117.310	
15,500.00	7,293.45	21,591.00	7,370.98	135.73	238.88	131.22	-381.99	163.45	8,111.35	8,043.01	68.33	118.704	
15,600.00	7,293.43	21,591.00	7,370.98	137.31	238.88	131.22	-381.99	163.45	8,211.23	8,142.86	68.37	120.093	
15,700.00	7,293.41	21,591.00	7,370.98	138.88	238.88	131.22	-381.99	163.45	8,311.12	8,242.70	68.42	121.477	
15,800.00	7,293.39	21,591.00	7,370.98	140.46	238.88	131.22	-381.99	163.45	8,411.00	8,342.54	68.46	122.857	
15,900.00	7,293.37	21,591.00	7,370.98	142.03	238.88	131.22	-381.99	163.45	8,510.90	8,442.39	68.51	124.232	
16,000.00	7,293.35	21,591.00	7,370.98	143.61	238.88	131.22	-381.99	163.45	8,610.79	8,542.23	68.56	125.603	
16,100.00	7,293.34	21,591.00	7,370.98	145.19	238.88	131.22	-381.99	163.45	8,710.69	8,642.08	68.61	126.969	
16,200.00	7,293.32	21,591.00	7,370.98	146.77	238.88	131.22	-381.99	163.45	8,810.58	8,741.93	68.66	128.330	
16,300.00	7,293.30	21,591.00	7,370.98	148.35	238.88	131.22	-381.99	163.45	8,910.49	8,841.78	68.71	129.687	
16,400.00	7,293.28	21,591.00	7,370.98	149.93	238.88	131.22	-381.99	163.45	9,010.39	8,941.63	68.76	131.038	
16,500.00	7,293.26	21,591.00	7,370.98	151.51	238.88	131.22	-381.99	163.45	9,110.29	9,041.48	68.82	132.386	
16,600.00	7,293.24	21,591.00	7,370.98	153.09	238.88	131.22	-381.99	163.45	9,210.20	9,141.33	68.87	133.728	
16,700.00	7,293.22	21,591.00	7,370.98	154.67	238.88	131.22	-381.99	163.45	9,310.11	9,241.18	68.93	135.066	
16,800.00	7,293.20	21,591.00	7,370.98	156.25	238.88	131.22	-381.99	163.45	9,410.02	9,341.03	68.99	136.400	
16,900.00	7,293.18	21,591.00	7,370.98	157.83	238.88	131.22	-381.99	163.45	9,509.93	9,440.89	69.05	137.729	
17,000.00	7,293.16	21,591.00	7,370.98	159.42	238.88	131.22	-381.99	163.45	9,609.85	9,540.74	69.11	139.053	
17,100.00	7,293.14	21,591.00	7,370.98	161.00	238.88	131.22	-381.99	163.45	9,709.77	9,640.59	69.17	140.372	
17,200.00	7,293.12	21,591.00	7,370.98	162.58	238.88	131.22	-381.99	163.45	9,809.68	9,740.45	69.24	141.687	
17,300.00	7,293.10	21,591.00	7,370.98	164.17	238.88	131.22	-381.99	163.45	9,909.60	9,840.30	69.30	142.997	
17,400.00	7,293.08	21,591.00	7,370.98	165.75	238.88	131.22	-381.99	163.45	10,009.53	9,940.16	69.36	144.302	
17,500.00	7,293.06	21,591.00	7,370.98	167.34	238.88	131.22	-381.99	163.45	10,109.45	10,040.02	69.43	145.603	
17,600.00	7,293.04	21,591.00	7,370.98	168.92	238.88	131.22	-381.99	163.45	10,209.37	10,139.87	69.50	146.899	
17,667.15	7,293.03	21,591.00	7,370.98	169.99	238.88	131.22	-381.99	163.45	10,276.48	10,206.93	69.55	147.767	
17,700.00	7,293.02	21,591.00	7,370.98	170.51	238.88	131.22	-381.99	163.45	10,309.30	10,239.73	69.57	148.191	
17,802.15	7,293.00	21,591.00	7,370.98	172.13	238.88	131.22	-381.99	163.45	10,411.38	10,341.74	69.64	149.505	

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 756H - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 28-Standard Keeper 105, 359-MWD+HRGM+MS, 21532-Project — **Offset Well Error:** 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	21,397.73	7,106.24	0.00	232.15	-179.71	-1,561.57	-7.86	7,455.61				
100.00	100.00	21,397.94	7,106.24	0.25	232.16	-179.72	-1,561.56	-7.65	7,357.86	7,234.42	123.44	59.608	
200.00	200.00	21,398.14	7,106.24	0.61	232.16	-179.73	-1,561.56	-7.45	7,260.17	7,136.55	123.62	58.730	
300.00	300.00	21,398.35	7,106.24	0.97	232.16	-179.73	-1,561.56	-7.24	7,162.54	7,038.73	123.82	57.847	
400.00	400.00	21,398.56	7,106.24	1.33	232.17	-179.74	-1,561.56	-7.03	7,064.98	6,940.95	124.03	56.961	
500.00	500.00	21,398.76	7,106.24	1.68	232.17	-179.75	-1,561.56	-6.83	6,967.49	6,843.23	124.26	56.071	
600.00	599.98	21,397.85	7,106.24	2.04	232.16	-134.04	-1,561.56	-7.74	6,870.34	6,745.83	124.50	55.182	
611.38	611.35	21,397.61	7,106.24	2.08	232.15	-134.66	-1,561.57	-7.98	6,859.32	6,734.80	124.53	55.084	
700.00	699.90	21,395.57	7,106.24	2.40	232.12	-134.59	-1,561.58	-10.02	6,773.62	6,648.85	124.76	54.293	
800.00	799.83	21,393.27	7,106.23	2.75	232.08	-134.52	-1,561.60	-12.32	6,677.00	6,551.95	125.04	53.397	
900.00	899.75	21,390.95	7,106.23	3.11	232.05	-134.44	-1,561.61	-14.64	6,580.47	6,455.13	125.35	52.498	
1,000.00	999.68	21,388.62	7,106.22	3.47	232.01	-134.36	-1,561.63	-16.97	6,484.06	6,358.39	125.67	51.596	
1,100.00	1,099.60	21,386.28	7,106.22	3.83	231.97	-134.29	-1,561.64	-19.31	6,387.75	6,261.74	126.01	50.691	
1,200.00	1,199.53	21,383.93	7,106.21	4.19	231.94	-134.21	-1,561.66	-21.66	6,291.56	6,165.18	126.38	49.784	
1,300.00	1,299.45	21,381.57	7,106.21	4.55	231.90	-134.13	-1,561.67	-24.02	6,195.49	6,068.73	126.76	48.875	
1,400.00	1,399.38	21,379.19	7,106.20	4.91	231.86	-134.05	-1,561.69	-26.40	6,099.54	5,972.37	127.17	47.964	
1,500.00	1,499.30	21,376.80	7,106.20	5.27	231.82	-133.97	-1,561.71	-28.79	6,003.72	5,876.13	127.60	47.052	
1,600.00	1,599.22	21,374.39	7,106.19	5.63	231.79	-133.90	-1,561.72	-31.20	5,908.04	5,779.99	128.05	46.139	
1,700.00	1,699.15	21,371.98	7,106.19	5.99	231.75	-133.82	-1,561.74	-33.61	5,812.51	5,683.98	128.53	45.225	
1,800.00	1,799.07	21,369.55	7,106.18	6.35	231.71	-133.74	-1,561.76	-36.04	5,717.13	5,588.10	129.03	44.310	
1,900.00	1,899.00	21,367.11	7,106.18	6.71	231.67	-133.66	-1,561.77	-38.48	5,621.90	5,492.35	129.55	43.394	
2,000.00	1,998.92	21,364.65	7,106.18	7.07	231.63	-133.57	-1,561.79	-40.94	5,526.85	5,396.74	130.11	42.479	
2,100.00	2,098.85	21,362.19	7,106.17	7.43	231.59	-133.49	-1,561.81	-43.40	5,431.96	5,301.27	130.69	41.563	
2,200.00	2,198.77	21,359.71	7,106.17	7.79	231.55	-133.41	-1,561.82	-45.88	5,337.27	5,205.96	131.31	40.648	
2,300.00	2,298.70	21,357.21	7,106.17	8.15	231.51	-133.33	-1,561.84	-48.38	5,242.77	5,110.82	131.95	39.733	
2,400.00	2,398.62	21,354.70	7,106.16	8.51	231.47	-133.25	-1,561.86	-50.89	5,148.48	5,015.85	132.63	38.819	
2,500.00	2,498.54	21,352.18	7,106.16	8.87	231.43	-133.16	-1,561.88	-53.41	5,054.40	4,921.06	133.34	37.906	
2,600.00	2,598.47	21,349.65	7,106.16	9.23	231.39	-133.08	-1,561.89	-55.94	4,960.56	4,826.47	134.09	36.994	
2,700.00	2,698.39	21,347.10	7,106.16	9.60	231.35	-132.99	-1,561.91	-58.49	4,866.96	4,732.08	134.88	36.084	
2,800.00	2,798.32	21,344.54	7,106.15	9.96	231.31	-132.91	-1,561.93	-61.05	4,773.61	4,637.90	135.71	35.175	
2,900.00	2,898.24	21,341.96	7,106.15	10.32	231.27	-132.83	-1,561.95	-63.63	4,680.54	4,543.96	136.58	34.268	
3,000.00	2,998.17	21,339.37	7,106.15	10.68	231.23	-132.74	-1,561.97	-66.22	4,587.77	4,450.26	137.51	33.364	
3,100.00	3,098.09	21,336.76	7,106.15	11.04	231.19	-132.65	-1,561.99	-68.83	4,495.29	4,356.82	138.48	32.463	
3,200.00	3,198.02	21,334.14	7,106.15	11.40	231.15	-132.57	-1,562.00	-71.44	4,403.15	4,263.65	139.50	31.564	
3,300.00	3,297.94	21,331.51	7,106.14	11.76	231.11	-132.48	-1,562.02	-74.08	4,311.35	4,170.77	140.58	30.668	
3,400.00	3,397.86	21,328.86	7,106.14	12.12	231.07	-132.39	-1,562.04	-76.73	4,219.93	4,078.21	141.72	29.777	
3,500.00	3,497.79	21,335.18	7,106.14	12.48	231.17	-132.60	-1,561.96	-70.41	4,128.89	3,985.92	142.97	28.879	
3,600.00	3,597.71	21,329.49	7,106.14	12.85	231.08	-132.41	-1,562.02	-76.09	4,038.29	3,894.06	144.23	28.000	
3,700.00	3,697.64	21,323.85	7,106.14	13.21	230.99	-132.23	-1,562.07	-81.74	3,948.13	3,802.58	145.55	27.125	
3,800.00	3,797.56	21,318.24	7,106.14	13.57	230.90	-132.04	-1,562.12	-87.35	3,858.46	3,711.51	146.95	26.256	
3,900.00	3,897.49	21,312.67	7,106.14	13.93	230.81	-131.86	-1,562.15	-92.92	3,769.31	3,620.87	148.44	25.393	
4,000.00	3,997.41	21,307.14	7,106.14	14.29	230.72	-131.67	-1,562.18	-98.45	3,680.70	3,530.69	150.01	24.536	
4,100.00	4,097.34	21,301.65	7,106.14	14.65	230.64	-131.49	-1,562.21	-103.94	3,592.69	3,441.01	151.68	23.686	
4,200.00	4,197.26	21,296.19	7,106.14	15.01	230.55	-131.31	-1,562.22	-109.40	3,505.32	3,351.88	153.45	22.844	
4,300.00	4,297.18	21,290.77	7,106.13	15.37	230.46	-131.13	-1,562.23	-114.82	3,418.64	3,263.32	155.32	22.010	
4,400.00	4,397.11	21,285.39	7,106.13	15.74	230.38	-130.95	-1,562.23	-120.20	3,332.70	3,175.39	157.31	21.186	
4,500.00	4,497.03	21,280.04	7,106.12	16.10	230.29	-130.78	-1,562.23	-125.55	3,247.55	3,088.14	159.41	20.372	
4,600.00	4,596.96	21,274.73	7,106.12	16.46	230.21	-130.60	-1,562.22	-130.86	3,163.28	3,001.64	161.64	19.570	
4,700.00	4,696.88	21,269.46	7,106.11	16.82	230.13	-130.42	-1,562.20	-136.13	3,079.93	2,915.93	164.01	18.779	
4,800.00	4,796.81	21,264.21	7,106.11	17.18	230.04	-130.25	-1,562.18	-141.37	2,997.61	2,831.10	166.51	18.002	
4,900.00	4,896.73	21,259.01	7,106.10	17.54	229.96	-130.08	-1,562.15	-146.58	2,916.38	2,747.21	169.16	17.240	
5,000.00	4,996.66	21,253.84	7,106.09	17.90	229.88	-129.91	-1,562.11	-151.75	2,836.34	2,664.37	171.97	16.493	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 756H - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 28-Standard Keeper 105, 359-MWD+HRGM+MS, 21532-Project

Offset Well Error: 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,100.00	5,096.58	21,248.70	7,106.08	18.26	229.80	-129.74	-1,562.07	-156.89	2,757.61	2,582.67	174.94	15.763	
5,200.00	5,196.50	21,243.60	7,106.08	18.63	229.72	-129.57	-1,562.02	-161.99	2,680.28	2,502.21	178.08	15.051	
5,300.00	5,296.43	21,238.53	7,106.07	18.99	229.64	-129.40	-1,561.97	-167.06	2,604.50	2,423.12	181.38	14.359	
5,400.00	5,396.35	21,233.49	7,106.06	19.35	229.56	-129.23	-1,561.92	-172.10	2,530.39	2,345.53	184.86	13.688	
5,500.00	5,496.28	21,228.48	7,106.05	19.71	229.48	-129.06	-1,561.85	-177.10	2,458.11	2,269.60	188.52	13.039	
5,600.00	5,596.20	21,223.65	7,106.03	20.07	229.40	-128.90	-1,561.79	-181.94	2,387.83	2,195.49	192.34	12.414	
5,700.00	5,696.13	21,220.14	7,106.03	20.43	229.35	-128.79	-1,561.74	-185.44	2,319.73	2,123.38	196.34	11.815	
5,800.00	5,796.05	21,216.79	7,106.01	20.79	229.29	-128.68	-1,561.69	-188.80	2,253.99	2,053.49	200.50	11.242	
5,900.00	5,895.98	21,213.58	7,106.00	21.16	229.24	-128.57	-1,561.65	-192.01	2,190.85	1,986.05	204.80	10.698	
6,000.00	5,995.90	21,210.50	7,105.99	21.52	229.19	-128.47	-1,561.61	-195.08	2,130.53	1,921.31	209.22	10.183	
6,100.00	6,095.82	21,207.55	7,105.97	21.88	229.15	-128.37	-1,561.57	-198.04	2,073.28	1,859.55	213.73	9.701	
6,200.00	6,195.75	21,204.72	7,105.96	22.24	229.10	-128.27	-1,561.53	-200.87	2,019.35	1,801.06	218.29	9.251	
6,300.00	6,295.67	21,201.99	7,105.94	22.60	229.06	-128.18	-1,561.50	-203.59	1,969.03	1,746.17	222.86	8.835	
6,400.00	6,395.60	21,199.38	7,105.92	22.96	229.02	-128.10	-1,561.46	-206.21	1,922.59	1,695.21	227.38	8.455	
6,500.00	6,495.52	21,196.86	7,105.91	23.32	228.98	-128.01	-1,561.43	-208.72	1,880.32	1,648.53	231.79	8.112	
6,600.00	6,595.45	21,194.43	7,105.89	23.68	228.94	-127.93	-1,561.40	-211.15	1,842.52	1,606.50	236.01	7.807	
6,641.25	6,636.67	21,193.46	7,105.88	23.83	228.92	-127.90	-1,561.39	-212.12	1,828.29	1,590.60	237.69	7.692	
6,650.00	6,645.41	21,193.32	7,105.88	23.87	228.92	-141.23	-1,561.39	-212.27	1,825.36	1,587.33	238.04	7.668	
6,700.00	6,695.38	21,194.78	7,105.89	24.03	228.94	99.56	-1,561.40	-210.80	1,809.04	1,569.03	240.01	7.537	
6,750.00	6,745.12	21,200.06	7,105.93	24.19	229.03	90.97	-1,561.47	-205.52	1,793.43	1,551.50	241.93	7.413	
6,800.00	6,794.33	21,209.03	7,105.98	24.34	229.17	89.30	-1,561.59	-196.55	1,778.62	1,534.83	243.78	7.296	
6,850.00	6,842.70	21,221.54	7,106.03	24.49	229.37	88.91	-1,561.76	-184.04	1,764.66	1,519.09	245.57	7.186	
6,900.00	6,889.94	21,246.94	7,106.08	24.63	229.77	88.59	-1,562.06	-158.65	1,751.55	1,504.22	247.32	7.082	
6,950.00	6,935.75	21,279.85	7,106.12	24.76	230.29	88.24	-1,562.23	-125.74	1,739.17	1,490.17	249.00	6.985	
7,000.00	6,979.84	21,318.28	7,106.14	24.89	230.90	87.85	-1,562.12	-87.31	1,727.42	1,476.85	250.58	6.894	
7,050.00	7,021.96	21,344.31	7,106.15	25.02	231.31	87.89	-1,561.93	-61.28	1,716.31	1,464.29	252.01	6.810	
7,100.00	7,061.84	21,373.63	7,106.19	25.16	231.77	87.87	-1,561.73	-31.96	1,705.86	1,452.49	253.36	6.733	
7,150.00	7,099.23	21,405.94	7,106.26	25.29	232.28	87.81	-1,561.51	0.35	1,695.99	1,441.36	254.63	6.660	
7,200.00	7,133.90	21,450.64	7,106.42	25.42	232.99	87.51	-1,561.11	45.05	1,686.53	1,430.67	255.86	6.592	
7,250.00	7,165.64	21,491.99	7,106.61	25.56	233.22	87.37	-1,560.53	86.40	1,677.25	1,420.70	256.56	6.538	
7,300.00	7,194.26	21,532.00	7,106.80	25.71	233.24	87.33	-1,559.97	126.40	1,668.21	1,411.20	257.01	6.491	
7,350.00	7,219.57	21,532.00	7,106.80	25.86	233.24	88.03	-1,559.97	126.40	1,659.89	1,401.94	257.94	6.435	
7,400.00	7,241.42	21,532.00	7,106.80	26.03	233.24	88.63	-1,559.97	126.40	1,652.81	1,394.13	258.69	6.389	
7,450.00	7,259.68	21,532.00	7,106.80	26.20	233.24	89.12	-1,559.97	126.40	1,647.06	1,387.83	259.23	6.354	
7,500.00	7,274.23	21,532.00	7,106.80	26.38	233.24	89.49	-1,559.97	126.40	1,642.66	1,383.11	259.56	6.329	
7,550.00	7,284.99	21,532.00	7,106.80	26.58	233.24	89.74	-1,559.97	126.40	1,639.68	1,380.01	259.67	6.314	
7,600.00	7,291.88	21,532.00	7,106.80	26.78	233.24	89.87	-1,559.97	126.40	1,638.12	1,378.56	259.56	6.311	SF
7,629.01	7,294.09	21,532.00	7,106.80	26.91	233.24	89.88	-1,559.97	126.40	1,637.87	1,378.48	259.40	6.314	CC, ES
7,650.00	7,294.87	21,532.00	7,106.80	27.00	233.24	89.87	-1,559.97	126.40	1,638.00	1,378.77	259.23	6.319	
7,663.21	7,295.00	21,532.00	7,106.80	27.06	233.24	89.85	-1,559.97	126.40	1,638.21	1,379.11	259.10	6.323	
7,700.00	7,294.99	21,532.00	7,106.80	27.23	233.24	89.85	-1,559.97	126.40	1,639.35	1,380.67	258.68	6.337	
7,800.00	7,294.97	21,532.00	7,106.80	27.74	233.24	89.85	-1,559.97	126.40	1,646.61	1,389.60	257.01	6.407	
7,900.00	7,294.95	21,532.00	7,106.80	28.34	233.24	89.85	-1,559.97	126.40	1,659.86	1,405.26	254.60	6.519	
8,000.00	7,294.93	21,532.00	7,106.80	29.02	233.24	89.85	-1,559.97	126.40	1,678.98	1,427.48	251.51	6.676	
8,100.00	7,294.91	21,532.00	7,106.80	29.77	233.24	89.85	-1,559.97	126.40	1,703.77	1,455.97	247.79	6.876	
8,200.00	7,294.89	21,532.00	7,106.80	30.58	233.24	89.85	-1,559.97	126.40	1,733.97	1,490.42	243.55	7.119	
8,253.21	7,294.88	21,532.00	7,106.80	31.04	233.24	89.85	-1,559.97	126.40	1,752.16	1,511.05	241.11	7.267	
8,300.00	7,294.87	21,532.00	7,106.80	31.46	233.24	89.85	-1,559.97	126.40	1,769.68	1,530.79	238.88	7.408	
8,400.00	7,294.86	21,532.00	7,106.80	32.39	233.24	89.85	-1,559.97	126.40	1,812.89	1,578.94	233.95	7.749	
8,500.00	7,294.84	21,532.00	7,106.80	33.38	233.24	89.85	-1,559.97	126.40	1,863.48	1,634.57	228.91	8.141	
8,600.00	7,294.82	21,532.00	7,106.80	34.41	233.24	89.84	-1,559.97	126.40	1,920.80	1,696.93	223.87	8.580	
8,700.00	7,294.80	21,532.00	7,106.80	35.48	233.24	89.84	-1,559.97	126.40	1,984.21	1,765.25	218.96	9.062	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 756H - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 28-Standard Keeper 105, 359-MWD+HRGM+MS, 21532-Project

Offset Well Error: 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Rule Assigned: Warning
8,724.88	7,294.79	21,532.00	7,106.80	35.76	233.24	89.83	-1,559.97	126.40	2,000.86	1,783.08	217.77	9.188	
8,800.00	7,294.78	21,532.00	7,106.80	36.59	233.24	89.83	-1,559.97	126.40	2,052.36	1,838.15	214.21	9.581	
8,900.00	7,294.76	21,532.00	7,106.80	37.74	233.24	89.83	-1,559.97	126.40	2,123.11	1,913.55	209.56	10.131	
9,000.00	7,294.74	21,532.00	7,106.80	38.91	233.24	89.83	-1,559.97	126.40	2,196.14	1,991.10	205.04	10.711	
9,100.00	7,294.72	21,532.00	7,106.80	40.12	233.24	89.83	-1,559.97	126.40	2,271.22	2,070.57	200.66	11.319	
9,200.00	7,294.70	21,532.00	7,106.80	41.35	233.24	89.83	-1,559.97	126.40	2,348.16	2,151.74	196.43	11.954	
9,300.00	7,294.68	21,532.00	7,106.80	42.61	233.24	89.83	-1,559.97	126.40	2,426.79	2,234.43	192.36	12.616	
9,400.00	7,294.66	21,532.00	7,106.80	43.89	233.24	89.83	-1,559.97	126.40	2,506.93	2,318.48	188.46	13.303	
9,500.00	7,294.64	21,532.00	7,106.80	45.20	233.24	89.83	-1,559.97	126.40	2,588.46	2,403.75	184.72	14.013	
9,600.00	7,294.62	21,532.00	7,106.80	46.52	233.24	89.83	-1,559.97	126.40	2,671.24	2,490.11	181.14	14.747	
9,700.00	7,294.60	21,532.00	7,106.80	47.85	233.24	89.83	-1,559.97	126.40	2,755.17	2,577.45	177.72	15.503	
9,800.00	7,294.58	21,532.00	7,106.80	49.21	233.24	89.83	-1,559.97	126.40	2,840.14	2,665.68	174.45	16.280	
9,900.00	7,294.56	21,532.00	7,106.80	50.58	233.24	89.83	-1,559.97	126.40	2,926.06	2,754.72	171.34	17.078	
10,000.00	7,294.54	21,532.00	7,106.80	51.96	233.24	89.83	-1,559.97	126.40	3,012.84	2,844.48	168.36	17.895	
10,100.00	7,294.52	21,532.00	7,106.80	53.35	233.24	89.83	-1,559.97	126.40	3,100.43	2,934.90	165.53	18.731	
10,200.00	7,294.50	21,532.00	7,106.80	54.76	233.24	89.83	-1,559.97	126.40	3,188.74	3,025.92	162.82	19.584	
10,300.00	7,294.48	21,532.00	7,106.80	56.18	233.24	89.83	-1,559.97	126.40	3,277.72	3,117.49	160.24	20.455	
10,400.00	7,294.46	21,532.00	7,106.80	57.60	233.24	89.83	-1,559.97	126.40	3,367.33	3,209.56	157.77	21.343	
10,500.00	7,294.44	21,532.00	7,106.80	59.04	233.24	89.83	-1,559.97	126.40	3,457.50	3,302.08	155.42	22.246	
10,600.00	7,294.42	21,532.00	7,106.80	60.48	233.24	89.83	-1,559.97	126.40	3,548.20	3,395.03	153.17	23.165	
10,700.00	7,294.40	21,532.00	7,106.80	61.93	233.24	89.83	-1,559.97	126.40	3,639.39	3,488.36	151.03	24.098	
10,800.00	7,294.38	21,532.00	7,106.80	63.39	233.24	89.83	-1,559.97	126.40	3,731.03	3,582.05	148.97	25.045	
10,900.00	7,294.36	21,532.00	7,106.80	64.86	233.24	89.83	-1,559.97	126.40	3,823.09	3,676.07	147.01	26.005	
11,000.00	7,294.34	21,532.00	7,106.80	66.33	233.24	89.83	-1,559.97	126.40	3,915.53	3,770.40	145.14	26.978	
11,100.00	7,294.32	21,532.00	7,106.80	67.81	233.24	89.83	-1,559.97	126.40	4,008.35	3,865.00	143.34	27.963	
11,200.00	7,294.30	21,532.00	7,106.80	69.30	233.24	89.83	-1,559.97	126.40	4,101.49	3,959.87	141.62	28.960	
11,300.00	7,294.28	21,532.00	7,106.80	70.79	233.24	89.83	-1,559.97	126.40	4,194.96	4,054.98	139.98	29.969	
11,400.00	7,294.26	21,532.00	7,106.80	72.28	233.24	89.83	-1,559.97	126.40	4,288.72	4,150.32	138.40	30.988	
11,500.00	7,294.24	21,532.00	7,106.80	73.78	233.24	89.83	-1,559.97	126.40	4,382.75	4,245.86	136.89	32.017	
11,600.00	7,294.22	21,532.00	7,106.80	75.28	233.24	89.83	-1,559.97	126.40	4,477.04	4,341.61	135.44	33.057	
11,700.00	7,294.20	21,532.00	7,106.80	76.79	233.24	89.83	-1,559.97	126.40	4,571.58	4,437.54	134.04	34.105	
11,800.00	7,294.18	21,532.00	7,106.80	78.30	233.24	89.83	-1,559.97	126.40	4,666.34	4,533.64	132.71	35.163	
11,900.00	7,294.16	21,532.00	7,106.80	79.82	233.24	89.83	-1,559.97	126.40	4,761.32	4,629.90	131.42	36.229	
12,000.00	7,294.14	21,532.00	7,106.80	81.33	233.24	89.83	-1,559.97	126.40	4,856.50	4,726.31	130.19	37.304	
12,100.00	7,294.12	21,532.00	7,106.80	82.86	233.24	89.83	-1,559.97	126.40	4,951.87	4,822.87	129.00	38.387	
12,200.00	7,294.10	21,532.00	7,106.80	84.38	233.24	89.83	-1,559.97	126.40	5,047.42	4,919.56	127.86	39.477	
12,300.00	7,294.09	21,532.00	7,106.80	85.91	233.24	89.83	-1,559.97	126.40	5,143.14	5,016.38	126.76	40.574	
12,400.00	7,294.07	21,532.00	7,106.80	87.44	233.24	89.83	-1,559.97	126.40	5,239.02	5,113.31	125.70	41.678	
12,500.00	7,294.05	21,532.00	7,106.80	88.97	233.24	89.83	-1,559.97	126.40	5,335.04	5,210.36	124.68	42.789	
12,600.00	7,294.03	21,532.00	7,106.80	90.51	233.24	89.83	-1,559.97	126.40	5,431.22	5,307.52	123.70	43.906	
12,700.00	7,294.01	21,532.00	7,106.80	92.04	233.24	89.83	-1,559.97	126.40	5,527.53	5,404.77	122.75	45.029	
12,800.00	7,293.99	21,532.00	7,106.80	93.58	233.24	89.83	-1,559.97	126.40	5,623.96	5,502.12	121.84	46.158	
12,900.00	7,293.97	21,532.00	7,106.80	95.13	233.24	89.83	-1,559.97	126.40	5,720.52	5,599.56	120.96	47.292	
13,000.00	7,293.95	21,532.00	7,106.80	96.67	233.24	89.83	-1,559.97	126.40	5,817.20	5,697.09	120.11	48.432	
13,100.00	7,293.93	21,532.00	7,106.80	98.22	233.24	89.83	-1,559.97	126.40	5,913.98	5,794.69	119.29	49.576	
13,200.00	7,293.91	21,532.00	7,106.80	99.76	233.24	89.83	-1,559.97	126.40	6,010.88	5,892.38	118.50	50.725	
13,300.00	7,293.89	21,532.00	7,106.80	101.31	233.24	89.83	-1,559.97	126.40	6,107.87	5,990.13	117.73	51.879	
13,400.00	7,293.87	21,532.00	7,106.80	102.87	233.24	89.83	-1,559.97	126.40	6,204.96	6,087.96	116.99	53.036	
13,500.00	7,293.85	21,532.00	7,106.80	104.42	233.24	89.83	-1,559.97	126.40	6,302.13	6,185.85	116.28	54.198	
13,600.00	7,293.83	21,532.00	7,106.80	105.97	233.24	89.83	-1,559.97	126.40	6,399.40	6,283.81	115.59	55.363	
13,700.00	7,293.81	21,532.00	7,106.80	107.53	233.24	89.83	-1,559.97	126.40	6,496.75	6,381.83	114.92	56.532	
13,800.00	7,293.79	21,532.00	7,106.80	109.09	233.24	89.83	-1,559.97	126.40	6,594.18	6,479.90	114.28	57.704	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - (O) RU 756H - OH - OH

Offset Site Error: 0.00 usft

Survey Program: 28-Standard Keeper 105, 359-MWD+HRGM+MS, 21532-Project

Rule Assigned:

Offset Well Error: 3.28 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,293.77	21,532.00	7,106.80	110.65	233.24	89.83	-1,559.97	126.40	6,691.68	6,578.03	113.65	58.880	
14,000.00	7,293.75	21,532.00	7,106.80	112.21	233.24	89.83	-1,559.97	126.40	6,789.26	6,676.21	113.04	60.058	
14,100.00	7,293.73	21,532.00	7,106.80	113.77	233.24	89.83	-1,559.97	126.40	6,886.90	6,774.44	112.46	61.239	
14,200.00	7,293.71	21,532.00	7,106.80	115.33	233.24	89.83	-1,559.97	126.40	6,984.61	6,872.72	111.89	62.423	
14,300.00	7,293.69	21,532.00	7,106.80	116.89	233.24	89.83	-1,559.97	126.40	7,082.39	6,971.05	111.34	63.610	
14,400.00	7,293.67	21,532.00	7,106.80	118.46	233.24	89.83	-1,559.97	126.40	7,180.23	7,069.42	110.81	64.798	
14,500.00	7,293.65	21,532.00	7,106.80	120.02	233.24	89.83	-1,559.97	126.40	7,278.12	7,167.83	110.29	65.989	
14,600.00	7,293.63	21,532.00	7,106.80	121.59	233.24	89.83	-1,559.97	126.40	7,376.08	7,266.28	109.79	67.182	
14,700.00	7,293.61	21,532.00	7,106.80	123.16	233.24	89.83	-1,559.97	126.40	7,474.08	7,364.77	109.31	68.376	
14,800.00	7,293.59	21,532.00	7,106.80	124.73	233.24	89.83	-1,559.97	126.40	7,572.14	7,463.30	108.84	69.572	
14,900.00	7,293.57	21,532.00	7,106.80	126.30	233.24	89.83	-1,559.97	126.40	7,670.25	7,561.87	108.38	70.770	
15,000.00	7,293.55	21,532.00	7,106.80	127.87	233.24	89.83	-1,559.97	126.40	7,768.41	7,660.47	107.94	71.969	
15,100.00	7,293.53	21,532.00	7,106.80	129.44	233.24	89.83	-1,559.97	126.40	7,866.61	7,759.10	107.51	73.170	
15,200.00	7,293.51	21,532.00	7,106.80	131.01	233.24	89.83	-1,559.97	126.40	7,964.86	7,857.77	107.10	74.371	
15,300.00	7,293.49	21,532.00	7,106.80	132.58	233.24	89.83	-1,559.97	126.40	8,063.15	7,956.46	106.69	75.574	
15,400.00	7,293.47	21,532.00	7,106.80	134.16	233.24	89.83	-1,559.97	126.40	8,161.49	8,055.19	106.30	76.778	
15,500.00	7,293.45	21,532.00	7,106.80	135.73	233.24	89.83	-1,559.97	126.40	8,259.86	8,153.94	105.92	77.982	
15,600.00	7,293.43	21,532.00	7,106.80	137.31	233.24	89.83	-1,559.97	126.40	8,358.27	8,252.72	105.55	79.187	
15,700.00	7,293.41	21,532.00	7,106.80	138.88	233.24	89.83	-1,559.97	126.40	8,456.72	8,351.53	105.19	80.393	
15,800.00	7,293.39	21,532.00	7,106.80	140.46	233.24	89.83	-1,559.97	126.40	8,555.20	8,450.36	104.84	81.599	
15,900.00	7,293.37	21,532.00	7,106.80	142.03	233.24	89.83	-1,559.97	126.40	8,653.72	8,549.22	104.51	82.805	
16,000.00	7,293.35	21,532.00	7,106.80	143.61	233.24	89.83	-1,559.97	126.40	8,752.28	8,648.10	104.18	84.012	
16,100.00	7,293.34	21,532.00	7,106.80	145.19	233.24	89.83	-1,559.97	126.40	8,850.86	8,747.00	103.86	85.219	
16,200.00	7,293.32	21,532.00	7,106.80	146.77	233.24	89.83	-1,559.97	126.40	8,949.48	8,845.93	103.55	86.425	
16,300.00	7,293.30	21,532.00	7,106.80	148.35	233.24	89.83	-1,559.97	126.40	9,048.13	8,944.88	103.25	87.632	
16,400.00	7,293.28	21,532.00	7,106.80	149.93	233.24	89.83	-1,559.97	126.40	9,146.80	9,043.85	102.96	88.839	
16,500.00	7,293.26	21,532.00	7,106.80	151.51	233.24	89.83	-1,559.97	126.40	9,245.51	9,142.83	102.68	90.045	
16,600.00	7,293.24	21,532.00	7,106.80	153.09	233.24	89.83	-1,559.97	126.40	9,344.24	9,241.84	102.40	91.252	
16,700.00	7,293.22	21,532.00	7,106.80	154.67	233.24	89.83	-1,559.97	126.40	9,443.00	9,340.87	102.13	92.457	
16,800.00	7,293.20	21,532.00	7,106.80	156.25	233.24	89.83	-1,559.97	126.40	9,541.79	9,439.91	101.87	93.663	
16,900.00	7,293.18	21,532.00	7,106.80	157.83	233.24	89.83	-1,559.97	126.40	9,640.60	9,538.98	101.62	94.868	
17,000.00	7,293.16	21,532.00	7,106.80	159.42	233.24	89.83	-1,559.97	126.40	9,739.43	9,638.06	101.38	96.072	
17,100.00	7,293.14	21,532.00	7,106.80	161.00	233.24	89.83	-1,559.97	126.40	9,838.29	9,737.15	101.14	97.275	
17,200.00	7,293.12	21,532.00	7,106.80	162.58	233.24	89.83	-1,559.97	126.40	9,937.17	9,836.27	100.91	98.478	
17,300.00	7,293.10	21,532.00	7,106.80	164.17	233.24	89.83	-1,559.97	126.40	10,036.08	9,935.39	100.68	99.680	
17,400.00	7,293.08	21,532.00	7,106.80	165.75	233.24	89.83	-1,559.97	126.40	10,135.00	10,034.54	100.46	100.881	
17,500.00	7,293.06	21,532.00	7,106.80	167.34	233.24	89.83	-1,559.97	126.40	10,233.95	10,133.69	100.25	102.081	
17,600.00	7,293.04	21,532.00	7,106.80	168.92	233.24	89.83	-1,559.97	126.40	10,332.91	10,232.86	100.05	103.280	
17,667.15	7,293.03	21,532.00	7,106.80	169.99	233.24	89.83	-1,559.97	126.40	10,399.38	10,299.47	99.91	104.085	
17,700.00	7,293.02	21,532.00	7,106.80	170.51	233.24	89.83	-1,559.97	126.40	10,431.90	10,332.05	99.85	104.479	
17,802.15	7,293.00	21,532.00	7,106.80	172.13	233.24	89.83	-1,559.97	126.40	10,533.03	10,433.39	99.65	105.701	

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - Rosa Unit 842H - OH - Prelim 7 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM+MS — **Rule Assigned:** — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-76.51	5.83	-24.28	24.97				
100.00	100.00	100.00	100.00	0.25	0.25	-76.51	5.83	-24.28	24.97	24.47	0.50	49.759	
200.00	200.00	200.00	200.00	0.61	0.61	-76.51	5.83	-24.28	24.97	23.75	1.22	20.489	
300.00	300.00	300.00	300.00	0.97	0.97	-76.51	5.83	-24.28	24.97	23.04	1.94	12.901	
400.00	400.00	400.00	400.00	1.33	1.33	-76.51	5.83	-24.28	24.97	22.32	2.65	9.414	
500.00	500.00	500.00	500.00	1.68	1.68	-76.51	5.83	-24.28	24.97	21.60	3.37	7.411	
600.00	599.98	600.02	600.00	2.04	2.03	-30.71	4.09	-24.46	23.29	19.22	4.07	5.727	
611.38	611.35	611.38	611.35	2.08	2.07	-32.29	3.67	-24.51	22.92	18.78	4.15	5.530	
700.00	699.90	699.60	699.44	2.40	2.36	-50.57	-1.09	-25.00	21.09	16.34	4.75	4.440	
704.82	704.72	704.39	704.21	2.41	2.38	-51.83	-1.42	-25.03	21.08	16.30	4.78	4.407	CC, ES
800.00	799.83	798.56	798.02	2.75	2.70	-78.05	-9.64	-25.88	24.14	18.70	5.44	4.438	
900.00	899.75	896.66	895.40	3.11	3.05	-98.67	-21.45	-27.11	34.30	28.18	6.12	5.602	
1,000.00	999.68	993.70	991.26	3.47	3.41	-109.99	-36.38	-28.66	50.11	43.32	6.80	7.374	
1,100.00	1,099.60	1,091.61	1,087.68	3.83	3.78	-116.04	-53.33	-30.41	68.84	61.35	7.49	9.189	
1,200.00	1,199.53	1,189.65	1,184.22	4.19	4.17	-119.49	-70.30	-32.17	88.00	79.81	8.19	10.740	
1,300.00	1,299.45	1,287.69	1,280.77	4.55	4.56	-121.70	-87.27	-33.93	107.36	98.46	8.90	12.061	
1,400.00	1,399.38	1,385.73	1,377.31	4.91	4.95	-123.24	-104.24	-35.69	126.83	117.21	9.61	13.195	
1,500.00	1,499.30	1,483.77	1,473.85	5.27	5.35	-124.37	-121.21	-37.44	146.36	136.03	10.32	14.175	
1,600.00	1,599.22	1,581.81	1,570.39	5.63	5.75	-125.23	-138.18	-39.20	165.93	154.89	11.04	15.030	
1,700.00	1,699.15	1,679.85	1,666.94	5.99	6.16	-125.91	-155.16	-40.96	185.53	173.77	11.76	15.781	
1,800.00	1,799.07	1,777.89	1,763.48	6.35	6.56	-126.46	-172.13	-42.72	205.15	192.68	12.47	16.445	
1,900.00	1,899.00	1,875.93	1,860.02	6.71	6.97	-126.92	-189.10	-44.48	224.79	211.59	13.19	17.037	
2,000.00	1,998.92	1,973.96	1,956.57	7.07	7.38	-127.30	-206.07	-46.24	244.44	230.52	13.91	17.568	
2,100.00	2,098.85	2,072.00	2,053.11	7.43	7.79	-127.62	-223.04	-47.99	264.09	249.46	14.63	18.045	
2,200.00	2,198.77	2,170.04	2,149.65	7.79	8.20	-127.90	-240.02	-49.75	283.76	268.40	15.36	18.478	
2,300.00	2,298.70	2,268.08	2,246.19	8.15	8.61	-128.14	-256.99	-51.51	303.43	287.35	16.08	18.871	
2,400.00	2,398.62	2,366.12	2,342.74	8.51	9.03	-128.36	-273.96	-53.27	323.10	306.30	16.80	19.230	
2,500.00	2,498.54	2,464.16	2,439.28	8.87	9.44	-128.55	-290.93	-55.03	342.78	325.25	17.52	19.560	
2,600.00	2,598.47	2,562.20	2,535.82	9.23	9.85	-128.72	-307.90	-56.79	362.46	344.21	18.25	19.862	
2,700.00	2,698.39	2,660.24	2,632.36	9.60	10.27	-128.87	-324.87	-58.54	382.14	363.17	18.97	20.142	
2,800.00	2,798.32	2,758.28	2,728.91	9.96	10.68	-129.00	-341.85	-60.30	401.83	382.13	19.70	20.401	
2,900.00	2,898.24	2,856.31	2,825.45	10.32	11.10	-129.13	-358.82	-62.06	421.52	401.09	20.42	20.641	
3,000.00	2,998.17	2,954.35	2,921.99	10.68	11.51	-129.24	-375.79	-63.82	441.21	420.06	21.15	20.864	
3,100.00	3,098.09	3,052.39	3,018.54	11.04	11.93	-129.34	-392.76	-65.58	460.90	439.02	21.87	21.073	
3,200.00	3,198.02	3,150.43	3,115.08	11.40	12.35	-129.44	-409.73	-67.33	480.59	457.99	22.60	21.268	
3,300.00	3,297.94	3,248.47	3,211.62	11.76	12.76	-129.52	-426.71	-69.09	500.28	476.96	23.32	21.451	
3,400.00	3,397.86	3,346.51	3,308.16	12.12	13.18	-129.60	-443.68	-70.85	519.98	495.93	24.05	21.622	
3,500.00	3,497.79	3,444.55	3,404.71	12.48	13.59	-129.68	-460.65	-72.61	539.67	514.90	24.77	21.784	
3,600.00	3,597.71	3,542.59	3,501.25	12.85	14.01	-129.75	-477.62	-74.37	559.37	533.87	25.50	21.936	
3,700.00	3,697.64	3,640.63	3,597.79	13.21	14.43	-129.81	-494.59	-76.13	579.07	552.84	26.23	22.079	
3,800.00	3,797.56	3,738.66	3,694.33	13.57	14.85	-129.87	-511.56	-77.88	598.76	571.81	26.95	22.215	
3,900.00	3,897.49	3,836.70	3,790.88	13.93	15.26	-129.93	-528.54	-79.64	618.46	590.78	27.68	22.344	
4,000.00	3,997.41	3,934.74	3,887.42	14.29	15.68	-129.98	-545.51	-81.40	638.16	609.76	28.41	22.465	
4,100.00	4,097.34	4,032.78	3,983.96	14.65	16.10	-130.03	-562.48	-83.16	657.86	628.73	29.13	22.581	
4,200.00	4,197.26	4,130.82	4,080.50	15.01	16.52	-130.08	-579.45	-84.92	677.56	647.70	29.86	22.691	
4,300.00	4,297.18	4,228.86	4,177.05	15.37	16.93	-130.12	-596.42	-86.68	697.26	666.67	30.59	22.796	
4,400.00	4,397.11	4,326.90	4,273.59	15.74	17.35	-130.17	-613.40	-88.43	716.96	685.65	31.31	22.896	
4,500.00	4,497.03	4,424.94	4,370.13	16.10	17.77	-130.21	-630.37	-90.19	736.66	704.62	32.04	22.991	
4,600.00	4,596.96	4,522.98	4,466.68	16.46	18.19	-130.24	-647.34	-91.95	756.36	723.60	32.77	23.082	
4,700.00	4,696.88	4,621.01	4,563.22	16.82	18.61	-130.28	-664.31	-93.71	776.07	742.57	33.50	23.169	
4,800.00	4,796.81	4,719.05	4,659.76	17.18	19.02	-130.31	-681.28	-95.47	795.77	761.54	34.22	23.252	
4,900.00	4,896.73	4,817.09	4,756.30	17.54	19.44	-130.35	-698.26	-97.23	815.47	780.52	34.95	23.332	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - Rosa Unit 842H - OH - Prelim 7 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM+MS — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Rule Assigned: Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	4,996.66	4,915.13	4,852.85	17.90	19.86	-130.38	-715.23	-98.98	835.17	799.49	35.68	23.408	
5,100.00	5,096.58	5,013.17	4,949.39	18.26	20.28	-130.41	-732.20	-100.74	854.88	818.47	36.41	23.481	
5,200.00	5,196.50	5,111.21	5,045.93	18.63	20.70	-130.43	-749.17	-102.50	874.58	837.44	37.13	23.551	
5,300.00	5,296.43	5,209.25	5,142.47	18.99	21.12	-130.46	-766.14	-104.26	894.28	856.42	37.86	23.619	
5,400.00	5,396.35	5,307.29	5,239.02	19.35	21.53	-130.49	-783.11	-106.02	913.98	875.39	38.59	23.684	
5,500.00	5,496.28	5,405.33	5,335.56	19.71	21.95	-130.51	-800.09	-107.77	933.69	894.37	39.32	23.747	
5,600.00	5,596.20	5,503.36	5,432.10	20.07	22.37	-130.53	-817.06	-109.53	953.39	913.34	40.05	23.807	
5,700.00	5,696.13	5,601.40	5,528.65	20.43	22.79	-130.56	-834.03	-111.29	973.10	932.32	40.78	23.865	
5,800.00	5,796.05	5,699.44	5,625.19	20.79	23.21	-130.58	-851.00	-113.05	992.80	951.30	41.50	23.921	
5,900.00	5,895.98	5,797.48	5,721.73	21.16	23.63	-130.60	-867.97	-114.81	1,012.50	970.27	42.23	23.975	
6,000.00	5,995.90	5,895.52	5,818.27	21.52	24.05	-130.62	-884.95	-116.57	1,032.21	989.25	42.96	24.027	
6,100.00	6,095.82	5,993.56	5,914.82	21.88	24.46	-130.64	-901.92	-118.32	1,051.91	1,008.22	43.69	24.077	
6,200.00	6,195.75	6,091.60	6,011.36	22.24	24.88	-130.66	-918.89	-120.08	1,071.62	1,027.20	44.42	24.126	
6,300.00	6,295.67	6,189.64	6,107.90	22.60	25.30	-130.67	-935.86	-121.84	1,091.32	1,046.17	45.15	24.173	
6,400.00	6,395.60	6,287.68	6,204.44	22.96	25.72	-130.69	-952.83	-123.60	1,111.02	1,065.15	45.88	24.218	
6,500.00	6,495.52	6,385.71	6,300.99	23.32	26.14	-130.71	-969.80	-125.36	1,130.73	1,084.13	46.60	24.262	
6,600.00	6,595.45	6,483.75	6,397.53	23.68	26.56	-130.72	-986.78	-127.12	1,150.43	1,103.10	47.33	24.305	
6,641.25	6,636.67	6,524.20	6,437.36	23.83	26.73	-130.73	-993.78	-127.84	1,158.56	1,110.93	47.63	24.322	
6,650.00	6,645.41	6,532.78	6,445.80	23.87	26.77	-144.49	-995.26	-127.99	1,160.27	1,112.58	47.70	24.326	
6,700.00	6,695.38	6,581.84	6,494.11	24.03	26.98	94.11	-1,003.76	-128.87	1,169.55	1,121.50	48.05	24.340	
6,750.00	6,745.12	6,630.72	6,542.25	24.19	27.19	83.78	-1,012.22	-129.75	1,177.94	1,129.55	48.39	24.344	
6,800.00	6,794.33	6,679.13	6,589.92	24.34	27.39	80.83	-1,020.60	-130.62	1,185.46	1,136.74	48.72	24.334	
6,850.00	6,842.70	6,726.76	6,636.83	24.49	27.60	79.59	-1,028.84	-131.47	1,192.16	1,143.12	49.04	24.312	
6,900.00	6,889.94	6,767.79	6,677.23	24.63	27.77	79.00	-1,035.98	-132.00	1,198.16	1,148.86	49.30	24.302	
6,950.00	6,935.75	6,800.00	6,708.88	24.76	27.91	78.59	-1,041.83	-130.96	1,203.88	1,154.38	49.50	24.320	
7,000.00	6,979.84	6,837.96	6,746.00	24.89	28.07	78.47	-1,049.06	-127.68	1,209.38	1,159.63	49.74	24.312	
7,050.00	7,021.96	6,873.80	6,780.74	25.02	28.22	78.46	-1,056.18	-122.55	1,214.66	1,164.68	49.97	24.307	
7,100.00	7,061.84	6,910.22	6,815.63	25.16	28.37	78.56	-1,063.70	-115.32	1,219.73	1,169.51	50.21	24.292	
7,150.00	7,099.23	6,950.00	6,853.13	25.29	28.54	78.82	-1,072.20	-105.16	1,224.59	1,174.10	50.49	24.256	
7,200.00	7,133.90	6,985.20	6,885.67	25.42	28.68	79.05	-1,079.96	-94.20	1,229.25	1,178.51	50.74	24.227	
7,250.00	7,165.64	7,023.96	6,920.66	25.56	28.83	79.42	-1,088.71	-80.06	1,233.71	1,182.68	51.03	24.175	
7,300.00	7,194.26	7,063.71	6,955.54	25.71	28.98	79.86	-1,097.90	-63.34	1,237.98	1,186.63	51.35	24.108	
7,350.00	7,219.57	7,104.61	6,990.18	25.86	29.14	80.38	-1,107.54	-43.86	1,242.08	1,190.38	51.70	24.026	
7,400.00	7,241.42	7,146.82	7,024.47	26.03	29.29	80.96	-1,117.63	-21.44	1,245.99	1,193.92	52.07	23.930	
7,450.00	7,259.68	7,190.51	7,058.25	26.20	29.45	81.62	-1,128.19	4.17	1,249.72	1,197.26	52.46	23.822	
7,500.00	7,274.23	7,235.92	7,091.33	26.38	29.61	82.35	-1,139.23	33.23	1,253.27	1,200.39	52.88	23.699	
7,550.00	7,284.99	7,283.28	7,123.46	26.58	29.77	83.16	-1,150.76	66.05	1,256.63	1,203.31	53.32	23.566	
7,600.00	7,291.88	7,332.89	7,154.33	26.78	29.94	84.04	-1,162.79	102.96	1,259.79	1,206.01	53.78	23.425	
7,650.00	7,294.87	7,385.08	7,183.51	27.00	30.12	85.00	-1,175.31	144.36	1,262.73	1,208.48	54.25	23.277	
7,663.21	7,295.00	7,399.34	7,190.87	27.06	30.17	85.26	-1,178.70	156.09	1,263.46	1,209.09	54.37	23.237	
7,700.00	7,294.99	7,440.88	7,210.77	27.23	30.32	86.18	-1,188.45	191.22	1,265.50	1,210.77	54.73	23.123	
7,800.00	7,294.97	7,568.39	7,256.72	27.74	30.78	88.27	-1,216.98	306.45	1,270.47	1,214.68	55.79	22.772	
7,900.00	7,294.95	7,711.88	7,279.52	28.34	31.39	89.31	-1,245.47	444.92	1,272.99	1,215.97	57.02	22.325	
8,000.00	7,294.93	7,822.03	7,280.34	29.02	31.94	89.34	-1,264.72	553.35	1,273.07	1,214.75	58.32	21.828	
8,100.00	7,294.91	7,922.03	7,280.39	29.77	32.51	89.35	-1,282.09	651.83	1,273.07	1,213.33	59.74	21.310	
8,200.00	7,294.89	8,022.03	7,280.44	30.58	33.16	89.35	-1,299.45	750.31	1,273.07	1,211.78	61.29	20.771	
8,253.21	7,294.88	8,075.23	7,280.47	31.04	33.53	89.35	-1,308.69	802.71	1,273.07	1,210.90	62.17	20.478	
8,255.31	7,294.88	8,077.34	7,280.47	31.06	33.55	89.35	-1,309.06	804.78	1,273.07	1,210.87	62.20	20.466	
8,300.00	7,294.87	8,122.02	7,280.49	31.46	33.88	89.35	-1,316.82	848.79	1,273.45	1,210.48	62.97	20.224	
8,400.00	7,294.86	8,221.96	7,280.55	32.39	34.66	89.36	-1,334.17	947.21	1,276.83	1,212.07	64.76	19.716	
8,500.00	7,294.84	8,321.72	7,280.60	33.38	35.49	89.36	-1,351.50	1,045.45	1,283.69	1,217.03	66.66	19.257	
8,600.00	7,294.82	8,421.18	7,280.65	34.41	36.38	89.37	-1,368.77	1,143.40	1,294.03	1,225.38	68.65	18.850	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - Rosa Unit 842H - OH - Prelim 7 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM+MS — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Rule Assigned: Minimum Separation (usft)	Separation Factor	Warning
8,700.00	7,294.80	8,520.22	7,280.70	35.48	37.32	89.37	-1,385.96	1,240.93	1,307.84	1,237.12	70.72	18.494	
8,724.88	7,294.79	8,544.77	7,280.72	35.76	37.56	89.37	-1,390.23	1,265.12	1,311.81	1,240.56	71.24	18.413	
8,800.00	7,294.78	8,618.88	7,280.75	36.59	38.29	89.38	-1,403.10	1,338.10	1,324.12	1,251.26	72.85	18.175	
8,900.00	7,294.76	8,717.53	7,280.81	37.74	39.31	89.39	-1,420.23	1,435.25	1,340.51	1,265.44	75.06	17.858	
9,000.00	7,294.74	8,890.68	7,280.90	38.91	41.16	89.41	-1,446.02	1,606.44	1,354.61	1,276.83	77.78	17.416	
9,100.00	7,294.72	9,080.33	7,280.99	40.12	43.24	89.42	-1,462.39	1,795.35	1,362.27	1,281.73	80.53	16.915	
9,200.00	7,294.70	9,239.57	7,281.06	41.35	45.02	89.43	-1,466.67	1,954.51	1,363.69	1,280.56	83.13	16.405	
9,300.00	7,294.68	9,339.57	7,281.11	42.61	46.17	89.43	-1,467.66	2,054.51	1,363.68	1,278.06	85.62	15.926	
9,400.00	7,294.66	9,439.57	7,281.15	43.89	47.34	89.43	-1,468.65	2,154.50	1,363.68	1,275.52	88.17	15.467	
9,500.00	7,294.64	9,539.57	7,281.20	45.20	48.53	89.44	-1,469.64	2,254.50	1,363.68	1,272.93	90.75	15.027	
9,600.00	7,294.62	9,639.57	7,281.25	46.52	49.75	89.44	-1,470.63	2,354.50	1,363.68	1,270.31	93.37	14.605	
9,700.00	7,294.60	9,739.57	7,281.29	47.85	50.99	89.44	-1,471.62	2,454.49	1,363.68	1,267.65	96.03	14.200	
9,800.00	7,294.58	9,839.57	7,281.34	49.21	52.25	89.44	-1,472.61	2,554.49	1,363.68	1,264.96	98.72	13.813	
9,900.00	7,294.56	9,939.57	7,281.38	50.58	53.53	89.45	-1,473.59	2,654.48	1,363.68	1,262.24	101.44	13.443	
10,000.00	7,294.54	10,039.57	7,281.43	51.96	54.83	89.45	-1,474.58	2,754.48	1,363.68	1,259.49	104.19	13.088	
10,100.00	7,294.52	10,139.57	7,281.47	53.35	56.15	89.45	-1,475.57	2,854.47	1,363.68	1,256.71	106.97	12.748	
10,200.00	7,294.50	10,239.57	7,281.52	54.76	57.47	89.45	-1,476.56	2,954.47	1,363.68	1,253.91	109.77	12.423	
10,300.00	7,294.48	10,339.57	7,281.57	56.18	58.82	89.46	-1,477.55	3,054.46	1,363.68	1,251.09	112.59	12.112	
10,400.00	7,294.46	10,439.57	7,281.61	57.60	60.17	89.46	-1,478.54	3,154.46	1,363.68	1,248.25	115.43	11.814	
10,500.00	7,294.44	10,539.57	7,281.66	59.04	61.54	89.46	-1,479.53	3,254.45	1,363.68	1,245.39	118.29	11.529	
10,600.00	7,294.42	10,639.57	7,281.70	60.48	62.92	89.47	-1,480.52	3,354.45	1,363.67	1,242.51	121.16	11.255	
10,700.00	7,294.40	10,739.57	7,281.75	61.93	64.31	89.47	-1,481.50	3,454.44	1,363.67	1,239.62	124.06	10.992	
10,800.00	7,294.38	10,839.57	7,281.79	63.39	65.71	89.47	-1,482.49	3,554.44	1,363.67	1,236.71	126.96	10.741	
10,900.00	7,294.36	10,939.57	7,281.84	64.86	67.11	89.47	-1,483.48	3,654.43	1,363.67	1,233.79	129.89	10.499	
11,000.00	7,294.34	11,039.57	7,281.89	66.33	68.53	89.48	-1,484.47	3,754.43	1,363.67	1,230.85	132.82	10.267	
11,100.00	7,294.32	11,139.57	7,281.93	67.81	69.96	89.48	-1,485.46	3,854.42	1,363.67	1,227.90	135.77	10.044	
11,200.00	7,294.30	11,239.57	7,281.98	69.30	71.39	89.48	-1,486.45	3,954.42	1,363.67	1,224.94	138.73	9.830	
11,300.00	7,294.28	11,339.57	7,282.02	70.79	72.83	89.48	-1,487.44	4,054.41	1,363.67	1,221.97	141.70	9.624	
11,400.00	7,294.26	11,439.57	7,282.07	72.28	74.28	89.49	-1,488.43	4,154.41	1,363.67	1,218.99	144.68	9.425	
11,500.00	7,294.24	11,539.57	7,282.11	73.78	75.73	89.49	-1,489.41	4,254.40	1,363.67	1,216.00	147.67	9.235	
11,600.00	7,294.22	11,639.57	7,282.16	75.28	77.19	89.49	-1,490.40	4,354.40	1,363.67	1,213.00	150.67	9.051	
11,700.00	7,294.20	11,739.57	7,282.21	76.79	78.65	89.50	-1,491.39	4,454.39	1,363.67	1,209.99	153.68	8.874	
11,800.00	7,294.18	11,839.57	7,282.25	78.30	80.12	89.50	-1,492.38	4,554.39	1,363.67	1,206.97	156.69	8.703	
11,900.00	7,294.16	11,939.57	7,282.30	79.82	81.60	89.50	-1,493.37	4,654.38	1,363.67	1,203.95	159.72	8.538	
12,000.00	7,294.14	12,039.57	7,282.34	81.33	83.08	89.50	-1,494.36	4,754.38	1,363.66	1,200.92	162.75	8.379	
12,100.00	7,294.12	12,139.57	7,282.39	82.86	84.57	89.51	-1,495.35	4,854.37	1,363.66	1,197.88	165.78	8.226	
12,200.00	7,294.10	12,239.57	7,282.43	84.38	86.05	89.51	-1,496.34	4,954.37	1,363.66	1,194.84	168.83	8.077	
12,300.00	7,294.09	12,339.57	7,282.48	85.91	87.55	89.51	-1,497.32	5,054.36	1,363.66	1,191.79	171.88	7.934	
12,400.00	7,294.07	12,439.57	7,282.53	87.44	89.04	89.52	-1,498.31	5,154.36	1,363.66	1,188.73	174.93	7.795	
12,500.00	7,294.05	12,539.57	7,282.57	88.97	90.55	89.52	-1,499.30	5,254.35	1,363.66	1,185.67	177.99	7.661	
12,600.00	7,294.03	12,639.57	7,282.62	90.51	92.05	89.52	-1,500.29	5,354.35	1,363.66	1,182.60	181.06	7.532	
12,700.00	7,294.01	12,739.57	7,282.66	92.04	93.56	89.52	-1,501.28	5,454.34	1,363.66	1,179.53	184.13	7.406	
12,800.00	7,293.99	12,839.57	7,282.71	93.58	95.07	89.53	-1,502.27	5,554.34	1,363.66	1,176.46	187.20	7.284	
12,900.00	7,293.97	12,939.57	7,282.75	95.13	96.58	89.53	-1,503.26	5,654.33	1,363.66	1,173.38	190.28	7.167	
13,000.00	7,293.95	13,039.57	7,282.80	96.67	98.10	89.53	-1,504.24	5,754.33	1,363.66	1,170.29	193.36	7.052	
13,100.00	7,293.93	13,139.57	7,282.85	98.22	99.62	89.53	-1,505.23	5,854.32	1,363.66	1,167.21	196.45	6.941	
13,200.00	7,293.91	13,239.57	7,282.89	99.76	101.14	89.54	-1,506.22	5,954.32	1,363.66	1,164.11	199.54	6.834	
13,300.00	7,293.89	13,339.57	7,282.94	101.31	102.67	89.54	-1,507.21	6,054.31	1,363.66	1,161.02	202.64	6.730	
13,400.00	7,293.87	13,439.57	7,282.98	102.87	104.19	89.54	-1,508.20	6,154.31	1,363.66	1,157.92	205.74	6.628	
13,500.00	7,293.85	13,539.57	7,283.03	104.42	105.72	89.55	-1,509.19	6,254.30	1,363.65	1,154.82	208.84	6.530	
13,600.00	7,293.83	13,639.57	7,283.07	105.97	107.25	89.55	-1,510.18	6,354.30	1,363.65	1,151.71	211.94	6.434	
13,700.00	7,293.81	13,739.57	7,283.12	107.53	108.79	89.55	-1,511.17	6,454.29	1,363.65	1,148.60	215.05	6.341	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Offset Design: Rosa Unit 43 - Rosa Unit 842H - OH - Prelim 7 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM+MS — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Rule Assigned: Warning
13,800.00	7,293.79	13,839.57	7,283.17	109.09	110.32	89.55	-1,512.15	6,554.29	1,363.65	1,145.49	218.16	6.251	
13,900.00	7,293.77	13,939.57	7,283.21	110.65	111.86	89.56	-1,513.14	6,654.28	1,363.65	1,142.38	221.28	6.163	
14,000.00	7,293.75	14,039.57	7,283.26	112.21	113.40	89.56	-1,514.13	6,754.28	1,363.65	1,139.26	224.39	6.077	
14,100.00	7,293.73	14,139.57	7,283.30	113.77	114.94	89.56	-1,515.12	6,854.27	1,363.65	1,136.14	227.51	5.994	
14,200.00	7,293.71	14,239.57	7,283.35	115.33	116.48	89.56	-1,516.11	6,954.27	1,363.65	1,133.02	230.63	5.913	
14,300.00	7,293.69	14,339.57	7,283.39	116.89	118.03	89.57	-1,517.10	7,054.26	1,363.65	1,129.89	233.76	5.834	
14,400.00	7,293.67	14,439.57	7,283.44	118.46	119.58	89.57	-1,518.09	7,154.26	1,363.65	1,126.77	236.88	5.757	
14,500.00	7,293.65	14,539.57	7,283.49	120.02	121.12	89.57	-1,519.08	7,254.25	1,363.65	1,123.64	240.01	5.682	
14,600.00	7,293.63	14,639.57	7,283.53	121.59	122.67	89.58	-1,520.06	7,354.25	1,363.65	1,120.51	243.14	5.608	
14,700.00	7,293.61	14,739.57	7,283.58	123.16	124.22	89.58	-1,521.05	7,454.24	1,363.65	1,117.37	246.27	5.537	
14,800.00	7,293.59	14,839.57	7,283.62	124.73	125.77	89.58	-1,522.04	7,554.24	1,363.65	1,114.24	249.41	5.468	
14,900.00	7,293.57	14,939.57	7,283.67	126.30	127.33	89.58	-1,523.03	7,654.23	1,363.65	1,111.10	252.55	5.400	
15,000.00	7,293.55	15,039.57	7,283.71	127.87	128.88	89.59	-1,524.02	7,754.23	1,363.65	1,107.96	255.68	5.333	
15,100.00	7,293.53	15,139.57	7,283.76	129.44	130.44	89.59	-1,525.01	7,854.22	1,363.64	1,104.82	258.82	5.269	
15,200.00	7,293.51	15,239.57	7,283.81	131.01	132.00	89.59	-1,526.00	7,954.22	1,363.64	1,101.68	261.96	5.205	
15,300.00	7,293.49	15,339.57	7,283.85	132.58	133.55	89.59	-1,526.99	8,054.21	1,363.64	1,098.54	265.11	5.144	
15,400.00	7,293.47	15,439.57	7,283.90	134.16	135.11	89.60	-1,527.97	8,154.21	1,363.64	1,095.39	268.25	5.083	
15,500.00	7,293.45	15,539.57	7,283.94	135.73	136.67	89.60	-1,528.96	8,254.20	1,363.64	1,092.24	271.40	5.025	
15,600.00	7,293.43	15,639.57	7,283.99	137.31	138.23	89.60	-1,529.95	8,354.20	1,363.64	1,089.10	274.55	4.967	
15,700.00	7,293.41	15,739.57	7,284.03	138.88	139.80	89.61	-1,530.94	8,454.20	1,363.64	1,085.95	277.69	4.911	
15,800.00	7,293.39	15,839.57	7,284.08	140.46	141.36	89.61	-1,531.93	8,554.19	1,363.64	1,082.80	280.84	4.855	
15,900.00	7,293.37	15,939.57	7,284.13	142.03	142.92	89.61	-1,532.92	8,654.19	1,363.64	1,079.64	284.00	4.802	
16,000.00	7,293.35	16,039.57	7,284.17	143.61	144.49	89.61	-1,533.91	8,754.18	1,363.64	1,076.49	287.15	4.749	
16,100.00	7,293.34	16,139.57	7,284.22	145.19	146.05	89.62	-1,534.90	8,854.18	1,363.64	1,073.34	290.30	4.697	
16,200.00	7,293.32	16,239.57	7,284.26	146.77	147.62	89.62	-1,535.88	8,954.17	1,363.64	1,070.18	293.46	4.647	
16,300.00	7,293.30	16,339.57	7,284.31	148.35	149.19	89.62	-1,536.87	9,054.17	1,363.64	1,067.02	296.62	4.597	
16,400.00	7,293.28	16,439.57	7,284.35	149.93	150.76	89.63	-1,537.86	9,154.16	1,363.64	1,063.86	299.77	4.549	
16,500.00	7,293.26	16,539.57	7,284.40	151.51	152.32	89.63	-1,538.85	9,254.16	1,363.64	1,060.71	302.93	4.501	
16,600.00	7,293.24	16,639.57	7,284.45	153.09	153.89	89.63	-1,539.84	9,354.15	1,363.64	1,057.55	306.09	4.455	
16,700.00	7,293.22	16,739.57	7,284.49	154.67	155.46	89.63	-1,540.83	9,454.15	1,363.64	1,054.38	309.25	4.409	
16,800.00	7,293.20	16,839.57	7,284.54	156.25	157.04	89.64	-1,541.82	9,554.14	1,363.63	1,051.22	312.41	4.365	
16,900.00	7,293.18	16,939.57	7,284.58	157.83	158.61	89.64	-1,542.80	9,654.14	1,363.63	1,048.06	315.58	4.321	
17,000.00	7,293.16	17,039.57	7,284.63	159.42	160.18	89.64	-1,543.79	9,754.13	1,363.63	1,044.89	318.74	4.278	
17,100.00	7,293.14	17,139.57	7,284.67	161.00	161.75	89.64	-1,544.78	9,854.13	1,363.63	1,041.73	321.90	4.236	
17,200.00	7,293.12	17,239.57	7,284.72	162.58	163.33	89.65	-1,545.77	9,954.12	1,363.63	1,038.56	325.07	4.195	
17,300.00	7,293.10	17,339.57	7,284.77	164.17	164.90	89.65	-1,546.76	10,054.12	1,363.63	1,035.40	328.24	4.154	
17,400.00	7,293.08	17,439.57	7,284.81	165.75	166.48	89.65	-1,547.75	10,154.11	1,363.63	1,032.23	331.40	4.115	
17,500.00	7,293.06	17,539.57	7,284.86	167.34	168.05	89.66	-1,548.74	10,254.11	1,363.63	1,029.06	334.57	4.076	
17,600.00	7,293.04	17,639.57	7,284.90	168.92	169.63	89.66	-1,549.73	10,354.10	1,363.63	1,025.89	337.74	4.038	
17,667.15	7,293.03	17,706.72	7,284.93	169.99	170.69	89.66	-1,550.39	10,421.25	1,363.63	1,023.76	339.87	4.012	
17,700.00	7,293.02	17,739.57	7,284.95	170.51	171.20	89.66	-1,550.71	10,454.10	1,363.63	1,022.72	340.91	4.000	
17,802.15	7,293.00	17,841.72	7,284.99	172.13	172.81	89.66	-1,551.72	10,556.25	1,363.63	1,019.48	344.15	3.962	SF

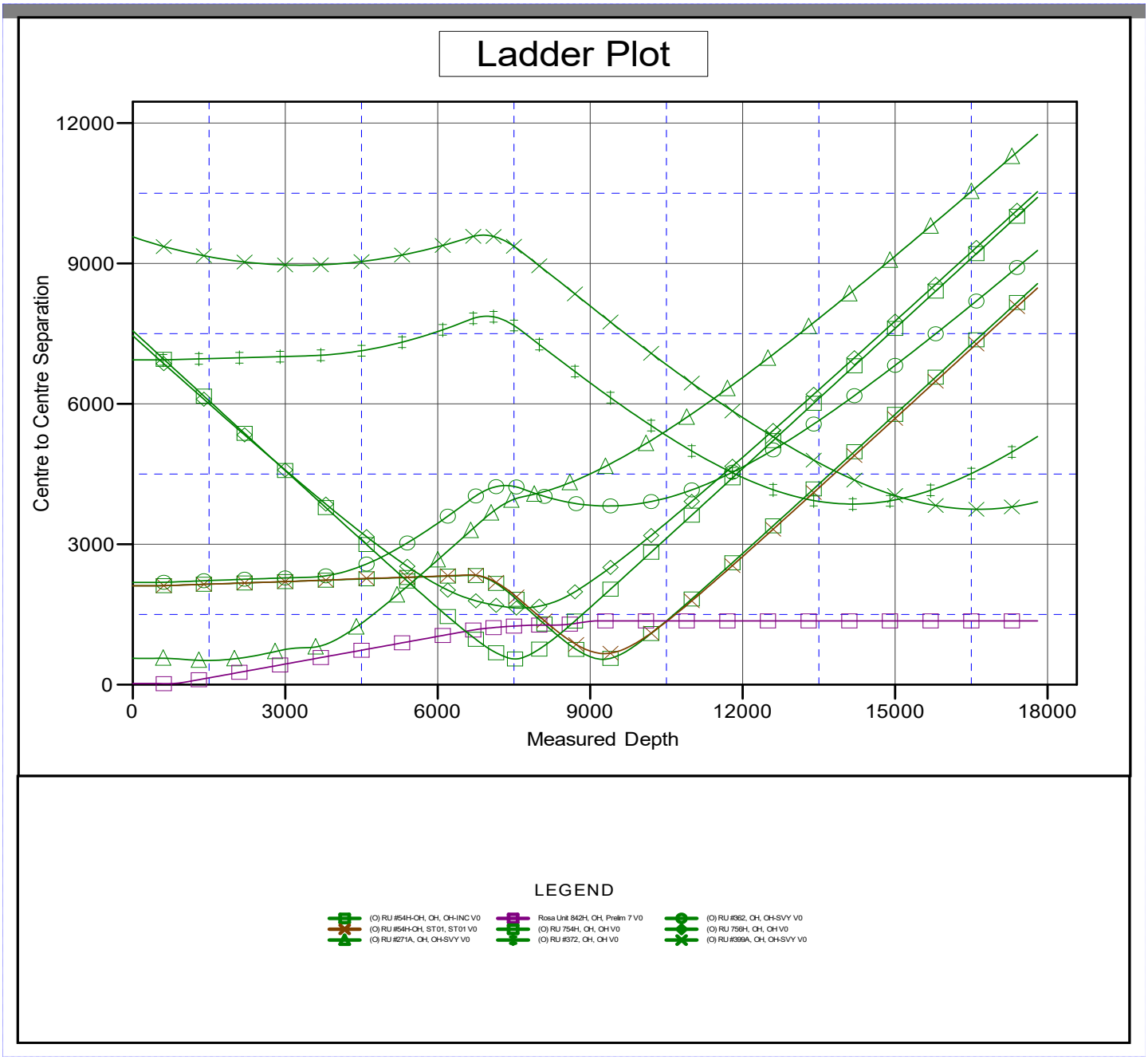
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to 6718+30 @ 6748.00usft (H&P 530)	Coordinates are relative to: Rosa Unit 840H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, New Mexico Western Zone
Central Meridian is -107.833334	Grid Convergence at Surface is: 0.31°



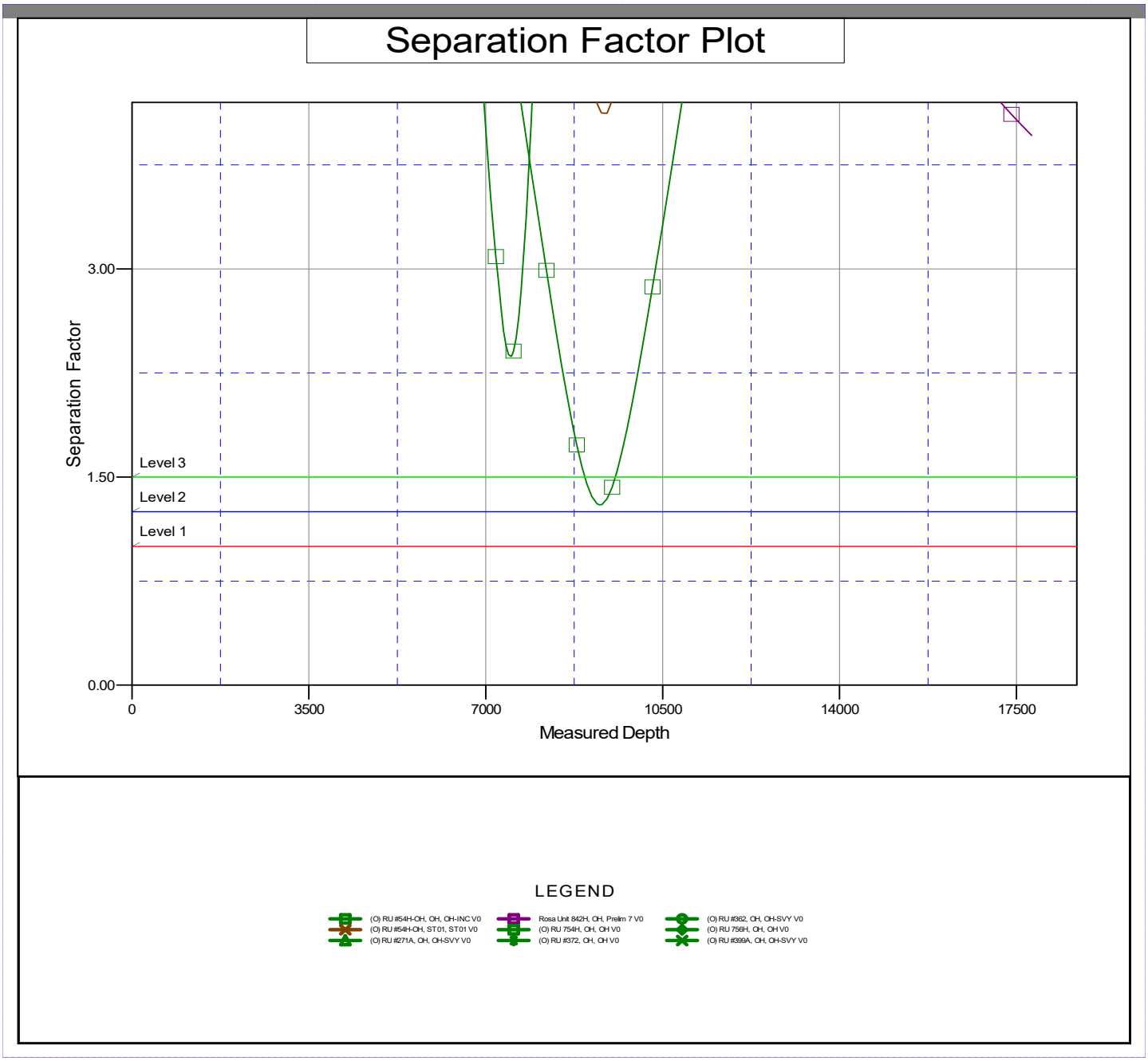
SDT

Anticollision Report

Company:	Logos Operating LLC	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Project:	Rio Arriba, NM (NAD83)	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Reference Site:	Rosa Unit 43	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	EDM 5000 Multi User Db
Reference Design:	Prelim 3	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to 6718+30 @ 6748.00usft (H&P 530)
Offset Depths are relative to Offset Datum
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit 840H
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.31°



Logos Operating LLC

Rio Arriba, NM (NAD83)
Rosa Unit 43
Rosa Unit 840H

OH

Plan: Prelim 3

Standard Planning Report

06 March, 2025

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

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 43

Site Position:		**Northing:**	2,130,954.39 usft	**Latitude:**	36.855038
From:	Lat/Long	**Easting:**	2,872,057.63 usft	**Longitude:**	-107.324157
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "		

Well Rosa Unit 840H

Well Position	**+N/-S**	0.00 usft	**Northing:**	2,130,948.69 usft	**Latitude:**	36.855022
	+E/-W	0.00 usft	**Easting:**	2,872,081.95 usft	**Longitude:**	-107.324074
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	6,718.00 usft
Grid Convergence:		0.31 °				

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/10/2024	8.34	63.41	49,367.12892696

Design Prelim 3

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	90.57

Plan Survey Tool Program **Date** 3/6/2025

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	17,802.15	Prelim 3 (OH)	MWD+HRGM+MS	
				MWD + HRGM + Multi-Station	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
611.38	2.23	308.12	611.35	1.34	-1.70	2.00	2.00	0.00	308.12	
6,641.25	2.23	308.12	6,636.67	146.03	-186.08	0.00	0.00	0.00	0.00	
7,663.21	90.01	100.00	7,295.00	47.41	442.72	9.00	8.59	14.86	151.86	RU 840H POE
8,253.21	90.01	100.00	7,294.88	-55.04	1,023.75	0.00	0.00	0.00	0.00	
8,724.88	90.01	90.57	7,294.79	-98.42	1,492.89	2.00	0.00	-2.00	-90.00	
17,667.15	90.01	90.57	7,293.03	-186.85	10,434.73	0.00	0.00	0.00	0.00	RU 840H FPP
17,802.15	90.01	90.57	7,293.00	-188.18	10,569.72	0.00	0.00	0.00	0.00	RU 840H PBHL

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	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
Start Build 2.00									
600.00	2.00	308.12	599.98	1.08	-1.37	-1.38	2.00	2.00	0.00
611.38	2.23	308.12	611.35	1.34	-1.70	-1.72	2.00	2.00	0.00
Start 6029.87 hold at 611.38 MD									
700.00	2.23	308.12	699.90	3.46	-4.41	-4.45	0.00	0.00	0.00
800.00	2.23	308.12	799.83	5.86	-7.47	-7.53	0.00	0.00	0.00
900.00	2.23	308.12	899.75	8.26	-10.53	-10.61	0.00	0.00	0.00
1,000.00	2.23	308.12	999.68	10.66	-13.59	-13.69	0.00	0.00	0.00
1,100.00	2.23	308.12	1,099.60	13.06	-16.64	-16.77	0.00	0.00	0.00
1,200.00	2.23	308.12	1,199.53	15.46	-19.70	-19.85	0.00	0.00	0.00
1,300.00	2.23	308.12	1,299.45	17.86	-22.76	-22.94	0.00	0.00	0.00
1,400.00	2.23	308.12	1,399.38	20.26	-25.82	-26.02	0.00	0.00	0.00
1,500.00	2.23	308.12	1,499.30	22.66	-28.88	-29.10	0.00	0.00	0.00
1,600.00	2.23	308.12	1,599.22	25.06	-31.93	-32.18	0.00	0.00	0.00
1,700.00	2.23	308.12	1,699.15	27.46	-34.99	-35.26	0.00	0.00	0.00
1,800.00	2.23	308.12	1,799.07	29.86	-38.05	-38.34	0.00	0.00	0.00
1,900.00	2.23	308.12	1,899.00	32.26	-41.11	-41.42	0.00	0.00	0.00
2,000.00	2.23	308.12	1,998.92	34.66	-44.16	-44.51	0.00	0.00	0.00
2,100.00	2.23	308.12	2,098.85	37.06	-47.22	-47.59	0.00	0.00	0.00
2,200.00	2.23	308.12	2,198.77	39.46	-50.28	-50.67	0.00	0.00	0.00
2,300.00	2.23	308.12	2,298.70	41.86	-53.34	-53.75	0.00	0.00	0.00
2,400.00	2.23	308.12	2,398.62	44.26	-56.39	-56.83	0.00	0.00	0.00
2,500.00	2.23	308.12	2,498.54	46.65	-59.45	-59.91	0.00	0.00	0.00
2,600.00	2.23	308.12	2,598.47	49.05	-62.51	-63.00	0.00	0.00	0.00
2,700.00	2.23	308.12	2,698.39	51.45	-65.57	-66.08	0.00	0.00	0.00
2,800.00	2.23	308.12	2,798.32	53.85	-68.63	-69.16	0.00	0.00	0.00
2,873.74	2.23	308.12	2,872.00	55.62	-70.88	-71.43	0.00	0.00	0.00
Ojo Alamo									
2,900.00	2.23	308.12	2,898.24	56.25	-71.68	-72.24	0.00	0.00	0.00
3,000.00	2.23	308.12	2,998.17	58.65	-74.74	-75.32	0.00	0.00	0.00
3,100.00	2.23	308.12	3,098.09	61.05	-77.80	-78.40	0.00	0.00	0.00
3,115.92	2.23	308.12	3,114.00	61.43	-78.29	-78.89	0.00	0.00	0.00
Kirtland									
3,200.00	2.23	308.12	3,198.02	63.45	-80.86	-81.48	0.00	0.00	0.00
3,300.00	2.23	308.12	3,297.94	65.85	-83.91	-84.57	0.00	0.00	0.00
3,366.11	2.23	308.12	3,364.00	67.44	-85.94	-86.60	0.00	0.00	0.00
Fruitland									
3,400.00	2.23	308.12	3,397.86	68.25	-86.97	-87.65	0.00	0.00	0.00
3,437.16	2.23	308.12	3,435.00	69.14	-88.11	-88.79	0.00	0.00	0.00
T/Coals									
3,500.00	2.23	308.12	3,497.79	70.65	-90.03	-90.73	0.00	0.00	0.00
3,562.26	2.23	308.12	3,560.00	72.14	-91.93	-92.65	0.00	0.00	0.00
B/Coals									
3,600.00	2.23	308.12	3,597.71	73.05	-93.09	-93.81	0.00	0.00	0.00
3,700.00	2.23	308.12	3,697.64	75.45	-96.15	-96.89	0.00	0.00	0.00
3,750.40	2.23	308.12	3,748.00	76.66	-97.69	-98.44	0.00	0.00	0.00
Pictured Cliffs									

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
3,800.00	2.23	308.12	3,797.56	77.85	-99.20	-99.97	0.00	0.00	0.00
3,880.50	2.23	308.12	3,878.00	79.78	-101.67	-102.45	0.00	0.00	0.00
Lewis									
3,900.00	2.23	308.12	3,897.49	80.25	-102.26	-103.05	0.00	0.00	0.00
4,000.00	2.23	308.12	3,997.41	82.65	-105.32	-106.14	0.00	0.00	0.00
4,100.00	2.23	308.12	4,097.34	85.05	-108.38	-109.22	0.00	0.00	0.00
4,200.00	2.23	308.12	4,197.26	87.45	-111.43	-112.30	0.00	0.00	0.00
4,300.00	2.23	308.12	4,297.18	89.85	-114.49	-115.38	0.00	0.00	0.00
4,400.00	2.23	308.12	4,397.11	92.25	-117.55	-118.46	0.00	0.00	0.00
4,500.00	2.23	308.12	4,497.03	94.65	-120.61	-121.54	0.00	0.00	0.00
4,600.00	2.23	308.12	4,596.96	97.04	-123.67	-124.63	0.00	0.00	0.00
4,700.00	2.23	308.12	4,696.88	99.44	-126.72	-127.71	0.00	0.00	0.00
4,800.00	2.23	308.12	4,796.81	101.84	-129.78	-130.79	0.00	0.00	0.00
4,900.00	2.23	308.12	4,896.73	104.24	-132.84	-133.87	0.00	0.00	0.00
4,941.30	2.23	308.12	4,938.00	105.23	-134.10	-135.14	0.00	0.00	0.00
Chacra									
5,000.00	2.23	308.12	4,996.66	106.64	-135.90	-136.95	0.00	0.00	0.00
5,100.00	2.23	308.12	5,096.58	109.04	-138.95	-140.03	0.00	0.00	0.00
5,200.00	2.23	308.12	5,196.50	111.44	-142.01	-143.11	0.00	0.00	0.00
5,300.00	2.23	308.12	5,296.43	113.84	-145.07	-146.20	0.00	0.00	0.00
5,400.00	2.23	308.12	5,396.35	116.24	-148.13	-149.28	0.00	0.00	0.00
5,460.69	2.23	308.12	5,457.00	117.70	-149.98	-151.15	0.00	0.00	0.00
U/Cliff House									
5,500.00	2.23	308.12	5,496.28	118.64	-151.19	-152.36	0.00	0.00	0.00
5,600.00	2.23	308.12	5,596.20	121.04	-154.24	-155.44	0.00	0.00	0.00
5,700.00	2.23	308.12	5,696.13	123.44	-157.30	-158.52	0.00	0.00	0.00
5,768.93	2.23	308.12	5,765.00	125.09	-159.41	-160.65	0.00	0.00	0.00
Cliff House									
5,800.00	2.23	308.12	5,796.05	125.84	-160.36	-161.60	0.00	0.00	0.00
5,802.95	2.23	308.12	5,799.00	125.91	-160.45	-161.69	0.00	0.00	0.00
Menefee									
5,900.00	2.23	308.12	5,895.98	128.24	-163.42	-164.68	0.00	0.00	0.00
6,000.00	2.23	308.12	5,995.90	130.64	-166.47	-167.77	0.00	0.00	0.00
6,016.11	2.23	308.12	6,012.00	131.02	-166.97	-168.26	0.00	0.00	0.00
Point Lookout									
6,100.00	2.23	308.12	6,095.82	133.04	-169.53	-170.85	0.00	0.00	0.00
6,200.00	2.23	308.12	6,195.75	135.44	-172.59	-173.93	0.00	0.00	0.00
6,300.00	2.23	308.12	6,295.67	137.84	-175.65	-177.01	0.00	0.00	0.00
6,400.00	2.23	308.12	6,395.60	140.24	-178.71	-180.09	0.00	0.00	0.00
6,500.00	2.23	308.12	6,495.52	142.64	-181.76	-183.17	0.00	0.00	0.00
6,516.49	2.23	308.12	6,512.00	143.03	-182.27	-183.68	0.00	0.00	0.00
Mancos									
6,600.00	2.23	308.12	6,595.45	145.04	-184.82	-186.25	0.00	0.00	0.00
6,641.25	2.23	308.12	6,636.67	146.03	-186.08	-187.53	0.00	0.00	0.00
Start DLS 9.00 TFO 151.86									
6,650.00	1.58	321.74	6,645.41	146.22	-186.29	-187.74	9.00	-7.43	155.63
6,700.00	3.48	82.48	6,695.38	146.96	-185.21	-186.66	9.00	3.81	241.48
6,750.00	7.89	92.40	6,745.12	147.02	-180.27	-181.72	9.00	8.82	19.85
6,800.00	12.37	95.20	6,794.33	146.39	-171.50	-172.95	9.00	8.95	5.61
6,850.00	16.85	96.53	6,842.70	145.08	-158.96	-160.40	9.00	8.98	2.65
6,900.00	21.35	97.31	6,889.94	143.10	-142.73	-144.14	9.00	8.99	1.56
6,950.00	25.84	97.83	6,935.75	140.45	-122.90	-124.29	9.00	8.99	1.04
7,000.00	30.34	98.20	6,979.84	137.16	-99.59	-100.95	9.00	8.99	0.75

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,050.00	34.84	98.49	7,021.96	133.25	-72.95	-74.27	9.00	8.99	0.57
7,100.00	39.33	98.72	7,061.84	128.74	-43.15	-44.43	9.00	9.00	0.46
7,150.00	43.83	98.91	7,099.23	123.65	-10.36	-11.59	9.00	9.00	0.38
7,200.00	48.33	99.06	7,133.90	118.03	25.20	24.03	9.00	9.00	0.32
7,204.68	48.75	99.08	7,137.00	117.48	28.67	27.50	9.00	9.00	0.29
Black Top									
7,250.00	52.83	99.20	7,165.64	111.90	63.33	62.21	9.00	9.00	0.28
7,300.00	57.33	99.33	7,194.26	105.30	103.78	102.73	9.00	9.00	0.25
7,350.00	61.83	99.44	7,219.57	98.27	146.31	145.32	9.00	9.00	0.22
7,400.00	66.33	99.54	7,241.42	90.86	190.65	189.74	9.00	9.00	0.20
7,450.00	70.83	99.63	7,259.68	83.11	236.53	235.70	9.00	9.00	0.19
7,500.00	75.33	99.72	7,274.23	75.07	283.68	282.91	9.00	9.00	0.18
7,550.00	79.82	99.81	7,284.99	66.78	331.78	331.10	9.00	9.00	0.17
7,600.00	84.32	99.90	7,291.88	58.31	380.56	379.96	9.00	9.00	0.17
7,650.00	88.82	99.98	7,294.87	49.70	429.71	429.20	9.00	9.00	0.17
7,663.21	90.01	100.00	7,295.00	47.41	442.72	442.22	9.00	9.00	0.17
Start 590.00 hold at 7663.21 MD									
7,700.00	90.01	100.00	7,294.99	41.02	478.95	478.52	0.00	0.00	0.00
7,800.00	90.01	100.00	7,294.97	23.66	577.43	577.17	0.00	0.00	0.00
7,900.00	90.01	100.00	7,294.95	6.29	675.91	675.82	0.00	0.00	0.00
8,000.00	90.01	100.00	7,294.93	-11.07	774.39	774.47	0.00	0.00	0.00
8,100.00	90.01	100.00	7,294.91	-28.44	872.88	873.12	0.00	0.00	0.00
8,200.00	90.01	100.00	7,294.89	-45.80	971.36	971.76	0.00	0.00	0.00
8,253.21	90.01	100.00	7,294.88	-55.04	1,023.75	1,024.25	0.00	0.00	0.00
Start DLS 2.00 TFO -90.00									
8,300.00	90.01	99.06	7,294.87	-62.79	1,069.90	1,070.47	2.00	0.00	-2.00
8,400.00	90.01	97.06	7,294.86	-76.82	1,168.91	1,169.61	2.00	0.00	-2.00
8,500.00	90.01	95.06	7,294.84	-87.38	1,268.34	1,269.15	2.00	0.00	-2.00
8,600.00	90.01	93.06	7,294.82	-94.47	1,368.09	1,368.96	2.00	0.00	-2.00
8,700.00	90.01	91.06	7,294.80	-98.07	1,468.02	1,468.92	2.00	0.00	-2.00
8,724.88	90.01	90.57	7,294.79	-98.42	1,492.89	1,493.80	2.00	0.00	-2.00
Start 8942.28 hold at 8724.88 MD									
8,800.00	90.01	90.57	7,294.78	-99.17	1,568.01	1,568.92	0.00	0.00	0.00
8,900.00	90.01	90.57	7,294.76	-100.16	1,668.01	1,668.92	0.00	0.00	0.00
9,000.00	90.01	90.57	7,294.74	-101.15	1,768.00	1,768.92	0.00	0.00	0.00
9,100.00	90.01	90.57	7,294.72	-102.13	1,868.00	1,868.92	0.00	0.00	0.00
9,200.00	90.01	90.57	7,294.70	-103.12	1,967.99	1,968.92	0.00	0.00	0.00
9,300.00	90.01	90.57	7,294.68	-104.11	2,067.99	2,068.92	0.00	0.00	0.00
9,400.00	90.01	90.57	7,294.66	-105.10	2,167.98	2,168.92	0.00	0.00	0.00
9,500.00	90.01	90.57	7,294.64	-106.09	2,267.98	2,268.92	0.00	0.00	0.00
9,600.00	90.01	90.57	7,294.62	-107.08	2,367.97	2,368.92	0.00	0.00	0.00
9,700.00	90.01	90.57	7,294.60	-108.07	2,467.97	2,468.92	0.00	0.00	0.00
9,800.00	90.01	90.57	7,294.58	-109.06	2,567.96	2,568.92	0.00	0.00	0.00
9,900.00	90.01	90.57	7,294.56	-110.05	2,667.96	2,668.92	0.00	0.00	0.00
10,000.00	90.01	90.57	7,294.54	-111.03	2,767.95	2,768.92	0.00	0.00	0.00
10,100.00	90.01	90.57	7,294.52	-112.02	2,867.95	2,868.92	0.00	0.00	0.00
10,200.00	90.01	90.57	7,294.50	-113.01	2,967.94	2,968.92	0.00	0.00	0.00
10,300.00	90.01	90.57	7,294.48	-114.00	3,067.94	3,068.92	0.00	0.00	0.00
10,400.00	90.01	90.57	7,294.46	-114.99	3,167.93	3,168.92	0.00	0.00	0.00
10,500.00	90.01	90.57	7,294.44	-115.98	3,267.93	3,268.92	0.00	0.00	0.00
10,600.00	90.01	90.57	7,294.42	-116.97	3,367.92	3,368.92	0.00	0.00	0.00
10,700.00	90.01	90.57	7,294.40	-117.96	3,467.92	3,468.92	0.00	0.00	0.00
10,800.00	90.01	90.57	7,294.38	-118.94	3,567.91	3,568.92	0.00	0.00	0.00
10,900.00	90.01	90.57	7,294.36	-119.93	3,667.91	3,668.92	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,000.00	90.01	90.57	7,294.34	-120.92	3,767.90	3,768.92	0.00	0.00	0.00
11,100.00	90.01	90.57	7,294.32	-121.91	3,867.90	3,868.92	0.00	0.00	0.00
11,200.00	90.01	90.57	7,294.30	-122.90	3,967.89	3,968.92	0.00	0.00	0.00
11,300.00	90.01	90.57	7,294.28	-123.89	4,067.89	4,068.92	0.00	0.00	0.00
11,400.00	90.01	90.57	7,294.26	-124.88	4,167.88	4,168.92	0.00	0.00	0.00
11,500.00	90.01	90.57	7,294.24	-125.87	4,267.88	4,268.92	0.00	0.00	0.00
11,600.00	90.01	90.57	7,294.22	-126.86	4,367.87	4,368.92	0.00	0.00	0.00
11,700.00	90.01	90.57	7,294.20	-127.84	4,467.87	4,468.92	0.00	0.00	0.00
11,800.00	90.01	90.57	7,294.18	-128.83	4,567.86	4,568.92	0.00	0.00	0.00
11,900.00	90.01	90.57	7,294.16	-129.82	4,667.86	4,668.92	0.00	0.00	0.00
12,000.00	90.01	90.57	7,294.14	-130.81	4,767.85	4,768.92	0.00	0.00	0.00
12,100.00	90.01	90.57	7,294.12	-131.80	4,867.85	4,868.92	0.00	0.00	0.00
12,200.00	90.01	90.57	7,294.10	-132.79	4,967.84	4,968.92	0.00	0.00	0.00
12,300.00	90.01	90.57	7,294.09	-133.78	5,067.84	5,068.92	0.00	0.00	0.00
12,400.00	90.01	90.57	7,294.07	-134.77	5,167.83	5,168.92	0.00	0.00	0.00
12,500.00	90.01	90.57	7,294.05	-135.75	5,267.83	5,268.92	0.00	0.00	0.00
12,600.00	90.01	90.57	7,294.03	-136.74	5,367.82	5,368.92	0.00	0.00	0.00
12,700.00	90.01	90.57	7,294.01	-137.73	5,467.82	5,468.92	0.00	0.00	0.00
12,800.00	90.01	90.57	7,293.99	-138.72	5,567.81	5,568.92	0.00	0.00	0.00
12,900.00	90.01	90.57	7,293.97	-139.71	5,667.81	5,668.92	0.00	0.00	0.00
13,000.00	90.01	90.57	7,293.95	-140.70	5,767.81	5,768.92	0.00	0.00	0.00
13,100.00	90.01	90.57	7,293.93	-141.69	5,867.80	5,868.92	0.00	0.00	0.00
13,200.00	90.01	90.57	7,293.91	-142.68	5,967.80	5,968.92	0.00	0.00	0.00
13,300.00	90.01	90.57	7,293.89	-143.67	6,067.79	6,068.92	0.00	0.00	0.00
13,400.00	90.01	90.57	7,293.87	-144.65	6,167.79	6,168.92	0.00	0.00	0.00
13,500.00	90.01	90.57	7,293.85	-145.64	6,267.78	6,268.92	0.00	0.00	0.00
13,600.00	90.01	90.57	7,293.83	-146.63	6,367.78	6,368.92	0.00	0.00	0.00
13,700.00	90.01	90.57	7,293.81	-147.62	6,467.77	6,468.92	0.00	0.00	0.00
13,800.00	90.01	90.57	7,293.79	-148.61	6,567.77	6,568.92	0.00	0.00	0.00
13,900.00	90.01	90.57	7,293.77	-149.60	6,667.76	6,668.92	0.00	0.00	0.00
14,000.00	90.01	90.57	7,293.75	-150.59	6,767.76	6,768.92	0.00	0.00	0.00
14,100.00	90.01	90.57	7,293.73	-151.58	6,867.75	6,868.92	0.00	0.00	0.00
14,200.00	90.01	90.57	7,293.71	-152.57	6,967.75	6,968.92	0.00	0.00	0.00
14,300.00	90.01	90.57	7,293.69	-153.55	7,067.74	7,068.92	0.00	0.00	0.00
14,400.00	90.01	90.57	7,293.67	-154.54	7,167.74	7,168.92	0.00	0.00	0.00
14,500.00	90.01	90.57	7,293.65	-155.53	7,267.73	7,268.92	0.00	0.00	0.00
14,600.00	90.01	90.57	7,293.63	-156.52	7,367.73	7,368.92	0.00	0.00	0.00
14,700.00	90.01	90.57	7,293.61	-157.51	7,467.72	7,468.92	0.00	0.00	0.00
14,800.00	90.01	90.57	7,293.59	-158.50	7,567.72	7,568.92	0.00	0.00	0.00
14,900.00	90.01	90.57	7,293.57	-159.49	7,667.71	7,668.92	0.00	0.00	0.00
15,000.00	90.01	90.57	7,293.55	-160.48	7,767.71	7,768.92	0.00	0.00	0.00
15,100.00	90.01	90.57	7,293.53	-161.46	7,867.70	7,868.92	0.00	0.00	0.00
15,200.00	90.01	90.57	7,293.51	-162.45	7,967.70	7,968.92	0.00	0.00	0.00
15,300.00	90.01	90.57	7,293.49	-163.44	8,067.69	8,068.92	0.00	0.00	0.00
15,400.00	90.01	90.57	7,293.47	-164.43	8,167.69	8,168.92	0.00	0.00	0.00
15,500.00	90.01	90.57	7,293.45	-165.42	8,267.68	8,268.92	0.00	0.00	0.00
15,600.00	90.01	90.57	7,293.43	-166.41	8,367.68	8,368.92	0.00	0.00	0.00
15,700.00	90.01	90.57	7,293.41	-167.40	8,467.67	8,468.92	0.00	0.00	0.00
15,800.00	90.01	90.57	7,293.39	-168.39	8,567.67	8,568.92	0.00	0.00	0.00
15,900.00	90.01	90.57	7,293.37	-169.38	8,667.66	8,668.92	0.00	0.00	0.00
16,000.00	90.01	90.57	7,293.35	-170.36	8,767.66	8,768.92	0.00	0.00	0.00
16,100.00	90.01	90.57	7,293.34	-171.35	8,867.65	8,868.92	0.00	0.00	0.00
16,200.00	90.01	90.57	7,293.32	-172.34	8,967.65	8,968.92	0.00	0.00	0.00
16,300.00	90.01	90.57	7,293.30	-173.33	9,067.64	9,068.92	0.00	0.00	0.00

SDT
Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,400.00	90.01	90.57	7,293.28	-174.32	9,167.64	9,168.92	0.00	0.00	0.00
16,500.00	90.01	90.57	7,293.26	-175.31	9,267.63	9,268.92	0.00	0.00	0.00
16,600.00	90.01	90.57	7,293.24	-176.30	9,367.63	9,368.92	0.00	0.00	0.00
16,700.00	90.01	90.57	7,293.22	-177.29	9,467.62	9,468.92	0.00	0.00	0.00
16,800.00	90.01	90.57	7,293.20	-178.28	9,567.62	9,568.92	0.00	0.00	0.00
16,900.00	90.01	90.57	7,293.18	-179.26	9,667.61	9,668.92	0.00	0.00	0.00
17,000.00	90.01	90.57	7,293.16	-180.25	9,767.61	9,768.92	0.00	0.00	0.00
17,100.00	90.01	90.57	7,293.14	-181.24	9,867.60	9,868.92	0.00	0.00	0.00
17,200.00	90.01	90.57	7,293.12	-182.23	9,967.60	9,968.92	0.00	0.00	0.00
17,300.00	90.01	90.57	7,293.10	-183.22	10,067.59	10,068.92	0.00	0.00	0.00
17,400.00	90.01	90.57	7,293.08	-184.21	10,167.59	10,168.92	0.00	0.00	0.00
17,500.00	90.01	90.57	7,293.06	-185.20	10,267.59	10,268.92	0.00	0.00	0.00
17,600.00	90.01	90.57	7,293.04	-186.19	10,367.58	10,368.92	0.00	0.00	0.00
17,667.15	90.01	90.57	7,293.03	-186.85	10,434.73	10,436.07	0.00	0.00	0.00
Start 135.00 hold at 17667.15 MD									
17,700.00	90.01	90.57	7,293.02	-187.17	10,467.58	10,468.92	0.00	0.00	0.00
17,802.15	90.01	90.57	7,293.00	-188.18	10,569.72	10,571.07	0.00	0.00	0.00
TD at 17802.15									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
RU 840H SHL - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	2,130,948.69	2,872,081.95	36.855022	-107.324074
RU 840H KOP - plan hits target center - Point	0.00	0.00	6,636.67	146.03	-186.08	2,131,093.73	2,871,895.09	36.855423	-107.324710
RU 840H PBHL - plan hits target center - Point	0.00	0.00	7,293.00	-188.18	10,569.72	2,130,816.86	2,882,652.52	36.854500	-107.287947
RU 840H FPP - plan hits target center - Point	0.00	0.00	7,293.03	-186.85	10,434.73	2,130,817.48	2,882,517.52	36.854504	-107.288409
RU 840H POE - plan hits target center - Point	0.00	0.00	7,295.00	47.41	442.72	2,130,998.46	2,872,524.40	36.855152	-107.322561

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 840H
Company:	Logos Operating LLC	**TVD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	**MD Reference:**	6718+30 @ 6748.00usft (H&P 530)
Site:	Rosa Unit 43	**North Reference:**	True
Well:	Rosa Unit 840H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Prelim 3		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,873.74	2,872.00	Ojo Alamo			
3,115.92	3,114.00	Kirtland			
3,366.11	3,364.00	Fruitland			
3,437.16	3,435.00	T/Coals			
3,562.26	3,560.00	B/Coals			
3,750.40	3,748.00	Pictured Cliffs			
3,880.50	3,878.00	Lewis			
4,941.30	4,938.00	Chacra			
5,460.69	5,457.00	U/Cliff House			
5,768.93	5,765.00	Cliff House			
5,802.95	5,799.00	Menefee			
6,016.11	6,012.00	Point Lookout			
6,516.49	6,512.00	Mancos			
7,204.68	7,137.00	Black Top			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
500.00	500.00	0.00	0.00	Start Build 2.00
611.38	611.35	1.34	-1.70	Start 6029.87 hold at 611.38 MD
6,641.25	6,636.67	146.03	-186.08	Start DLS 9.00 TFO 151.86
7,663.21	7,295.00	47.41	442.72	Start 590.00 hold at 7663.21 MD
8,253.21	7,294.88	-55.04	1,023.75	Start DLS 2.00 TFO -90.00
8,724.88	7,294.79	-98.42	1,492.89	Start 8942.28 hold at 8724.88 MD
17,667.15	7,293.03	-186.85	10,434.73	Start 135.00 hold at 17667.15 MD
17,802.15	7,293.00	-188.18	10,569.72	TD at 17802.15

Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
https://www.emnrd.nm.gov/ocd/contact-us

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

CONDITIONS

Action 477397

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 477397
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
etta trujillo	Cement is required to circulate on both surface and intermediate1 strings of casing.	6/20/2025
etta trujillo	If cement does not circulate on any string, a Cement Bond Log (CBL) is required for that string of casing.	6/20/2025
ward.rikala	Notify the OCD 24 hours prior to casing & cement.	7/15/2025
ward.rikala	File As Drilled C-102 and a directional Survey with C-104 completion packet.	7/15/2025
ward.rikala	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.	7/15/2025
ward.rikala	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.	7/15/2025